Work Order No. 15730.001.008

Pulp Dryer, No. 3 Paper Machine Vents, No. 2 and 3 Smelt Dissolving Tank Vents, and No. 1 and 2 Combination Boilers Emission Test Report

New-Indy Catawba, LLC
Catawba, South Carolina
Test Dates: 21-27 June 2021

Prepared For

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21 July 2021

WESTON SOLUTIONS, INC. (WESTON®)
INTEGRATED AIR SERVICES – AUBURN OPERATIONS
ACCREDITATION STIPULATION

Laboratory:	Weston Solutions, Inc.
Accreditor(s):	Louisiana Environmental Laboratory Accreditation Program (LELAP) – Laboratory and Emission Testing Practice
Accreditation ID:	LELAP – 03024
Scope:	Total Reduced Sulfur and Sulfur Dioxide Sampling and Analysis
Effective:	LELAP – 21 December 2001
Renewal Date:	LELAP – 30 June 2022

Data Qualifiers

The following are general reporting notes that are applicable to all WESTON reports, unless otherwise noted.

- **NL** denotes data that was not from a LELAP accredited method.
- **LNL** denotes lab results that are not from an accredited LELAP laboratory.
- **NN** denotes data that was not from The NELAC Institute (TNI) accredited method.
- **NNL** denotes lab results that are not from an accredited TNI laboratory.
- **ED** denotes data that is not to be used for compliance purposes and may deviate from approved procedures.
- **Q** denotes data whose QA/QC check did not fall within the specified range. This data is still considered valid.
- **A** denotes data that is anomalously high with no explanation for the outlier.
- **BDL** denotes values that were below the limit of detection of the analyzer and 2% of the span gas was used to calculate an emission rate.
- **DF** denotes a dilution factor.
- **NAP** denotes emission testing performed by personnel from a non-TNI accredited laboratory.
- **S** denotes analysis that has been subcontracted.
- All values are reported on a "dry" basis, unless otherwise designated as "actual" or "wet" basis.

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SECTION 1
INTRODUCTION

Weston Solutions, Inc. (WESTON®) was contracted by New-Indy Catawba, LLC (NIC) to conduct emission testing on the Pulp Dryer, No. 3 Paper Machine Vents, No. 2 and 3 Smelt Dissolving Tank Vents (SDTV), and No. 2 and 3 Combination Boilers (CB) at the NIC mill in Catawba, South Carolina. The purpose of the testing was to document the emissions from sources identified in Condition No. 5 (Order to Correct Undesirable Level of Air Contaminants) issued by the South Carolina Department of Health and Environmental Control (SC DHEC).

WESTON performed the emission testing during 21-27 June 2021. The project team included the following individuals.

Name	Project Role
Wayne Roberts	Project Manager/Test Team Leader (Team 2)
Van Dubay	Test Team Leader (Team 1)
Tyler Robinson	Test Team Member (Team 1)
Cory Lestochi	Test Team Member (Team 1)
Bryan Alldredge	Test Team Member (Team 2)
Brock Ennis	Test Team Member (Team 2)
Templeton Simpkins	Test Team Member
Chris Hartsky	Test Team Member (Liquid Sample Collection)
Natalie Hammonds	Quality Assurance Manager
Ashley Bryant	Report Coordinator

Mr. Dan Mallett of NIC coordinated the testing with mill operations and served as WESTON's technical contact throughout the effort. Mr. David Monroe of SC DHEC was present during the testing on 22, 23, and 26 June 2021. Mr. James Justice of SC DHEC was present during the testing on 22-26 June 2021. Mr. Derek Williams of SC DHEC was present during the testing on 27 June 2021.

The Louisiana Environmental Laboratory Accreditation Program (LELAP) is the accrediting body through which WESTON obtains both its LELAP and TNI accreditations. WESTON is accredited for operations in the states of Texas, Florida, and Virginia through reciprocity agreements with LELAP.

SECTION 2
RESULTS AND DISCUSSION

The test program was to be completed between 15 June 2021 and 30 June 2021 as described in Condition 5. A WESTON test team conducted cyclonic flow checks on the No. 3 Paper Machine Vents on 15 June 2021. Stack extensions were installed on all vents to meet Method 1 criteria. All vents were determined to be noncyclonic and suitable for testing.

WESTON utilized two separate mobile laboratories and two separate test teams to complete the scope of work within the described timeline. The two teams traveled to NIC on 21 June 2021 and set up all the necessary equipment for testing. Team 1 was located on the No. 1 and 2 CBs with Team 2 located at the Paper Machine. Testing was scheduled to begin on 22 June 2021 but was delayed due to issues with the pulp mill that resulted in plugging of the process lines during the evening of 21 June 2021. Mill operations were back under normal operations on 23 June 2021, and testing was initiated. Team 1 conducted sulfur dioxide (SO_2) and total reduced sulfur (TRS) measurements on CB1 operating with non-condensable gases (NCG) and stripper off gases (SOG) in the boiler followed by Condition 2, which consisted of three more sample runs with only the NCGs in CB1. Team 2 conducted testing on Paper Machine Vent 1. After reviewing the flow data collected on 23 June with the cyclonic flow data collected on 15 June, it was apparent that there was an issue with the fan on the No. 1 Paper Machine. Mill maintenance personnel verified that the belts on No. 1 and No. 2 Paper Machine Vents were damaged. The belts were replaced, and the No. 1 Paper Machine Vent testing was rescheduled for later in the week. The data collected on the No. 1 Paper Machine Vent (6-23-21) has been included in Appendix D for reference only.

On 24 June 2021, Test Team 1 conducted SO_2 and TRS measurements on CB2 while burning both the NCG and SOG gases. Test Team 2 started testing on the Paper Machine Vent 3 conducting three TRS sample runs. After completing Paper Machine Vent 3, the team moved to Paper Machine Vent 2 and conducted three one-hour TRS sample runs. It was determined through multiple discussions that the Paper Machine had a total of 7 vents rather than the 6 vents previously included in the scope of work and test plan. The 7 Paper Machine Vents are designated as Vents 1, 2, 3, 4, 6, 7, and 8. Adjustments were made to the schedule to sample all 7 vents.

On 25 June 2021, Test Team 1 conducted SO_2 and TRS measurements on CB2 while burning NCG gases only. Test Team 2 started testing on Paper Machine Vent 1 followed by Paper Machine Vent 4 and finally Paper Machine Vent 6. Three one-hour TRS sample runs were conducted on each vent.

On 26 June 2021, Test Team 1 conducted TRS measurements on the Pulp Dryer following the installation of the stack extension and scaffold. A cyclonic flow determination was conducted prior to the start of testing, and the stack was determined to be noncyclonic. Test Team 2 started testing on Paper Machine Vent 7 followed by Paper Machine Vent 8.

On 27 June 2021, Test Team 1 conducted TRS measurements on the No. 2 and 3 Combined SDTVs. All Paper Machine testing had been completed and verified as accurate.

Although cyclonic flow checks had been conducted on all the Paper Machine Vents prior to the start of testing, a second cyclonic flow check was conducted on the day of testing for each vent. The TRS concentrations on all Paper Machine Vents were less than 1 ppm. Volumetric flow rate (VFR) measurements were conducted using a Method 5 train with a heated probe, heated filter, and a cold box. A full 16-point traverse was conducted on each vent. Gravimetric measurements were conducted on each impinger before and after each run. Volumetric flow rate run time was set at 48 minutes for all flow measurements conducted simultaneously with the 60-minute TRS measurement to allow time for port changes and leak checks.

Cyclonic flow checks were also conducted prior to the start of testing on CB1, CB2, Pulp Dryer, and the SDTV. Volumetric flow rate measurements were conducted using a Method 5 train with a heated probe, heated filter, and a cold box. Gravimetric measurements were conducted on each impinger before and after each run. The VFR run time was set at 48-60 minutes for all flow measurements conducted simultaneously with the pollutant measurement.

Water samples were also collected by NIC personnel during 24-26 June 2021. These samples were analyzed by ALS Environmental at their Simi Valley, California laboratory. The samples were analyzed for five sulfur compounds using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). The laboratory report can be found in Appendix G.

All testing proceeded as planned. The test teams coordinated with mill operations to ensure each process was operating at normal operating rates. Process data is included in Appendix H to document the operating rate for each source.

Table 2-1 provides a summary of the mean emission results for each source. Tables 2-2 through 2-14 provide detailed summaries of the emission results. Tables 2-15 through 2-18 provide detailed summaries of the water sample test results. Measurement uncertainty is not shown but has been taken into consideration during method development. Any differences between the calculated results presented in the appendices and the results reported in the summary tables are due to rounding for presentation.

TABLE 2-1
SUMMARY OF MEAN EMISSION RESULTS

Source/Parameter	Mean Test Value
Pulp Dryer	
Total Reduced Sulfur, lb/hr	0.19
No. 3 Paper Machine Vent 1	
Total Reduced Sulfur, lb/hr	0.09
No. 3 Paper Machine Vent 2	
Total Reduced Sulfur, lb/hr	0.18
No. 3 Paper Machine Vent 3	
Total Reduced Sulfur, lb/hr	0.21
No. 3 Paper Machine Vent 4	
Total Reduced Sulfur, lb/hr	0.10
No. 3 Paper Machine Vent 6	
Total Reduced Sulfur, lb/hr	0.13
No. 3 Paper Machine Vent 7	
Total Reduced Sulfur, lb/hr	0.16
No. 3 Paper Machine Vent 8	
Total Reduced Sulfur, lb/hr	0.19
No. 2 and 3 Smelt Dissolving Tank Vents	
Total Reduced Sulfur, lb/hr	1.13
No. 1 Combination Boiler (Condition 1: NCG & SOG Gases)	
Total Reduced Sulfur, lb/hr	0.52
Sulfur Dioxide, lb/hr	360.9
No. 1 Combination Boiler (Condition 2: NCG Gases Only)	
Total Reduced Sulfur, lb/hr	0.44
Sulfur Dioxide, lb/hr	436.1
No. 2 Combination Boiler (Condition 1: NCG & SOG Gases)	
Total Reduced Sulfur, lb/hr	0.68
Sulfur Dioxide, lb/hr	504.0
No. 2 Combination Boiler (Condition 2: NCG Gases Only)	
Total Reduced Sulfur, lb/hr	0.77
Sulfur Dioxide, lb/hr	376.4

TABLE 2-2
PULP DRYER
SUMMARY OF TRS EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/26/21	6/26/21	6/26/21	----
Time Began	1230	1347	1506	----
Time Ended	1339	1454	1611	----
Stack Gas Data				
Temperature, °F	158	159	158	158
Velocity, ft/sec	43	44	44	43
Moisture, %	7.8	11	9.2	9.2
CO_2 Concentration, %	0.0	0.0	0.0	0.0
O_2 Concentration, %	20.8	20.9	20.9	20.9
VFR, x 10^4 dscfm	3.93	3.90	3.97	3.93
Total Reduced Sulfur				
Concentration, ppm	0.99	0.89	0.83	0.90
Emission Rate, lb/hr	0.21	0.18	0.17	0.19

TABLE 2-3
NO. 3 PAPER MACHINE VENT 1
SUMMARY OF TRS EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/25/21	6/25/21	6/25/21	----
Time Began	0755	0900	1005	----
Time Ended	0855	1000	1105	----
Stack Gas Data				
Temperature, °F	171	172	173	172
Velocity, ft/sec	64	63	63	63
Moisture, %	19	19	18	19
CO_2 Concentration, %	0.2	0.2	0.2	0.2
O_2 Concentration, %	20.2	20.2	20.2	20.2
VFR, x 10^4 dscfm	3.50	3.47	3.47	3.48
Total Reduced Sulfur				
Concentration, ppm	0.43	0.48	0.57	0.49
Emission Rate, lb/hr	0.08	0.09	0.10	0.09

TABLE 2-4
NO. 3 PAPER MACHINE VENT 2
SUMMARY OF TRS EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/24/21	6/24/21	6/24/21	----
Time Began	1310	1416	1522	----
Time Ended	1410	1516	1622	----
Stack Gas Data				
Temperature, °F	178	178	179	179
Velocity, ft/sec	78	77	80	78
Moisture, %	20	19	19	19
CO_2 Concentration, %	0.2	0.2	0.2	0.2
O_2 Concentration, %	20.2	20.2	20.2	20.2
VFR, x 10^4 dscfm	5.20	5.26	5.45	5.30
Total Reduced Sulfur				
Concentration, ppm	0.68	0.62	0.57	0.62
Emission Rate, lb/hr	0.19	0.17	0.16	0.18

TABLE 2-5
NO. 3 PAPER MACHINE VENT 3
SUMMARY OF TRS EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/24/21	6/24/21	6/24/21	----
Time Began	0937	1042	1145	----
Time Ended	1037	1142	1245	----
Stack Gas Data				
Temperature, °F	185	187	182	185
Velocity, ft/sec	83	82	82	82
Moisture, %	21	21	20	21
CO_2 Concentration, %	0.2	0.2	0.2	0.2
O_2 Concentration, %	20.2	20.2	20.2	20.2
VFR, x 10^4 dscfm	5.45	5.30	5.51	5.42
Total Reduced Sulfur				
Concentration, ppm	0.81	0.69	0.73	0.74
Emission Rate, lb/hr	0.23	0.19	0.21	0.21

TABLE 2-6
NO. 3 PAPER MACHINE VENT 4
SUMMARY OF TRS EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/25/21	6/25/21	6/25/21	----
Time Began	1135	1240	1345	----
Time Ended	1235	1340	1445	----
Stack Gas Data				
Temperature, °F	193	194	194	194
Velocity, ft/sec	55	58	55	56
Moisture, %	27	27	26	27
CO_2 Concentration, %	0.2	0.2	0.2	0.2
O_2 Concentration, %	20.2	20.2	20.2	20.2
VFR, x 10^4 dscfm	3.32	3.47	3.31	3.37
Total Reduced Sulfur				
Concentration, ppm	0.56	0.53	0.62	0.57
Emission Rate, lb/hr	0.10	0.10	0.11	0.10

TABLE 2-7
NO. 3 PAPER MACHINE VENT 6
SUMMARY OF TRS EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/25/21	6/25/21	6/25/21	----
Time Began	1555	1715	1820	----
Time Ended	1655	1816	1920	----
Stack Gas Data				
Temperature, °F	191	191	190	191
Velocity, ft/sec	79	80	76	78
Moisture, %	25	26	22	25
CO_2 Concentration, %	0.2	0.2	0.2	0.2
O_2 Concentration, %	20.2	20.2	20.2	20.2
VFR, x 10^4 dscfm	4.18	4.18	4.21	4.19
Total Reduced Sulfur				
Concentration, ppm	0.57	0.59	0.59	0.58
Emission Rate, lb/hr	0.13	0.13	0.13	0.13

TABLE 2-8
NO. 3 PAPER MACHINE VENT 7
SUMMARY OF TRS EMISSION RESULTS

	Run 1	**Run 2**	**Run 3**	**Mean**
Date	6/26/21	6/26/21	6/26/21	----
Time Began	0945	1050	1155	----
Time Ended	1046	1150	1255	----
Stack Gas Data				
Temperature, °F	188	188	190	189
Velocity, ft/sec	75	74	76	75
Moisture, %	26	24	25	25
CO_2 Concentration, %	0.2	0.1	0.2	0.2
O_2 Concentration, %	20.2	20.2	20.2	20.2
VFR, x 10^4 dscfm	6.40	6.42	6.52	6.45
Total Reduced Sulfur				
Concentration, ppm	0.42	0.43	0.52	0.46
Emission Rate, lb/hr	0.14	0.15	0.18	0.16

TABLE 2-9
NO. 3 PAPER MACHINE VENT 8
SUMMARY OF TRS EMISSION RESULTS

	Run 1	**Run 2**	**Run 3**	**Mean**
Date	6/26/21	6/26/21	6/26/21	----
Time Began	1315	1420	1525	----
Time Ended	1415	1520	1625	----
Stack Gas Data				
Temperature, °F	184	184	184	184
Velocity, ft/sec	72	74	70	72
Moisture, %	24	23	23	23
CO_2 Concentration, %	0.1	0.1	0.1	0.1
O_2 Concentration, %	20.2	20.2	20.2	20.2
VFR, x 10^4 dscfm	6.31	6.57	6.27	6.38
Total Reduced Sulfur				
Concentration, ppm	0.59	0.51	0.56	0.55
Emission Rate, lb/hr	0.20	0.18	0.19	0.19

TABLE 2-10
NO. 2 AND 3 SMELT DISSOLVING TANK VENTS
SUMMARY OF TRS EMISSION RESULTS

	Run 1	**Run 2**	**Run 3**	**Mean**
Date	6/27/21	6/27/21	6/27/21	----
Time Began	1100	1222	1344	----
Time Ended	1210	1331	1454	----
Stack Gas Data				
Temperature, °F	168	170	169	169
Velocity, ft/sec	31	33	32	32
Moisture, %	39	41	41	40
CO_2 Concentration, %	0.0	0.0	0.0	0.0
O_2 Concentration, %	20.1	20.0	20.3	20.1
VFR, x 10^4 dscfm	2.60	2.61	2.54	2.58
Total Reduced Sulfur				
Concentration, ppm	7.36	9.23	8.20	8.26
Emission Rate, lb/hr	1.02	1.28	1.10	1.13

TABLE 2-11
NO. 1 COMBINATION BOILER
CONDITION 1: NCG AND SOG GASES
SUMMARY OF TRS AND SO_2 EMISSION RESULTS

	Run 1	**Run 2**	**Run 3**	**Mean**
Date	6/23/21	6/23/21	6/23/21	----
Time Began	1158	1400	1541	----
Time Ended	1258	1500	1641	----
Stack Gas Data				
Temperature, °F	415	418	415	416
Velocity, ft/sec	59	57	57	57
Moisture, %	17	18	16	17
CO_2 Concentration, %	7.8	8.4	7.7	8.0
O_2 Concentration, %	12.1	11.4	12.0	11.8
VFR, x 10^5 dscfm	1.35	1.31	1.33	1.33
Total Reduced Sulfur				
Concentration, ppm	0.78	0.71	0.70	0.73
Emission Rate, lb/hr	0.56	0.49	0.50	0.52
Sulfur Dioxide				
Concentration, ppm	195	278	344	272
Emission Rate, lb/hr	262.7	362.5	457.4	360.9

TABLE 2-12
NO. 1 COMBINATION BOILER
CONDITION 2: NCG GASES ONLY
SUMMARY OF TRS AND SO_2 EMISSION RESULTS

	Run 1	**Run 2**	**Run 3**	**Mean**
Date	6/23/21	6/23/21	6/23/21	----
Time Began	1824	2019	2202	----
Time Ended	1924	2119	2302	----
Stack Gas Data				
Temperature, °F	416	411	415	414
Velocity, ft/sec	56	56	56	56
Moisture, %	16	16	17	17
CO_2 Concentration, %	8.3	7.8	8.1	8.1
O_2 Concentration, %	11.4	11.9	11.6	11.6
VFR, x 10^5 dscfm	1.30	1.31	1.30	1.30
Total Reduced Sulfur				
Concentration, ppm	0.63	0.60	0.67	0.63
Emission Rate, lb/hr	0.43	0.42	0.46	0.44
Sulfur Dioxide				
Concentration, ppm	313	348	349	337
Emission Rate, lb/hr	404.4	452.9	450.8	436.1

TABLE 2-13
NO. 2 COMBINATION BOILER
CONDITION 1: NCG AND SOG GASES
SUMMARY OF TRS AND SO_2 EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/24/21	6/24/21	6/24/21	----
Time Began	1445	1630	1806	----
Time Ended	1545	1730	1906	----
Stack Gas Data				
Temperature, °F	475	474	479	476
Velocity, ft/sec	69	69	69	69
Moisture, %	14	14	15	14
CO_2 Concentration, %	6.6	6.9	7.3	6.9
O_2 Concentration, %	13.1	12.7	12.3	12.7
VFR, x 10^5 dscfm	1.57	1.56	1.54	1.56
Total Reduced Sulfur				
Concentration, ppm	0.92	0.76	0.77	0.82
Emission Rate, lb/hr	0.77	0.63	0.63	0.68
Sulfur Dioxide				
Concentration, ppm	324	327	322	324
Emission Rate, lb/hr	508.7	507.2	496.1	504.0

TABLE 2-14
NO. 2 COMBINATION BOILER
CONDITION 2: NCG GASES ONLY
SUMMARY OF TRS AND SO_2 EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/25/21	6/25/21	6/25/21	----
Time Began	1000	1135	1315	----
Time Ended	1100	1235	1415	----
Stack Gas Data				
Temperature, °F	468	470	481	473
Velocity, ft/sec	68	69	69	69
Moisture, %	14	14	14	14
CO_2 Concentration, %	6.9	6.8	7.3	7.0
O_2 Concentration, %	12.8	12.7	12.3	12.6
VFR, x 10^5 dscfm	1.56	1.55	1.56	1.56
Total Reduced Sulfur				
Concentration, ppm	1.04	0.99	0.76	0.93
Emission Rate, lb/hr	0.86	0.82	0.63	0.77
Sulfur Dioxide				
Concentration, ppm	247	245	235	242
Emission Rate, lb/hr	383.2	380.0	366.2	376.4

TABLE 2-15
PAPER MACHINE 3 WHITEWATER (SAMPLE ID: 3A)
SUMMARY OF RESULTS

Date	Time	Hydrogen Sulfide (µg/L)	Methyl Mercaptan (µg/L)	Dimethyl Sulfide (µg/L)	Carbon Disulfide (µg/L)	Dimethyl Disulfide (µg/L)
6/24/21	10:00	200,000	740	ND	ND	ND
6/24/21	11:15	210,000	700	ND	ND	ND
6/24/21	11:15 (Duplicate)	190,000	840	310	ND	680
6/24/21	12:10	170,000	640	ND	ND	ND
6/24/21	13:31	160,000	540	ND	ND	ND
6/24/21	14:50	170,000	560	ND	ND	ND
6/24/21	16:00	190,000	830	360	ND	710
6/25/21	08:17	190,000	790	ND	ND	ND
6/25/21	09:24	130,000	560	170	ND	ND
6/25/21	10:30	150,000	710	170	ND	ND
6/25/21	12:00	130,000	620	340	ND	550
6/25/21	12:55	140,000	730	180	ND	ND
6/25/21	14:03	180,000	1,200	400	ND	840
6/25/21	16:30	160,000	1,300	ND	ND	430
6/25/21	17:40	170,000	1,300	ND	ND	250
6/25/21	18:45	140,000	1,300	ND	ND	ND
6/26/21	10:10	90,000	1,100	420	ND	710
6/26/21	11:25	75,000	1,700	180	ND	170
6/26/21	12:30	59,000	2,000	170	ND	ND
6/26/21	14:00	42,000	1,500	150	ND	170
6/26/21	14:45	37,000	1,500	ND	ND	120
6/26/21	15:50	41,000	1,700	190	22	81

Note: ND (Not Detected). The compound was analyzed but not detected above the laboratory report limit.

TABLE 2-16
PULP DRYER WATER (SAMPLE ID: 3B)
SUMMARY OF RESULTS

Date	Time	Hydrogen Sulfide (µg/L)	Methyl Mercaptan (µg/L)	Dimethyl Sulfide (µg/L)	Carbon Disulfide (µg/L)	Dimethyl Disulfide (µg/L)
6/26/21	13:05	9.4	7.7	37	ND	11
6/26/21	14:15	7.7	5.8	42	ND	15
6/26/21	15:30	5.4	5.9	47	ND	17

Note: ND (Not Detected). The compound was analyzed but not detected above the laboratory report limit.

TABLE 2-17
STEAM STRIPPER INLET FOUL CONDENSATE (SAMPLE ID: 2A)
SUMMARY OF RESULTS

Date	Time	Hydrogen Sulfide (µg/L)	Methyl Mercaptan (µg/L)	Dimethyl Sulfide (µg/L)	Carbon Disulfide (µg/L)	Dimethyl Disulfide (µg/L)
6/24/21	15:10	130,000	14,000	16,000	ND	13,000
6/24/21	15:10 Duplicate	140,000	14,000	16,000	ND	17,000
6/24/21	17:00	140,000	17,000	18,000	ND	14,000
6/24/21	18:45	150,000	19,000	18,000	ND	16,000
6/25/21	10:35	130,000	12,000	12,000	ND	11,000
6/25/21	12:05	120,000	10,000	12,000	ND	9,600
6/25/21	13:45	190,000	22,000	22,000	ND	23,000

Note: ND (Not Detected). The compound was analyzed but not detected above the laboratory report limit.

TABLE 2-18
STEAM STRIPPER OUT (SAMPLE ID: 2B)
SUMMARY OF RESULTS

Date	Time	Hydrogen Sulfide (µg/L)	Methyl Mercaptan (µg/L)	Dimethyl Sulfide (µg/L)	Carbon Disulfide (µg/L)	Dimethyl Disulfide (µg/L)
6/24/21	15:15	5,000	200	2,800	ND	4,100
6/24/21	15:15 Duplicate	3,200	94	3,000	ND	4,400
6/24/21	17:05	7,100	540	2,900	ND	3,900
6/24/21	18:50	8,100	760	3,000	ND	4,100
6/25/21	10:40	3,300	100	2,400	ND	3,600
6/25/21	12:10	550	4.8	1,900	2.0	3,000
6/25/21	13:50	3,500	260	2,500	ND	4,300

Note: ND (Not Detected). The compound was analyzed but not detected above the laboratory report limit.

SECTION 3
SOURCE TESTING METHODOLOGY

The emission testing program was conducted in accordance with the U.S. EPA Reference Methods summarized in Table 3-1. Method descriptions and quality assurance data are provided in the referenced appendices.

TABLE 3-1
SOURCE TESTING METHODOLOGY

Parameter	Method Number	Appendix Reference Method Description	Appendix Reference Quality Control Data	Comments
Volumetric Flow Rate	1,2,4	B.1	H	
Gas Composition	3A	B.2	H	Instrumental
Gas Composition (Bags)	3A	B.3	H	See Note
Total Reduced Sulfur	16	B.4	H	
Sulfur Dioxide	6C	B.5	H	Instrumental

Note: Oxygen (O_2) and carbon dioxide (CO_2) concentrations for the Pulp Dryer, No. 3 Paper Machine Vents, and the No. 2 and 3 SDTVs were determined from integrated bag samples collected concurrently with the TRS sampling. These samples were analyzed instrumentally using an analyzer calibrated according to the procedures of Method 3A.

These results meet all requirements of TNI unless otherwise specified.

The results within this report relate only to the samples listed in the body of this report.

SECTION 4
QUALITY ASSURANCE/ QUALITY CONTROL

4.1 QUALITY CONTROL PROCEDURES

As part of all testing, WESTON implements a QA/QC program. The field team leader is responsible for implementation of field QA/QC procedures. Individual laboratory managers are responsible for implementation of analytical QA/QC procedures. The overall project manager and the Quality Assurance Manager oversee all QA/QC procedures to ensure that sampling and analyses meet the QA/QC requirements and that accurate data results are generated from the test program.

4.2 GAS STREAM SAMPLING QA/QC PROCEDURES

General checks that are conducted during testing and apply to all methods include the following:

- Performance of leak checks.
- Use of standardized forms, labels, and checklists.
- Maintenance of sample traceability.
- Collection of appropriate blanks.
- Use of calibrated instrumentation.
- Review of data sheets in the field to verify completeness.
- Use of validated spreadsheets for calculation of results.

The following section details the specific procedures applied to the reference method sampling system.

Instrumental Reference Method Sampling Systems

- The sampling system (probe to sample conditioner) is leak-checked prior to the testing.

- All analyzers are calibrated prior to testing to ensure precise and accurate data. Protocol standards are used to calibrate each of the analyzers. Each analyzer is calibrated at three to four points (zero, low, mid, and high range) depending on reference method requirements. Nitrogen or hydrocarbon-free air is used to set the instrument zero. The CO_2 and O_2 calibration standards are 40 to 60 and 100% of span.

- Pre- and post-test calibration bias and calibration drift tests are performed for each test run. The bias check is performed with the calibration standard that is closest to the observed concentration in the sample gas. The average pretest/posttest bias did not exceed 5% of full scale. The calibration drift did not exceed 3%.

- Prior to formal testing, a 12-point stratification check is performed at the test location. Alternatively, per Section 8.1.2 of EPA Method 7E, a three-point stratification check passing through the centroidal area of the stack is performed. The three points (16.7, 50, and 83.3% of the stack diameter) are sampled a minimum of two times the system response.

- A response time check is performed before sampling. Sample flow rate must be maintained within 10% of the flow rate at which the system response time was measured.

- A permanent data record of analyzer responses is recorded using computer software designed by WESTON.

4.3 QA/QC CHECKS FOR DATA REDUCTION AND VALIDATION

All data and/or calculations for flow rates and moisture contents, which are made using a computer software program, are validated by an independent check. In addition, all calculations are spot checked for accuracy and completeness by the Field Team Manager.

In general, all measurement data are validated based on the following criteria:

- Process conditions during sampling or testing.
- Acceptable sample collection procedures.
- Consistency with expected or other results.
- Adherence to prescribed QC procedures.

Any suspect data are flagged and identified with respect to the nature of the problem and potential effect on the data quality.

Upon completion of testing, the Field Team Manager is responsible for preparation of a complete data summary including calculation results, raw data sheets, and laboratory reports.

APPENDIX A
SAMPLE CALCULATIONS

SAMPLE CALCULATIONS

No. 3 Paper Machine Vent 1

Run No. 1

Meter Pressure (Pm), in. Hg

$$Pm = Pb + \frac{\Delta H}{13.6\ in.\ H_2O/in.\ Hg}$$

where, Pb = barometric pressure, in. Hg
ΔH = Pressure differential of orifice in. H_2O

$$Pm = 29.68\ in.\ Hg + \frac{1.300\ in.\ H_2O}{13.6\ in.\ H_2O/in.\ Hg} = 29.78\ in.\ Hg$$

Absolute Stack Gas Pressure (Ps), in. Hg

$$Ps = Pb + \frac{Pg}{13.6\ in.\ H_2O/in.\ Hg}$$

where, Pb = barometric pressure, in. Hg
Pg = Static Pressure, in. H_2O

$$Ps = 29.68\ in.\ Hg + \frac{-0.65\ in.H_2O}{13.6\ in.\ H_2O/in.\ Hg} = 29.63\ in.\ Hg$$

Standard Meter Volume (Vmstd), dscf

$$Vmstd = \frac{17.64\ °R/in.\ Hg\ x\ Y\ x\ Vm\ x\ Pm}{Tm}$$

where, Y = meter correction factor
Vm = meter volume, dscf
Pm = meter pressure, in. Hg
Tm = meter temperature, °R

$$Vmstd = \frac{17.64\ °R/in.\ Hg\ x\ 1.003\ x\ 29.740\ dscf\ x\ 29.78\ in.\ Hg}{522.2\ °R} = 30.003\ dscf$$

Standard Wet Volume (Vwstd), scf

$$Vwstd = 0.04707 ft^3/mL\ x\ Vlc$$

where, Vlc = volume of H_2O collected, mL

$$Vwstd = 0.04707\, ft^3/mL \;x\; 147.7\;mL \;=\; 6.952\, scf$$

Moisture Fraction (Measured), (Bws)

$$Bws = \frac{Vwstd}{(Vwstd + Vmstd)} = \frac{6.952\; scf}{6.952\; scf\; +\; 30.003\; dscf} = 0.188$$

where, Vwstd = standard wet volume, scf
Vmstd = standard meter volume, dscf

Moisture %, (Bws %)

$$Bws \;=\; Bws \;x\; 100 \;=\; 0.188 \;x\; 100 \;=\; 18.8$$

where, Bws = moisture fraction, measured or at saturation, whichever is lowest

Molecular Weight (DRY) (Md), lb/lb-mole

$$Md \;=\; (0.44 \;x\,\%\,CO_2) + (0.32 \;x\,\%\,O_2) + (0.28\,(100 - \%\,CO_2 - \%\,O_2))$$

$$Md \;=\; (0.44 \;x\; 0.2) \;+\; (0.32 \;x\; 20.2) \;+\; (0.28\;(100 - 0.2 - 20.2)) \;=\; 28.84\; lb/lb\text{-}mole$$

Molecular Weight (WET) (Ms), lb/lb-mole

$$Ms \;=\; Md\;\;(1 - Bws)\;\; + 18\;(Bws)$$

where, Md = molecular weight (DRY), lb/lb-mole
Bws = moisture fraction, dimensionless

$$Ms = 28.84\; lb/lb\text{-}mole\;\;(1 - 0.188)\;\; + 18\;(0.188) = 26.80\; lb/lb\text{-}mole$$

Average Velocity (Vs), ft/sec

$$Vs = 85.49\,\frac{ft}{sec}\sqrt{\frac{(lb/lb - mole)\;(in.\;Hg)}{(°R)(in.\;H_2O)}}\;\; x\;\; Cp\;\; x\;\; \sqrt{Delta\;P}\;\; avg.\;\; x\;\; \sqrt{\frac{Ts}{Ps\;x\;Ms}}$$

where, Cp = pitot tube coefficient
Delta P = velocity head of stack gas, in. H_2O
Ts = absolute stack temperature, °R
Ps = absolute stack gas pressure, in. Hg
Ms = molecular weight of stack gas, lb/lb-mole

$$Vs = 85.49\;\frac{ft}{sec}\;\sqrt{\frac{(lb/lb\text{-}mole)\;(in.\;Hg)}{(°R)(in.H_2O)}}\;\; x\;\; 0.84\;\; x\;\; 0.993\; in.\; H_2O\;\; x\;\; \sqrt{\frac{631.2\;\;°R}{29.63\;\; in.\;\; Hg\; x\; 26.80\;\; lb/lb\text{-}mole}}$$

$$Vs \;=\; 63.60\; ft/sec$$

Average Stack Gas Flow at Stack Conditions (Qa), acfm

$$Qa = 60\ sec/min\ \ x\ \ Vs\ \ x\ \ As$$

where, Vs = stack gas velocity, ft/sec
As = cross-sectional area of stack, ft^2

$$Qa = 60\ sec/min\ \ x\ \ 63.60\ ft/sec\ \ x\ \ 13.64\ ft^2 = 5.20\ E{+}4\ acfm$$

Average Stack Gas Flow at Standard Conditions (Qs), dscfm

$$Qs = 17.64\ \frac{°R}{in.\ Hg}\ \ x\ \ Qa\ \ x\ \ (1 - Bws)\ \ x\ \ \frac{Ps}{Ts}$$

where, Qa = average stack gas flow at stack conditions, ft^3/min
Bws = moisture content (dimensionless)
Ps = absolute stack gas pressure, in. Hg
Ts = absolute stack temperature, °R

$$Qs = 17.64\ \frac{°R}{in.\ Hg}\ \ x\ \ 5.20\ E{+}4\ \frac{acf}{min}\ \ x\ \ (1 - 0.188)\ \ x\ \ \frac{29.63\ in.\ Hg}{631.2\ °R} = 3.50\ E{+}4\ \ dscfm$$

Total Reduced Sulfur Emission Rate (EMR), lb/hr

$$EMR = \frac{TRS\ conc.\ \ x\ \ MW\ \ x\ \ Qs\ \frac{dscf}{min}\ \ x\ \ 60\ \frac{min}{hr}\ \ x\ \ 28.32\ \frac{L}{dscf}}{24.04\ \frac{L}{g-mole}\ \ x\ \ 1.0\ x\ 10^6\ \frac{\mu L}{L}\ \ x\ \ 454\ \frac{g}{lb}}$$

where, MW = molecular weight of TRS, 34.08 g/g-mole
Qs = stack gas flow at standard conditions, dscfm

$$EMR = \frac{0.43\ ppm\ \ x\ \ 34.08\ \frac{g}{g\text{-}mole}\ \ x\ \ 3.50\ E{+}4\ \frac{dscf}{min}\ \ x\ \ 60\ \frac{min}{hr}\ \ x\ \ 28.32\ \frac{L}{dscf}}{24.04\ \frac{L}{g\text{-}mole}\ \ x\ \ 1.0\ x\ 10^6\ \frac{\mu L}{L}\ \ x\ \ 454\ \frac{g}{lb}} = 0.08\ lb/hr$$

Note: Sulfur dioxide was calculated using the same equation as presented for TRS, substituting molecular weight.

APPENDIX B
TEST METHODOLOGY

B.1 VOLUMETRIC FLOW RATE

Mass emission rates are calculated by multiplying measured target analyte concentrations by calculated volumetric flow rates. Volumetric flow rates are determined using measurement data obtained by EPA Reference Methods 1-4.

The ductwork is measured at the sample location to the nearest 0.25 inch using a steel tape measure. Traverse points are selected in accordance with EPA Reference Method 1 on the basis of ductwork dimensions, geometry, and upstream and downstream disturbances. When a sample location does not meet EPA Reference Method 1 criteria, the maximum recommended number of traverse points are used.

Gas Velocity

The velocity of the gas stream is measured in accordance with EPA Reference Method 2 by reading the instantaneous velocity pressure at each traverse point using an "S" type pitot tube and a leveled, inclined manometer with a scale of 0 to 10 inches. In rare cases of highly negative pressure sources, a Magnahelic gauge with scales of 0 to 5 or 0 to 25 inches of water may be used in place of an inclined manometer. The stack pressure is calculated from the measured static pressure of the stack and the ambient barometric pressure corrected for elevation when applicable. The static pressure is measured by using the static side of the pitot tube, and the barometric pressure is measured using a calibrated aneroid barometer. The stack temperature is measured at each traverse point with a calibrated thermocouple and pyrometer.

Gas Composition and Moisture Content

The composition of the gas stream will be measured in accordance with EPA Reference Method 3 and/or 3A using an Orsat analyzer or Paramagnetic O_2 and Infrared CO_2 analyzers using Protcol-1 gases. Gas composition determinations are conducted using integrated sampling techniques.

Integrated samples are collected by withdrawing a sample from the M5 sampling train into a Tedlar sample bag.

The moisture content of the gas stream is determined according to EPA Reference Method 4, by collecting an integrated sample of source gas from a single point on the gas stream. At the conclusion of each run the volume of condensed moisture collected in the impingers of the sampling train is measured and used to evaluate the moisture content of the gas stream.

When sources are saturated or contain entrained water droplets, moisture content is also determined using the temperature measured at each traverse point and psychometric chart values corrected for stack pressure or by use of saturation vapor pressure tables. In these conditions, the lower moisture of the measured and saturation based values is used for volumetric flow rate calculations.

The molecular weight of the gas stream is calculated using the determined moisture, oxygen, and carbon dioxide concentrations. The balance of the gas stream is assumed to be nitrogen. The volumetric flow is then calculated at stack and standard conditions using the calculated molecular weight, the measured stack temperature, and measured velocity, stack and barometric pressures. Standard conditions are 68 °F and 29.92 inches of mercury and 0% moisture.

Data Acquisition and Reporting

Data are recorded at the time of collection on preprinted data sheets. Calculations are performed (where possible) with preprogrammed calculators or spreadsheet software.

Quality Control

Quality control procedures for volumetric flow measurements involve leak checks of pitot tubes, pitot tube lines and manometers; calibration of gas metering systems; and periodic calibration checks of thermocouples and pyrometers. Magnahelics are verified against inclined manometers prior to each use.

Data transfers are minimized. Data sheets are checked for completeness and accuracy. Calculations are verified by a second person.

B.2 GAS COMPOSITION (INSTRUMENTAL)

Oxygen (O_2) and carbon dioxide (CO_2) testing is conducted in accordance with EPA Reference Method 3A.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. The sample is withdrawn continuously from the source through a heated probe, filter, and sample line to a sample conditioner which removes moisture from the gas stream. The sample is then transported to a Paramagnetic O_2 analyzer and an Infrared CO_2 analyzer.

Sample Analysis

The O_2 analyzer uses an electrochemical cell or a paramagnetic detector, and the CO_2 analyzer uses a non-dispersive infra-red (NDIR) detector to produce an electrical signal which is linearly proportional to the O_2 and CO_2 concentration, respectively.

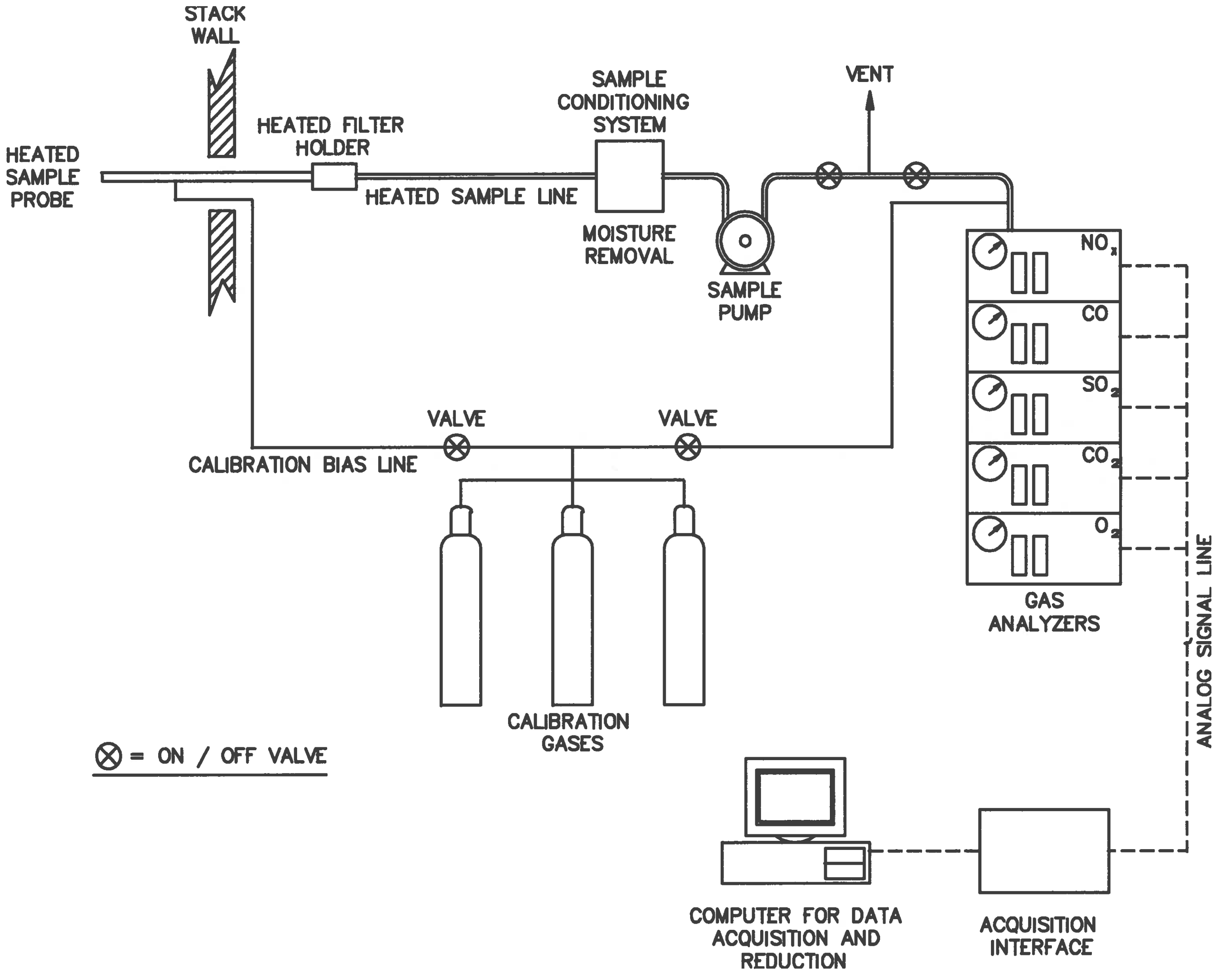

Figure B-1 Continuous Emission Monitoring System

Data Acquisition and Reduction

Data are acquired electronically using a computer with software designed by WESTON for EPA Reference Method 3A analysis. This system generates a calibration curve, converts electronic signals into concentrations, and provides one-minute averages during the sample run and an average concentration over the duration of the sample run.

Quality Control

At the time of analysis, O_2 and CO_2 in nitrogen calibration gases certified according to EPA Protocol-1, are used to calibrate the analyzer and to determine a bias correction factor for the entire system bias in accordance with EPA Reference Method 3A. The calibration gases are introduced directly to the analyzer to generate the calibration curve. A zero gas and an upscale calibration gas are introduced at the probe and recovered through the sampling and analytical system. A bias correction factor is calculated using the ratio of the concentration measured from the sampling system and concentration measured directly at the analyzer. Sample run averages are corrected for system bias results.

B.3 GAS COMPOSITION (BAGS WITH INSTRUMENTAL ANALYSIS)

Oxygen (O_2) and carbon dioxide (CO_2) measurement is conducted by collecting integrated samples in Tedlar® gas-sampling bags collected according to the procedures specified in EPA Reference Method 3. The samples are analyzed on equipment operated and calibrated according to EPA Reference Method 3A.

Sampling Equipment and Procedures

Samples of the source gas are collected in Tedlar® gas-sampling bags. The gas is sampled at a constant flow rate over the duration of a test run at each traverse point. The flow rate is set to a value which results in a sample volume that is adequate for analysis without overfilling the bag. The sample passes through a moisture condenser before entering the bag.

Sample Analysis

Analysis of the sample is performed by attaching the bag directly to the inlets of electronic O_2 and CO_2 analyzers. These analyzers are calibrated before analysis using the procedures described in Method 3A. At least three data points are recorded for each sample, and the sample concentration is taken as the average of these values.

The oxygen analyzer uses a paramagnetic detector. This device exploits magnetic properties unique to O_2 to produce an electrical signal that is linearly proportional to the concentration of the gas.

The carbon dioxide analyzer uses non-dispersive infrared (NDIR) technology. The sample gas is passed through a chamber through which is passed infrared light of a wavelength that is specific to CO_2. The CO_2 in the gas absorbs light of this wavelength to a degree that is proportional to the CO_2 concentration. The electronics in the analyzer measure the absorption of the light and produce a signal that is linearly proportional to the gas concentration.

Data Acquisition and Reduction

The electrical outputs of the analyzers are connected to an analog-to-digital (A/D) conversion device installed in a Windows®-based computer running software designed by WESTON for analysis by Method 3A and similar EPA Methods.

The software reads the values presented by the A/D device at one-second intervals and periodically records averages of these readings. The software also handles calibrations and the generation of calibration curves and performs all calculations, including the determination of gas concentrations from the recorded inputs.

Quality Control

The bags and the equipment used to fill the bags are checked for leaks before sampling begins. Bags are analyzed as soon as possible after sample collection and are not held for more than 8 hours before analysis.

The analyzers are calibrated prior to analysis using gas mixtures certified by their manufacturer according to EPA Protocol 1. For calibration, the gases are introduced directly to the analyzers.

B.4 TOTAL REDUCED SULFUR

Total reduced sulfur testing is performed using the procedures described in EPA Reference Method 16. When TRS data must be oxygen corrected, EPA Reference Method 3A using a calibrated O_2 analyzer, is performed on an integrated bag sample to measure oxygen concentration.

Sampling Equipment and Procedures

Figure B-2 illustrates the sampling system. A Teflon®-lined, stainless steel probe of sufficient length to monitor the gas stream (without wall effects) is used to extract a gas sample from the emission source. The probe tip is directed away from stack gas flow to minimize particulate and moisture entrainment. The probe is connected directly to the recovery gas line and sample conditioning system.

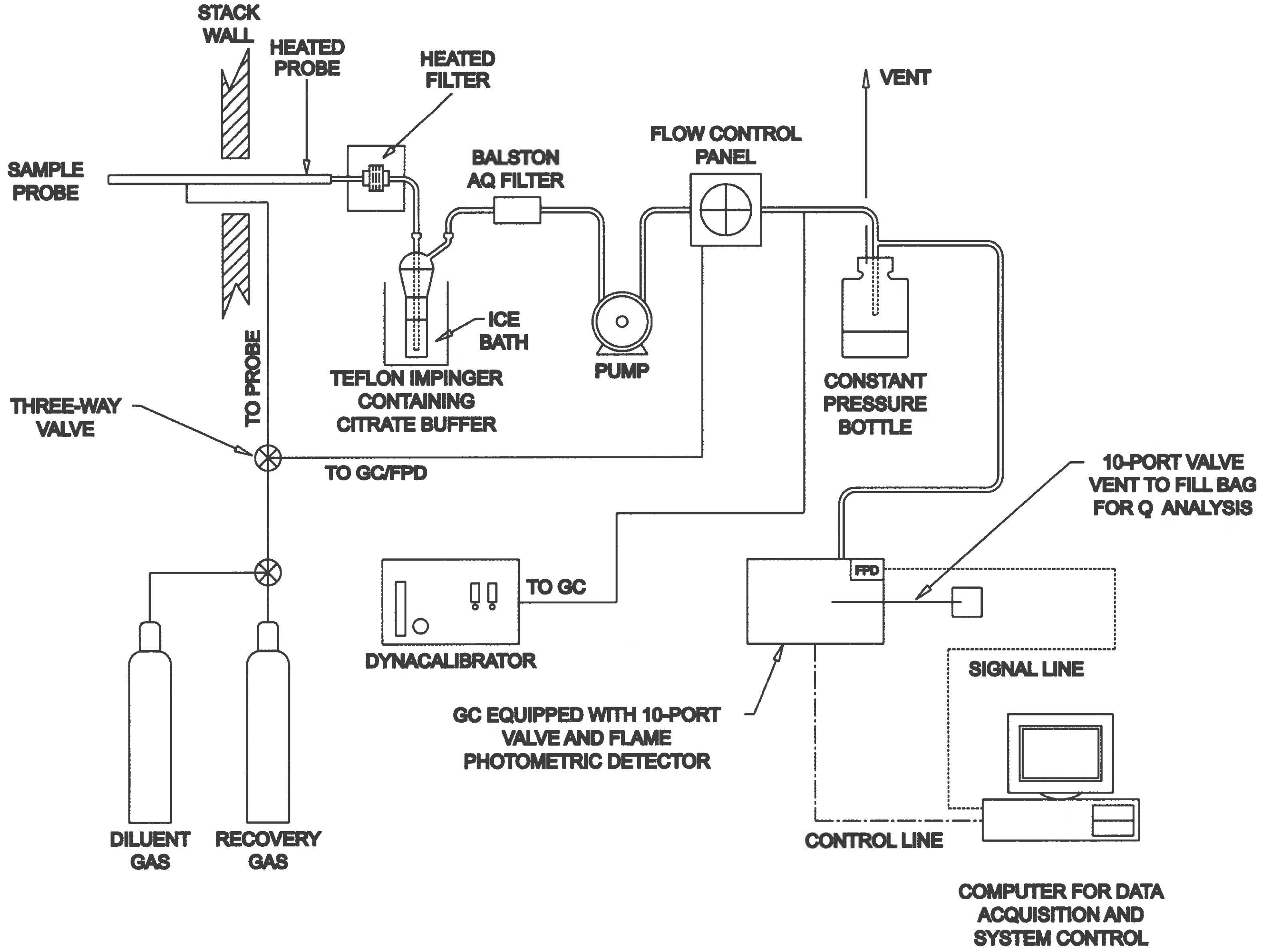

Figure B-2 EPA Reference Method 16 Sampling and Analytical Train

The sample conditioning system consists of a Teflon® impinger containing 1.5M citrate buffer, adjusted to a pH of 5.4 to 5.6, maintained in an ice bath. Moisture is condensed in the impingers, yielding a dry sample and thus eliminating the need for heated sample lines. Even though the impinger set traps entrained particulate matter, very fine particulate matter is removed by a Balston® AQ Microfiber filter installed at the impinger outlet.

An unheated nylon line is connected from the filter to the sample pump inlet. Sample line length and connections are minimized to reduce surface adsorption of TRS and the possibility of leaks.

The pump outlet is connected directly to a constant pressure bottle. At this point, a major portion of the sample is vented to the atmosphere, and the remainder is used to charge the gas chromatograph (GC) sample loop. The GC sample loop outlet is connected to a Tedlar® gas collection bag gas sample collection and subsequent analysis using a calibrated O_2 analyzer.

Sample Analysis

Separation of hydrogen sulfide (H_2S), methyl mercaptan (MeSH), dimethyl sulfide (DMS), and dimethyl disulfide (DMDS) is accomplished by gas chromatography using a column suitable for separating these compounds. After resolution of H_2S, MeSH, and DMS, the column is backflushed to achieve resolution of DMDS within 2-3 minutes from sample injection. The gas chromatograph is operated on periodic cycle to produce a minimum of 20 injections per hour.

Detection of reduced sulfur compounds is accomplished with a flame photometric detector (FPD). The FPD response is calibrated before and after testing using gas phase standards prepared from gravimetrically certified permeation devices.

Data Acquisition and Reduction

The FPD responses are recorded by a computer equipped with software designed by WESTON for reduced sulfur compound analysis. The software controls the timing of the gas-chromatographic cycle, integrates and records peaks, performs calculations, and prints the results. Calibration curves are generated by the software using log-log linear least squares best fit of the data.

Quality Control

Permeation devices certified by the vendor are used to calibrate the FPD response. They are kept in a permeation chamber that is maintained at a constant temperature of 50° $\pm$ 1°C, the temperature at which the vendor certified the permeation rates. This assures that the actual permeation rates are the same as the certified rates. This temperature is verified at the time of sampling using a National Institute of Standards and Technology (NIST) traceable mercury-in-glass thermometer.

VICI-Metronics, Santa Clara, California, supplied the permeation devices for the testing. The devices are gravimetrically analyzed to measure the emission rate before shipment.

Various concentrations of the permeants are generated by varying the flow of the diluent gas stream over the devices. A calibration curve is constructed of at least three concentrations of each permeant; three successive injections at each concentration yield peak areas that differ from the mean peak area value by less than 5%.

Sampling system integrity is evaluated after every three hours of sampling by injecting a known concentration of H_2S at the probe tip and recovering the sample through the sample conditioning and sample transport subsystems. The same gas stream is then introduced directly to the GC sample loop. The ratio of concentrations corresponds to the system correction factor. This factor is then used to adjust measured reduced sulfur compound concentrations.

A system audit gas (of appropriate H_2S concentration) is used to evaluate the analytical system integrity each test day.

B.5 SULFUR DIOXIDE (INSTRUMENTAL)

Sulfur dioxide (SO_2) testing is conducted in accordance with EPA Reference Method 6C.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. The sample is withdrawn from the source through a heated probe, heated filter, and heated sample line to a sample conditioner which removes moisture from the gas stream. The sample is then transported to the analyzer through a Teflon® line.

Sample Analysis

The analyzer measures, at two discrete wavelengths, the absorption of ultraviolet radiation by the gas sample. The concentration of the components absorbing the light are then determined from relationships developed through application of the ideal gas law in concert with the laws of Bouguer, Beer, and Lambert.

Data Acquisition and Reduction

Data are acquired electronically using a computer with software designed by WESTON for EPA Reference Method 6C analysis. This system generates a calibration curve, converts electronic signals into concentrations, and provides bias-corrected averages.

Quality Control

At the time of analysis, SO_2 in nitrogen calibration gases (certified according to EPA Protocol-1) are used to calibrate the analyzer and to determine a bias correction factor for the entire system in accordance with EPA Reference Method 6C.

Calibration gases are introduced directly to the analyzer to generate the calibration curve. Zero level and upscale calibration gases are introduced at the probe and recovered through the sampling and analytical system. A bias correction factor is then calculated using the ratio of the measured concentration of the bias gas introduced through the sampling system and the measured concentration of the bias gas introduced directly to the analyzer. Run averages are adjusted for this bias correction factor.

APPENDIX C
FIELD DATA – PULP DRYER

New Indy
Catawba, SC

15730.001.008
Pulp Dryer

EMISSION CALCULATIONS

	Run 1	Run 2	Run 3	Mean
Date	**6/26/21**	**6/26/21**	**6/26/21**	---
Time Began	**1230**	**1347**	**1506**	---
Time Ended	**1339**	**1454**	**1611**	---
Volumetric Flow Rate, (Qs), DSCFM	3.93E+04	3.90E+04	3.97E+04	3.93E+04
BWS	0.078	0.106	0.092	0.092
% Oxygen	20.8	20.9	20.9	20.9

Total Reduced Sulfur (TRS MW)= 34.08				
Concentration, ppm	0.99	0.89	0.83	0.90
Emission Rate, lb/hr	0.21	0.18	0.17	0.19

SH

New Indy
Catawba, SC

15730.001.008
Pulp Dryer

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/26/21	6/26/21	6/26/21	---
Time Began		1230	1347	1506	---
Time Ended		1341	1455	1614	---
	INPUT DATA				
Sampling Time, min	(Theta)	64.0	64	64	64
Stack Diameter, in.	(Dia.)	60	60	60	60
Barometric Pressure, in. Hg	(Pb)	29.70	29.70	29.70	29.70
Static Pressure, in. H2O	(Pg)	-0.27	-0.27	-0.27	-0.27
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	0.9880	0.9880	0.9880	0.9880
Orifice Calibration Value	(Delta H@)	1.7320	1.7320	1.7320	1.7320
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	42.959	43.492	43.845	43.432
Meter Temperature, °F	(Tm)	86.8	92.3	93.6	90.9
Meter Temperature, °R	(Tm-R)	546.8	552.3	553.6	550.9
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	73.0	102.8	88.4	88.1
CO2 Concentration, %	(CO2)	0.0	0.0	0.0	0.0
O2 Concentration, %	(O2)	20.8	20.9	20.9	20.9
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	0.689	0.702	0.705	0.699
Stack Temperature, °F	(Ts)	157.8	158.8	157.8	158.1
Stack Temperature, °R	(Ts-R)	617.8	618.8	617.8	618.1
Moisture Fraction (at Saturation)	(BWS)	0.309	0.316	0.309	0.311
	CALCULATED DATA				
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	19.63	19.63	19.63	19.63
Stack Pressure, in. Hg	(Ps)	29.68	29.68	29.68	29.68
Meter Pressure, in. Hg	(Pm)	29.80	29.80	29.80	29.80
Standard Meter Volume, ft^3	(Vmstd)	40.797	40.896	41.130	40.941
Standard Water Volume, ft^3	(Vwstd)	3.436	4.839	4.161	4.145
Moisture Fraction (Measured)	(BWS)	0.078	0.106	0.092	0.092
Moisture Fraction (lower sat/meas)	(BWS)	0.078	0.106	0.092	0.092
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	28.83	28.84	28.84	28.83
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	27.99	27.69	27.84	27.84
Average Stack Gas Velocity, ft/sec	(Vs)	42.65	43.74	43.78	43.39
Stack Gas Flow, actual, ft^3/min	(Qa)	50245	51527	51580	51118
Stack Gas Flow, Std , ft^3/min	(Qs)	39272	38983	39695	39317
Calibration check	(Yqa)	0.9904	0.9831	0.9763	0.983
Percent difference from Y					-0.48%

SH

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source Pulp Dryer
Sample Location Stack outlet
W. O. Number 15730.001.008
Run Number 1
Date 6/26/21
Test Personnel AR/C
Sample Time 64 min.

Console ID A010
Meter Corr., Y .988
Console ΔH@ 1.732
Probe ID/Length PR5B 5'
Liner Material SS
Pitot ID/Coeff. P172 0.84
Thermo ID A010
Nozzle ID/Diams. .250 .250 .250 .250
Avg. Nozzle Diam. .250 in.

Ambient Temp. 85 °F
Baro. Pressure* 29.70 in. Hg
Static Pressure -.27 in. H_2O
Impinger Gain 64.7 mL 73
Silica Gel Gain 8.3 g
Stack Area 19.63 ft^2
Total Traverse Points 16

K Factor NA

Leak Checks

	Initial	Final
Volume, ft^3	.000	.000
@ Vac., in. Hg	8	3
Pitot	.000	.000

Filter ID NA
Sample ID Run 1

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	12:30			352.400									
A-1	4		.42	1.3	355.1	156		83	237	241		67	2.5	
2	8		.43	1.3	357.7	156		83	238	253		66	2.5	
3	12		.45	1.3	~~60~~ 361.0 AR	156		84	245	253		65	2.5	
4	16		.48	1.3	363.2	158		84	252	254		64	2.5	*Purge @
5	20		.53	1.3	365.7	158		85	253	254		64	2.5	12:40-12:4
6	24		.51	1.3	368.2	163		86	244	254		65	2.5	
7	28		.50	1.3	371.0	161		86	250	251		64	2.5	
8	32	13:06	.48	1.3	373.7	159		86	249	252		63	2.5	
B-1	36	13:09	.52	1.3	376.5	155		86	250	253		65	3	
2	40		.53	1.3	379.4	156		87	248	253		64	3	
3	44		.48	1.3	381.8	156		88	249	252		65	3	
4	48		.50	1.3	384.6	157		88	245	253		66	3	
5	52		.46	1.3	387.2	158		89	244	250		66	3	
6	56		.45	1.3	390.0	158		91	246	249		65	3.5	
7	60		.43	1.3	393.0	159		91	246	249		65	3.5	
8	64	13:41	.43	1.3	395.354	159		92	247	250		66	3.5	

*Barometric Pressure is at port elevation

Avg √Δp	Avg ΔH	Total Volume	Avg T_s	Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac	V_{m-std}, scf
.68867	1.3	42.459	157.81	86.81	237/253	241/254		67	3.5	

.475 AB 6/30

Avg √ΔH 1.140

Flue Gas Composition
Oxygen, % ______
Carbon Dioxide, % ______
Moisture, % ______

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run ______
Post-run ______

Thermocouple Check
Meter Temp., °F ______
Ref. Temp, °F ______
Result ______

Q_s, dscfm ______
% Isokinetic ______
Calculated by ______
QC by AM

Comments ______

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Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client	New Indy
Location/Plant	Catawba, SC
Source	Pulp Dryer
Sample Location	stack outlet
W. O. Number	15730.001.008
Run Number	2
Date	6/26/21
Test Personnel	AR / CL
Sample Time	64 min.

Console ID	A016
Meter Corr., Y	.988
Console ΔH@	1.732
Probe ID/Length	PR5B 5'
Liner Material	SS
Pitot ID/Coeff.	P172 0.84
Thermo ID	A016
Nozzle ID/Diams.	.250 .250 .250 .250
Avg. Nozzle Diam.	.250 in.

Ambient Temp.	90 °F
Baro. Pressure*	29.70 in. Hg
Static Pressure	-.27 in. H_2O
Impinger Gain	93.8 mL
Silica Gel Gain	9 g
Stack Area	14.63 ft²
Total Traverse Points	16

102.8

K Factor	NA

Leak Checks

	Initial	Final
Volume, ft³	.000	.066
@ Vac., in. Hg	8	5
Pitot	.000	.000

Filter ID NA
Sample ID Run4

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	13:47			395.500									
~~A~~-1 B	4		.50	1.3	397.8	157		41	240	245		66	3.5	
2	8		.51	1.3	401.1	158		41	242	246		66	3.5	
3	12		.52	1.3	403.7	158		42	244	238		64	3.5	
4	16		.50	1.3	406.3	159		42	246	247		64	3.5	
5	20		.47	1.3	404.2	160		42	246	249		63	3.5	
6	24		.47	1.3	411.4 ~~404.3~~ AR	160		42	248	249		62	4	
7	28		.45	1.3	415.2	161		41	246	248		61	4	
8	32	14:19	.43	1.3	417.0	161		42	247	249		60	4	
~~B~~-1 A	36	14:23	.44	1.3	414.7	158		42	249	260		63	4	
2	40		.44	1.3	421.9	159		42	250	252		58	4	
3	44		.45	1.3	425.2	159		42	251	249		58	4	
4	48		.48	1.3	428.0	158		42	253	249		59	4	
5	52		.55	1.3	431.0	159		43	253	251		59	4	
6	56		.53	1.3	433.3	158		44	252	252		60	4	
7	60		.56	1.3	436.4	158		44	251	252		60	4	
8	64	14:55	.60	1.3	438.942 ✓	158		94	250	253		61	4	
*Barometric Pressure is at port elevation			Avg √Δp .70189	Avg ΔH 1.3 ✓	Total Volume ✓ 43.442	Avg T_s 158.81 ✓		Avg T_m ✓ 42.25	Min/Max 240/253 ✓	Min/Max 238/260	Min/Max ✓	Max Temp 66 ✓	Max Vac 9 ✓	
			.49378 AB 6/30 ✓	Avg √ΔH 1.140 ✓										

V_{m-std}, scf	
Q_s, dscfm	
% Isokinetic	
Calculated by	
QC by	AB ✓

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Comments

Flue Gas Composition

Oxygen, %	
Carbon Dioxide, %	
Moisture, %	

O_2/CO_2 by Orsat Fyrite M3A

Leak Check, Pre-run	
Post-run	

Thermocouple Check

Meter Temp., °F	
Ref. Temp, °F	
Result	

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: Pulp Dryer
Sample Location: Stack outlet
W. O. Number: 15730.001.008
Run Number: 3
Date: 6/26/21
Test Personnel: ATR / CL
Sample Time: 64 min.

Console ID: A010
Meter Corr., Y: AT'L ~~.998~~ .988
Console ΔH@: 1.732
Probe ID/Length: PA 5B 3'
Liner Material: SS
Pitot ID/Coeff.: PIT2 0.84
Thermo ID: A010
Nozzle ID/Diams.: .250 | .250 | .250 | .250
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 40 °F
Baro. Pressure*: 29.70 in. Hg
Static Pressure: -.27 in. H_2O
Impinger Gain: 93.8 mL
Silica Gel Gain: 4 g
93.4-88.4
102.8
4.5
Stack Area: 14.63 ft^2
Total Traverse Points: 16

K Factor	NA

Leak Checks

	Initial	Final
Volume, ft^3	.000	.000
@ Vac., in. Hg	8	5
Pitot	.000	.000

Filter ID: NA
Sample ID: Run 1

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	Imp. ~~FILTER~~ EXIT TEMP (°F)	filter ~~IMPINGER~~ EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	~~14:06~~			~~4434~~ 434.200									
A-1	4	15:06	.42	1.3	442.0	156		43	246	254	66		3.5	
2	8		.41	1.3	444.6	158		43	248	254	64		3.5	
3	12		.45	1.3	447.8	157		43	249	253	65		3.5	
4	16		.46	1.3	450.2	157		44	248	253	64		3.5	
5	20		.52	1.3	453.8	157		44	247	254	64		3.5	
6	24		.53	1.3	455.5	158		44	246	254	64		4	
7	28		.54	1.3	458.3	158		43	246	253	63		4	
8	32	15:38	.53	1.3	460.4	158		44	247	254	63		4	
B-1	36	15:42	.48	1.3	463.7	158		43	246	255	66		4	
2	40		.55	1.3	466.6	158		43	245	254	62		4	
3	44		.55	1.3	469.2	159		43	248	253	63		4	
4	48		.52	1.3	472.1	158		44	249	252	63		4	
5	52		.49	1.3	474.9	158		44	250	251	63		4	
6	56		.50	1.3	477.8	158		44	249	253	64		4	
7	60		.49	1.3	480.5	159		44	249	251	65		4	
8	64	16:14	.53	1.3	483.045	158		44	248	250	65		4	

*Barometric Pressure is at port elevation

Avg √Δp	Avg ΔH	Total Volume	Avg T_s	Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac
.7051	1.3	43.845	157.81	43.56	245/250	250/255	66		4

.4981

Avg √ΔH: 1.140

Comments: Run 1

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

V_{m-std}, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by AN

Integrated Air Services

Sample Recovery Field Data

Method: EPA 4, Moisture

Client New Indy
Location/Plant Catawba, SC

Source Pulp Dryer
W.O. Number 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample Date 6/26/21
Recovery Date 6/26/21
Sample ID Run 1
Filter ID NA
Analyst ATR

	Impingers 1	2	3		Imp.Total	Silica Gel	Total
Contents	AR DI	DI	empty		▨	grams	▨
Final	~~643.2~~ 700.1	780.3	643.2			917.9	
Initial	643.2	774.3	643.4		✓	909.6	
Gain	56.9 ✓	6 ✓	1.8 ✓		64.7	~~8.3~~ AR 8.3 ✓	73 ✓

Impinger Color clear
Silica Gel Condition good
Labled? —
Sealed? —

Run No. 2
Sample Date 6/26/21
Recovery Date 6/26/21
Sample ID Run 2
Filter ID NA
Analyst ATR

	Impingers 1	2	3		Imp.Total	Silica Gel	Total
Contents	DI	DI	empty		▨	grams	▨
Final	809.2	804.2	636.4			835.7	
Initial	721.0	800.1	634.9		✓	826.7	
Gain	88.2 ✓	4.1 ✓	1.5 ✓		43.8	9 ✓	102.8 ✓

Impinger Color clear
Silica Gel Condition used
Labled? ✓
Sealed? ✓

Run No. 3
Sample Date 6/26/21
Recovery Date 6/26/21
Sample ID Run3
Filter ID NA
Analyst AZ

	Impingers 1	2	3		Imp.Total	Silica Gel	Total
Contents	DI	DI	empty		▨	grams	▨
Final	778.1	785.2	646.2			922.4	
Initial	700.1	780.3	645.2		✓	917.9	
Gain	78 ✓	4.9 ✓	1.0 ✓		83.9	4.5 ✓	88.4 ✓

Impinger Color clear
Silica Gel Condition used
Labled? —
Sealed? —

Check COC for Sample IDs of Media Blanks

ABV ✓

WESTON SOLUTIONS
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Sample and Velocity Traverse Point Data Sheet - Method 1

Client: New Indy
Loaction/Plant: Catawba, SC
Source: Pulp Dryer
Operator: VD
Date: 25-Jun-21
W.O. Number: 15730.001.008

Duct Type ☑ Circular ☐ Rectangular Duct
Traverse Type ☐ Particulate Traverse ☑ Velocity Traverse
Indicate appropriate type

Distance from far wall to outside of port (in.) = C	60.125
Port Depth (in.) = D	0.125
Depth of Duct, diameter (in.) = C-D	60
Area of Duct (ft^2)	19.63
Total Traverse Points	16
Total Traverse Points per Port	8

Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

Flow Disturbances	
Upstream - A (ft)	8.75
Downstream - B (ft)	13.125
Upstream - A (duct diameters)	1.75
Downstream - B (duct diameters)	2.63

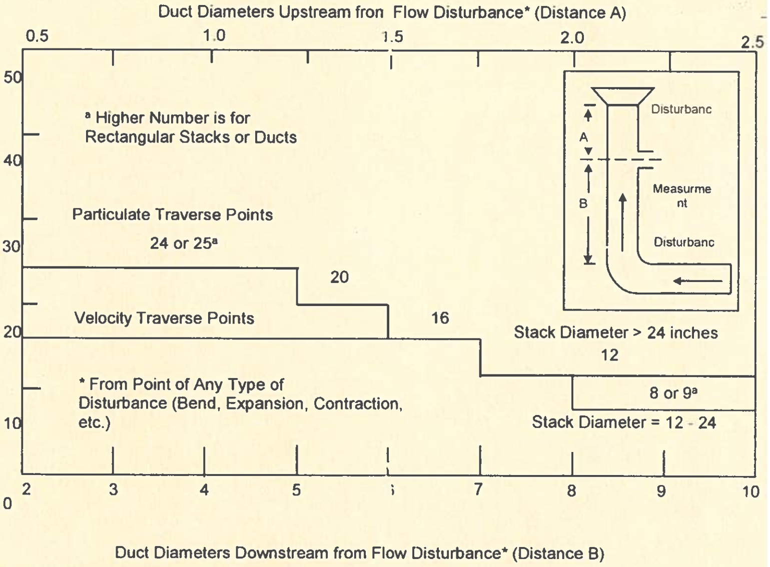
Diagram of Stack

See Next Pages

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	2	2
2	10.5	6 1/2	6 1/2
3	19.4	11 1/2	12
4	32.3	19 1/2	19 1/2
5	67.7	40 1/2	40 1/2
6	80.6	48 1/2	48 1/2
7	89.5	53 1/2	54
8	96.8	58	58
9			
10			
11			
12			

Equivalent Diameter = (2*L*W)/(L+W)



Traverse Point Location Percent of Stack -Circular

Traverse Location Point	1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

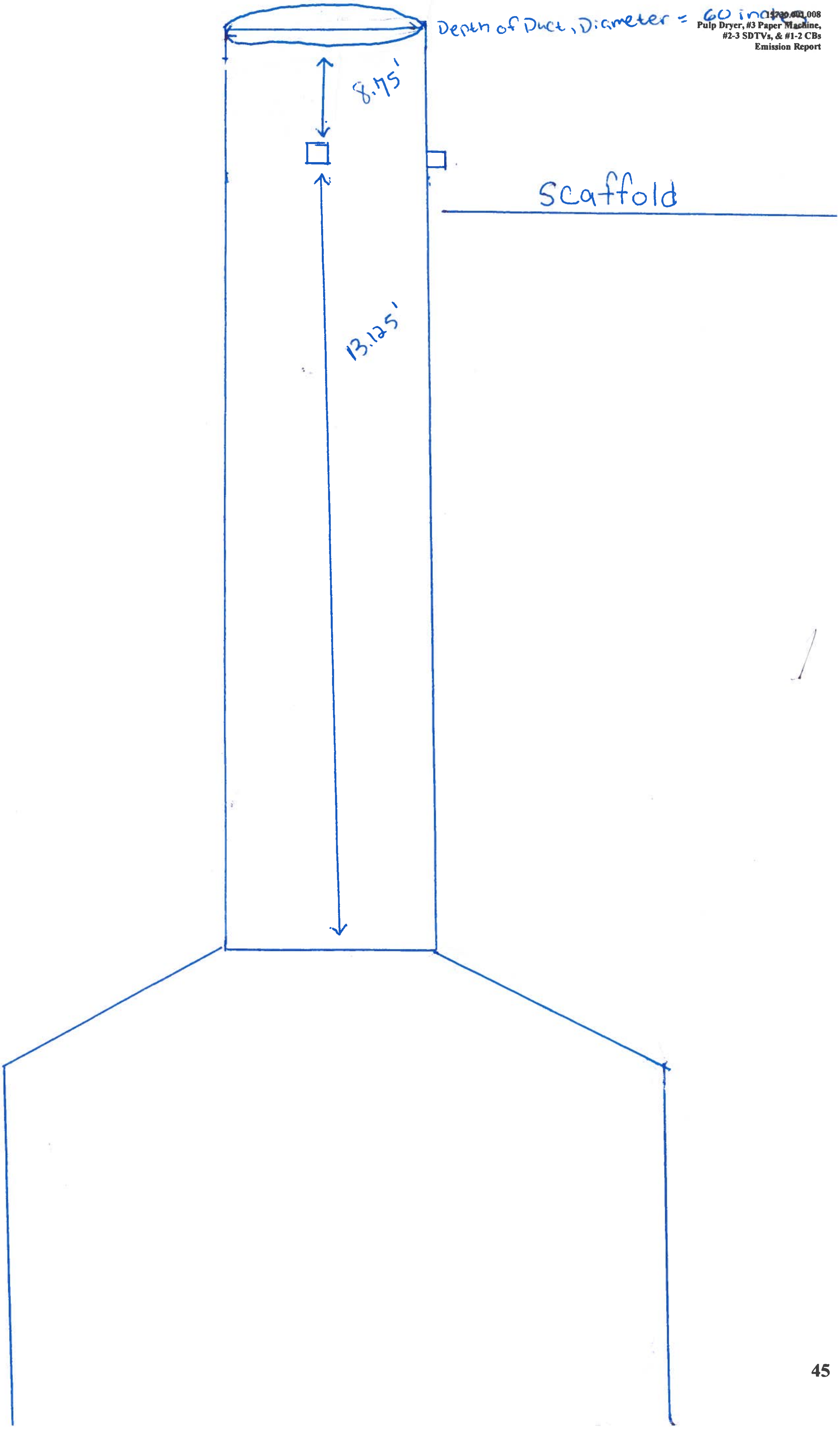
Traverse Point Location Percent of Stack -Rectangular

Traverse Location Point	1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

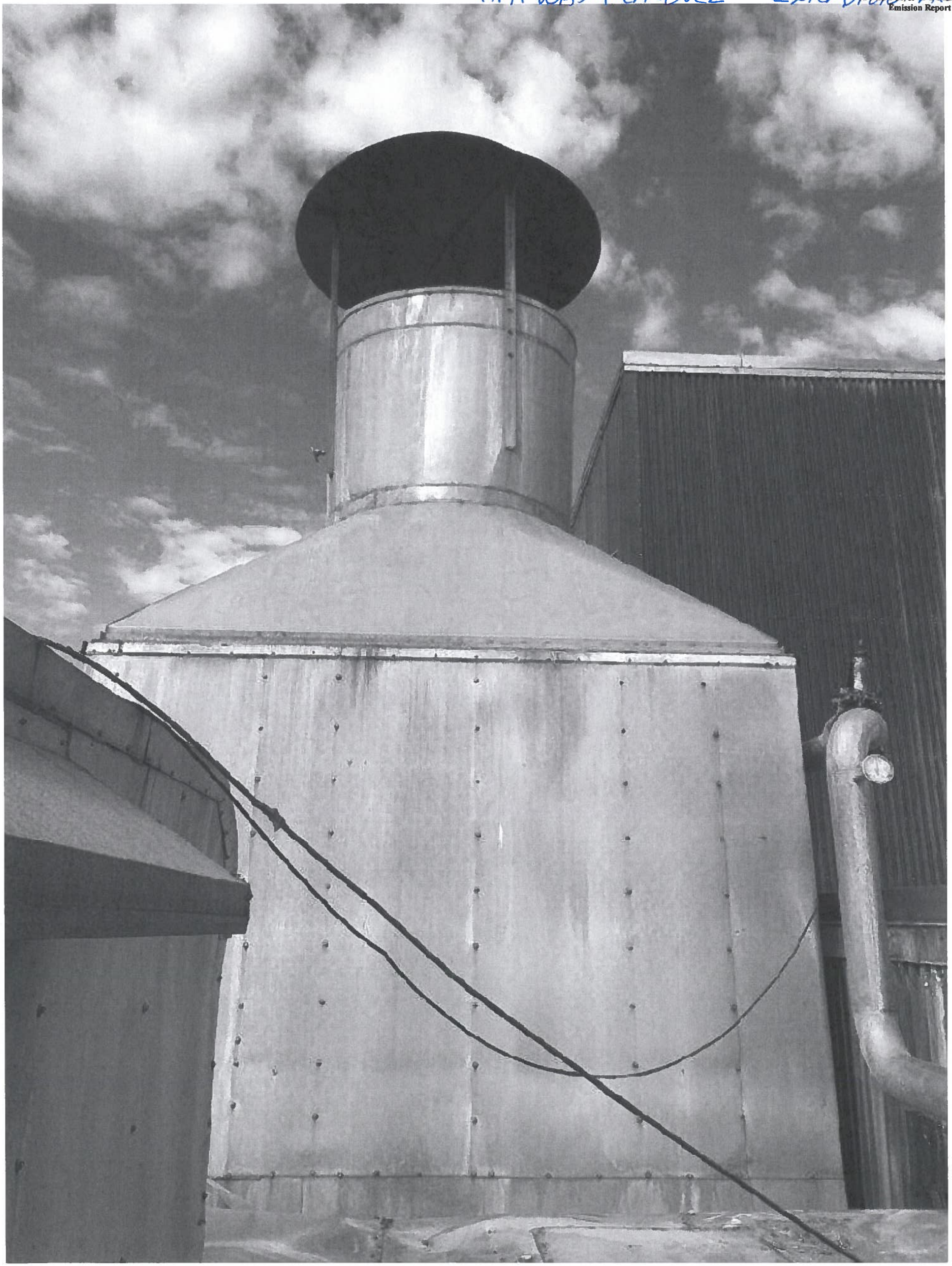
Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Port Diam. (in) = ______
Number of Ports = ______

Tape Measure I.D. # ______


Depth of Duct, Diameter = 60 inches
8.75'
Scaffold
13.125'

HAT WAS removed & Extension Added



RUN SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time 12:30 **End Time** 13:39

Average Measured TRS Conc.	0.96 **ppm** ✓
Recovery No. 2	96.6 **%** ✓
TRS Corrected for Recovery	0.99 **ppm** ✓

RUN SUMMARY
Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time 13:47 **End Time** 14:54

Average Measured TRS Conc.	0.86 **ppm**	✓
Recovery No. 2	96.6 **%**	✓
TRS Corrected for Recovery	0.89 **ppm**	✓

RUN SUMMARY

Number 3

Client:	**New Indy**			Project Number:	**15730.001.008**
Location:	**Catawba, NC**	Method	**16**	Operator:	**VD**
Source:	**Pulp Dryer**	Calibration	**1**	Date:	**26 Jun 2021**

Start Time 15:06 **End Time** 16:11

Average Measured TRS Conc.	0.80 **ppm** ✓
Recovery No. 2	96.6 **%** ✓
TRS Corrected for Recovery	0.83 **ppm** ✓

RUN DATA
Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
12:30	5	0.11	95	0.91	<2	<0.080	<2	<0.038	1.02
12:33	6	0.13	96	0.91	<2	<0.080	<2	<0.038	1.04
12:36	<2	<0.070	95	0.91	<2	<0.080	<2	<0.038	0.91
12:39	4	0.11	95	0.91	<2	<0.080	<2	<0.038	1.02
12:42	7	0.13	95	0.91	<2	<0.080	<2	<0.038	1.04
12:45	6	0.12	95	0.91	<2	<0.080	<2	<0.038	1.04
12:48	5	0.11	95	0.91	<2	<0.080	<2	<0.038	1.02
12:51	5	0.11	94	0.91	<2	<0.080	<2	<0.038	1.01
12:54	4	0.11	94	0.91	<2	<0.080	<2	<0.038	1.01
12:57	<2	<0.070	92	0.90	<2	<0.080	<2	<0.038	0.90
Paused for port change									
13:09	<2	<0.070	88	0.88	<2	<0.080	<2	<0.038	0.88
13:12	<2	<0.070	89	0.88	<2	<0.080	<2	<0.038	0.88
13:15	3	0.09	88	0.87	<2	<0.080	<2	<0.038	0.97
13:18	<2	<0.070	91	0.89	<2	<0.080	<2	<0.038	0.89
13:21	3	0.09	89	0.88	<2	<0.080	<2	<0.038	0.97
13:24	<2	<0.070	89	0.88	<2	<0.080	<2	<0.038	0.88
13:27	2	0.08	91	0.89	<2	<0.080	<2	<0.038	0.97
13:30	<2	<0.070	86	0.86	<2	<0.080	<2	<0.038	0.86
13:33	4	0.10	87	0.87	<2	<0.080	<2	<0.038	0.97
13:36	2	0.08	87	0.87	<2	<0.080	<2	<0.038	0.95
Average		**<0.070**		**0.89**		**<0.080**		**<0.038**	**0.96** ✓

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
13:47	3	0.09	79	0.83	<2	<0.080	<2	<0.038	0.92
13:50	<2	<0.070	79	0.83	<2	<0.080	<2	<0.038	0.83
13:53	<2	<0.070	80	0.83	<2	<0.080	2	0.04	0.92
13:56	<2	<0.070	80	0.83	2	0.08	<2	<0.038	0.92
13:59	3	0.09	79	0.82	<2	<0.080	<2	<0.038	0.91
14:02	3	0.09	79	0.82	<2	<0.080	<2	<0.038	0.91
14:05	4	0.11	79	0.83	<2	<0.080	<2	<0.038	0.93
14:08	<2	<0.070	78	0.82	<2	<0.080	<2	<0.038	0.82
14:11	<2	<0.070	75	0.81	<2	<0.080	2	0.04	0.89
14:14	<2	<0.070	77	0.82	<2	<0.080	<2	<0.038	0.82
14:24	<2	<0.070	74	0.80	<2	<0.080	<2	<0.038	0.80
14:27	<2	<0.070	73	0.79	<2	<0.080	<2	<0.038	0.79
14:30	3	0.09	75	0.81	<2	<0.080	<2	<0.038	0.89
14:33	<2	<0.070	76	0.81	<2	<0.080	<2	<0.038	0.81
14:36	<2	<0.070	76	0.81	<2	<0.080	<2	<0.038	0.81
14:39	<2	<0.070	75	0.80	<2	<0.080	<2	<0.038	0.80
14:42	2	0.08	75	0.81	<2	<0.080	<2	<0.038	0.88
14:45	3	0.09	77	0.81	<2	<0.080	<2	<0.038	0.90
14:48	<2	<0.070	77	0.81	<2	<0.080	<2	<0.038	0.81
14:51	<2	<0.070	73	0.79	<2	<0.080	<2	<0.038	0.79
Average		**<0.070**		**0.81**		**<0.080**		**<0.038**	**0.86** ✓

RUN DATA
Number 3

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
15:06	<2	<0.070	68	0.77	<2	<0.080	2	0.04	0.85
15:09	<2	<0.070	72	0.79	<2	<0.080	<2	<0.038	0.79
15:12	<2	<0.070	71	0.78	<2	<0.080	<2	<0.038	0.78
15:15	<2	<0.070	73	0.79	<2	<0.080	<2	<0.038	0.79
15:18	<2	<0.070	75	0.81	<2	<0.080	<2	<0.038	0.81
15:21	<2	<0.070	74	0.80	<2	<0.080	<2	<0.038	0.80
15:24	<2	<0.070	74	0.80	<2	<0.080	<2	<0.038	0.80
15:27	<2	<0.070	75	0.81	<2	<0.080	<2	<0.038	0.81
15:30	2	0.08	75	0.80	<2	<0.080	<2	<0.038	0.88
15:33	3	0.08	75	0.80	<2	<0.080	<2	<0.038	0.89
15:41	<2	<0.070	70	0.78	<2	<0.080	<2	<0.038	0.78
15:44	<2	<0.070	71	0.78	<2	<0.080	<2	<0.038	0.78
15:47	<2	<0.070	69	0.77	<2	<0.080	<2	<0.038	0.77
15:50	<2	<0.070	72	0.79	<2	<0.080	<2	<0.038	0.79
15:53	<2	<0.070	70	0.78	<2	<0.080	<2	<0.038	0.78
15:56	<2	<0.070	70	0.78	<2	<0.080	<2	<0.038	0.78
15:59	<2	<0.070	74	0.80	<2	<0.080	<2	<0.038	0.80
16:02	<2	<0.070	71	0.78	<2	<0.080	<2	<0.038	0.78
16:05	<2	<0.070	69	0.77	<2	<0.080	<2	<0.038	0.77
16:08	<2	<0.070	70	0.78	<2	<0.080	<2	<0.038	0.78
Average		**<0.070**		**0.79**		**<0.080**		**<0.038**	**0.80** ✓

RUN DATA

Number 0

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
				CC416806 7.257 ppm					
09:13	13230	7.45	<2	<0.12	<2	<0.080	<2	<0.038	7.45
09:16	13533	7.54	<2	<0.12	<2	<0.080	<2	<0.038	7.54
09:19	13251	7.45	<2	<0.12	<2	<0.080	<2	<0.038	7.45
Average		**7.48**		**<0.12**		**<0.080**		**<0.038**	**7.48**

RECOVERY DATA
Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Before Run 1
Start Time 10:47 **End Time** 11:08

Recovery Gas to Probe, Time 10:47

Peak Areas, mv-sec			Average	ppm
11865	11836	11866	11856 ✓	7.03

Recovery Gas to GC, Time 11:06

Peak Areas, mv-sec			Average	ppm
14001	14035	13928	13988 ✓	7.67

Recovery 91.6% ✓

AL

RECOVERY DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

After Run 3 **Before Run** 4
Start Time 16:11 **End Time** 16:23

Recovery Gas to Probe, Time 16:11

Peak Areas, mv-sec			Average		ppm
12698	12844	13017	12853	✓	7.33

Recovery Gas to GC, Time 16:20

Peak Areas, mv-sec			Average		ppm
13674	13559	13930	13721	✓	7.59

Recovery 96.6% ✓

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51828	33-53274	89-53332	89-53266
Perm. Rate, nL/min	346	363	470	238
Ret. Time, sec	16.0	22.5	48.0	127.0

1 Flow = **38.9** mL/Min	**8.90** ppm	**9.36** ppm	**12.1** ppm	**6.12** ppm
Time: 06:02	**Peak Areas, mv-sec**			
	18368	8795	28785	34758
	18368	8383	27462	34707
	18202	8971	28270	35006
Average Area	**18313** ✓	**8716** ✓	**28172** ✓	**34824** ✓
2 Flow = **82.3** mL/Min	**4.21** ppm	**4.42** ppm	**5.72** ppm	**2.89** ppm
Time: 07:54	**Peak Areas, mv-sec**			
	4512	2067	6969	8481
	4642	2032	7036	8510
	4706	2195	7080	8577
Average Area	**4620** ✓	**2098** ✓	**7028** ✓	**8523** ✓
3 Flow = **175** mL/Min	**1.98** ppm	**2.08** ppm	**2.69** ppm	**1.36** ppm
Time: 08:29	**Peak Areas, mv-sec**			
	1065	476	1647	1910
	1045	464	1599	1954
	1126	467	1556	1919
Average Area	**1079** ✓	**469** ✓	**1601** ✓	**1928** ✓

CALIBRATION SUMMARY

Number 1

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, NC**	Operator:	**VD**
Source:	**Pulp Dryer**	Date:	**25 Jun 2021**

Method **16**

H_2S	**1**	**2**	**3**		
Time	06:02	07:54	08:29		
Concentration, ppm	8.90	4.21	1.98		
Area, mv-sec	18313	4620	1079		
Calc. Conc., ppm	8.85	4.26	1.97		
% Error	-0.6	1.2	-0.6		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8832	2.4794	0.9999	2	0.070

MeSH	**1**	**2**	**3**		
Time	06:02	07:54	08:29		
Concentration, ppm	9.36	4.42	2.08		
Area, mv-sec	8716	2098	469		
Calc. Conc., ppm	9.31	4.47	2.07		
% Error	-0.5	1.1	-0.5		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9432	2.0579	0.9999	2	0.12

DMS	**1**	**2**	**3**		
Time	06:02	07:54	08:29		
Concentration, ppm	12.1	5.72	2.69		
Area, mv-sec	28172	7028	1601		
Calc. Conc., ppm	12.0	5.80	2.67		
% Error	-0.7	1.4	-0.7		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9072	2.3902	0.9999	2	0.080

DMDS	**1**	**2**	**3**		
Time	06:02	07:54	08:29		
Concentration, ppm	6.12	2.89	1.36		
Area, mv-sec	34824	8523	1928		
Calc. Conc., ppm	6.08	2.93	1.35		
% Error	-0.6	1.2	-0.6		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9245	3.0328	0.9999	2	0.038

CALIBRATION DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51828	33-53274	89-53332	89-53266
Perm. Rate, nL/min	346	363	470	238
Ret. Time, sec	16.0	22.5	48.0	127.0

1 Flow = **37.1** mL/Min	**9.32** ppm	**9.79** ppm	**12.7** ppm	**6.41** ppm
Time: 07:00	**Peak Areas, mv-sec**			
	17531	8727	27825	33485
	17951	8703	27443	33712
	18066	8758	27669	33342
Average Area	**17849** ✓	**8730** ✓	**27646** ✓	**33513** ✓

2 Flow = **78.5** mL/Min	**4.41** ppm	**4.63** ppm	**5.99** ppm	**3.03** ppm
Time: 08:24	**Peak Areas, mv-sec**			
	4366	2153	6888	8191
	4464	2149	6729	8050
	4361	2131	6827	8110
Average Area	**4397** ✓	**2145** ✓	**6815** ✓	**8117** ✓

3 Flow = **172** mL/Min	**2.01** ppm	**2.11** ppm	**2.73** ppm	**1.38** ppm
Time: 08:47	**Peak Areas, mv-sec**			
	1026	464	1561	1864
	980	466	1558	1873
	996	463	1569	1872
Average Area	**1001** ✓	**464** ✓	**1563** ✓	**1870** ✓

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

H_2S	**1**	**2**	**3**		
Time	07:00	08:24	08:47		
Concentration, ppm	9.32	4.41	2.01		
Area, mv-sec	17849	4397	1001		
Calc. Conc., ppm	9.31	4.42	2.01		
% Error	-0.1	0.2	-0.1		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8784	2.4316	>0.9999	2	0.073

MeSH	**1**	**2**	**3**		
Time	07:00	08:24	08:47		
Concentration, ppm	9.79	4.63	2.11		
Area, mv-sec	8730	2145	464		
Calc. Conc., ppm	9.74	4.68	2.10		
% Error	-0.5	1.0	-0.5		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9131	2.0496	0.9999	2	0.12

DMS	**1**	**2**	**3**		
Time	07:00	08:24	08:47		
Concentration, ppm	12.7	5.99	2.73		
Area, mv-sec	27646	6815	1563		
Calc. Conc., ppm	12.7	6.00	2.73		
% Error	-0.1	0.1	-0.1		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8729	2.3765	>0.9999	2	0.078

DMDS	**1**	**2**	**3**		
Time	07:00	08:24	08:47		
Concentration, ppm	6.41	3.03	1.38		
Area, mv-sec	33513	8117	1870		
Calc. Conc., ppm	6.42	3.02	1.38		
% Error	0.1	-0.3	0.1		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8815	3.0064	>0.9999	2	0.036

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	16.0	22.5	48.0	127.0
Peak Detection Window, sec	3.0	7.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	2.0	3.0
Ending Peak Width, sec	2.0	6.0	4.0	5.0
Permeation Device ID	T-51828	33-53274	89-53332	89-53266
Permeation Rate, ng/min	483 ✓	716 ✓	1197 ✓	918 ✓
Permeation Rate, nL/min*	346	363	470	238

Barometric Pressure: 29.70 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 483 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.70)$$
$$= 346 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, NC**
Source: **Pulp Dryer**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

File: C:\Data\210626 New Indy Catawba Pulp Dryer.trs
Program Version: 2.0, built 15 May 2017 **File Version:** 2.0
Computer: WLT5 **Trailer:** 281

Analog Input Device: MCC USB-1608G **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: Shimadzu GC8-A **Serial No.** C10493615061
Detector Range: 10

Gases	Press. psi	Flow mL/min
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 140
Detector: 140

Columns

Primary: Carbopack
Secondary: N/A
Sample Loop: 4"

Injection Cycle

Total Length: 180 sec **Sampling Time:** 170 sec **Load/Backflush Time:** 80 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 2 mv-sec **Minimum peak height** 1 mv above baseline

Dynacalibrator

Chamber Temperature 50.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.70 in. Hg

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Pulp Dryer**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
	Pulp Dryer Run 1			
13:37:08	7063	20.8	-8	0.0
13:37:18	7062	20.8	-6	0.0
13:37:28	7061	20.8	-5	0.0
13:37:38	7061	20.8	-5	0.0
13:37:48	7062	20.8	-5	0.0
13:37:58	7061	20.8	-5	0.0
13:38:08	7061	20.8	-6	0.0
13:38:18	7061	20.8	-8	0.0
13:38:28	7061	20.8	-8	0.0
13:38:38	7061	20.8	-6	0.0
13:38:48	7062	20.8	-5	0.0
13:38:58	7061	20.8	-5	0.0
Avgs	**7061**	**20.8**	**-6**	**0.0**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Pulp Dryer**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
Pulp Dryer Run 2				
14:57:11	7115	20.9	-5	0.0
14:57:21	7115	20.9	-5	0.0
14:57:31	7115	20.9	-5	0.0
14:57:41	7116	20.9	-5	0.0
14:57:51	7115	20.9	-5	0.0
14:58:01	7116	20.9	-8	0.0
14:58:11	7116	20.9	-5	0.0
14:58:21	7114	20.9	-5	0.0
14:58:31	7116	20.9	-5	0.0
14:58:41	7115	20.9	-5	0.0
14:58:51	7114	20.9	-5	0.0
14:59:01	7114	20.9	-5	0.0
Avgs	**7115**	**20.9**	**-5**	**0.0**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Pulp Dryer**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
Pulp Dryer Run 3				
16:13:58	7118	20.9	-6	0.0
16:14:08	7118	20.9	-5	0.0
16:14:18	7116	20.9	-5	0.0
16:14:28	7118	20.9	-5	0.0
16:14:38	7116	20.9	-5	0.0
16:14:48	7116	20.9	-5	0.0
16:14:58	7117	20.9	-7	0.0
16:15:08	7118	20.9	-8	0.0
16:15:18	7118	20.9	-6	0.0
16:15:28	7118	20.9	-5	0.0
16:15:38	7115	20.9	-5	0.0
16:15:48	7118	20.9	-5	0.0
Avgs	**7117**	**20.9**	**-6**	**0.0**

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Pulp Dryer**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time: 10:58

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	-5
10.1	XC013544B	3430
20.2	CC275468	6891

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
340.7	-12	>0.9999

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	-7
10.2	XC013544B	4123
20.3	CC275468	8231

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
406.4	-7	1.0000

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Pulp Dryer**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time: 10:58

O_2

Method: EPA 3A
Span Conc. 20.2 %
Slope 340.7 **Intercept** -11.6

Standard %	**Response mv**	**Result %**	**Difference %**	**Error %**	**Status**
Zero	-5	0.0	0.0	0.0 ✓	Pass
10.1	3430	10.1	0.0	0.0 ✓	Pass
20.2	6891	20.3	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A
Span Conc. 20.3 %
Slope 406.4 **Intercept** -6.7

Standard %	**Response mv**	**Result %**	**Difference %**	**Error %**	**Status**
Zero	-7	0.0	0.0	0.0 ✓	Pass
10.2	4123	10.2	0.0	0.0 ✓	Pass
20.3	8231	20.3	0.0	0.0 ✓	Pass

CALIBRATION ERROR DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Pulp Dryer**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time: 16:23

O_2
Method: EPA 3A
Span Conc. 20.2 %
Slope 340.7 **Intercept** -11.6

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-5	0.0	0.0	0.0 ✓	Pass
10.1	3430	10.1	0.0	0.0 ✓	Pass
20.2	6891	20.3	0.1	0.5 ✓	Pass

CO_2
Method: EPA 3A
Span Conc. 20.3 %
Slope 406.4 **Intercept** -6.7

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-7	0.0	0.0	0.0 ✓	Pass
10.2	4123	10.2	0.0	0.0 ✓	Pass
20.3	8231	20.3	0.0	0.0 ✓	Pass

METHODS AND ANALYZERS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Pulp Dryer**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

File: C:\Data\210626 New Indy Catawba Pulp Dryer.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: WSAUBCHEMLABGC1 **Trailer:** 281
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T802 s/n: 172**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.2**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T802 s/n: 172**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.3**

APPENDIX D
FIELD DATA – NO. 3 PAPER MACHINE

VENT 1

New Indy
Catawba, SC

15730.001.008
No. 1 Hood Exhaust
Paper Machine Vent 1

EMISSION CALCULATIONS

			Run 1	**Run 2**	**Run 3**	**Mean**
Date			**6/25/21** ✓	**6/25/21** ✓	**6/25/21** ✓	---
Time Began			**755** ✓	**900** ✓	**1005** ✓	---
Time Ended			**855** ✓	**1000** ✓	**1105** ✓	---
Volumetric Flow Rate, (Qs), DSCFM			3.50E+04 ✓	3.47E+04 ✓	3.47E+04 ✓	3.48E+04
BWS			0.188 ✓	0.188 ✓	0.182 ✓	0.186
% Oxygen			20.2 ✓	20.2 ✓	20.2 ✓	20.2
Total Reduced Sulfur	(TRS MW)=	34.08				
Concentration, ppm			0.43 ✓	0.48 ✓	0.57 ✓	0.49
Emission Rate, lb/hr			0.08 ✓	0.09	0.10	0.09

New Indy
Catawba, SC

15730.001.008
No. 1 Hood Exhaust

Paper Machine Vent 1

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/25/21	6/25/21	6/25/21	---
Time Began		755	900	1005	---
Time Ended		844	952	1054	---
INPUT DATA					
Sampling Time, min	(Theta)	48.0	48	48	48
Stack Diameter, in.	(Dia.)	50.00	50.00	50.00	50.00
Barometric Pressure, in. Hg	(Pb)	29.68	29.68	29.68	29.68
Static Pressure, in. H2O	(Pg)	-0.65	-0.68	-0.68	-0.67
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	1.0030	1.0030	1.0030	1.0030
Orifice Calibration Value	(Delta H@)	1.8000	1.8000	1.8000	1.8000
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	29.740	29.705	30.008	29.818
Meter Temperature, °F	(Tm)	62.2	69.8	75.6	69.2
Meter Temperature, °R	(Tm-R)	522.2	529.8	535.6	529.2
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	147.7	145.6	139.1	144.1
CO2 Concentration, %	(CO2)	0.2	0.2	0.2	0.2
O2 Concentration, %	(O2)	20.2	20.2	20.2	20.2
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	0.993	0.987	0.980	0.987
Stack Temperature, °F	(Ts)	171.2	172.3	173.1	172.2
Stack Temperature, °R	(Ts-R)	631.2	632.3	633.1	632.2
Moisture Fraction (at Saturation)	(BWS)	0.423	0.434	0.442	0.433
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	13.64	13.64	13.64	13.64
Stack Pressure, in. Hg	(Ps)	29.63	29.63	29.63	29.63
Meter Pressure, in. Hg	(Pm)	29.78	29.78	29.78	29.78
Standard Meter Volume, ft^3	(Vmstd)	30.003	29.538	29.516	29.686
Standard Water Volume, ft^3	(Vwstd)	6.952	6.853	6.547	6.784
Moisture Fraction (Measured)	(BWS)	0.188	0.188	0.182	0.186
Moisture Fraction (lower sat/meas)	(BWS)	0.188	0.188	0.182	0.186
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	28.84	28.84	28.84	28.84
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	26.80	26.80	26.87	26.82
Average Stack Gas Velocity, ft/sec	(Vs)	63.60	63.25	62.73	63.19
Stack Gas Flow, actual, ft^3/min	(Qa)	52031	51745	51320	51699
Stack Gas Flow, Std , ft^3/min	(Qs)	34982	34718	34676	34792
Calibration check	(Yqa)	1.0288	1.0375	1.0326	1.033
Percent difference from Y					2.99%

No. 1 Hood Exhaust

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. ~~4~~ 1 Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 1
Date 6/25/21
Test Personnel DE/DE
Sample Time 48 min.

Console ID A023
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length 7R6C 6'
Liner Material SS
Pitot ID/Coeff. P7 0.84
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 63 °F
Baro. Pressure* 28.68 in. Hg
Static Pressure -.65 in. H_2O
Impinger Gain 140.7 mL
Silica Gel Gain 7 g
Stack Area 13.64 ft^2
Total Traverse Points 16

K Factor N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.000	0.001
@ Vac., in. Hg	13"	5"
Pitot	Good	Good

Filter ID N/A
Sample ID Run 1

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	7:55			731.586									
A-1	3		1.0	~~1.8~~ 1.3	733.4	170	N/A	57	244	241	N/A	58	3	
2	6		1.2	1.3	735.4	170		58	240	249		52	3	
3	9		.95	1.3	737.2	171		60	242	253		52	3	
4	12		1.1	1.3	739.1	172		60	243	250		53	3	
5	15		1.0	1.3	741.0	172		61	244	254		53	3	
6	18		1.0	1.3	742.8	172		61	241	254		54	3	
7	21		1.0	1.3	744.7	172		62	241	256		54	3	
8	24		1.0	1.3	746.5	172		62	240	255		55	3	
B-1	27		.97	1.3	748.3	170		63	242	254		55	3	
2	30		.98	1.3	750.1	171		62	243	254		54	3	
3	33		.99	1.3	752.0	171		63	242	256		54	3	
4	36		.98	1.3	753.8	171		64	241	257		55	3	
5	39		.99	1.3	755.7	171		65	243	256		55	3	
6	42		.97	1.3	757.5	172		65	242	254		56	3	
7	45		.94	1.3	759.4	172		66	242	258		57	3	
8	48	8:44	.75	1.3	761.246	170		66	241	254		57	3	

*Barometric Pressure is at port elevation

Avg √Δp	Avg ΔH	Total Volume	Avg T_s	Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac
.9934 ✓	1.300 ✓	29.74 ✓	171.2 ✓	62.2 ✓	240/244	241/258		58	3
.9888 ✓	Avg √ΔH 1.1402 ✓								

$V_{m\text{-std}}$, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by

Flue Gas Composition
Oxygen, % 20.2
Carbon Dioxide, % 0.2
Moisture, % 18.8

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Comments

WESTON SOLUTIONS®
Integrated Air Services

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 1 Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 2
Date 6/23/21
Test Personnel BEA/BG
Sample Time 48 min.

Console ID A023
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length PR6C - 6'
Liner Material SS
Pitot ID/Coeff. P77 0.84
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 70 °F
Baro. Pressure* 29.68 in. Hg
Static Pressure -.68 in. H_2O
Impinger Gain 139.6 mL
Silica Gel Gain 6 g
Stack Area 13.64 ft²
Total Traverse Points 16

K Factor N/A

Leak Checks

	Initial	Final
Volume, ft³	.005	.001
@ Vac., in. Hg	12"	5"
Pitot	Good	Good

Filter ID N/A
Sample ID run 2

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	09:00			761.500									
A-1	3	~~1.1~~ BE	1.1	1.3	763.4	173	N/A	68	244	254	N/A	51	3	
2	6		1.1	1.3	765.2	173		68	241	256		49	3	
3	9		1.2	1.3	767.0	173		68	242	264		48	3	
4	12		1.1	1.3	769.1	173		69	243	254		47	3	
5	15		1.0	1.3	770.8	173		69	244	258		49	3	
6	18		.99	1.3	772.6	173		68	242	256		50	3	
7	21		.96	1.3	774.5	173		69	244	258		51	3	
8	24		.94	1.3	776.3	172		70	245	254		51	3	
B-1	27		.95	1.3	778.1	172		70	243	255		54	3	
2	30		.94	1.3	780.0	172		70	242	254		52	3	
3	33		.97	1.3	781.8	172		71	241	256		52	3	
4	36		.98	1.3	783.7	173		71	243	255		53	3	
5	39		1.0	1.3	785.6	173		71	244	256		53	3	
6	42		.99	1.3	787.5	173		72	244	254		54	3	
7	45		.71	1.3	789.3	169		70	241	253		54	3	
8	48	09:52	.72	1.3	791.205	169		72	242	253		54	3	
*Barometric Pressure is at port elevation			Avg √Δp .9870	Avg ΔH 1.300	Total Volume 29.705	Avg T_s 172.3	Avg T_m 69.8		Min/Max 241/245	Min/Max 253/264	Min/Max	Max Temp 54	Max Vac 3	
				Avg √ΔH 1.1402										

$V_{m\text{-std}}$, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by AV

Flue Gas Composition
Oxygen, % 20.2
Carbon Dioxide, % 0.2
Moisture, % 18.8

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Comments

WESTON SOLUTIONS®
Integrated Air Services

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 1 Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 3
Date 6/25/21
Test Personnel BEA/BE
Sample Time 48 min.

Console ID A023
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length PR6C - 6'
Liner Material SS
Pitot ID/Coeff. P77 0.84
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 74 °F
Baro. Pressure* 29.68 in. Hg
Static Pressure -.68 in. H_2O
Impinger Gain 136.7 mL
Silica Gel Gain 2.4 g
Stack Area 13.64 ft²
Total Traverse Points 16

K Factor N/A

Leak Checks

	Initial	Final
Volume, ft³	0.000	0.000
@ Vac., in. Hg	12"	8"
Pitot	Good	Good

Filter ID N/A
Sample ID Run 3

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	10:05			791.500									
A-1	3		.92	1.3	793.4	172	N/A	73	244	256	N/A	BE ~~60~~ 58	2	
2	6		.91	1.3	795.2	172		74	241	250		59	2	
3	9		.96	1.3	~~977.~~ BE 797.1	173		74	241	255		57	2	
4	12		.98	1.3	799.0	173		74	244	255		56	2	
5	15		1.0	1.3	800.9	173		75	242	254		54	2	
6	18		.99	1.3	802.8	174		75	240	253		54	2	
7	21		.98	1.3	804.7	174		75	242	256		54	2	
8	24		.92	1.3	806.6	173		76	240	255		55	2	
B-1	27		.82	1.3	808.5	171		76	244	250		58	2	
2	30		1.1	1.3	810.4	173		76	243	253		57	2	
3	33		1.1	1.3	812.2	174		76	244	252		56	2	
4	36		1.1	1.3	814.1	174		77	241	254		56	2	
5	39		.93	1.3	816.0	174		77	240	255		57	2	
6	42		.94	1.3	817.8	174		77	241	253		58	2	
7	45		.87	1.3	819.6	173		77	240	255		58	2	
8	48	10:54	.86	1.3	821.508	172		78	243	250		60	2	
*Barometric Pressure is at port elevation			Avg √Δp .9796 .9613	Avg ΔH 1.300 Avg √ΔH 1.1402	Total Volume 30.008	Avg T_s 173.1		Avg T_m 75.6	Min/Max 240/244	Min/Max 250/256	Min/Max	Max Temp 60	Max Vac 2	

Comments

Flue Gas Composition
Oxygen, % 20.2
Carbon Dioxide, % 0.2
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

$V_{m\text{-std}}$, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by AB

WESTON SOLUTIONS®
Integrated Air Services

Sample Recovery Field Data

Method: EPA 4, Moisture

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 1 Hood Exhaust
W.O. Number: 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample ID:
Sample Date: 6/25/21
Filter ID: N/A
Recovery Date: 6/25/21
Analyst: BEA/BE

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents						grams	
Final	864.6	896.1	651.1			881.7	
Initial	747.5	828.6	645.0			874.7	
Gain	117.1 ✓	17.5 ✓	6.1 ✓		140.7	7 ✓	147.7

Impinger Color: Clear
Silica Gel Condition: Good
Labled?
Sealed?

Run No. 2
Sample ID:
Sample Date: 6/25/21
Filter ID: N/A
Recovery Date: 6/25/21
Analyst: BEA/BE

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents						grams	
Final	881.6	711.8	551.5			911.0	
Initial	759.5	696.2	549.6			905.0	
Gain	122.1 ✓	15.6 ✓	1.9 ✓		139.6	6 ✓	145.6

Impinger Color: Clear
Silica Gel Condition: Good
Labled?
Sealed?

Run No. 3
Sample ID:
Sample Date: 6/25/21
Filter ID: N/A
Recovery Date: 6/25/21
Analyst: BEA/BE

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents						grams	
Final	879.4	823.0	652.9			852.1	
Initial	764.4	803.9	650.3			849.7	
Gain	115 ✓	19.1 ✓	2.6 ✓		136.7	2.4	139.1

Impinger Color: Clear
Silica Gel Condition: Good
Labled?
Sealed?

Check COC for Sample IDs of Media Blanks

Sample and Velocity Traverse Point Data Sheet - Method 1

Client New Indy
Loaction/Plant Catawba, SC
Source No. 1 Hood Exhaust
Operator VD / LF
Date 15-Jun-21
W.O. Number 15730.001.008

Duct Type	☑	Circular	☐	Rectangular Duct	Indicate appropriate type
Traverse Type	☐	Particulate Traverse	☑	Velocity Traverse	

Distance from far wall to outside of port (in.) = C	50.125
Port Depth (in.) = D	0.125
Depth of Duct, diameter (in.) = C-D	50
Area of Duct (ft^2)	13.64
Total Traverse Points	16
Total Traverse Points per Port	8

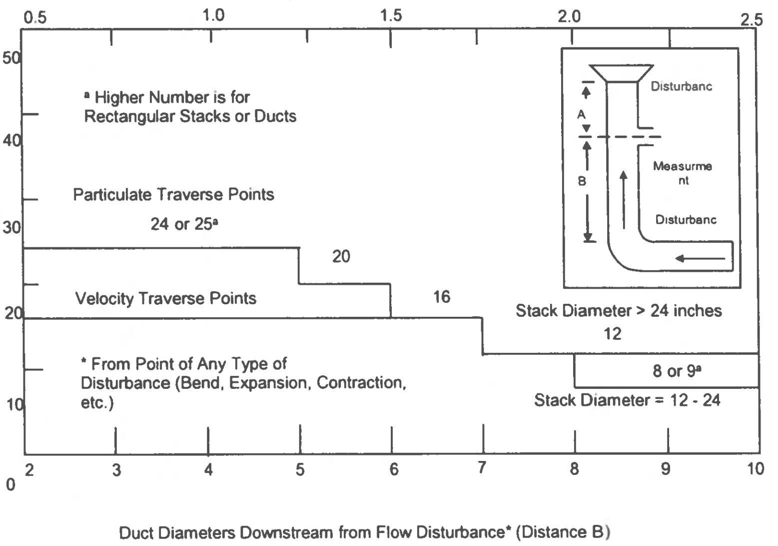
Flow Disturbances	
Upstream - A (ft)	4.417
Downstream - B (ft)	25.0
Upstream - A (duct diameters)	1.06
Downstream - B (duct diameters)	6.00

Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	1 1/2	1 1/2
2	10.5	5 1/2	5 1/2
3	19.4	9 1/2	10
4	32.3	16	16 1/2
5	67.7	34	34
6	80.6	40 1/2	40 1/2
7	89.5	45	45
8	96.8	48 1/2	48 1/2
9			
10			
11			
12			

Diagram of Stack



Equivalent Diameter = (2*L*W)/(L+W)

Traverse Point Location Percent of Stack -Circular

Traverse Point Location	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Point Location	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Port Diam. (in) = 4
Number of Ports = 2

Tape Measure I.D. # TM-07

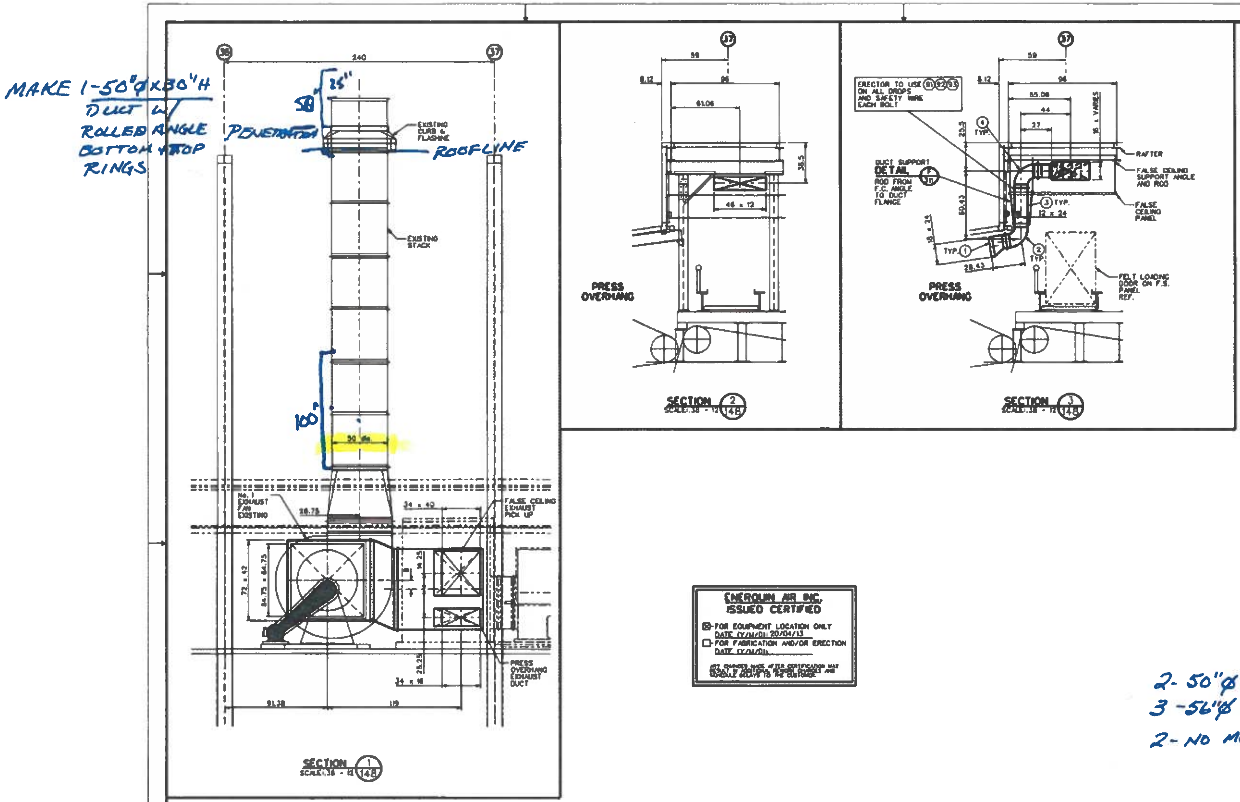
Method 1 Version 2

RECEIVED Reference# 218002

PROJECT/CLIENT: 203829 – Project Columbia

DATE: 4/27/2020 Sherry Krebs

☐ 1
☐ 2
☐ 3
☒ 4
☐ 5
☐ 6



#1

ENERQUIN AIR INC.
ISSUED CERTIFIED

☒ - FOR EQUIPMENT LOCATION ONLY
DATE (Y/M/D): 20/04/13
☐ - FOR FABRICATION AND/OR ERECTION
DATE (Y/M/D): ______

2- 50"ø x 30"H
3 - 56⅛"ø x 48"H
2- NO MODIF.

SEE DWG 19-168-148
FOR ALL NOTES

EXISTING FAN AND STACK INFORMATION
TAKEN FROM "AER" DRAWING 8748 & 87481

BILL OF MATERIAL	S-168-149-BM	DUCT DETAILS - SHT. 3	19-168-314
No. 1 HOOD EXH FAN & DUCT L/O - SHT 1	19-168-148		
DUCT ERECTION DETAILS	19-168-311		
DUCT DETAILS - SHT. 1	19-168-312		
DUCT DETAILS - SHT. 2	19-168-313		
REFERENCE DRAWINGS	No.	REFERENCE DRAWINGS	No.

ENERQUIN AIR Inc.

P.A.S. FOR No. 3 P.M.
No. 1 HOOD EXHAUST
FAN & DUCT LAYOUT SHT - 2
NEW INDY
CATAWBA SOUTH CAROLINA

C.J.D.
N.S.T.
DATES
.38 - 12
19-4705
19-168-149
1

N/A
N/A

RUN SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time 07:55 **End Time** 08:55

Average Measured TRS Conc.	0.42 **ppm**
Recovery No. 2	97.6 **%**
TRS Corrected for Recovery	0.43 **ppm** ✓

vwh

RUN SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time 09:00 **End Time** 10:00

Average Measured TRS Conc.	0.47 **ppm**
Recovery No. 2	97.6 **%**
TRS Corrected for Recovery	0.48 **ppm** ✓

RUN SUMMARY

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time 10:05 **End Time** 11:05

Average Measured TRS Conc.	0.56 **ppm**
Recovery No. 2	97.6 **%**
TRS Corrected for Recovery	0.57 **ppm** ✓

RUN DATA
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
07:55	<2	<0.07	<2	<0.08	<2	<0.07	<2	<0.02	-
07:58	<2	<0.07	<2	<0.08	<2	<0.07	<2	<0.02	-
08:01	19	0.24	6	0.15	27	0.28	<2	<0.02	0.67
08:04	<2	<0.07	<2	<0.08	10	0.17	<2	<0.02	0.17
08:07	<2	<0.07	20	0.28	<2	<0.07	<2	<0.02	0.28
08:10	12	0.18	<2	<0.08	<2	<0.07	<2	<0.02	0.18
08:13	24	0.27	16	0.24	33	0.32	<2	<0.02	0.82
08:16	10	0.17	<2	<0.08	<2	<0.07	33	0.11	0.39
08:19	10	0.16	<2	<0.08	8	0.15	<2	<0.02	0.31
08:22	23	0.26	24	0.30	<2	<0.07	<2	<0.02	0.56
08:25	20	0.24	14	0.23	<2	<0.07	49	0.13	0.73
08:28	29	0.29	<2	<0.08	<2	<0.07	42	0.12	0.54
08:31	17	0.22	37	0.38	<2	<0.07	<2	<0.02	0.59
08:34	23	0.26	11	0.20	<2	<0.07	27	0.10	0.66
08:37	<2	<0.07	<2	<0.08	25	0.27	<2	<0.02	0.27
08:40	19	0.23	<2	<0.08	37	0.34	71	0.16	0.90
08:43	21	0.25	12	0.21	<2	<0.07	<2	<0.02	0.45
08:46	<2	<0.07	<2	<0.08	<2	<0.07	<2	<0.02	-
08:49	<2	<0.07	<2	<0.08	54	0.41	<2	<0.02	0.41
08:52	24	0.26	<2	<0.08	<2	<0.07	25	0.09	0.45
Average		**0.15**		**0.10**		**0.10**		**0.04**	**0.42**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
09:00	5	0.12	<2	<0.08	12	0.18	<2	<0.02	0.30
09:03	<2	<0.07	<2	<0.08	<2	<0.07	<2	<0.02	-
09:06	12	0.18	65	0.51	<2	<0.07	<2	<0.02	0.69
09:09	39	0.34	<2	<0.08	<2	<0.07	<2	<0.02	0.34
09:12	<2	<0.07	<2	<0.08	<2	<0.07	<2	<0.02	-
09:15	11	0.17	9	0.18	<2	<0.07	<2	<0.02	0.36
09:18	41	0.35	<2	<0.08	<2	<0.07	26	0.10	0.54
09:21	67	0.45	63	0.50	<2	<0.07	13	0.07	1.08
09:24	19	0.23	<2	<0.08	<2	<0.07	<2	<0.02	0.23
09:27	16	0.21	32	0.35	9	0.16	<2	<0.02	0.72
09:30	23	0.26	16	0.24	<2	<0.07	<2	<0.02	0.50
09:33	5	0.11	<2	<0.08	10	0.17	<2	<0.02	0.28
09:36	<2	<0.07	<2	<0.08	<2	<0.07	40	0.12	0.24
09:39	18	0.23	<2	<0.08	<2	<0.07	<2	<0.02	0.23
09:42	<2	<0.07	<2	<0.08	<2	<0.07	54	0.14	0.28
09:45	29	0.29	<2	<0.08	17	0.22	<2	<0.02	0.51
09:48	17	0.22	<2	<0.08	39	0.35	46	0.13	0.83
09:51	7	0.14	30	0.34	<2	<0.07	<2	<0.02	0.48
09:54	24	0.26	7	0.15	<2	<0.07	<2	<0.02	0.42
09:57	22	0.25	65	0.51	62	0.44	30	0.10	1.41
Average		**0.19**		**0.14**		**0.08**		**0.03**	**0.47**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
10:05	9	0.16	<2	<0.08	<2	<0.07	<2	<0.02	0.16
10:08	8	0.15	<2	<0.08	27	0.28	<2	<0.02	0.43
10:11	40	0.35	<2	<0.08	<2	<0.07	<2	<0.02	0.35
10:14	29	0.29	11	0.20	18	0.23	<2	<0.02	0.72
10:17	23	0.26	22	0.29	<2	<0.07	9	0.05	0.65
10:20	66	0.45	<2	<0.08	<2	<0.07	6	0.05	0.54
10:23	6	0.13	16	0.25	44	0.37	<2	<0.02	0.75
10:26	22	0.25	23	0.29	14	0.20	16	0.07	0.89
10:29	12	0.18	22	0.29	<2	<0.07	<2	<0.02	0.47
10:32	46	0.37	<2	<0.08	<2	<0.07	18	0.08	0.53
10:35	14	0.20	32	0.35	24	0.27	<2	<0.02	0.82
10:38	<2	<0.07	<2	<0.08	<2	<0.07	13	0.07	0.13
10:41	17	0.22	<2	<0.08	38	0.34	<2	<0.02	0.56
10:44	10	0.16	<2	<0.08	6	0.13	20	0.08	0.46
10:47	<2	<0.07	32	0.35	12	0.19	<2	<0.02	0.54
10:50	16	0.21	25	0.31	11	0.17	18	0.08	0.85
10:53	<2	<0.07	23	0.30	44	0.37	<2	<0.02	0.67
10:56	13	0.19	15	0.24	<2	<0.07	<2	<0.02	0.43
10:59	<2	<0.07	9	0.18	25	0.27	<2	<0.02	0.46
11:02	61	0.43	<2	<0.08	28	0.29	<2	<0.02	0.72
Average		**0.20**		**0.15**		**0.16**		**0.02**	**0.56**

RUN DATA

Number 14

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
				Calibration drift check					
20:16	14345	7.84	<2	<0.08	<2	<0.07	<2	<0.02	7.84
20:19	14713	7.94	<2	<0.08	<2	<0.07	<2	<0.02	7.94
20:22	14122	7.77	<2	<0.08	<2	<0.07	<2	<0.02	7.77
Average		**7.85**		**<0.08**		**<0.07**		**<0.02**	**7.85**

RECOVERY DATA

Number 1

Client: New Indy
Location: Catawba, SC
Source: Paper Machine Vent 1

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Before Run 1
Start Time 07:25 **End Time** 07:33

Recovery Gas to Probe, Time 07:25

Peak Areas, mv-sec			Average	ppm
14784	14214	14219	14406	7.85

Recovery Gas to GC, Time 07:29

Peak Areas, mv-sec			Average	ppm
14953	14792	14800	14848	7.98

Recovery 98.4%

RECOVERY DATA

Number 2

Client:	**New Indy**			Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Method	**16**	Operator:	**VD**
Source:	**Paper Machine Vent 1**	Calibration	**1**	Date:	**25 Jun 2021**

After Run 3 **Before Run** 4
Start Time 11:06 **End Time** 11:15

Recovery Gas to Probe, Time 11:06

Peak Areas, mv-sec			**Average**	**ppm**
13991	13801	13923	13905	7.71

Recovery Gas to GC, Time 11:12

Peak Areas, mv-sec			**Average**	**ppm**
14345	14801	14524	14556	7.90

Recovery 97.6%

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	460	457	298	232
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **42.9** mL/Min	**10.7** ppm	**10.7** ppm	**6.95** ppm	**5.41** ppm
Time: 06:02	**Peak Areas, mv-sec**			
	25099	20594	10407	44232
	24750	21533	10445	46016
	25597	21979	10703	45950
Average Area	**25149**	**21369**	**10519**	**45399**

2 Flow = **82.8** mL/Min	**5.56** ppm	**5.52** ppm	**3.60** ppm	**2.80** ppm
Time: 06:53	**Peak Areas, mv-sec**			
	7926	6406	2923	14068
	7950	6306	2884	13591
	8444	6460	2990	14698
Average Area	**8107**	**6390**	**2932**	**14119**

3 Flow = **130** mL/Min	**3.54** ppm	**3.52** ppm	**2.29** ppm	**1.79** ppm
Time: 07:08	**Peak Areas, mv-sec**			
	3069	2599	1371	5786
	3064	2578	1331	5729
	3088	2512	1340	5842
Average Area	**3074**	**2563**	**1347**	**5786**

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

H_2S	**1**	**2**	**3**	
Time	06:02	06:53	07:08	
Concentration, ppm	10.7	5.56	3.54	
Area, mv-sec	25149	8107	3074	
Calc. Conc., ppm	10.6	5.79	3.46	✓
% Error	-1.6	4.2	-2.4	

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8847	2.4717	0.9980	2	0.07

MeSH	**1**	**2**	**3**	
Time	06:02	06:53	07:08	
Concentration, ppm	10.7	5.52	3.52	
Area, mv-sec	21369	6390	2563	
Calc. Conc., ppm	10.6	5.62	3.48	✓
% Error	-0.7	1.8	-1.1	

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9089	2.3742	0.9996	2	0.08

DMS	**1**	**2**	**3**	
Time	06:02	06:53	07:08	
Concentration, ppm	6.95	3.60	2.29	
Area, mv-sec	10519	2932	1347	
Calc. Conc., ppm	7.00	3.53	2.32	✓
% Error	0.8	-2.0	1.2	

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8617	2.4483	0.9995	2	0.07

DMDS	**1**	**2**	**3**	
Time	06:02	06:53	07:08	
Concentration, ppm	5.41	2.80	1.79	
Area, mv-sec	45399	14119	5786	
Calc. Conc., ppm	5.37	2.86	1.77	✓
% Error	-0.8	2.0	-1.2	

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8537	3.3043	0.9995	2	0.02

CALIBRATION DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	460	457	298	232
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **43.6** mL/Min	**10.5** ppm	**10.5** ppm	**6.82** ppm	**5.31** ppm
Time: 19:32		**Peak Areas, mv-sec**		
	23668	22380	10086	46114
	24884	23771	10653	47622
	24624	24375	10810	50274
Average Area	**24392**	**23509**	**10516**	**48003**
2 Flow = **65.8** mL/Min	**6.99** ppm	**6.95** ppm	**4.53** ppm	**3.53** ppm
Time: 19:43		**Peak Areas, mv-sec**		
	14069	11744	5164	24545
	13746	12537	5293	24899
	13905	12112	5280	24958
Average Area	**13907**	**12131**	**5246**	**24800**
3 Flow = **123** mL/Min	**3.74** ppm	**3.71** ppm	**2.42** ppm	**1.88** ppm
Time: 19:59		**Peak Areas, mv-sec**		
	4288	3691	1547	7409
	4623	3823	1561	7662
	4672	3745	1545	7541
Average Area	**4527**	**3753**	**1551**	**7538**

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

H2S	**1**	**2**	**3**		
Time	19:32	19:43	19:59		
Concentration, ppm	10.5	6.99	3.74		
Area, mv-sec	24392	13907	4527		
Calc. Conc., ppm	10.3	7.29	3.68		
% Error	-2.5	4.3	-1.6 ✓		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.6380	2.7299	0.9976	2	0.03

MeSH	**1**	**2**	**3**		
Time	19:32	19:43	19:59		
Concentration, ppm	10.5	6.95	3.71		
Area, mv-sec	23509	12131	3753		
Calc. Conc., ppm	10.3	7.11	3.68		
% Error	-1.4	2.4	-0.9 ✓		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7779	2.5690	0.9992	2	0.05

DMS	**1**	**2**	**3**		
Time	19:32	19:43	19:59		
Concentration, ppm	6.82	4.53	2.42		
Area, mv-sec	10516	5246	1551		
Calc. Conc., ppm	6.73	4.63	2.40		
% Error	-1.3	2.2	-0.9 ✓		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8539	2.4865	0.9993	2	0.07

DMDS	**1**	**2**	**3**		
Time	19:32	19:43	19:59		
Concentration, ppm	5.31	3.53	1.88		
Area, mv-sec	48003	24800	7538		
Calc. Conc., ppm	5.23	3.62	1.86		
% Error	-1.6	2.7	-1.0 ✓		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7949	3.3916	0.9990	2	0.02

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**
Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	25.0	35.0	63.0	132.0
Peak Detection Window, sec	10.0	10.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	3.0	3.0
Ending Peak Width, sec	2.0	3.0	5.0	5.0
Permeation Device ID	T-51831	33-50536	89-50725	89-53405
Permeation Rate, ng/min	642	901	758	895
Permeation Rate, nL/min*	460	457	298	232

Barometric Pressure: 29.70 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 642 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.70)$$
$$= 460 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 1**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

File: E:\6-25-21.trs
Program Version: 2.0, built 21 Feb 2015 **File Version:** 2.0
Computer: JWS-PROGRAMMING **Trailer:** 271

Analog Input Device: Keithley KUSB-3108 **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: GC-8A **Serial No.** C10494419420SA
Detector Range: 10

Gases

	Press. psi	Flow mL/min
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 100
Detector: 120

Columns

Primary: 3'
Secondary:
Sample Loop: 6" unlined

Injection Cycle

Total Length: 180 sec **Sampling Time:** 160 sec **Load/Backflush Time:** 85 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 5 mv-sec **Minimum peak height** 5 mv above baseline

Dynacalibrator

Chamber Temperature 130.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.70 in. Hg

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 1**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
	PM vent 1	**Run 1**		
09:07:29	6776	20.2	40	0.2
09:07:44	6774	20.2	41	0.2
09:07:59	6775	20.2	40	0.2
09:08:14	6774	20.2	43	0.2
09:08:29	6776	20.2	42	0.2
09:08:44	6773	20.2	43	0.2
09:08:59	6776	20.2	43	0.2
09:09:14	6777	20.2	43	0.2
09:09:29	6776	20.2	43	0.2
09:09:44	6773	20.2	42	0.2
09:09:59	6775	20.2	42	0.2
09:10:14	6775	20.2	40	0.2
09:10:29	6775	20.2	41	0.2
09:10:44	6773	20.2	41	0.2
09:10:59	6774	20.2	41	0.2
09:11:14	6774	20.2	39	0.2
09:11:29	6774	20.2	42	0.2
Avgs	**6775**	**20.2**	**42**	**0.2**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent** |

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
	PM vent 1		**Run 2**	
10:12:11	6777	20.2	36	0.2
10:12:26	6776	20.2	38	0.2
10:12:41	6774	20.2	37	0.2
10:12:56	6777	20.2	36	0.2
10:13:11	6774	20.2	37	0.2
10:13:26	6776	20.2	38	0.2
10:13:41	6775	20.2	37	0.2
10:13:56	6777	20.2	37	0.2
10:14:11	6775	20.2	37	0.2
10:14:26	6774	20.2	37	0.2
10:14:41	6773	20.2	38	0.2
10:14:56	6776	20.2	36	0.2
10:15:11	6776	20.2	36	0.2
10:15:26	6775	20.2	37	0.2
10:15:41	6774	20.2	36	0.2
10:15:56	6774	20.2	35	0.2
10:16:11	6776	20.2	37	0.2
10:16:26	6775	20.2	38	0.2
10:16:41	6773	20.2	37	0.2
10:16:56	6776	20.2	36	0.2
Avgs	**6775**	**20.2**	**37**	**0.2**

RUN DATA
Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent **
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
PM vent 1 Run 3				
11:20:14	6778	20.2	37	0.2
11:20:29	6777	20.2	35	0.2
11:20:44	6776	20.2	36	0.2
11:20:59	6778	20.2	33	0.2
11:21:14	6776	20.2	34	0.2
11:21:29	6778	20.2	33	0.2
11:21:44	6775	20.2	33	0.2
11:21:59	6777	20.2	35	0.2
11:22:14	6776	20.2	34	0.2
11:22:29	6775	20.2	34	0.2
11:22:44	6773	20.2	35	0.2
11:22:59	6778	20.2	35	0.2
11:23:14	6777	20.2	34	0.2
11:23:29	6775	20.2	34	0.2
11:23:44	6774	20.2	33	0.2
11:23:59	6776	20.2	35	0.2
11:24:14	6775	20.2	35	0.2
11:24:29	6776	20.2	35	0.2
11:24:44	6774	20.2	34	0.2
11:24:59	6775	20.2	34	0.2
11:25:14	6776	20.2	34	0.2
Avgs	**6776**	**20.2**	**34**	**0.2**

RUN DATA

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
11:31:32	3335	10.0	3225	9.9
11:31:47	3332	10.0	3232	9.9
11:32:02	3330	10.0	3232	9.9
11:32:17	3330	10.0	3236	9.9
Cylinder # SG9168283BAL 10.12 O2 and 10.16 CO2				
11:32:32	3328	10.0	3235	9.9
11:32:47	3328	10.0	3238	9.9
11:33:02	3330	10.0	3237	9.9
11:33:17	3329	10.0	3237	9.9
11:33:32	3327	10.0	3240	9.9
11:33:47	3329	10.0	3241	9.9
11:34:02	3328	10.0	3237	9.9
11:34:17	3330	10.0	3242	9.9
11:34:32	3329	10.0	3239	9.9
11:34:47	3328	10.0	3238	9.9
11:35:02	3331	10.0	3239	9.9
11:35:17	3331	10.0	3238	9.9
11:35:32	3333	10.0	3235	9.9
11:35:47	3334	10.0	3235	9.9
Avgs	**3330**	**10.0**	**3236**	**9.9**

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 08:20

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	8
10.1 ✓	SG9168283BAL	3287
19.5 ✓	CC454190	6576

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
336.7 ✓	-31 ✓	0.9998 ✓

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	5
10.2 ✓	SG9168283BAL	3276
20.4 ✓	CC454190	6722

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
329.3 ✓	-20 ✓	0.9999 ✓

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 08:20

O_2

Method: EPA 3A
Span Conc. 19.5 %
Slope 336.7 **Intercept** -31.5

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	8	0.1	0.1	0.5 ✓	Pass
10.1	3287	9.9	-0.2	-1.0 ✓	Pass
19.5	6576	19.6	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A
Span Conc. 20.4 %
Slope 329.3 **Intercept** -19.9

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	5	0.1	0.1	0.5 ✓	Pass
10.2	3276	10.0	-0.2	-1.0 ✓	Pass
20.4	6722	20.5	0.1	0.5 ✓	Pass

METHODS AND ANALYZERS

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**Paper Machine vent**	Date:	**25 Jun 2021**

File: C:\Users\Trailer 271\Documents\New Indy\6-25-21.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: DESKTOP-GQ0I9UV **Trailer:** 271
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	O_2
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.5**

Channel 2

Analyte	CO_2
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.4**

VENT 2

New Indy
Catawba, SC

15730.001.008
No. 2 Hood Exhaust
Paper Machine Vent 2

EMISSION CALCULATIONS

	Run 1	**Run 2**	**Run 3**	**Mean**
Date	**6/24/21**	**6/24/21**	**6/24/21**	**---**
Time Began	**1310**	**1416**	**1522**	**---**
Time Ended	**1410**	**1516**	**1622**	**---**
Volumetric Flow Rate, (Qs), DSCFM	5.20E+04	5.26E+04	5.45E+04	5.30E+04
BWS	0.202	0.187	0.187	0.192
% Oxygen	20.2	20.2	20.2	20.2

Total Reduced Sulfur (TRS MW)= 34.08				
Concentration, ppm	0.68	0.62	0.57	0.62
Emission Rate, lb/hr	0.19	0.17	0.16	0.18

AB for SH ✓

New Indy
Catawba, SC

15730.001.008
No. 2 Hood Exhaust

Paper Machine Vent 2

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/24/21	6/24/21	6/24/21	---
Time Began		1310	1416	1522	---
Time Ended		1401	1508	1613	---

INPUT DATA

Sampling Time, min	(Theta)	48.0	48	48	48
Stack Diameter, in.	(Dia.)	55.875	55.875	55.875	55.875
Barometric Pressure, in. Hg	(Pb)	29.70	29.70	29.70	29.70
Static Pressure, in. H2O	(Pg)	-0.82	-0.82	-0.82	-0.82
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	1.0030	1.0030	1.0030	1.0030
Orifice Calibration Value	(Delta H@)	1.8000	1.8000	1.8000	1.8000
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	30.104	30.681	30.709	30.498
Meter Temperature, °F	(Tm)	89.3	87.4	87.8	88.2
Meter Temperature, °R	(Tm-R)	549.3	547.4	547.8	548.2
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	155.6	144.8	144.0	148.1
CO2 Concentration, %	(CO2)	0.2	0.2	0.2	0.2
O2 Concentration, %	(O2)	20.2	20.2	20.2	20.2
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	1.207	1.202	1.244	1.218
Stack Temperature, °F	(Ts)	178.2	178.4	179.1	178.6
Stack Temperature, °R	(Ts-R)	638.2	638.4	639.1	638.6
Moisture Fraction (at Saturation)	(BWS)	0.496	0.498	0.506	0.500

CALCULATED DATA

Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	17.03	17.03	17.03	17.03
Stack Pressure, in. Hg	(Ps)	29.64	29.64	29.64	29.64
Meter Pressure, in. Hg	(Pm)	29.80	29.80	29.80	29.80
Standard Meter Volume, ft^3	(Vmstd)	28.891	29.547	29.553	29.330
Standard Water Volume, ft^3	(Vwstd)	7.324	6.816	6.778	6.973
Moisture Fraction (Measured)	(BWS)	0.202	0.187	0.187	0.192
Moisture Fraction (lower sat/meas)	(BWS)	0.202	0.187	0.187	0.192
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	28.84	28.84	28.84	28.84
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	26.65	26.81	26.82	26.76
Average Stack Gas Velocity, ft/sec	(Vs)	77.94	77.40	80.12	78.49
Stack Gas Flow, actual, ft^3/min	(Qa)	79629	79074	81860	80188
Stack Gas Flow, Std , ft^3/min	(Qs)	52043	52622	54475	53047

Calibration check	(Yqa)	1.0420	1.0207	1.0201	1.028
Percent difference from Y					2.45%

ABfor SH✓

No. 2 Hood Exhaust

55.875 dia

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: No. ~~3~~ 2 Hood Exhaust
Sample Location: Roof
W. O. Number: 15730.001.008
Run Number: 1
Date: 6/24/21
Test Personnel: BCA/BE
Sample Time: 48 min.

Console ID: A023
Meter Corr., Y: 1.003
Console ΔH@: 1.800
Probe ID/Length: PR6C - 6'
Liner Material: SS
Pitot ID/Coeff.: P77 0.84
Thermo ID: A023
Nozzle ID/Diams.:
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 79 °F
Baro. Pressure*: 29.70 in. Hg
Static Pressure: -.82 in. H_2O
Impinger Gain: 149.2 mL
Silica Gel Gain: 6.1 g
Stack Area: 17.03 ft^2
Total Traverse Points: 16

K Factor: N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.002	0.000
@ Vac., in. Hg	12"	5
Pitot	Good	Good

Filter ID: N/A
Sample ID: Run 1

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	13:10			638.696									
A-1	3		1.5	1.3	640.4	178	N/A	89	250	245	N/A	62	3	
2	6		1.7	1.3	642.3	178		89	250	244		53	3	
3	9		1.7	1.3	644.1	178		90	250	243		49	3	
4	12		1.7	1.3	646.0	178		90	250	241		48	3	
5	15		1.6	1.3	648.0	178		90	252	247		48	3	
6	18		1.6	1.3	649.7	178		90	254	248		49	3	
7	21		1.3	1.3	651.6	179		90	249	246		50	3	
8	24		1.3	1.3	653.6	180		89	253	246		49	3	
B-1	27		1.2	1.3	655.5	178		89	255	242		53	3	
2	30		1.2	1.3	657.4	179		87	250	245		50	3	
3	33		1.4	1.3	659.3	179		89	251	244		50	3	
4	36		1.4	1.3	661.2	179		89	251	245		49	3	
5	39		1.4	1.3	663.1	178		89	252	245		49	3	
6	42		1.4	1.3	664.9	178		89	252	245		50	3	
7	45		1.4	1.3	666.8	178		89	253	244		50	3	
8	48	14:01	1.6	1.3	668.800	175		89	256	247		51	3	
*Barometric Pressure is at port elevation			Avg √Δp 1.2078	Avg ΔH 1.300	Total Volume 30.104	Avg T_s 178.2	Avg T_m 89.3		Min/Max 249/256	Min/Max 241/248	Min/Max	Max Temp 62	Max Vac 3	
			1.463	Avg √ΔH 1.1402										

AB 6/24

Comments

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

$V_{m\text{-std}}$, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by

WESTON SOLUTIONS®
Integrated Air Services

No. 2 Hood Exhaust

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: No. ~~3~~ 2 Hood Exhaust
Sample Location: Roof
W. O. Number: 15730.001.008
Run Number: 2
Date: 6/24/21
Test Personnel: BEA/ EE
Sample Time: 48 min.

Console ID: A023
Meter Corr., Y: 1.003
Console ΔH@: 1.800
Probe ID/Length: PR6C-6'
Liner Material: SS
Pitot ID/Coeff.: P77 0.84
Thermo ID: A023
Nozzle ID/Diams.:
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 81 °F
Baro. Pressure*: 29.70 in. Hg
Static Pressure: -.82 in. H_2O
Impinger Gain: 136.2 mL
Silica Gel Gain: 8.6 g
Stack Area: 17.03 ft^2
Total Traverse Points: 16

K Factor: N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.008	0.004
@ Vac., in. Hg	12''	12''
Pitot	Good	Good

Filter ID: N/A
Sample ID: run 2

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	14:16			669.605									
A-1	3		1.3	1.3	671.5	178	N/A	88	252	243	N/A	62	2	
2	6		1.2	1.3	673.3	178		88	253	245		60	2	
3	9		1.2	1.3	675.3	178		88	252	246		57	2	
4	12		1.3	1.3	677.2	179		87	254	243		56	2	
5	15		1.4	1.3	679.1	179		87	252	247		56	2	
6	18		1.4	1.3	681.1	179		87	253	244		58	2	
7	21		1.5	1.3	683.0	176		88	258	239		58	2	
8	24		1.6	1.3	684.0	176		88	256	244		59	2	
B-1	27		1.5	1.3	686.9	176		88	256	245		60	2	
2	30		1.5	1.3	688.8	179		87	249	245		62	2	
3	33		1.7	1.3	690.7	179		88	252	241		63	2	
4	36		1.7	1.3	692.6	179		87	250	247		66	2	
5	39		1.7	1.3	694.4	179		87	251	245		67	2	
6	42		1.9	1.3	696.3	180		87	249	245		66	2	
7	45		1.4	1.3	698.3	180		87	251	247		65	2	
8	48	15:08	1.4	1.3	700.286	180		87	251	244		62	2	
*Barometric Pressure is at port elevation			Avg √Δp 1.2024 ✓	Avg ΔH 1.300 ✓	Total Volume 30.681 ✓	Avg T_s 178.4 ✓	Avg T_m 87.4 ✓		Min/Max 249/258 ✓	Min/Max 239/247	Min/Max ✓	Max Temp 67 ✓	Max Vac 2 ✓	
				Avg √ΔH 1.1402 ✓										

$V_{m\text{-}std}$, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Comments

WESTON SOLUTIONS®
Integrated Air Services

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 2 Hood Exhaust
Sample Location: Roof
W. O. Number: 15730.001.008
Run Number: 3
Date: 6/29/21
Test Personnel: BEA/BE
Sample Time: 48 min.

Console ID: A023
Meter Corr., Y: 1.003
Console ΔH@: 1.800
Probe ID/Length: PR6C-6'
Liner Material: SS
Pitot ID/Coeff.: P77 0.84
Thermo ID: A023
Nozzle ID/Diams.:
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 81 °F
Baro. Pressure*: 29.70 in. Hg
Static Pressure: -.82 in. H_2O
Impinger Gain: 138.9 mL
Silica Gel Gain: 5.1 g
Stack Area: 17.03 ft^2
Total Traverse Points: 16

K Factor: N/A

Leak Checks

	Initial	Final
Volume, ft^3	.004	.002
@ Vac., in. Hg	12"	5"
Pitot	Good	Good

Filter ID: N/A
Sample ID: run 3

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	15:22			700.564									
A-1	3		1.5	1.3	702.5	179	N/A	87	253	247	N/A	67	3	
2	6		1.5	1.3	704.5	180		87	255	246		57	3	
3	9		1.6	1.3	706.4	179		87	252	242		52	3	
4	12		1.6	1.3	708.3	179		88	253	246		51	3	
5	15		1.7	1.3	710.3	180		88	248	242		51	3	
6	18		1.7	1.3	712.2	179		87	251	248		52	3	
7	21		1.7	1.3	714.1	179		87	251	247		52	3	
8	24		1.5	1.3	716.0	179		87	250	245		52	3	
B-1	27		1.5	1.3	717.9	179		88	252	243		55	3	
2	30		1.5	1.3	719.8	179		88	254	245		52	3	
3	33		1.5	1.3	721.7	179		88	250	241		51	3	
4	36		1.6	1.3	723.6	179		88	249	242		52	3	
5	39		1.6	1.3	725.5	179		88	251	247		53	3	
6	42		1.5	1.3	727.4	179		89	251	247		53	3	
7	45		1.5	1.3	729.3	179		89	252	248		54	3	
8	48	16:13	1.3	1.3	731.273	179		89	254	246		53	3	
*Barometric Pressure is at port elevation			Avg √Δp 1.2443 ✓	Avg ΔH 1.300 ✓	Total Volume 30.709 ✓	Avg T_s 179.1 ✓		Avg T_m 87.8 ✓	Min/Max 248/255	Min/Max 241/248	Min/Max	Max Temp 67 ✓	Max Vac 3 ✓	V_{m-std} scf
				Avg √ΔH 1.1402 ✓										

Comments

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by AM

WESTON SOLUTIONS
Integrated Air Services

Sample Recovery Field Data

Method: EPA 4, Moisture

Client: New Indy
Location/Plant: Catawba, SC
Source: No. ~~4~~ 2 Hood Exhaust
W.O. Number: 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample Date: 6/24/21
Recovery Date: 6/24/21
Sample ID: Run 1
Filter ID: N/A
Analyst: BA

	Impingers 1	2	3		Imp.Total	Silica Gel	Total
Contents					▨	grams	▨
Final	835.1	721.3	560.2			899.9	
Initial	742.4	668.1	556.9			893.5	
Gain	92.7 ✓	53.2 ✓	3.3 ✓		149.2	~~6.1~~ 6.4	155.6

Impinger Color: Clear ✓ ✓ ✓
Silica Gel Condition: Good
Labled? ✓ ✓ ✓ ✓
Sealed? ✓ ✓

Run No. 2
Sample Date: 6/24/21
Recovery Date: 6/24/21
Sample ID: Run 2
Filter ID: N/A
Analyst: BA

	Impingers 1	2	3		Imp.Total	Silica Gel	Total
Contents					▨	grams	▨
Final	868.1	841.8	648.0			874.7	
Initial	752.4	824.3	645.0			866.1	
Gain	115.7 ✓	17.5 ✓	3 ✓		136.2	8.6 ✓	144.8

Impinger Color: Clear ✓ ✓ ✓
Silica Gel Condition: Good
Labled? ✓ ✓ ✓ ✓
Sealed? ✓

Run No. 3
Sample Date: 6/24/21
Recovery Date: 6/24/21
Sample ID: Run 3
Filter ID: N/A
Analyst: BA

	Impingers 1	2	3		Imp.Total	Silica Gel	Total
Contents					▨	grams	▨
Final	868.5	696.7	553.9			905.0	
Initial	760.2	669.1	550.9			899.9	
Gain	108.3 ✓	27.6 ✓	3 ✓		138.9	5.1 ✓	144.0

Impinger Color: Clear ✓ ✓ ✓
Silica Gel Condition: Good
Labled? ✓ ✓ ✓ ✓
Sealed? ✓

Check COC for Sample IDs of Media Blanks

AB ✓

WESTON SOLUTIONS
Integrated Air Services

Sample and Velocity Traverse Point Data Sheet - Method 1

Client: New Indy
Loaction/Plant: Catawba, SC
Source: No. 2 Hood Exhaust

Operator: VD / LF
Date: 15-Jun-21
W.0. Number: 15730.001.008

Duct Type	☑	Circular	☐	Rectangular Duct	Indicate appropriate type
Traverse Type	☐	Particulate Traverse	☑	Velocity Traverse	

Distance from far wall to outside of port (in.) = C	56.000
Port Depth (in.) = D	0.125
Depth of Duct, diameter (in.) = C-D	55.875
Area of Duct (ft^2)	17.03
Total Traverse Points	16
Total Traverse Points per Port	8

Flow Disturbances	
Upstream - A (ft)	7.208
Downstream - B (ft)	25.0
Upstream - A (duct diameters)	1.55
Downstream - B (duct diameters)	5.37

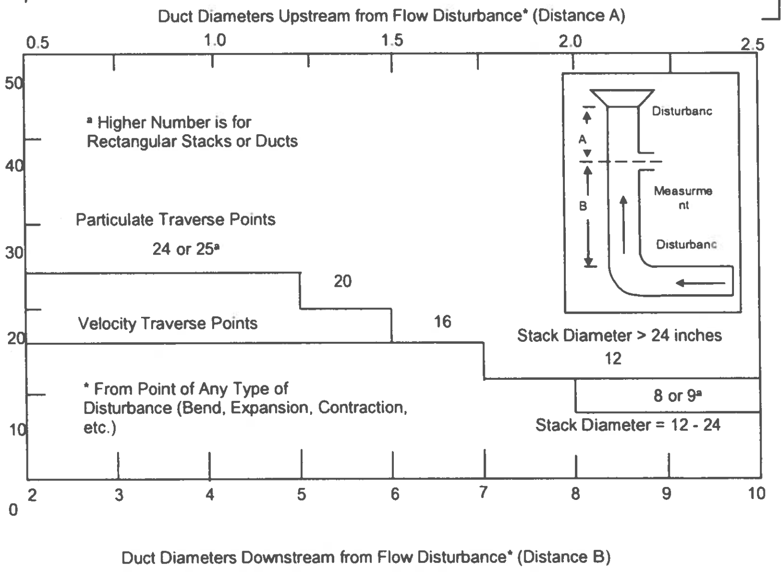
Diagram of Stack

Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	2	2
2	10.5	6	6
3	19.4	11	11
4	32.3	18	18
5	67.7	38	38
6	80.6	45	45
7	89.5	50	50
8	96.8	54	54
9			
10			
11			
12			

Equivalent Diameter = (2*L*W)/(L+W)



Traverse Point Location Percent of Stack -Circular

Traverse Location Point	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

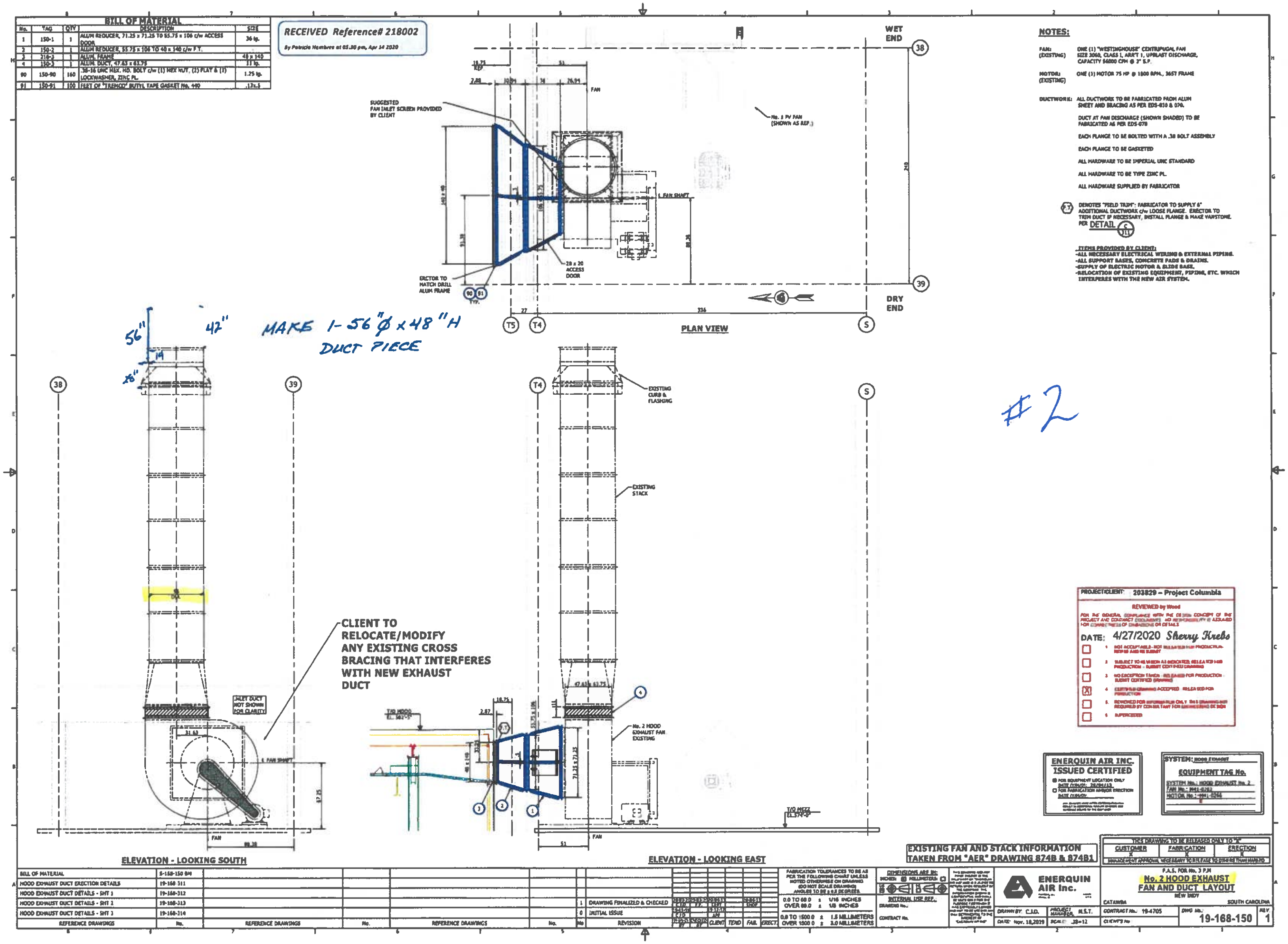
Traverse Point Location Percent of Stack -Rectangular

Traverse Location Point	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Port Diam. (in) = 4
Number of Ports = 2

Tape Measure I.D. # TM-07



RECEIVED Reference# 218002
By Patricia Membreno at 05:30 pm, Apr 14 2020

MAKE 1-56"Ø x 48"H DUCT PIECE

CLIENT TO RELOCATE/MODIFY ANY EXISTING CROSS BRACING THAT INTERFERES WITH NEW EXHAUST DUCT

BILL OF MATERIAL

No.	TAG	QTY	DESCRIPTION	SIZE
1	150-1	1	ALUM REDUCER, 71.25 x 71.25 TO 55.75 x 106 c/w ACCESS DOOR	36 lg.
2	150-2	1	ALUM REDUCER, 55.75 x 106 TO 40 x 140 c/w F.T.	
3	210-3	1	ALUM. FRAME	40 x 140
4	150-3	1	ALUM. DUCT, 47.63 x 61.75	11 lg.
90	150-90	160	.38-16 UNC HEX. HD. BOLT c/w (1) HEX NUT, (2) FLAT & (1) LOCKWASHER, ZINC PL.	1.25 lg.
91	150-91	100	FEET OF "TREMCO" BUTYL TAPE GASKET No. 440	.13x.5

NOTES:

FAN: (EXISTING) ONE (1) "WESTINGHOUSE" CENTRIFUGAL FAN SIZE 3060, CLASS 1, ARR'T 1, UPBLAST DISCHARGE, CAPACITY 56000 CFM @ 2" S.P.

MOTOR: (EXISTING) ONE (1) MOTOR 75 HP @ 1800 RPM., 365T FRAME

DUCTWORK: ALL DUCTWORK TO BE FABRICATED FROM ALUM SHEET AND BRACING AS PER EDS-030 & 070.

DUCT AT FAN DISCHARGE (SHOWN SHADED) TO BE FABRICATED AS PER EDS-070

EACH FLANGE TO BE BOLTED WITH A .38 BOLT ASSEMBLY

EACH FLANGE TO BE GASKETED

ALL HARDWARE TO BE IMPERIAL UNC STANDARD

ALL HARDWARE TO BE TYPE ZINC PL.

ALL HARDWARE SUPPLIED BY FABRICATOR

DENOTES "FIELD TRIM": FABRICATOR TO SUPPLY 6" ADDITIONAL DUCTWORK c/w LOOSE FLANGE. ERECTOR TO TRIM DUCT IF NECESSARY, INSTALL FLANGE & MAKE VANSTONE PER DETAIL C/311

ITEMS PROVIDED BY CLIENT:
- ALL NECESSARY ELECTRICAL WIRING & EXTERNAL PIPING.
- ALL SUPPORT BASES, CONCRETE PADS & DRAINS.
- SUPPLY OF ELECTRIC MOTOR & SLIDE BASE.
- RELOCATION OF EXISTING EQUIPMENT, PIPING, ETC. WHICH INTERFERES WITH THE NEW AIR SYSTEM.

PROJECT/CLIENT: 203829 – Project Columbia

REVIEWED by Wood

FOR THE GENERAL COMPLIANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND CONTRACT DOCUMENTS. NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS OF DIMENSIONS OR DETAILS

DATE: 4/27/2020 Sherry Krebs

☐ 1 NOT ACCEPTABLE - NOT RELEASED FOR PRODUCTION - REVISE AND RE-SUBMIT
☐ 2 SUBJECT TO REVISION AS INDICATED, RELEASED FOR PRODUCTION - SUBMIT CERTIFIED DRAWING
☐ 3 NO EXCEPTION TAKEN - RELEASED FOR PRODUCTION - SUBMIT CERTIFIED DRAWING
☒ 4 CERTIFIED DRAWING ACCEPTED - RELEASED FOR PRODUCTION
☐ 5 REVIEWED FOR INFORMATION ONLY. THIS DRAWING NOT REQUIRED BY CONSULTANT FOR ENGINEERING DESIGN
☐ 6 SUPERCEDED

ENERQUIN AIR INC. ISSUED CERTIFIED
● FOR EQUIPMENT LOCATION ONLY
DATE (Y/M/D): 20/04/13
○ FOR FABRICATION AND/OR ERECTION
DATE (Y/M/D): ______

SYSTEM: HOOD EXHAUST
EQUIPMENT TAG No.
SYSTEM No.: HOOD EXHAUST No. 2
FAN No.: 9941-0202
MOTOR No.: 9941-0266

EXISTING FAN AND STACK INFORMATION TAKEN FROM "AER" DRAWING 874B & 874B1

THIS DRAWING TO BE RELEASED ONLY TO "X"

CUSTOMER	FABRICATION	ERECTION
X	X	X

MANAGEMENT APPROVAL NECESSARY TO RELEASE TO OTHERS THAN MARKED

REFERENCE DRAWINGS	No.
BILL OF MATERIAL	S-168-150 BM
HOOD EXHAUST DUCT ERECTION DETAILS	19-168-311
HOOD EXHAUST DUCT DETAILS - SHT 1	19-168-312
HOOD EXHAUST DUCT DETAILS - SHT 2	19-168-313
HOOD EXHAUST DUCT DETAILS - SHT 3	19-168-314

No.	REVISION
1	DRAWING FINALIZED & CHECKED
0	INITIAL ISSUE

FABRICATION TOLERANCES TO BE AS PER THE FOLLOWING CHART UNLESS NOTED OTHERWISE ON DRAWING (DO NOT SCALE DRAWING) ANGLES TO BE ± 0.5 DEGREES
0.0 TO 60.0 ± 1/16 INCHES
OVER 60.0 ± 1/8 INCHES
0.0 TO 1500.0 ± 1.5 MILLIMETERS
OVER 1500.0 ± 3.0 MILLIMETERS

DIMENSIONS ARE IN: INCHES: ☒ MILLIMETERS: ☐

INTERNAL USE REF.
DRAWING No.
CONTRACT No.

ENERQUIN AIR Inc.

F.A.S. FOR No. 3 P.M
No. 2 HOOD EXHAUST FAN AND DUCT LAYOUT
NEW INDY
CATAWBA SOUTH CAROLINA

DRAWN BY: C.J.D.
PROJECT MANAGER: H.S.T.
DATE: Nov. 18,2019
SCALE: .38=12
CONTRACT No.: 19-4705
CLIENT'S No.
DWG No.: 19-168-150
REV. 1

RUN SUMMARY

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~ 2**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time 13:10 **End Time** 14:10

Average Measured TRS Conc.	0.67 **ppm**
Recovery No. 3	98.0 **%**
TRS Corrected for Recovery	0.68 **ppm**

SH

RUN SUMMARY

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~** 2

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time 14:16 **End Time** 15:16

Average Measured TRS Conc.	0.61 **ppm** ✓
Recovery No. 3	98.0 **%** ✓
TRS Corrected for Recovery	0.62 **ppm** ✓

SH

RUN SUMMARY

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~** 2

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time 15:22 **End Time** 16:22

Average Measured TRS Conc.	0.56 **ppm** ✓
Recovery No. 3	98.0 **%** ✓
TRS Corrected for Recovery	0.57 **ppm** ✓

SH

RUN DATA

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~** 2

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
				Run 1 on PM vent 2					
13:10	31	0.32	4	0.13	8	0.18	29	0.11	0.86
13:13	26	0.29	10	0.22	<2	<0.091	<2	<0.027	0.51
13:16	14	0.21	44	0.45	<2	<0.091	<2	<0.027	0.66
13:19	23	0.27	9	0.21	<2	<0.091	<2	<0.027	0.48
13:22	13	0.20	18	0.29	<2	<0.091	<2	<0.027	0.49
13:25	10	0.17	27	0.35	<2	<0.091	<2	<0.027	0.53
13:28	36	0.35	9	0.20	<2	<0.091	20	0.09	0.73
13:31	10	0.17	7	0.18	<2	<0.091	11	0.07	0.49
13:34	78	0.53	60	0.53	<2	<0.091	<2	<0.027	1.06
13:37	8	0.15	19	0.30	37	0.40	31	0.12	1.09
13:40	10	0.18	<2	<0.095	<2	<0.091	15	0.08	0.34
13:43	8	0.16	66	0.56	<2	<0.091	<2	<0.027	0.71
13:46	24	0.28	24	0.33	14	0.24	<2	<0.027	0.85
13:49	6	0.14	<2	<0.095	<2	<0.091	28	0.11	0.36
13:52	217	0.90	<2	<0.095	<2	<0.091	<2	<0.027	0.90
13:55	64	0.47	<2	<0.095	19	0.29	<2	<0.027	0.76
13:58	24	0.29	15	0.26	<2	<0.091	<2	<0.027	0.54
14:01	14	0.21	16	0.27	<2	<0.091	16	0.08	0.64
14:04	16	0.23	25	0.34	<2	<0.091	<2	<0.027	0.57
14:07	55	0.44	25	0.34	<2	<0.091	<2	<0.027	0.78
Average		**0.30**		**0.25**		**<0.091**		**0.03**	**0.67**

SH

RUN DATA
Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~** 2

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
				Run 2 PM vent 2					
14:16	<2	<0.076	<2	<0.095	<2	<0.091	<2	<0.027	-
14:19	17	0.23	9	0.20	<2	<0.091	5	0.04	0.52
14:22	91	0.57	<2	<0.095	31	0.37	<2	<0.027	0.93
14:25	59	0.45	25	0.34	<2	<0.091	<2	<0.027	0.79
14:28	19	0.25	<2	<0.095	13	0.24	13	0.07	0.64
14:31	6	0.13	40	0.43	<2	<0.091	25	0.10	0.77
14:34	<2	<0.076	<2	<0.095	12	0.22	11	0.07	0.36
14:37	4	0.11	253	1.10	<2	<0.091	<2	<0.027	1.21
14:40	20	0.26	25	0.34	5	0.14	62	0.17	1.07
14:43	<2	<0.076	<2	<0.095	<2	<0.091	17	0.09	0.17
14:46	<2	<0.076	50	0.48	22	0.31	49	0.15	1.09
14:49	<2	<0.076	<2	<0.095	<2	<0.091	<2	<0.027	-
14:52	<2	<0.076	7	0.17	<2	<0.091	15	0.08	0.33
14:55	<2	<0.076	83	0.62	56	0.50	<2	<0.027	1.12
14:58	97	0.59	<2	<0.095	<2	<0.091	<2	<0.027	0.59
15:01	32	0.33	<2	<0.095	34	0.39	18	0.09	0.89
15:04	9	0.17	17	0.28	10	0.21	13	0.07	0.80
15:07	<2	<0.076	<2	<0.095	<2	<0.091	<2	<0.027	-
15:10	9	0.17	6	0.17	<2	<0.091	<2	<0.027	0.34
15:13	13	0.20	7	0.18	13	0.24	<2	<0.027	0.62
Average		**0.17**		**0.22**		**0.13**		**0.05**	**0.61** ✓

RUN DATA

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~ 2**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
				Run 3 PM vent 2					
15:22	8	0.16	<2	<0.095	<2	<0.091	<2	<0.027	0.16
15:25	14	0.22	14	0.26	41	0.42	<2	<0.027	0.89
15:28	266	1.00	<2	<0.095	<2	<0.091	<2	<0.027	1.00
15:31	9	0.17	<2	<0.095	43	0.43	11	0.07	0.73
15:34	12	0.20	5	0.16	18	0.28	<2	<0.027	0.63
15:37	13	0.21	7	0.18	9	0.20	17	0.08	0.76
15:40	58	0.45	24	0.33	<2	<0.091	<2	<0.027	0.78
15:43	154	0.75	<2	<0.095	21	0.30	<2	<0.027	1.06
15:46	3	0.09	43	0.45	<2	<0.091	22	0.10	0.73
15:49	7	0.15	8	0.19	<2	<0.091	<2	<0.027	0.33
15:52	8	0.16	9	0.20	<2	<0.091	43	0.14	0.64
15:55	15	0.22	<2	<0.095	11	0.21	<2	<0.027	0.43
15:58	14	0.22	13	0.24	<2	<0.091	<2	<0.027	0.46
16:01	32	0.33	<2	<0.095	<2	<0.091	<2	<0.027	0.33
16:04	<2	<0.076	<2	<0.095	33	0.38	<2	<0.027	0.38
16:07	24	0.29	5	0.15	<2	<0.091	<2	<0.027	0.44
16:10	10	0.17	<2	<0.095	<2	<0.091	9	0.06	0.29
16:13	<2	<0.076	12	0.24	<2	<0.091	<2	<0.027	0.24
16:16	9	0.17	22	0.32	5	0.15	<2	<0.027	0.63
16:19	<2	<0.076	<2	<0.095	<2	<0.091	60	0.16	0.33
Average		**0.25**		**0.14**		**0.12**		**0.03**	**0.56**

RECOVERY DATA

Number 2

Client:	**New Indy**			Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Method	**16**	Operator:	**VD**
Source:	**Paper Machine Vent ~~3~~ 2**	Calibration	**1**	Date:	**24 Jun 2021**

After Run 3 **Before Run** 4
Start Time 12:45 **End Time** 12:55

Recovery Gas to Probe, Time 12:45

Peak Areas, mv-sec			Average	ppm
12908	13446	13416	13257	7.84

Recovery Gas to GC, Time 12:51

Peak Areas, mv-sec			Average	ppm
13746	14196	14064	14002	8.07

Recovery 97.2% ✓

SH

RECOVERY DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~** 2

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

After Run 6 **Before Run** 7
Start Time 16:23 **End Time** 16:31

Recovery Gas to Probe, Time 16:23

Peak Areas, mv-sec			Average	ppm
13311	13711	14111	13711	7.98

Recovery Gas to GC, Time 16:28

Peak Areas, mv-sec			Average	ppm
14746	14386	13597	14243	8.14

Recovery 98.0% ✓

SH

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~** 2

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.60 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	461	458	299	233
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **42.9** mL/Min	**10.8** ppm	**10.7** ppm	**6.97** ppm	**5.43** ppm
Time: 06:01		**Peak Areas, mv-sec**		
	23635	22744	10268	43754
	23397	21865	10275	43943
	23478	22059	10303	44074
Average Area	**23503**	**22223**	**10282**	**43924**

2 Flow = **80.0** mL/Min	**5.77** ppm	**5.73** ppm	**3.73** ppm	**2.91** ppm
Time: 07:13		**Peak Areas, mv-sec**		
	8086	7277	3039	14674
	7612	6821	2896	13428
	7977	6961	2956	14718
Average Area	**7892**	**7020**	**2964**	**14273**

3 Flow = **133** mL/Min	**3.46** ppm	**3.44** ppm	**2.24** ppm	**1.74** ppm
Time: 07:30		**Peak Areas, mv-sec**		
	2749	2295	1139	5166
	2668	2461	1022	4984
	2689	2285	1136	5151
Average Area	**2702**	**2347**	**1099**	**5100**

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~** 2

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

H$_2$S	**1**	**2**	**3**
Time	06:01	07:13	07:30
Concentration, ppm	10.8	5.77	3.46
Area, mv-sec	23503	7892	2702
Calc. Conc., ppm	10.6	5.97	3.40
% Error	-1.5	3.5	-1.9 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9001	2.4228	0.9986	2	0.076

MeSH	**1**	**2**	**3**
Time	06:01	07:13	07:30
Concentration, ppm	10.7	5.73	3.44
Area, mv-sec	22223	7020	2347
Calc. Conc., ppm	10.6	5.89	3.38
% Error	-1.3	2.9	-1.5 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9758	2.3243	0.9991	2	0.095

DMS	**1**	**2**	**3**
Time	06:01	07:13	07:30
Concentration, ppm	6.97	3.73	2.24
Area, mv-sec	10282	2964	1099
Calc. Conc., ppm	6.98	3.72	2.25
% Error	0.2	-0.5	0.3 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9707	2.3484	>0.9999	2	0.091

DMDS	**1**	**2**	**3**
Time	06:01	07:13	07:30
Concentration, ppm	5.43	2.91	1.74
Area, mv-sec	43924	14273	5100
Calc. Conc., ppm	5.38	2.97	1.72
% Error	-0.9	2.1	-1.2 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8936	3.2593	0.9995	2	0.027

CALIBRATION DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~** 2
Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.60 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	461	458	299	233
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **44.4** mL/Min	**10.4** ppm	**10.3** ppm	**6.72** ppm	**5.23** ppm
Time: 16:34		**Peak Areas, mv-sec**		
	23321	20338	9959	43670
	24380	21799	10647	46630
	25056	22227	10285	45442
Average Area	**24252**	**21454** ✓	**10297**	**45247**

2 Flow = **77.4** mL/Min	**5.96** ppm	**5.92** ppm	**3.86** ppm	**3.01** ppm
Time: 16:51		**Peak Areas, mv-sec**		
	9796	7866	3569	17108
	9812	7920	3556	17604
	9831	7352	3254	15792
Average Area	**9813**	**7713**	**3460** ✓	**16834**

3 Flow = **130** mL/Min	**3.56** ppm	**3.53** ppm	**2.30** ppm	**1.79** ppm
Time: 17:05		**Peak Areas, mv-sec**		
	3510	2899	1228	5869
	3467	2681	1272	6176
	3570	2800	1253	6307
Average Area	**3516**	**2793**	**1251**	**6117** ✓

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~ 2**
Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

H_2S	1	2	3
Time	16:34	16:51	17:05
Concentration, ppm	10.4	5.96	3.56
Area, mv-sec	24252	9813	3516
Calc. Conc., ppm	10.2	6.18	3.49
% Error	-1.7	3.6	-1.8 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8007	2.5680	0.9984	2	0.055

MeSH	1	2	3
Time	16:34	16:51	17:05
Concentration, ppm	10.3	5.92	3.53
Area, mv-sec	21454	7713	2793
Calc. Conc., ppm	10.3	5.99	3.51
% Error	-0.6	1.2	-0.6 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9025	2.4083	0.9998	2	0.078

DMS	1	2	3
Time	16:34	16:51	17:05
Concentration, ppm	6.72	3.86	2.30
Area, mv-sec	10297	3460	1251
Calc. Conc., ppm	6.72	3.86	2.30 ✓
% Error	-0.0	0.1	-0.0

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9679	2.3846	>0.9999	2	0.087

DMDS	1	2	3
Time	16:34	16:51	17:05
Concentration, ppm	5.23	3.01	1.79
Area, mv-sec	45247	16834	6117
Calc. Conc., ppm	5.19	3.06	1.78
% Error	-0.8	1.7	-0.9 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8669	3.3201	0.9996	2	0.024

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent** #2
Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	25.0	35.0	63.0	132.0
Peak Detection Window, sec	10.0	10.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	3.0	3.0
Ending Peak Width, sec	2.0	3.0	5.0	5.0
Permeation Device ID	T-51831	33-50536	89-50725	89-53405
Permeation Rate, ng/min	642 ✓	901 ✓	758 ✓	895 ✓
Permeation Rate, nL/min*	461	458	299	233

Barometric Pressure: 29.60 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 642 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.60)$$
$$= 461 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~ 2**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

File: E:\6-24-21.trs
Program Version: 2.0, built 15 May 2017 **File Version:** 2.0
Computer: JWS-PROGRAMMING **Trailer:** 271

Analog Input Device: Keithley KUSB-3108 **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: GC-8A **Serial No.** C10494419420SA
Detector Range: 10

Gases

	Press. psi	Flow mL/min
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 100
Detector: 120

Columns

Primary: 3'
Secondary:
Sample Loop: 6" unlined

Injection Cycle

Total Length: 180 sec **Sampling Time:** 160 sec **Load/Backflush Time:** 85 sec

---

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 5 mv-sec **Minimum peak height** 5 mv above baseline

---

Dynacalibrator

Chamber Temperature 130.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.60 in. Hg

RUN DATA

Number 7

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~3~~** 2

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	**H_2S**		**MeSH**		**DMS**		**DMDS**		**TRS**
	area	**ppm**	**area**	**ppm**	**area**	**ppm**	**area**	**ppm**	**ppm**
				Post test drift					
17:22	13670	7.97	<2	<0.095	<2	<0.091	<2	<0.027	7.97
17:23	13643	7.96	<2	<0.095	<2	<0.091	<2	<0.027	7.96
17:25	13246	7.84	<2	<0.095	<2	<0.091	<2	<0.027	7.84
Average		**7.92**		**<0.095**		**<0.091**		**<0.027**	**7.92** ✓

RUN DATA

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 2**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

PM vent 2 Run 1

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
14:37:42	6760	20.2	-18	0.2
14:37:57	6760	20.2	-18	0.2
14:38:12	6759	20.2	-19	0.2
14:38:27	6762	20.2	-20	0.2
14:38:42	6761	20.2	-19	0.2
14:38:57	6759	20.2	-20	0.2
14:39:12	6760	20.2	-20	0.2
14:39:27	6760	20.2	-19	0.2
14:39:42	6758	20.2	-20	0.2
14:39:57	6761	20.2	-20	0.2
14:40:12	6760	20.2	-19	0.2
14:40:27	6759	20.2	-19	0.2
14:40:42	6759	20.2	-20	0.2
14:40:57	6760	20.2	-20	0.2
Avgs	**6760**	**20.2**	**-19**	**0.2**

RUN DATA

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 2**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
15:28:17	6773	20.2	-35	0.2
	PM Vent 2	**Run 2**		
15:28:32	6773	20.2	-35	0.2
15:28:47	6774	20.2	-34	0.2
15:29:02	6774	20.2	-35	0.2
15:29:17	6773	20.2	-35	0.2
15:29:32	6775	20.2	-34	0.2
15:29:47	6774	20.2	-35	0.2
15:30:02	6774	20.2	-35	0.2
15:30:17	6774	20.2	-35	0.2
15:30:32	6773	20.2	-35	0.2
15:30:47	6775	20.2	-35	0.2
15:31:02	6774	20.2	-35	0.2
15:31:17	6774	20.2	-35	0.2
15:31:32	6775	20.2	-35	0.2
15:31:47	6775	20.2	-35	0.2
15:32:02	6775	20.2	-35	0.2
15:32:17	6775	20.2	-35	0.2
15:32:32	6775	20.2	-36	0.2
15:32:47	6773	20.2	-36	0.2
15:33:02	6773	20.2	-35	0.2
15:33:17	6775	20.2	-34	0.2
15:33:32	6774	20.2	-35	0.2
15:33:47	6773	20.2	-35	0.2
15:34:02	6774	20.2	-35	0.2
15:34:17	6773	20.2	-32	0.2
15:34:32	6768	20.2	-29	0.2
Avgs	**6774**	**20.2**	**-35**	**0.2**

RUN DATA

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 2**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
PM vent 2 Run 3				
16:40:11	6779	20.2	-34	0.2
16:40:26	6778	20.2	-34	0.2
16:40:41	6778	20.2	-32	0.2
16:40:56	6776	20.2	-32	0.2
16:41:11	6777	20.2	-32	0.2
16:41:26	6778	20.2	-32	0.2
16:41:41	6777	20.2	-32	0.2
16:41:56	6777	20.2	-31	0.2
16:42:11	6777	20.2	-31	0.2
16:42:26	6778	20.2	-32	0.2
16:42:41	6778	20.2	-33	0.2
16:42:56	6779	20.2	-32	0.2
16:43:11	6778	20.2	-31	0.2
16:43:26	6780	20.2	-32	0.2
16:43:41	6778	20.2	-30	0.2
16:43:56	6777	20.2	-29	0.2
16:44:11	6777	20.2	-31	0.2
16:44:26	6777	20.2	-31	0.2
16:44:41	6777	20.2	-32	0.2
Avgs	**6778**	**20.2**	**-32**	**0.2**

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 2**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 10:02

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	13
10.1 ✓	SG9168283BAL	3292
19.5 ✓	CC454190	6577

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
336.5 ✓	-26 ✓	0.9998 ✓

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	-68
10.2 ✓	SG9168283BAL	3027
20.4 ✓	CC454190	6279

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
311.1 ✓	-90	0.9999 ✓

AW

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 2**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 10:02

O_2

Method: EPA 3A
Span Conc. 19.5 %
Slope 336.5 **Intercept** -25.8

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	13	0.1	0.1	0.5 ✓	Pass
10.1	3292	9.9	-0.2	-1.0 ✓	Pass
19.5	6577	19.6	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A
Span Conc. 20.4 %
Slope 311.1 **Intercept** -90.1

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-68	0.1	0.1	0.5 ✓	Pass
10.2	3027	10.0	-0.2	-1.0 ✓	Pass
20.4	6279	20.5	0.1	0.5 ✓	Pass

METHODS AND ANALYZERS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 2**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

File: C:\Users\Trailer 271\Documents\New Indy\6-24-21.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: DESKTOP-GQ0I9UV **Trailer:** 271
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	O_2
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.5**

Channel 2

Analyte	CO_2
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.4**

VENT 3

New Indy
Catawba, SC

15730.001.008
No. 3 Hood Exhaust
Paper Machine Vent 3

EMISSION CALCULATIONS

			Run 1	**Run 2**	**Run 3** ✓	**Mean**
Date			**6/24/21** ✓	**6/24/21** ✓	**6/24/21**	---
Time Began			**937** ✓	**1042** ✓	**1145** ✓	---
Time Ended			**1037** ✓	**1142** ✓	**1245** ✓	---
Volumetric Flow Rate, (Qs), DSCFM			5.45E+04 ✓	5.30E+04 ✓	5.51E+04 ✓	5.42E+04
BWS			0.210 ✓	0.214 ✓	0.196 ✓	0.207
% Oxygen			20.2 ✓	20.2 ✓	20.2 ✓	20.2
Total Reduced Sulfur	(TRS MW)=	34.08				
Concentration, ppm			0.81 ✓	0.69 ✓	0.73 ✓	0.74
Emission Rate, lb/hr			0.23	0.19	0.21	0.21

New Indy
Catawba, SC

15730.001.008
No. 3 Hood Exhaust

Paper Machine Vent 3

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/24/21 ✓	6/24/21 ✓	6/24/21 ✓	---
Time Began		937 ✓	1042 ✓	1145 ✓	---
Time Ended		1029 ✓	1136 ✓	1236 ✓	---
INPUT DATA					
Sampling Time, min	(Theta)	48.0 ✓	48 ✓	48 ✓	48
Stack Diameter, in.	(Dia.)	55.88 ✓	55.88 ✓	55.88 ✓	55.88
Barometric Pressure, in. Hg	(Pb)	29.70 ✓	29.70 ✓	29.70 ✓	29.70
Static Pressure, in. H2O	(Pg)	-1.00 ✓	-1.00 ✓	-1.00 ✓	-1.00
Pitot Tube Coefficient	(Cp)	0.84 ✓	0.84 ✓	0.84 ✓	0.84
Meter Correction Factor	(Y)	1.0030 ✓	1.0030 ✓	1.0030 ✓	1.0030
Orifice Calibration Value	(Delta H@)	1.8000 ✓	1.8000 ✓	1.8000 ✓	1.8000
Nozzle Diameter, in.	(Dn)	0.250 ✓	0.250 ✓	0.250 ✓	0.250
Meter Volume, ft^3	(Vm)	30.544 ✓	30.347 ✓	30.732 ✓	30.541
Meter Temperature, °F	(Tm)	76.5 ✓	81.6 ✓	87.1 ✓	81.7
Meter Temperature, °R	(Tm-R)	536.5	541.6	547.1	541.7
Meter Orifice Pressure, in. H2O	(Delta H)	1.300 ✓	1.300 ✓	1.300 ✓	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140 ✓	1.140 ✓	1.140 ✓	1.140
Volume H2O Collected, mL	(Vlc)	170.0 ✓	170.6 ✓	153.2 ✓	164.6
CO2 Concentration, %	(CO2)	0.2 ✓	0.2 ✓	0.2 ✓	0.2
02 Concentration, %	(02)	20.2 ✓	20.2 ✓	20.2 ✓	20.2
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	1.282 ✓	1.254 ✓	1.273 ✓	1.270
Stack Temperature, °F	(Ts)	185.0 ✓	186.8 ✓	182.1 ✓	184.6
Stack Temperature, °R	(Ts-R)	645.0	646.8	642.1	644.6
Moisture Fraction (at Saturation)	(BWS)	0.576 ✓	0.599 ✓	0.541 ✓	0.572
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	17.03 ✓	17.03 ✓	17.03 ✓	17.03
Stack Pressure, in. Hg	(Ps)	29.63	29.63	29.63	29.63
Meter Pressure, in. Hg	(Pm)	29.80	29.80	29.80	29.80
Standard Meter Volume, ft^3	(Vmstd)	30.013	29.539	29.613	29.721
Standard Water Volume, ft^3	(Vwstd)	8.002	8.030	7.211	7.748
Moisture Fraction (Measured)	(BWS)	0.210	0.214	0.196	0.207
Moisture Fraction (lower sat/meas)	(BWS)	0.210	0.214	0.196	0.207
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	28.84	28.84	28.84	28.84
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	26.56	26.52	26.72	26.60
Average Stack Gas Velocity, ft/sec	(Vs)	83.37	81.68	82.34	82.46
Stack Gas Flow, actual, ft^3/min	(Qa)	85180	83452	84121	84251
Stack Gas Flow, Std , ft^3/min	(Qs)	54489	53016	55059	54188

Calibration check	(Yqa)	1.0150	1.0264	1.0187	1.020
Percent difference from Y					1.70%

No. 3 Hood Exhaust

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. ~~2~~ Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 1
Date 6/24/21
Test Personnel BEA/BG
Sample Time 48 min.

Console ID A023
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length PR-6C 6'
Liner Material SS
Pitot ID/Coeff. P77 0.84
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 68 °F
Baro. Pressure* 29.70 in. Hg
Static Pressure -1.0 in. H_2O
Impinger Gain 164.8 mL
Silica Gel Gain 5.5 g
Stack Area 17.03 ft^2
Total Traverse Points 16

K Factor	N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.006	0.000
@ Vac., in. Hg	13"	6"
Pitot	Good	Good

Filter ID N/A
Sample ID Run 1

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	0937			544.900									
A-1	3		1.8	1.3	546.8	186	N/A	76	253	248	N/A	64	3	
2	6		2.0	1.3	548.7	186		75	256	246		51	3	
3	9		2.0	1.3	550.7	186		75	255	245		47	3	
4	12		2.0	1.3	552.5	186		75	252	246		48	3	
5	15		1.4	1.3	554.4	186		75	252	246		49	3	
6	18		1.2	1.3	556.398	186		76	251	247		51	3	
7	21		1.3	1.3	558.299	185		76	256	245		52	3	
8	24		1.2	1.3	560.2	185		76	254	249		53	3	
B-1	27		1.7	1.3	562.1	180		77	252	246		57	3	
2	30		1.7	1.3	564.1	186		77	249	245		55	3	
3	33		1.9	1.3	566.0	186		77	249	244		54	3	
4	36		1.8	1.3	567.9	186		77	250	243		54	3	
5	39		1.8	1.3	569.9	186		78	252	246		55	3	
6	42		1.8	1.3	571.9	185		78	254	244		54	3	
7	45		1.5	1.3	573.5	185		78	251	247		56	3	
8	48	10:29	1.4	1.3	575.444	184		78	249	246		56	3	
*Barometric Pressure is at port elevation			Avg √Δp 1.2823 ✓ 1.656 ✓	Avg ΔH 1.3000 ✓ Avg √ΔH 1.1402 ✓	Total Volume 30.544 ✓	Avg T_s 185 ✓		Avg T_m 76.5 ✓	Min/Max 249/256	Min/Max 244/249	Min/Max	Max Temp 64	Max Vac 3	V_{m-std}, scf

WESTON SOLUTIONS®
Integrated Air Services

Comments

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by

✓

No. 3 Hood Exhaust

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: No. ~~2~~ 3 Hood Exhaust
Sample Location: Roof
W. O. Number: 15730.001.008
Run Number: 2
Date: 4/24/21
Test Personnel: BEA/BE
Sample Time: 48 min.

Console ID: A023
Meter Corr., Y: 1.003
Console ΔH@: 1.800
Probe ID/Length: P26C - 6'
Liner Material: SS
Pitot ID/Coeff.: P77 0.84
Thermo ID: A023
Nozzle ID/Diams.:
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 73 °F
Baro. Pressure*: 29.70 in. Hg
Static Pressure: -1.0 in. H_2O
Impinger Gain: 163.4 mL
Silica Gel Gain: 7.2 g
Stack Area: 17.03 ft²
Total Traverse Points: 16

K Factor: N/A

Leak Checks

	Initial	Final
Volume, ft³	0.54	.002
@ Vac., in. Hg	12"	5
Pitot	Good	Good

Filter ID: N/A
Sample ID: Run 2

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	10:42			576.747									
A-1	3		1.6	1.3	578.7	186	N/A	80	250	239	~~58~~ N/A	58	3	
2	6		1.8	1.3	580.5	188		80	251	243		57	3	
3	9		1.9	1.3	582.4	188		80	256	242		56	3	
4	12		1.9	1.3	584.2	188		81	251	243		56	3	
5	15		1.7	1.3	586.1	188		81	251	244		56	3	
6	18		1.6	1.3	588.1	189		81	251	242		56	3	
7	21		1.6	1.3	590.0	189		81	252	244		57	3	
8	24		1.6	1.3	591.9	189		82	252	242		57	3	
B-1	27		1.8	1.3	593.9	186		82	250	239		59	3	
2	30		2.0	1.3	595.8	189		82	249	241		58	3	
3	33		2.0	1.3	597.6	189		82	253	244		59	3	
4	36		1.1	1.3	599.5	187		82	252	242		60	3	
5	39		1.2	1.3	601.3	185		81	253	241		62	3	
6	42		1.1	1.3	603.2	185		83	254	241		64	3	
7	45		1.3	1.3	605.1	184		84	253	240		62	3	
8	48	11:36	1.2	1.3	607.094	179		84	253	243		57	3	

*Barometric Pressure is at port elevation

Avg √Δp	Avg ΔH	Total Volume	Avg T_s	Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac
1.2537 ✓	1.300 ✓	30.347 ✓	186.8 ✓	81.6 ✓	249/256	239/244		64	3

1.587 ✓

Avg √ΔH: 1.1402 ✓

V_{m-std}, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Comments

WESTON SOLUTIONS
Integrated Air Services

' start DGM: 607.685

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 3 Hood Exhaust
Sample Location: Roof
W. O. Number: 15730.001.008
Run Number: 3
Date: 6/24/21
Test Personnel: BEA/BE
Sample Time: 48 min.

Console ID: A023
Meter Corr., Y: 1.003
Console ΔH@: 1.800
Probe ID/Length: PRGC-6'
Liner Material: SS
Pitot ID/Coeff.: P77 0.84
Thermo ID: A023
Nozzle ID/Diams.:
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 75 °F
Baro. Pressure*: 29.70 in. Hg
Static Pressure: -1.0 in. H_2O
Impinger Gain: 146.8 mL
Silica Gel Gain: 6.4 g
Stack Area: 17.03 ft^2
Total Traverse Points: 16

K Factor: N/A

Leak Checks

	Initial	Final
Volume, ft^3	.003	.000
@ Vac., in. Hg	12"	6"
Pitot	Good	Good

Filter ID: N/A
Sample ID: Run 3

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	11:45			607.635 ~~607.084~~ BE									
A-1	3		1.6	1.3	609.9	180	N/A	85	250	209	N/A	60	3	
2	6		1.8	1.3	611.8	183		85	249	242		56	2	
3	9		1.8	1.3	613.6	184		85	250	247		54	2	
4	12		1.9	1.3	615.5	183		85	249	246		53	2	
5	15		1.8	1.3	617.4	183		86	253	247		54	2	
6	18		1.6	1.3	619.3	183		86	252	244		55	2	
7	21		1.6	1.3	621.2	183		86	251	243		55	2	
8	24		1.5	1.3	623.1	182		87	251	244		54	2	
B-1	27		1.7	1.3	625.0	179		88	249	245		57	2	
2	30		1.7	1.3	626.9	183		88	252	245		54	2	
3	33		1.9	1.3	628.8	183		88	252	248		54	2	
4	36		1.9	1.3	630.7	183		88	254	245		55	2	
5	39		1.8	1.3	632.5	183		89	254	249		56	2	
6	42		1.2	1.3	634.5	182		89	250	247		57	2	
7	45		1.2	1.3	636.4	183		89	253	244		57	2	
8	48	12:36	1.1	1.3	638.367	177		90	254	244		58	2	
			Avg √Δp 1.2730	Avg ΔH 1.300	Total Volume 30.782	Avg T_s 182.1	Avg T_m 87.1		Min/Max 249/254	Min/Max 209/249	Min/Max	Max Temp 60	Max Vac 3	
			1.631	Avg √ΔH 1.1402										

*Barometric Pressure is at port elevation

WESTON SOLUTIONS®
Integrated Air Services

Comments

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

$V_{m\text{-std}}$, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by TD

Sample Recovery Field Data

Method: EPA 4, Moisture

Client New Indy
Location/Plant Catawba, SC

Source No. ~~2~~ 3 Hood Exhaust
W.O. Number 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample ID
Sample Date 6/24/21
Filter ID N/A
Recovery Date 6/24/21
Analyst BEA/BE

	Impingers						
Contents	1	2	3		Imp.Total	Silica Gel grams	Total
Final	853.6	821.4	642.9			875.4	
Initial	726.0	789.5	637.9			869.9	
Gain	127.6 ✓	31.9 ✓	5 ✓		164.5 ✓	5.5 ✓	170.0

Impinger Color Clear
Silica Gel Condition Good
Labled? ✓
Sealed? ✓

Run No. 2
Sample ID
Sample Date 6/24/21
Filter ID N/A
Recovery Date 6/24/21
Analyst BEA/BE

	Impingers						
Contents	1	2	3		Imp.Total	Silica Gel grams	Total
Final	909.6	668.0	556.8			916.6	
Initial	767.3	649.7	554.0			909.4	
Gain	142.3 ✓	18.3 ✓	2.8 ✓		163.4 ✓	7.2 ✓	170.6

Impinger Color Clear
Silica Gel Condition Good
Labled? ✓
Sealed?

Run No. 3
Sample ID
Sample Date 6/24/21
Filter ID N/A
Recovery Date 6/24/21
Analyst BEA/BE

	Impingers						
Contents	1	2	3		Imp.Total	Silica Gel grams	Total
Final	880.1	841.3	645			866.1	
Initial	754.1	822.2	643.3			859.7	
Gain	126 ✓	19.1 ✓	1.7 ✓		146.8 ✓	6.4 ✓	153.2

Impinger Color Clear
Silica Gel Condition Good
Labled? ✓
Sealed? ✓

Check COC for Sample IDs of Media Blanks

WESTON SOLUTIONS
Integrated Air Services

Sample and Velocity Traverse Point Data Sheet - Method 1

Client New Indy
Loaction/Plant Catawba, SC
Source No. 3 Hood Exhaust

Operator VD / LF
Date 15-Jun-21
W.0. Number 15730.001.008

Duct Type	☑	Circular	☐	Rectangular Duct	Indicate appropriate type
Traverse Type	☐	Particulate Traverse	☑	Velocity Traverse	

Distance from far wall to outside of port (in.) = C	56.000
Port Depth (in.) = D	0.125
Depth of Duct, diameter (in.) = C-D	55.875
Area of Duct (ft^2)	17.03
Total Traverse Points	16
Total Traverse Points per Port	8

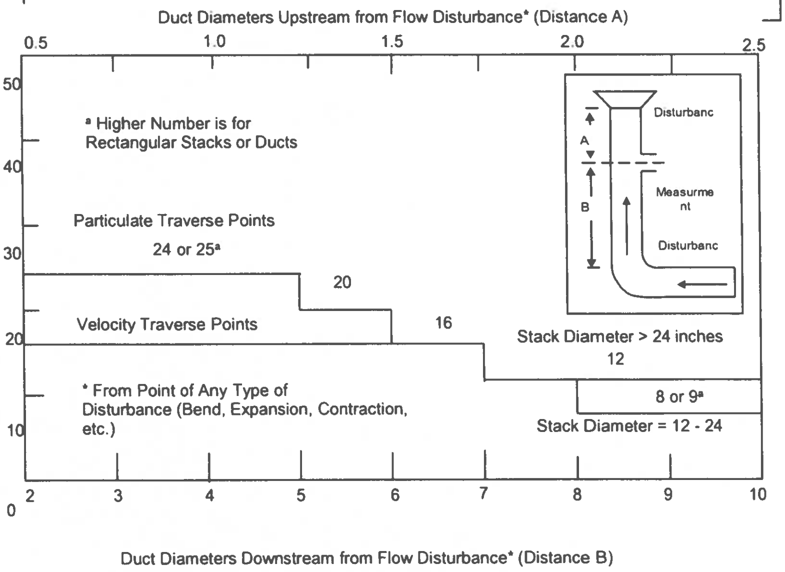
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

Flow Disturbances	
Upstream - A (ft)	7.000
Downstream - B (ft)	25.0
Upstream - A (duct diameters)	1.50
Downstream - B (duct diameters)	5.37

Diagram of Stack

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	2	2
2	10.5	6	6
3	19.4	11	11
4	32.3	18	18
5	67.7	38	38
6	80.6	45	45
7	89.5	50	50
8	96.8	54	54
9			
10			
11			
12			



Equivalent Diameter = (2*L*W)/(L+W)

Traverse Point Location Percent of Stack -Circular

Number of Traverse Points

Traverse Location Point		1	2	3	4	5	6	7	8	9	10	11	12
	1		14.6		6.7		4.4		3.2		2.6		2.1
	2		85.4		25		14.6		10.5		8.2		6.7
	3				75		29.6		19.4		14.6		11.8
	4				93.3		70.4		32.3		22.6		17.7
	5						85.4		67.7		34.2		25
	6						95.6		80.6		65.8		35.6
	7								89.5		77.4		64.4
	8								96.8		85.4		75
	9										91.8		82.3
	10										97.4		88.2
	11												93.3
	12												97.9

Traverse Point Location Percent of Stack -Rectangular

Number of Traverse Points

Traverse Location Point		1	2	3	4	5	6	7	8	9	10	11	12
	1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
	2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
	3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
	4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
	5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
	6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
	7							92.9	81.3	72.2	65.0	59.1	54.2
	8								93.8	83.3	75.0	68.2	62.5
	9									94.4	85.0	77.3	70.8
	10										95.0	86.4	79.2
	11											95.5	87.5
	12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Port Diam. (in) = 4
Number of Ports = 2

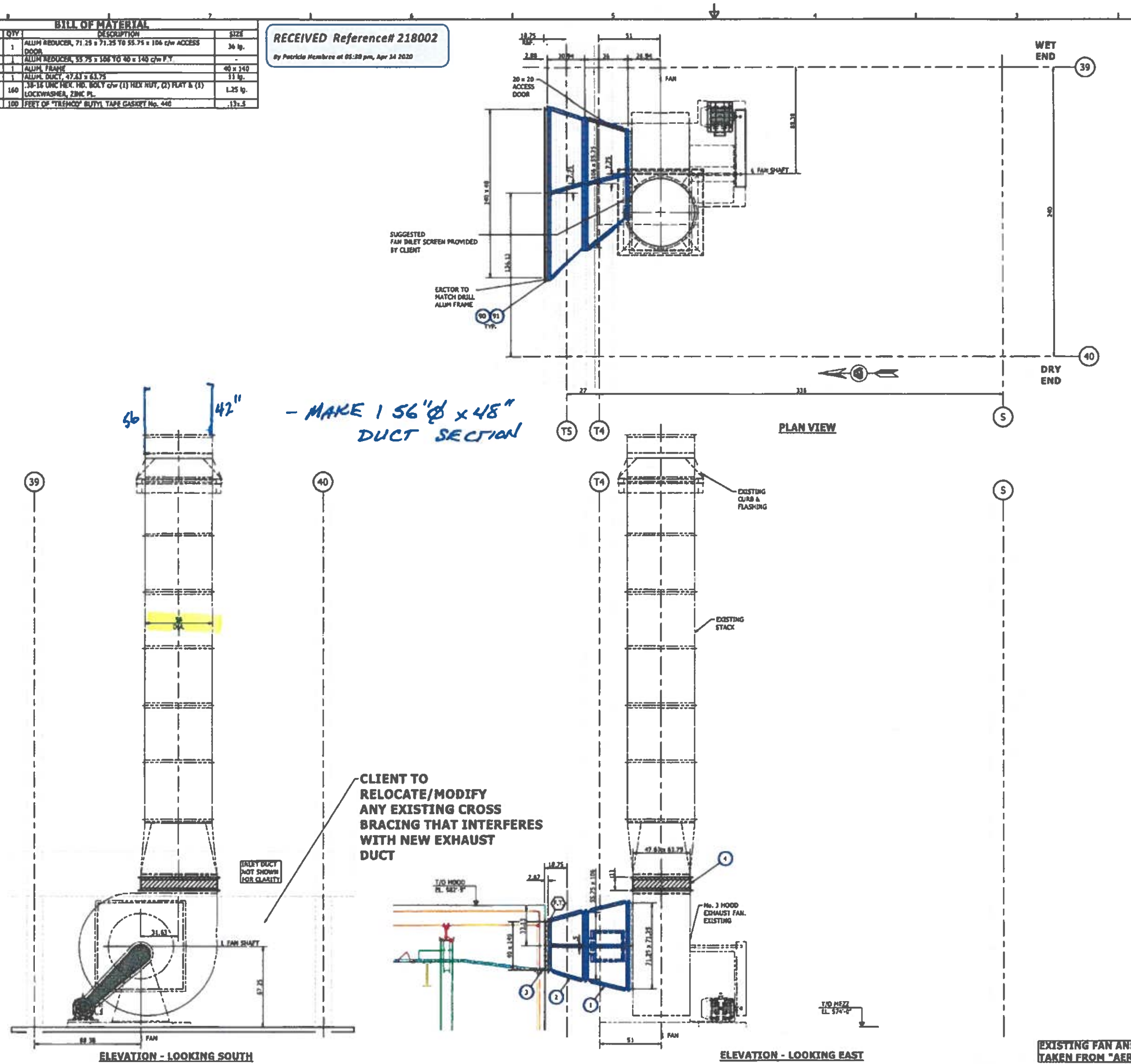
Tape Measure I.D. # TM-07

Method 1 Version 2

BILL OF MATERIAL

No.	TAG	QTY	DESCRIPTION	SIZE
1	151-1	1	ALUM REDUCER, 71.25 x 71.25 TO 55.75 x 106 c/w ACCESS DOOR	36 lg.
2	151-2	1	ALUM REDUCER, 55.75 x 106 TO 40 x 140 c/w F.T.	-
3	218-3	1	ALUM. FRAME	40 x 140
4	151-3	1	ALUM. DUCT, 47.63 x 63.75	11 lg.
90	151-90	160	.38-16 UNC HEX. HD. BOLT c/w (1) HEX NUT, (2) FLAT & (1) LOCKWASHER, ZINC PL.	1.25 lg.
91	151-91	100	FEET OF "TREMCO" BUTYL TAPE GASKET No. 440	.13x.5

RECEIVED Reference# 218002
By Patricia Membreo at 05:28 pm, Apr 14 2020



56 | 42"

- MAKE 1 56"Ø x 48" DUCT SECTION

CLIENT TO RELOCATE/MODIFY ANY EXISTING CROSS BRACING THAT INTERFERES WITH NEW EXHAUST DUCT

#3

NOTES:

FAN: (EXISTING) ONE (1) "WESTINGHOUSE" CENTRIFUGAL FAN SIZE 3660, CLASS I, ARR'T 1, UPBLAST DISCHARGE. CAPACITY 56000 CFM @ 2" S.P.

MOTOR: (EXISTING) ONE (1) MOTOR 60 HP @ 1880 RPM., 364T FRAME

DUCTWORK: ALL DUCTWORK TO BE FABRICATED FROM ALUM SHEET AND BRACING AS PER EDS-030 & 070.

DUCT AT FAN DISCHARGE (SHOWN SHADED) TO BE FABRICATED AS PER EDS-070

EACH FLANGE TO BE BOLTED WITH A .38 BOLT ASSEMBLY

EACH FLANGE TO BE GASKETED

ALL HARDWARE TO BE IMPERIAL UNC STANDARD

ALL HARDWARE TO BE TYPE ZINC PL.

ALL HARDWARE SUPPLIED BY FABRICATOR

F.T. DENOTES "FIELD TRIM": FABRICATOR TO SUPPLY 6" ADDITIONAL DUCTWORK c/w LOOSE FLANGE. ERECTOR TO TRIM DUCT IF NECESSARY, INSTALL FLANGE & MAKE VANSTONE. PER DETAIL C/311

ITEMS PROVIDED BY CLIENT:
- ALL NECESSARY ELECTRICAL WIRING & EXTERNAL PIPING.
- ALL SUPPORT BASES, CONCRETE PADS & DRAINS.
- SUPPLY OF ELECTRIC MOTOR & SLIDE BASE.
- RELOCATION OF EXISTING EQUIPMENT, PIPING, ETC. WHICH INTERFERES WITH THE NEW AIR SYSTEM.

PROJECT/CLIENT: 203829 – Project Columbia

REVIEWED by Wood

FOR THE GENERAL COMPLIANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND CONTRACT DOCUMENTS. NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS OF DIMENSIONS OR DETAILS

DATE: 4/27/2020 Sherry Krebs

☐ 1 NOT ACCEPTABLE - NOT RELEASED FOR PRODUCTION REVISE AND RE-SUBMIT
☐ 2 SUBJECT TO REVISION AS INDICATED. RELEASED FOR PRODUCTION - SUBMIT CERTIFIED DRAWING
☐ 3 NO EXCEPTIONS TAKEN - RELEASED FOR PRODUCTION - SUBMIT CERTIFIED DRAWING
☒ 4 CERTIFIED DRAWING ACCEPTED - RELEASED FOR PRODUCTION
☐ 5 REVIEWED FOR INFORMATION ONLY. THIS DRAWING NOT REQUIRED BY CONSULTANT FOR ENGINEERING DESIGN
☐ 6 SUPERCEDED

ENERQUIN AIR INC.
ISSUED CERTIFIED
● FOR EQUIPMENT LOCATION ONLY
DATE (Y/M/D): 20/04/13
○ FOR FABRICATION AND/OR ERECTION
DATE (Y/M/D): ____

SYSTEM HOOD EXHAUST
EQUIPMENT TAG No.
SYSTEM No.: HOOD EXHAUST No. 1
FAN No.: M41-0280
MOTOR No.: 9941-0287

THIS DRAWING TO BE RELEASED ONLY TO "X"		
CUSTOMER	FABRICATION	ERECTION
X	X	X
MANAGEMENT APPROVAL NECESSARY TO RELEASE TO OTHERS THAN MARKED		

EXISTING FAN AND STACK INFORMATION
TAKEN FROM "AER" DRAWING 874B & 874B1

REFERENCE DRAWINGS	No.
BILL OF MATERIAL	S-168-151-BM
HOOD EXHAUST DUCT ERECTION SECTIONS	19-168-311
HOOD EXHAUST DUCT DETAILS - SHT 1	19-168-312
HOOD EXHAUST DUCT DETAILS - SHT 2	19-168-313
HOOD EXHAUST DUCT DETAILS - SHT 3	19-168-314

No	REVISION
1	DRAWING FINALIZED & CHECKED
0	INITIAL ISSUE

FABRICATION TOLERANCES TO BE AS PER THE FOLLOWING CHART UNLESS NOTED OTHERWISE ON DRAWING (DO NOT SCALE DRAWING) ANGLES TO BE ± 0.5 DEGREES.
0.0 TO 60.0 ± 1/16 INCHES
OVER 60.0 ± 1/8 INCHES
0.0 TO 1500.0 ± 1.5 MILLIMETERS
OVER 1500.0 ± 3.0 MILLIMETERS

DIMENSIONS ARE IN: INCHES ☒ MILLIMETERS ☐

INTERNAL USE REF.:
DRAWING No.:
CONTRACT No.:

ENERQUIN AIR Inc.

P.A.S. FOR No. 3 P.M
No. 3 HOOD EXHAUST
FAN AND DUCT LAYOUT
NEW INDY
CATAWBA SOUTH CAROLINA

DRAWN BY: H.A.B.
PROJECT MANAGER: H.S.T.
DATE: Nov. 19,2019
SCALE: .38=12
CONTRACT No.: 19-4705
CLIENT'S No.:
DWG No.: 19-168-151
REV: 1

RUN SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time 09:37 **End Time** 10:37

Average Measured TRS Conc.	0.79 **ppm**
Recovery No. 2	97.2 **%**
TRS Corrected for Recovery	0.81 **ppm** ✓

✓ JCH

RUN SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time 10:42 **End Time** 11:42

Average Measured TRS Conc.	0.67 **ppm**
Recovery No. 2	97.2 **%**
TRS Corrected for Recovery	0.69 **ppm**

RUN SUMMARY

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time 11:45 **End Time** 12:45

Average Measured TRS Conc.	0.71 **ppm**
Recovery No. 2	97.2 **%**
TRS Corrected for Recovery	0.73 **ppm** ✓

RUN DATA
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
09:37	61	0.46	<2	<0.095	<2	<0.091	<2	<0.027	0.46
09:40	19	0.25	<2	<0.095	<2	<0.091	<2	<0.027	0.25
09:43	47	0.40	30	0.37	<2	<0.091	<2	<0.027	0.78
09:46	11	0.19	<2	<0.095	<2	<0.091	<2	<0.027	0.19
09:49	40	0.37	<2	<0.095	<2	<0.091	10	0.06	0.50
09:52	7	0.15	22	0.32	<2	<0.091	75	0.19	0.84
09:55	23	0.28	11	0.22	17	0.27	46	0.14	1.06
09:58	113	0.64	<2	<0.095	<2	<0.091	47	0.15	0.93
10:01	20	0.26	<2	<0.095	<2	<0.091	91	0.21	0.67
10:04	<2	<0.076	34	0.40	<2	<0.091	38	0.13	0.66
10:07	49	0.41	18	0.29	<2	<0.091	143	0.26	1.22
10:10	24	0.29	8	0.19	27	0.34	143	0.26	1.34
10:13	<2	<0.076	<2	<0.095	6	0.15	109	0.23	0.61
10:16	46	0.40	5	0.15	<2	<0.091	<2	<0.027	0.55
10:19	31	0.32	30	0.37	87	0.62	<2	<0.027	1.31
10:22	133	0.70	38	0.42	<2	<0.091	<2	<0.027	1.11
10:25	8	0.16	33	0.39	<2	<0.091	52	0.15	0.85
10:28	<2	<0.076	10	0.22	13	0.23	26	0.11	0.66
10:31	<2	<0.076	10	0.21	13	0.24	47	0.15	0.73
10:34	9	0.17	13	0.24	96	0.65	<2	<0.027	1.06
Average		**0.27**		**0.19**		**0.13**		**0.10**	**0.79**

RUN DATA

Number 2

Client: New Indy
Location: Catawba, SC
Source: Paper Machine Vent 3

Method **16**
Calibration **1**

Project Number: 15730.001.008
Operator: VD
Date: 24 Jun 2021

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
10:42	52	0.43	25	0.34	<2	<0.091	<2	<0.027	0.77
10:45	44	0.39	63	0.54	<2	<0.091	<2	<0.027	0.93
10:48	12	0.20	<2	<0.095	5	0.15	<2	<0.027	0.35
10:51	21	0.26	<2	<0.095	<2	<0.091	<2	<0.027	0.26
10:54	18	0.25	<2	<0.095	<2	<0.091	<2	<0.027	0.25
10:57	81	0.54	15	0.26	10	0.20	<2	<0.027	1.00
11:00	14	0.21	46	0.46	22	0.31	<2	<0.027	0.99
11:03	<2	<0.076	<2	<0.095	<2	<0.091	<2	<0.027	-
11:06	13	0.20	36	0.41	33	0.38	<2	<0.027	0.99
11:09	<2	<0.076	<2	<0.095	<2	<0.091	<2	<0.027	-
11:12	139	0.71	17	0.28	<2	<0.091	<2	<0.027	0.99
11:15	6	0.13	<2	<0.095	38	0.41	<2	<0.027	0.54
11:18	22	0.27	6	0.17	<2	<0.091	<2	<0.027	0.44
11:21	30	0.32	24	0.33	<2	<0.091	<2	<0.027	0.65
11:24	55	0.44	10	0.21	57	0.50	<2	<0.027	1.15
11:27	<2	<0.076	19	0.29	<2	<0.091	<2	<0.027	0.29
11:30	12	0.20	15	0.26	102	0.67	<2	<0.027	1.14
11:33	22	0.27	7	0.18	12	0.23	<2	<0.027	0.69
11:36	37	0.36	40	0.43	88	0.62	41	0.14	1.68
11:39	14	0.21	<2	<0.095	8	0.18	<2	<0.027	0.39
Average		**0.27**		**0.21**		**0.18**		**<0.027**	**0.67**

RUN DATA
Number 3

Client:	**New Indy**			Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Method	**16**	Operator:	**VD**
Source:	**Paper Machine Vent 3**	Calibration	**1**	Date:	**24 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
11:45	<2	<0.076	7	0.18	20	0.30	16	0.08	0.64
11:48	<2	<0.076	21	0.31	20	0.30	67	0.17	0.96
11:51	25	0.29	<2	<0.095	8	0.18	<2	<0.027	0.47
11:54	24	0.28	<2	<0.095	<2	<0.091	<2	<0.027	0.28
11:57	6	0.14	10	0.22	<2	<0.091	<2	<0.027	0.36
12:00	128	0.68	<2	<0.095	<2	<0.091	<2	<0.027	0.68
12:03	53	0.43	37	0.42	<2	<0.091	<2	<0.027	0.85
12:06	42	0.38	10	0.21	7	0.17	101	0.22	1.19
12:09	52	0.43	20	0.30	<2	<0.091	<2	<0.027	0.73
12:12	77	0.52	<2	<0.095	23	0.32	<2	<0.027	0.84
12:15	18	0.24	14	0.26	<2	<0.091	<2	<0.027	0.50
12:18	12	0.20	<2	<0.095	<2	<0.091	<2	<0.027	0.20
12:21	6	0.14	<2	<0.095	<2	<0.091	<2	<0.027	0.14
12:24	18	0.24	<2	<0.095	<2	<0.091	106	0.22	0.69
12:27	20	0.26	<2	<0.095	38	0.41	47	0.15	0.96
12:30	29	0.31	56	0.51	<2	<0.091	<2	<0.027	0.82
12:33	27	0.30	27	0.35	<2	<0.091	<2	<0.027	0.66
12:36	30	0.32	37	0.41	37	0.40	<2	<0.027	1.13
12:39	59	0.45	<2	<0.095	52	0.48	61	0.17	1.27
12:42	38	0.36	35	0.40	<2	<0.091	<2	<0.027	0.77
Average		**0.30**		**0.18**		**0.13**		**0.05**	**0.71**

RECOVERY DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Before Run 1
Start Time 07:42 **End Time** 07:59

Recovery Gas to Probe, Time 07:42

Peak Areas, mv-sec			Average	ppm
12673	11981	12277	12311	7.54

Recovery Gas to GC, Time 07:54

Peak Areas, mv-sec			Average	ppm
13351	13392	13952	13565	7.94

Recovery 95.0%

✓ wdt

RECOVERY DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

After Run 3 **Before Run** 4
Start Time 12:45 **End Time** 12:55

Recovery Gas to Probe, Time 12:45

Peak Areas, mv-sec			Average	ppm
12908	13446	13416	13257	7.84

Recovery Gas to GC, Time 12:51

Peak Areas, mv-sec			Average	ppm
13746	14196	14064	14002	8.07

Recovery 97.2%

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.60 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	461	458	299	233
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **42.9** mL/Min	**10.8** ppm	**10.7** ppm	**6.97** ppm	**5.43** ppm
Time: 06:01		**Peak Areas, mv-sec**		
	23635	22744	10268	43754
	23397	21865	10275	43943
	23478	22059	10303	44074
Average Area	**23503**	**22223**	**10282**	**43924**

2 Flow = **80.0** mL/Min	**5.77** ppm	**5.73** ppm	**3.73** ppm	**2.91** ppm
Time: 07:13		**Peak Areas, mv-sec**		
	8086	7277	3039	14674
	7612	6821	2896	13428
	7977	6961	2956	14718
Average Area	**7892**	**7020**	**2964**	**14273**

3 Flow = **133** mL/Min	**3.46** ppm	**3.44** ppm	**2.24** ppm	**1.74** ppm
Time: 07:30		**Peak Areas, mv-sec**		
	2749	2295	1139	5166
	2668	2461	1022	4984
	2689	2285	1136	5151
Average Area	**2702**	**2347**	**1099**	**5100**

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

H_2S	1	2	3		
Time	06:01	07:13	07:30		
Concentration, ppm	10.8	5.77	3.46		
Area, mv-sec	23503	7892	2702		
Calc. Conc., ppm	10.6	5.97	3.40		
% Error	-1.5	3.5	-1.9 ✓		
Calibration Curve	Slope	Intercept	Corr. Coeff.	Min. Area	Det. Lim.
	1.9001	2.4228	0.9986	2	0.076

MeSH	1	2	3		
Time	06:01	07:13	07:30		
Concentration, ppm	10.7	5.73	3.44		
Area, mv-sec	22223	7020	2347		
Calc. Conc., ppm	10.6	5.89	3.38		
% Error	-1.3	2.9	-1.5 ✓		
Calibration Curve	Slope	Intercept	Corr. Coeff.	Min. Area	Det. Lim.
	1.9758	2.3243	0.9991	2	0.095

DMS	1	2	3		
Time	06:01	07:13	07:30		
Concentration, ppm	6.97	3.73	2.24		
Area, mv-sec	10282	2964	1099		
Calc. Conc., ppm	6.98	3.72	2.25		
% Error	0.2	-0.5	0.3 ✓		
Calibration Curve	Slope	Intercept	Corr. Coeff.	Min. Area	Det. Lim.
	1.9707	2.3484	>0.9999	2	0.091

DMDS	1	2	3		
Time	06:01	07:13	07:30		
Concentration, ppm	5.43	2.91	1.74		
Area, mv-sec	43924	14273	5100		
Calc. Conc., ppm	5.38	2.97	1.72		
% Error	-0.9	2.1	-1.2 ✓		
Calibration Curve	Slope	Intercept	Corr. Coeff.	Min. Area	Det. Lim.
	1.8936	3.2593	0.9995	2	0.027

✓ WH

CALIBRATION DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.60 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	461	458	299	233
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **44.4** mL/Min	**10.4** ppm	**10.3** ppm	**6.72** ppm	**5.23** ppm
Time: 16:34	**Peak Areas, mv-sec**			
	23321	20338	9959	43670
	24380	21799	10647	46630
	25056	22227	10285	45442
Average Area	**24252**	**21454**	**10297**	**45247**

2 Flow = **77.4** mL/Min	**5.96** ppm	**5.92** ppm	**3.86** ppm	**3.01** ppm
Time: 16:51	**Peak Areas, mv-sec**			
	9796	7866	3569	17108
	9812	7920	3556	17604
	9831	7352	3254	15792
Average Area	**9813**	**7713**	**3460**	**16834**

3 Flow = **130** mL/Min	**3.56** ppm	**3.53** ppm	**2.30** ppm	**1.79** ppm
Time: 17:05	**Peak Areas, mv-sec**			
	3510	2899	1228	5869
	3467	2681	1272	6176
	3570	2800	1253	6307
Average Area	**3516**	**2793**	**1251**	**6117**

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

H_2S	1	2	3		
Time	16:34	16:51	17:05		
Concentration, ppm	10.4	5.96	3.56		
Area, mv-sec	24252	9813	3516		
Calc. Conc., ppm	10.2	6.18	3.49		
% Error	-1.7	3.6	-1.8 ✓		
Calibration Curve	Slope	Intercept	Corr. Coeff.	Min. Area	Det. Lim.
	1.8007	2.5680	0.9984	2	0.055

MeSH	1	2	3		
Time	16:34	16:51	17:05		
Concentration, ppm	10.3	5.92	3.53		
Area, mv-sec	21454	7713	2793		
Calc. Conc., ppm	10.3	5.99	3.51		
% Error	-0.6	1.2	-0.6 ✓		
Calibration Curve	Slope	Intercept	Corr. Coeff.	Min. Area	Det. Lim.
	1.9025	2.4083	0.9998	2	0.078

DMS	1	2	3		
Time	16:34	16:51	17:05		
Concentration, ppm	6.72	3.86	2.30		
Area, mv-sec	10297	3460	1251		
Calc. Conc., ppm	6.72	3.86	2.30		
% Error	-0.0	0.1	-0.0 ✓		
Calibration Curve	Slope	Intercept	Corr. Coeff.	Min. Area	Det. Lim.
	1.9679	2.3846	>0.9999	2	0.087

DMDS	1	2	3		
Time	16:34	16:51	17:05		
Concentration, ppm	5.23	3.01	1.79		
Area, mv-sec	45247	16834	6117		
Calc. Conc., ppm	5.19	3.06	1.78		
% Error	-0.8	1.7	-0.9 ✓		
Calibration Curve	Slope	Intercept	Corr. Coeff.	Min. Area	Det. Lim.
	1.8669	3.3201	0.9996	2	0.024

✓ WH

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	25.0	35.0	63.0	132.0
Peak Detection Window, sec	10.0	10.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	3.0	3.0
Ending Peak Width, sec	2.0	3.0	5.0	5.0
Permeation Device ID	T-51831	33-50536	89-50725	89-53405 ✓
Permeation Rate, ng/min	642 ✓	901 ✓	758 ✓	895
Permeation Rate, nL/min*	461	458	299	233

Barometric Pressure: 29.60 in. Hg **Ambient Temperature:** 72 °F

No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 642 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.60)$$
$$= 461 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

File: E:\6-24-21.trs
Program Version: 2.0, built 15 May 2017 **File Version:** 2.0
Computer: JWS-PROGRAMMING **Trailer:** 271

Analog Input Device: Keithley KUSB-3108 **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: GC-8A **Serial No.** C10494419420SA
Detector Range: 10

Gases

	Press. psi	Flow mL/min
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 100
Detector: 120

Columns

Primary: 3'
Secondary:
Sample Loop: 6" unlined

Injection Cycle

Total Length: 180 sec **Sampling Time:** 160 sec **Load/Backflush Time:** 85 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 5 mv-sec **Minimum peak height** 5 mv above baseline

Dynacalibrator

Chamber Temperature 130.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.60 in. Hg

RUN DATA

Number 7

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 3**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	H2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
				Post test drift					
17:22	13670	7.97	<2	<0.095	<2	<0.091	<2	<0.027	7.97
17:23	13643	7.96	<2	<0.095	<2	<0.091	<2	<0.027	7.96
17:25	13246	7.84	<2	<0.095	<2	<0.091	<2	<0.027	7.84
Average		**7.92**		**<0.095**		**<0.091**		**<0.027**	**7.92**

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent ~~2~~3**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
	PM vent 3 Run 1			
11:07:35	6776	20.2	-35	0.2
11:07:50	6778	20.2	-35	0.2
11:08:05	6777	20.2	-35	0.2
11:08:20	6778	20.2	-36	0.2
11:08:35	6776	20.2	-35	0.2
11:08:50	6777	20.2	-34	0.2
11:09:05	6779	20.2	-35	0.2
11:09:20	6778	20.2	-34	0.2
11:09:35	6778	20.2	-33	0.2
11:09:50	6779	20.2	-33	0.2
11:10:05	6776	20.2	-33	0.2
11:10:20	6780	20.2	-33	0.2
11:10:35	6776	20.2	-33	0.2
11:10:50	6777	20.2	-32	0.2
11:11:05	6780	20.2	-32	0.2
11:11:20	6776	20.2	-33	0.2
Avgs	**6778**	**20.2**	**-34**	**0.2**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent ~~2~~** 3

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
	PM 3	**Run 2**		
11:48:17	6776	20.2	-35	0.2
11:48:32	6776	20.2	-35	0.2
11:48:47	6775	20.2	-35	0.2
11:49:02	6779	20.2	-35	0.2
11:49:17	6778	20.2	-35	0.2
11:49:32	6776	20.2	-34	0.2
11:49:47	6778	20.2	-35	0.2
11:50:02	6779	20.2	-35	0.2
11:50:17	6777	20.2	-35	0.2
11:50:32	6777	20.2	-36	0.2
11:50:47	6777	20.2	-34	0.2
11:51:02	6777	20.2	-35	0.2
11:51:17	6777	20.2	-35	0.2
11:51:32	6778	20.2	-34	0.2
11:51:47	6778	20.2	-35	0.2
11:52:02	6779	20.2	-35	0.2
11:52:17	6776	20.2	-35	0.2
11:52:32	6778	20.2	-36	0.2
11:52:47	6777	20.2	-34	0.2
11:53:02	6777	20.2	-35	0.2
11:53:17	6779	20.2	-35	0.2
11:53:32	6778	20.2	-35	0.2
11:53:47	6776	20.2	-34	0.2
Avgs	**6777**	**20.2**	**-35**	**0.2**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent ~~2~~** 3
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
	PM 3	**Run 3**		
13:11:54	6772	20.2	-32	0.2
13:12:09	6774	20.2	-31	0.2
13:12:24	6774	20.2	-32	0.2
13:12:39	6774	20.2	-33	0.2
13:12:54	6775	20.2	-34	0.2
13:13:09	6774	20.2	-31	0.2
13:13:24	6774	20.2	-32	0.2
13:13:39	6774	20.2	-34	0.2
13:13:54	6772	20.2	-33	0.2
13:14:09	6773	20.2	-33	0.2
13:14:24	6774	20.2	-33	0.2
13:14:39	6773	20.2	-33	0.2
13:14:54	6773	20.2	-33	0.2
13:15:09	6774	20.2	-33	0.2
13:15:24	6773	20.2	-34	0.2
13:15:39	6775	20.2	-34	0.2
13:15:54	6773	20.2	-35	0.2
13:16:09	6774	20.2	-35	0.2
13:16:24	6774	20.2	-35	0.2
13:16:39	6774	20.2	-34	0.2
13:16:54	6773	20.2	-35	0.2
Avgs	**6774**	**20.2**	**-33**	**0.2**

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent ~~2~~** 3

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 10:02

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	13
10.1 ✓	SG9168283BAL	3292
19.5 ✓	CC454190	6577

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
336.5 ✓	-26 ✓	0.9998 ✓

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	-68
10.2 ✓	SG9168283BAL	3027
20.4 ✓	CC454190	6279

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
311.1 ✓	-90 ✓	0.9999 ✓

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent ~~2~~** 3
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 10:02

O_2

Method: EPA 3A
Span Conc. 19.5 %
Slope 336.5 **Intercept** -25.8

Standard %	**Response** mv	**Result** %	**Difference** %	**Error** %	**Status**
Zero	13	0.1	0.1	0.5 ✓	Pass
10.1	3292	9.9	-0.2	-1.0 ✓	Pass
19.5	6577	19.6	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A
Span Conc. 20.4 %
Slope 311.1 **Intercept** -90.1

Standard %	**Response** mv	**Result** %	**Difference** %	**Error** %	**Status**
Zero	-68	0.1	0.1	0.5 ✓	Pass
10.2	3027	10.0	-0.2	-1.0 ✓	Pass
20.4	6279	20.5	0.1	0.5	Pass

METHODS AND ANALYZERS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent ~~2~~** 3

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

File: K:\15730 New Indy\001 Catawba SC\008\Data\CEMS data\6-24-21.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: DESKTOP-GQ0I9UV **Trailer:** 271
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.5**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.4**

VENT 4

New Indy
Catawba, SC

15730.001.008
No. 4 Hood Exhaust
Paper Machine Vent 4

EMISSION CALCULATIONS

			Run 1	**Run 2**	**Run 3**	**Mean**
Date			**6/25/21**	**6/25/21**	**6/25/21**	---
Time Began			**1135**	**1240**	**1345**	---
Time Ended			**1235**	**1340**	**1445**	---
Volumetric Flow Rate, (Qs), DSCFM			3.32E+04	3.47E+04	3.31E+04	3.37E+04
BWS			0.269	0.268	0.263	0.267
% Oxygen			20.2	20.2	20.2	20.2
Total Reduced Sulfur	(TRS MW)=	34.08				
Concentration, ppm			0.56	0.53	0.62	0.57
Emission Rate, lb/hr			0.10	0.10	0.11	0.10

A13

New Indy
Catawba, SC

15730.001.008
No. 4 Hood Exhaust

Paper Machine Vent 4

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/25/21 ✓	6/25/21 ✓	6/25/21 ✓	---
Time Began		1135 ✓	1240 ✓	1345 ✓	---
Time Ended		1227 ✓	1334 ✓	1437 ✓	---
INPUT DATA					
Sampling Time, min	(Theta)	48.0 ✓	48 ✓	48 ✓	48
Stack Diameter, in.	(Dia.)	56.13 ✓	56.13 ✓	56.13 ✓	56.13
Barometric Pressure, in. Hg	(Pb)	29.68 ✓	29.68 ✓	29.68 ✓	29.68
Static Pressure, in. H2O	(Pg)	-0.49 ✓	-0.49 ✓	-0.49 ✓	-0.49
Pitot Tube Coefficient	(Cp)	0.84 ✓	0.84 ✓	0.84 ✓	0.84
Meter Correction Factor	(Y)	1.0030 ✓	1.0030 ✓	1.0030 ✓	1.0030
Orifice Calibration Value	(Delta H@)	1.8000 ✓	1.8000 ✓	1.8000 ✓	1.8000
Nozzle Diameter, in.	(Dn)	0.250 ✓	0.250 ✓	0.250 ✓	0.250
Meter Volume, ft^3	(Vm)	29.932 ✓	30.405 ✓	30.432 ✓	30.256
Meter Temperature, °F	(Tm)	84.1 ✓	86.3 ✓	85.2 ✓	85.2
Meter Temperature, °R	(Tm-R)	544.1	546.3	545.2	545.2
Meter Orifice Pressure, in. H2O	(Delta H)	1.300 ✓	1.300 ✓	1.300 ✓	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140 ✓	1.140 ✓	1.140 ✓	1.140
Volume H2O Collected, mL	(Vlc)	226.5 ✓	228.6 ✓	223.0 ✓	226.0
CO2 Concentration, %	(CO2)	0.2 ✓	0.2 ✓	0.2 ✓	0.2
O2 Concentration, %	(O2)	20.2 ✓	20.2 ✓	20.2 ✓	20.2
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	0.831 ✓	0.869 ✓	0.824 ✓	0.841
Stack Temperature, °F	(Ts)	193.1 ✓	193.6 ✓	194.1 ✓	193.6
Stack Temperature, °R	(Ts-R)	653.1	653.6	654.1	653.6
Moisture Fraction (at Saturation)	(BWS)	0.685 ✓	0.693 ✓	0.700 ✓	0.693
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	17.18 ✓	17.18 ✓	17.18 ✓	17.18
Stack Pressure, in. Hg	(Ps)	29.64	29.64	29.64	29.64
Meter Pressure, in. Hg	(Pm)	29.78	29.78	29.78	29.78
Standard Meter Volume, ft^3	(Vmstd)	28.981	29.321	29.406	29.236
Standard Water Volume, ft^3	(Vwstd)	10.661	10.760	10.497	10.639
Moisture Fraction (Measured)	(BWS)	0.269	0.268	0.263	0.267
Moisture Fraction (lower sat/meas)	(BWS)	0.269	0.268	0.263	0.267
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	28.84	28.84	28.84	28.84
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	25.92	25.93	25.99	25.95
Average Stack Gas Velocity, ft/sec	(Vs)	54.99	57.54	54.52	55.68
Stack Gas Flow, actual, ft^3/min	(Qa)	56682	59312	56198	57397
Stack Gas Flow, Std , ft^3/min	(Qs)	33178	34714	33109	33667

Calibration check	(Yqa)	1.0434	1.0293	1.0273	1.033
Percent difference from Y					3.02%

aBV ✓

Baro.
Pressure 29.68

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 4 Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 1
Date 6/25/21
Test Personnel BSA/BE
Sample Time 48 min.

Console ID A023
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length PR6C-6'
Liner Material SS
Pitot ID/Coeff. P77 0.84
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 75 °F
Baro. Pressure* ~~29.68~~ 82 in. Hg
Static Pressure -.49 in. H_2O
Impinger Gain 218.9 mL
Silica Gel Gain 7.6 g
Stack Area 17.18 ft^2
Total Traverse Points 16

K Factor	N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.000	0.000
@ Vac., in. Hg	12"	5"
Pitot	Good	Good

Filter ID N/A
Sample ID Run 1

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	11:35			821.800									
A-1	3		.78	1.3	823.6	193	N/A	82	243	251	N/A	63	3	
2	6		.73	1.3	825.4	193		82	243	252		63	3	
3	9		.72	1.3	827.2	193		83	242	255		54	3	
4	12		.54	1.3	829.1	193		83 ~~2483~~	243	253		50	3	
5	15		.68	1.3	831.0	193		84	241	250		50	3	
6	18		.70	1.3	832.9	193		83	240	250		50	3	
7	21		.67	1.3	834.8	193		84	241	251		50	3	
8	24		.60	1.3	836.7	191		85	242	254		50	3	
B-1	27		.77	1.3	838.6	193		84	241	255		56	3	
2	30		.79	1.3	840.4	193		86	241	254		51	3	
3	33		.70	1.3	842.3	193		85	243	251		49	3	
4	36		.68	1.3	844.2	193		85	242	255		49	3	
5	39		.69	1.3	846.1	195		85	242	251		49	3	
6	42		.70	1.3	848.0	195		85	243	254		50	3	
7	45		.66	1.3	849.8	193		85	241	253		50	3	
8	48	12:27	.65	1.3	851.732	193		85	242	251		51	3	
*Barometric Pressure is at port elevation			Avg √Δp .8306	Avg ΔH 1.300	Total Volume 29.932	Avg T_s 193.1		Avg T_m 84.1	Min/Max 240/243	Min/Max 250/255	Min/Max	Max Temp 63	Max Vac 3	
			.6913	Avg √ΔH 1.1402										

Flue Gas Composition
Oxygen, % 20.2
Carbon Dioxide, % 0.2
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

$V_{m\text{-}std}$, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by

WESTON SOLUTIONS®
Integrated Air Services

Comments

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 4 Hood Exhaust
Sample Location: Roof
W. O. Number: 15730.001.008
Run Number: 2
Date: 6/25/21
Test Personnel: BEA/BE
Sample Time: 48 min.

Console ID: A023
Meter Corr., Y: 1.003
Console ΔH@: 1.800
Probe ID/Length: PR6C-6'
Liner Material: SS
Pitot ID/Coeff.: P77 0.84
Thermo ID: A023
Nozzle ID/Diams.:
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 79 °F
Baro. Pressure*: 29.68 in. Hg
Static Pressure: -.49 in. H_2O
Impinger Gain: 220.9 mL
Silica Gel Gain: 7.7 g
Stack Area: 17.18 ft^2
Total Traverse Points: 16

K Factor: N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.000	0.000
@ Vac., in. Hg	12"	5"
Pitot	Good	Good

Filter ID: N/A
Sample ID: Run 2

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	12:40			851.900									
A-1	3		.84	1.3	853.9	192	N/A	86	243	256	N/A	65	2	
2	6		.84	1.3	855.8	193		86	242	255		64	2	
3	9		.85	1.3	857.7	194		87	241	255		61	2	
4	12		.74	1.3	859.5	194		86	242	257		61	2	
5	15		.76	1.3	861.4	194		85	241	251		61	2	
6	18		.74	1.3	863.3	194		86	242	255		61	2	
7	21		.73	1.3	865.2	194		86	242	256		63	2	
8	24		.66	1.3	867.1	193		87	242	252		65	2	
B-1	27		.81	1.3	869.0	194		87	243	254		64	2	
2	30		.84	1.3	870.9	194		87	239	257		62	2	
3	33		.79	1.3	872.7	194		87	242	258		61	2	
4	36		.67	1.3	874.7	194		86	241	256		61	2	
5	39		.71	1.3	876.6	194		86	243	248		61	2	
6	42		.73	1.3	878.5	194		86	241	251		62	2	
7	45		.72	1.3	880.4	193		86	242	251		63	2	
8	48	13:34	.67	1.3	882.305	193		87	242	254		64	2	
			Avg $\sqrt{\Delta p}$ .8689	Avg ΔH 1.300	Total Volume 30.405	Avg T_s 193.6	Avg T_m 86.3		Min/Max 239/243	Min/Max 248/258	Min/Max	Max Temp 65	Max Vac 2	
			.7563	Avg $\sqrt{\Delta H}$ 1.1402										

*Barometric Pressure is at port elevation

Flue Gas Composition
Oxygen, %: 20.2
Carbon Dioxide, %: 0.2
Moisture, %:

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run:
Post-run:

Thermocouple Check
Meter Temp., °F:
Ref. Temp, °F:
Result:

V_{m-std}, scf:
Q_s, dscfm:
% Isokinetic:
Calculated by:
QC by: VRB

Comments:

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Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 4 Hood Exhaust
Sample Location: Roof
W. O. Number: 15730.001.008
Run Number: 3
Date: 6/25/21
Test Personnel: BZA / BE
Sample Time: 48 min.

Console ID: A023
Meter Corr., Y: 1.003
Console ΔH@: 1.800
Probe ID/Length: PR6C-6'
Liner Material: SS
Pitot ID/Coeff.: D77 0.84
Thermo ID: A023
Nozzle ID/Diams.:
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 79 °F
Baro. Pressure*: 29.68 in. Hg
Static Pressure: -.49 in. H_2O
Impinger Gain: 217.3 mL
Silica Gel Gain: 5.7 g
Stack Area: 17.18 ft^2
Total Traverse Points: 16

K Factor	N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.004	0.001
@ Vac., in. Hg	12"	5"
Pitot	Good	Good

Filter ID: N/A
Sample ID: Run 3

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	13:45			882.557									
A-1	3		.81	1.3	884.5	195	N/A	86	243	256	N/A	63	3	
2	6		.80	1.3	886.4	195		86	239	255		62	3	
3	9		.76	1.3	888.2	195		85	241	254		57	3	
4	12		.54	1.3	890.1	194		85	240	254		55	3	
5	15		.50	1.3	892.0	194		85	242	252		55	3	
6	18		.71	1.3	893.9	194		84	239	~~251~~ BE 254		54	3	
7	21		.67	1.3	895.8	194		84	240	253		54	3	
8	24		.67	1.3	897.7	194		84	240	251		54	3	
B-1	27		.80	1.3	899.6	194		85	242	252		57	3	
2	30		.76	1.3	901.6	194		86	243	253		55	3	
3	33		.70	1.3	903.5	194		86	241	252		55	3	
4	36		.68	1.3	905.4	194		86	240	~~28~~ BE 258		56	3	
5	39		.63	1.3	907.2	194		86	243	252		57	3	
6	42		.58	1.3	909.1	194		85	240	252		58	3	
7	45		.65	1.3	911.0	194		85	240	252		59	3	
8	48	1432	.65	1.3	~~912.899~~ BE	193		85	240	254		59	3	
*Barometric Pressure is at port elevation			Avg √Δp .8239	Avg ΔH 1.300 Avg √ΔH 1.1402	Total Volume 912.989 30.432 ✓	Avg T_s 194.1	Avg T_m 85.2 ✓		Min/Max 239/243	Min/Max 251/258	Min/Max	Max Temp 63	Max Vac 3	V_{m-std}, scf

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Comments

Flue Gas Composition
Oxygen, %: 20.2
Carbon Dioxide, %: 0.2
Moisture, %:

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp., °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by

Sample time 48
DGM reading: 912.989

Sample Recovery Field Data

Method: EPA 4, Moisture

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 4 Hood Exhaust
W.O. Number: 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample Date: 6/25/21
Recovery Date: 6/25/21
Sample ID: Run 1
Filter ID: N/A
Analyst: BA

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents						grams	
Final	954.7	723.6	555.9			896.5	
Initial	766.9	690.8	557.6			888.9	
Gain	187.8 ✓	32.8 ✓	-1.7 ✓		218.9 ✓	7.6 ✓	226.5

Impinger Color: Clear
Silica Gel Condition: Good
Labled? ✓
Sealed? ✓

Run No. 2
Sample Date: 6/25/21
Recovery Date: 6/25/21
Sample ID: Run 2
Filter ID: N/A
Analyst: BA

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents						grams	
Final	940.9	839.8	658.5			859.8	
Initial	763.2	802.2	652.9			852.1	
Gain	177.7 ✓	37.6 ✓	5.6 ✓		220.9 ✓	7.7 ✓	228.6

Impinger Color: Clear
Silica Gel Condition: good
Labled? ✓
Sealed? ✓

Run No. 3
Sample Date: 6/25/21
Recovery Date: 6/25/21
Sample ID: Run 3
Filter ID: N/A
Analyst: BA

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents						grams	
Final	949.0	718.9	553.8			901.0	
Initial	762.9	684.6	556.9			895.3	
Gain	186.1 ✓	34.3 ✓	-3.1 ✓		217.3 ✓	5.7 ✓	223

Impinger Color: Clear
Silica Gel Condition: good
Labled? ✓ ✓
Sealed? ✓

Check COC for Sample IDs of Media Blanks

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Sample and Velocity Traverse Point Data Sheet - Method 1

Client	New Indy	Operator	VD / LF
Loaction/Plant	Catawba, SC	Date	15-Jun-21
Source	No. 4 Hood Exhaust	W.O. Number	15730.001.008

Duct Type	☑ Circular	☐ Rectangular Duct	Indicate appropriate type
Traverse Type	☐ Particulate Traverse	☑ Velocity Traverse	

Distance from far wall to outside of port (in.) = C	56.250
Port Depth (in.) = D	0.125
Depth of Duct, diameter (in.) = C-D	56.125
Area of Duct (ft^2)	17.18
Total Traverse Points	16
Total Traverse Points per Port	8

Flow Disturbances	
Upstream - A (ft)	5.670
Downstream - B (ft)	25.0
Upstream - A (duct diameters)	1.21
Downstream - B (duct diameters)	5.35

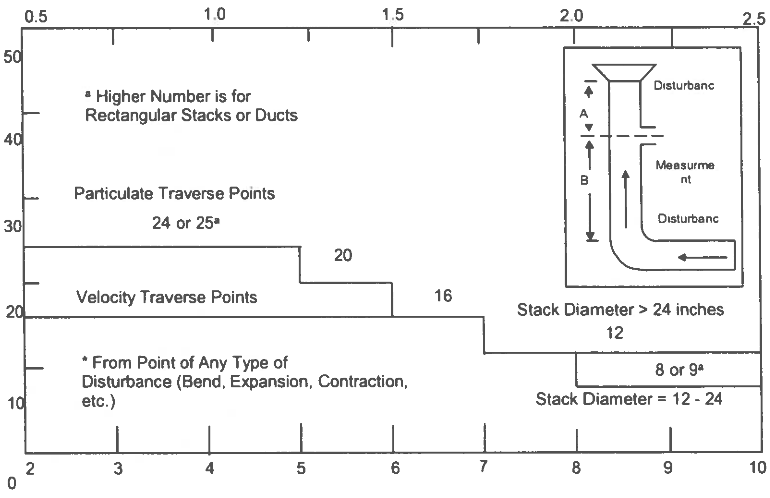
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

Diagram of Stack

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	2	2
2	10.5	6	6
3	19.4	11	11
4	32.3	18	18 1/2
5	67.7	38	38
6	80.6	45	45 1/2
7	89.5	50	50 1/2
8	96.8	54 1/2	54 1/2
9			
10			
11			
12			

Duct Diameters Upstream from Flow Disturbance* (Distance A)



Duct Diameters Downstream from Flow Disturbance* (Distance B)

Equivalent Diameter = (2*L*W)/(L+W)

Traverse Point Location Percent of Stack -Circular

Traverse Point Location	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

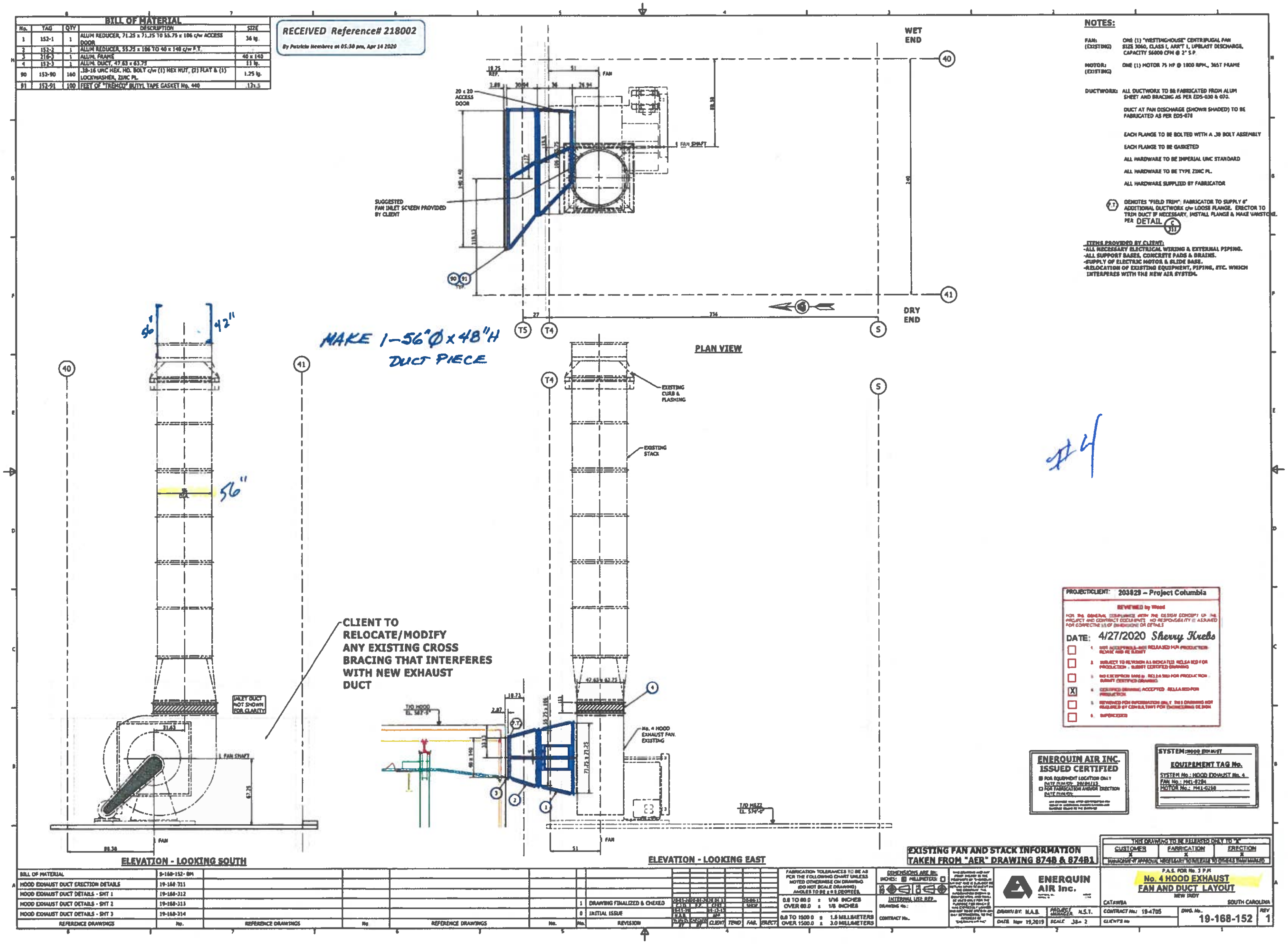
Traverse Point Location	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Port Diam. (in) = 4
Number of Ports = 2

Tape Measure I.D. # TM-07

Method 1 Version 2



MAKE 1-56"Ø x 48"H DUCT PIECE

CLIENT TO RELOCATE/MODIFY ANY EXISTING CROSS BRACING THAT INTERFERES WITH NEW EXHAUST DUCT

BILL OF MATERIAL

No.	TAG	QTY	DESCRIPTION	SIZE
1	152-1	1	ALUM REDUCER, 71.25 x 71.25 TO 55.75 x 106 c/w ACCESS DOOR	36 lg.
2	152-2	1	ALUM REDUCER, 55.75 x 106 TO 40 x 140 c/w F.T.	
3	216-3	1	ALUM. FRAME	40 x 140
4	152-3	1	ALUM. DUCT, 47.63 x 63.75	11 lg.
90	152-90	160	.38-16 UNC HEX. HD. BOLT c/w (1) HEX NUT, (2) FLAT & (1) LOCKWASHER, ZINC PL.	1.25 lg.
91	152-91	100	FEET OF "TREMCO" BUTYL TAPE GASKET No. 440	.13x.5

RECEIVED Reference# 218002
By Patricia Hembree at 05.30 pm, Apr 14 2020

NOTES:

FAN: (EXISTING) ONE (1) "WESTINGHOUSE" CENTRIFUGAL FAN SIZE 3060, CLASS I, ARR'T 1, UPBLAST DISCHARGE, CAPACITY 56000 CFM @ 2" S.P.

MOTOR: (EXISTING) ONE (1) MOTOR 75 HP @ 1800 RPM., 365T FRAME

DUCTWORK: ALL DUCTWORK TO BE FABRICATED FROM ALUM SHEET AND BRACING AS PER EDS-030 & 070.

DUCT AT FAN DISCHARGE (SHOWN SHADED) TO BE FABRICATED AS PER EDS-070

EACH FLANGE TO BE BOLTED WITH A .38 BOLT ASSEMBLY

EACH FLANGE TO BE GASKETED

ALL HARDWARE TO BE IMPERIAL UNC STANDARD

ALL HARDWARE TO BE TYPE ZINC PL.

ALL HARDWARE SUPPLIED BY FABRICATOR

F.T. DENOTES "FIELD TRIM": FABRICATOR TO SUPPLY 6" ADDITIONAL DUCTWORK c/w LOOSE FLANGE. ERECTOR TO TRIM DUCT IF NECESSARY, INSTALL FLANGE & MAKE VANSTONE PER DETAIL C/311

ITEMS PROVIDED BY CLIENT:
- ALL NECESSARY ELECTRICAL WIRING & EXTERNAL PIPING.
- ALL SUPPORT BASES, CONCRETE PADS & DRAINS.
- SUPPLY OF ELECTRIC MOTOR & SLIDE BASE.
- RELOCATION OF EXISTING EQUIPMENT, PIPING, ETC. WHICH INTERFERES WITH THE NEW AIR SYSTEM.

PROJECT/CLIENT: 203829 – Project Columbia
REVIEWED by Wood
FOR THE GENERAL COMPLIANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND CONTRACT DOCUMENTS. NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS OF DIMENSIONS OR DETAILS
DATE: 4/27/2020 Sherry Krebs
☐ 1. NOT ACCEPTABLE - NOT RELEASED FOR PRODUCTION. REVISE AND RE-SUBMIT
☐ 2. SUBJECT TO REVISION AS INDICATED. RELEASED FOR PRODUCTION. SUBMIT CERTIFIED DRAWING
☐ 3. NO EXCEPTION TAKEN. RELEASED FOR PRODUCTION. SUBMIT CERTIFIED DRAWING
☒ 4. CERTIFIED DRAWING ACCEPTED. RELEASED FOR PRODUCTION
☐ 5. REVIEWED FOR INFORMATION ONLY. THIS DRAWING NOT REQUIRED BY CONSULTANT FOR ENGINEERING DESIGN
☐ 6. SUPERCEDED

ENERQUIN AIR INC.
ISSUED CERTIFIED
■ FOR EQUIPMENT LOCATION ONLY
DATE (Y/M/D): 20/04/13
☐ FOR FABRICATION AND/OR ERECTION
DATE (Y/M/D):

SYSTEM: HOOD EXHAUST
EQUIPEMENT TAG No.
SYSTEM No.: HOOD EXHAUST No. 4
FAN No.: M41-8794
MOTOR No.: M41-0268

EXISTING FAN AND STACK INFORMATION TAKEN FROM "AER" DRAWING 874B & 874B1

THIS DRAWING TO BE RELEASED ONLY TO "X"

CUSTOMER	FABRICATION	ERECTION
X	X	X

No.	REVISION
1	DRAWING FINALIZED & CHECKED
0	INITIAL ISSUE

REFERENCE DRAWINGS	No.
BILL OF MATERIAL	19-168-152-BM
HOOD EXHAUST DUCT ERECTION DETAILS	19-168-311
HOOD EXHAUST DUCT DETAILS - SHT 1	19-168-312
HOOD EXHAUST DUCT DETAILS - SHT 2	19-168-313
HOOD EXHAUST DUCT DETAILS - SHT 3	19-168-314

FABRICATION TOLERANCES TO BE AS PER THE FOLLOWING CHART UNLESS NOTED OTHERWISE ON DRAWING (DO NOT SCALE DRAWING) ANGLES TO BE ± 0.5 DEGREES

0.0 TO 60.0	±	1/16 INCHES
OVER 60.0	±	1/8 INCHES
0.0 TO 1500.0	±	1.5 MILLIMETERS
OVER 1500.0	±	3.0 MILLIMETERS

DIMENSIONS ARE IN: INCHES: ■ MILLIMETERS: ☐
INTERNAL USE REF.
DRAWING No.:
CONTRACT No.:

ENERQUIN AIR Inc.

DRAWN BY: N.A.B. PROJECT MANAGER: N.S.T.
DATE: Nov 19,2019 SCALE: 3/8 = 2

P.A.S. FOR No. 3 P.M.
No. 4 HOOD EXHAUST
FAN AND DUCT LAYOUT
NEW INDY
CATAWBA SOUTH CAROLINA
CONTRACT No.: 19-4705
CLIENT'S No.
DWG. No. 19-168-152
REV 1

RUN SUMMARY

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 4

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time 11:35 **End Time** 12:35

Average Measured TRS Conc.	0.56 **ppm**
Recovery No. 3	98.5 **%** ✓
TRS Corrected for Recovery	0.56 **ppm** ✓

RUN SUMMARY

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 4

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time 12:40 **End Time** 13:40

Average Measured TRS Conc.	0.52 **ppm**
Recovery No. 3	98.5 **%** ✓
TRS Corrected for Recovery	0.53 **ppm** ✓

RUN SUMMARY

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 4
Method **16**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time 13:45 **End Time** 14:45

Average Measured TRS Conc.	0.61 **ppm**
Recovery No. 3	98.5 **%** /
TRS Corrected for Recovery	0.62 **ppm** /

RUN DATA

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 4

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S area	H_2S ppm	MeSH area	MeSH ppm	DMS area	DMS ppm	DMDS area	DMDS ppm	TRS ppm
				PM Vent 4	**Run 1**				
11:35	25	0.27	<2	<0.08	<2	<0.07	50	0.14	0.55
11:38	<2	<0.07	<2	<0.08	8	0.15	<2	<0.02	0.15
11:41	<2	<0.07	145	0.77	<2	<0.07	<2	<0.02	0.77
11:44	26	0.27	26	0.31	<2	<0.07	<2	<0.02	0.59
11:47	38	0.34	23	0.30	27	0.28	<2	<0.02	0.92
11:50	43	0.36	27	0.32	<2	<0.07	14	0.07	0.82
11:53	41	0.35	<2	<0.08	28	0.29	<2	<0.02	0.64
11:56	36	0.33	4	0.11	<2	<0.07	<2	<0.02	0.44
11:59	37	0.33	<2	<0.08	27	0.28	49	0.13	0.88
12:02	<2	<0.07	11	0.20	13	0.19	11	0.06	0.51
12:05	<2	<0.07	<2	<0.08	<2	<0.07	16	0.07	0.15
12:08	63	0.44	13	0.22	34	0.32	<2	<0.02	0.98
12:11	30	0.29	7	0.16	57	0.42	<2	<0.02	0.88
12:14	<2	<0.07	<2	<0.08	<2	<0.07	<2	<0.02	-
12:17	29	0.29	18	0.26	<2	<0.07	<2	<0.02	0.55
12:20	<2	<0.07	<2	<0.08	<2	<0.07	<2	<0.02	-
12:23	8	0.14	35	0.37	<2	<0.07	<2	<0.02	0.51
12:26	14	0.20	<2	<0.08	17	0.22	35	0.11	0.65
12:29	<2	<0.07	4	0.12	18	0.23	<2	<0.02	0.36
12:32	58	0.42	7	0.16	12	0.19	<2	<0.02	0.77
Average		**0.20**		**0.17**		**0.13**		**0.03**	**0.56**

RUN DATA

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 4

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
				PM vent 4 Run 2					
12:40	8	0.15	<2	<0.08	24	0.27	<2	<0.02	0.42
12:43	11	0.18	41	0.40	<2	<0.07	25	0.09	0.76
12:46	97	0.55	<2	<0.08	<2	<0.07	<2	<0.02	0.55
12:49	19	0.23	<2	<0.08	<2	<0.07	<2	<0.02	0.23
12:52	<2	<0.07	<2	<0.08	51	0.40	<2	<0.02	0.40
12:55	13	0.19	<2	<0.08	18	0.23	<2	<0.02	0.42
12:58	<2	<0.07	7	0.15	56	0.42	<2	<0.02	0.58
13:01	7	0.14	<2	<0.08	<2	<0.07	28	0.10	0.34
13:04	<2	<0.07	<2	<0.08	14	0.20	35	0.11	0.43
13:07	68	0.46	9	0.18	10	0.17	<2	<0.02	0.81
13:10	6	0.12	<2	<0.08	25	0.27	14	0.07	0.53
13:13	20	0.24	26	0.31	<2	<0.07	<2	<0.02	0.56
13:16	10	0.16	35	0.37	61	0.44	17	0.08	1.12
13:19	23	0.26	<2	<0.08	<2	<0.07	<2	<0.02	0.26
13:22	<2	<0.07	<2	<0.08	12	0.18	23	0.09	0.36
13:25	44	0.37	45	0.42	5	0.12	<2	<0.02	0.90
13:28	80	0.50	<2	<0.08	<2	<0.07	<2	<0.02	0.50
13:31	<2	<0.07	<2	<0.08	27	0.29	<2	<0.02	0.29
13:34	<2	<0.07	14	0.23	<2	<0.07	14	0.07	0.36
13:37	<2	<0.07	17	0.25	10	0.17	33	0.11	0.64
Average		**0.18**		**0.12**		**0.16**		**0.04**	**0.52**

RUN DATA

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~ 4**

Method **16**
Calibration **1**

Run 3

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
13:45	13	0.19	<2	<0.08	<2	<0.07	22	0.09	0.37
13:48	11	0.18	<2	<0.08	33	0.32	<2	<0.02	0.49
13:51	10	0.17	13	0.22	<2	<0.07	11	0.06	0.50
13:54	13	0.19	<2	<0.08	<2	<0.07	<2	<0.02	0.19
13:57	30	0.30	<2	<0.08	<2	<0.07	34	0.11	0.52
14:00	117	0.61	<2	<0.08	10	0.17	14	0.07	0.91
14:03	26	0.28	<2	<0.08	65	0.46	<2	<0.02	0.73
14:06	37	0.33	9	0.18	<2	<0.07	7	0.05	0.61
14:09	27	0.28	<2	<0.08	21	0.25	<2	<0.02	0.53
14:12	5	0.12	15	0.24	<2	<0.07	<2	<0.02	0.36
14:15	5	0.12	14	0.22	26	0.28	16	0.07	0.77
14:18	25	0.27	8	0.17	29	0.30	<2	<0.02	0.73
14:21	49	0.38	<2	<0.08	<2	<0.07	<2	<0.02	0.38
14:24	51	0.39	6	0.15	<2	<0.07	12	0.06	0.67
14:27	119	0.62	<2	<0.08	<2	<0.07	<2	<0.02	0.62
14:30	56	0.41	13	0.22	10	0.17	23	0.09	0.98
14:33	59	0.42	31	0.35	<2	<0.07	<2	<0.02	0.77
14:36	40	0.35	<2	<0.08	4	0.11	<2	<0.02	0.45
14:39	23	0.26	11	0.20	92	0.55	<2	<0.02	1.00
14:42	30	0.30	33	0.36	<2	<0.07	<2	<0.02	0.65
Average		**0.31**		**0.11**		**0.13**		**0.03**	**0.61**

RUN DATA

Number 14

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent** ~~1~~ 4

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
				Calibration drift check					
20:16	14345	7.84	<2	<0.08	<2	<0.07	<2	<0.02	7.84
20:19	14713	7.94	<2	<0.08	<2	<0.07	<2	<0.02	7.94
20:22	14122	7.77	<2	<0.08	<2	<0.07	<2	<0.02	7.77
Average		**7.85**		**<0.08**		**<0.07**		**<0.02**	**7.85**

RECOVERY DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 4

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

After Run 3 **Before Run** 4
Start Time 11:06 **End Time** 11:15

Recovery Gas to Probe, Time 11:06

Peak Areas, mv-sec			Average	ppm
13991	13801	13923	13905	7.71

Recovery Gas to GC, Time 11:12

Peak Areas, mv-sec			Average	ppm
14345	14801	14524	14556	7.90

Recovery 97.6%

RECOVERY DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 4

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

After Run 6 **Before Run** 10
Start Time 14:45 **End Time** 14:58

Recovery Gas to Probe, Time 14:45

Peak Areas, mv-sec			Average	ppm
14557	13955	14506	14339	7.83

Recovery Gas to GC, Time 14:54

Peak Areas, mv-sec			Average	ppm
15125	14482	14672	14759	7.95

Recovery 98.5%

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 4
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	460	457	298	232
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **42.9** mL/Min	**10.7** ppm	**10.7** ppm	**6.95** ppm	**5.41** ppm
Time: 06:02		**Peak Areas, mv-sec**		
	25099	20594	10407	44232
	24750	21533	10445	46016
	25597	21979	10703	45950
Average Area	**25149**	**21369**	**10519**	**45399**

2 Flow = **82.8** mL/Min	**5.56** ppm	**5.52** ppm	**3.60** ppm	**2.80** ppm
Time: 06:53		**Peak Areas, mv-sec**		
	7926	6406	2923	14068
	7950	6306	2884	13591
	8444	6460	2990	14698
Average Area	**8107**	**6390**	**2932**	**14119**

3 Flow = **130** mL/Min	**3.54** ppm	**3.52** ppm	**2.29** ppm	**1.79** ppm
Time: 07:08		**Peak Areas, mv-sec**		
	3069	2599	1371	5786
	3064	2578	1331	5729
	3088	2512	1340	5842
Average Area	**3074**	**2563**	**1347**	**5786**

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 4

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

H$_2$S	**1**	**2**	**3**		
Time	06:02	06:53	07:08		
Concentration, ppm	10.7	5.56	3.54		
Area, mv-sec	25149	8107	3074		
Calc. Conc., ppm	10.6	5.79	3.46		
% Error	-1.6	4.2	-2.4		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8847	2.4717	0.9980	2	0.07

MeSH	**1**	**2**	**3**		
Time	06:02	06:53	07:08		
Concentration, ppm	10.7	5.52	3.52		
Area, mv-sec	21369	6390	2563		
Calc. Conc., ppm	10.6	5.62	3.48		
% Error	-0.7	1.8	-1.1		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9089	2.3742	0.9996	2	0.08

DMS	**1**	**2**	**3**		
Time	06:02	06:53	07:08		
Concentration, ppm	6.95	3.60	2.29		
Area, mv-sec	10519	2932	1347		
Calc. Conc., ppm	7.00	3.53	2.32		
% Error	0.8	-2.0	1.2		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8617	2.4483	0.9995	2	0.07

DMDS	**1**	**2**	**3**		
Time	06:02	06:53	07:08		
Concentration, ppm	5.41	2.80	1.79		
Area, mv-sec	45399	14119	5786		
Calc. Conc., ppm	5.37	2.86	1.77		
% Error	-0.8	2.0	-1.2		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8537	3.3043	0.9995	2	0.02

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 4

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

H_2S	1	2	3		
Time	19:32	19:43	19:59		
Concentration, ppm	10.5	6.99	3.74		
Area, mv-sec	24392	13907	4527		
Calc. Conc., ppm	10.3	7.29	3.68		
% Error	-2.5	4.3	-1.6		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.6380	2.7299	0.9976	2	0.03

MeSH	1	2	3		
Time	19:32	19:43	19:59		
Concentration, ppm	10.5	6.95	3.71		
Area, mv-sec	23509	12131	3753		
Calc. Conc., ppm	10.3	7.11	3.68		
% Error	-1.4	2.4	-0.9		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7779	2.5690	0.9992	2	0.05

DMS	1	2	3		
Time	19:32	19:43	19:59		
Concentration, ppm	6.82	4.53	2.42		
Area, mv-sec	10516	5246	1551		
Calc. Conc., ppm	6.73	4.63	2.40		
% Error	-1.3	2.2	-0.9		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8539	2.4865	0.9993	2	0.07

DMDS	1	2	3		
Time	19:32	19:43	19:59		
Concentration, ppm	5.31	3.53	1.88		
Area, mv-sec	48003	24800	7538		
Calc. Conc., ppm	5.23	3.62	1.86		
% Error	-1.6	2.7	-1.0		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7949	3.3916	0.9990	2	0.02

CALIBRATION DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 4
Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	460	457	298	232
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **43.6** mL/Min	**10.5** ppm	**10.5** ppm	**6.82** ppm	**5.31** ppm
Time: 19:32	**Peak Areas, mv-sec**			
	23668	22380	10086	46114
	24884	23771	10653	47622
	24624	24375	10810	50274
Average Area	**24392**	**23509**	**10516**	**48003**

2 Flow = **65.8** mL/Min	**6.99** ppm	**6.95** ppm	**4.53** ppm	**3.53** ppm
Time: 19:43	**Peak Areas, mv-sec**			
	14069	11744	5164	24545
	13746	12537	5293	24899
	13905	12112	5280	24958
Average Area	**13907**	**12131**	**5246**	**24800**

3 Flow = **123** mL/Min	**3.74** ppm	**3.71** ppm	**2.42** ppm	**1.88** ppm
Time: 19:59	**Peak Areas, mv-sec**			
	4288	3691	1547	7409
	4623	3823	1561	7662
	4672	3745	1545	7541
Average Area	**4527**	**3753**	**1551**	**7538**

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent** ~~1~~ 4
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	25.0	35.0	63.0	132.0
Peak Detection Window, sec	10.0	10.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	3.0	3.0
Ending Peak Width, sec	2.0	3.0	5.0	5.0
Permeation Device ID	T-51831	33-50536	89-50725	89-53405
Permeation Rate, ng/min	642	901	758	895
Permeation Rate, nL/min*	460	457	298	232

Barometric Pressure: 29.70 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 642 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.70)$$
$$= 460 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~ 4**
Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

File: E:\6-25-21.trs
Program Version: 2.0, built 21 Feb 2015 **File Version:** 2.0
Computer: JWS-PROGRAMMING **Trailer:** 271

Analog Input Device: Keithley KUSB-3108 **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: GC-8A **Serial No.** C10494419420SA
Detector Range: 10

Gases

	Press. psi	Flow mL/min
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 100
Detector: 120

Columns

Primary: 3'
Secondary:
Sample Loop: 6" unlined

Injection Cycle

Total Length: 180 sec **Sampling Time:** 160 sec **Load/Backflush Time:** 85 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 5 mv-sec **Minimum peak height** 5 mv above baseline

Dynacalibrator

Chamber Temperature 130.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.70 in. Hg

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 4**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
	PM vent 4 Run 1			
12:46:45	6775	20.2	34	0.2
12:47:00	6777	20.2	34	0.2
12:47:15	6777	20.2	34	0.2
12:47:30	6775	20.2	35	0.2
12:47:45	6775	20.2	34	0.2
12:48:00	6777	20.2	34	0.2
12:48:15	6776	20.2	34	0.2
12:48:30	6778	20.2	35	0.2
12:48:45	6775	20.2	32	0.2
12:49:00	6776	20.2	31	0.2
12:49:15	6780	20.2	30	0.2
12:49:30	6775	20.2	31	0.2
12:49:45	6774	20.2	34	0.2
12:50:00	6777	20.2	32	0.2
12:50:15	6778	20.2	33	0.2
12:50:30	6776	20.2	32	0.2
12:50:45	6776	20.2	33	0.2
12:51:00	6776	20.2	32	0.2
12:51:15	6776	20.2	32	0.2
12:51:30	6776	20.2	31	0.2
12:51:45	6774	20.2	31	0.2
Avgs	**6776**	**20.2**	**33**	**0.2**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 4**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
PM vent 4 Run 2				
13:48:57	6773	20.2	34	0.2
13:49:12	6775	20.2	33	0.2
13:49:27	6775	20.2	34	0.2
13:49:42	6776	20.2	34	0.2
13:49:57	6774	20.2	34	0.2
13:50:12	6777	20.2	34	0.2
13:50:27	6775	20.2	33	0.2
13:50:42	6774	20.2	34	0.2
13:50:57	6776	20.2	34	0.2
13:51:12	6775	20.2	34	0.2
13:51:27	6774	20.2	34	0.2
13:51:42	6776	20.2	34	0.2
13:51:57	6773	20.2	34	0.2
13:52:12	6775	20.2	34	0.2
13:52:27	6766	20.2	35	0.2
13:52:42	6772	20.2	34	0.2
13:52:57	6775	20.2	34	0.2
13:53:12	6774	20.2	35	0.2
13:53:27	6774	20.2	34	0.2
13:53:42	6775	20.2	35	0.2
13:53:57	6775	20.2	34	0.2
13:54:12	6775	20.2	34	0.2
13:54:27	6773	20.2	35	0.2
13:54:42	6774	20.2	34	0.2
Avgs	**6774**	**20.2**	**34**	**0.2**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 4**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
PM vent 4 Run 3				
15:01:47	6759	20.2	52	0.2
15:02:02	6759	20.2	51	0.2
15:02:17	6761	20.2	50	0.2
15:02:32	6759	20.2	49	0.2
15:02:47	6758	20.2	51	0.2
15:03:02	6761	20.2	51	0.2
15:03:17	6760	20.2	51	0.2
15:03:32	6760	20.2	53	0.2
15:03:47	6759	20.2	52	0.2
15:04:02	6758	20.2	51	0.2
15:04:17	6759	20.2	51	0.2
15:04:32	6761	20.2	52	0.2
15:04:47	6758	20.2	53	0.2
15:05:02	6759	20.2	52	0.2
15:05:17	6759	20.2	52	0.2
15:05:32	6760	20.2	52	0.2
15:05:47	6760	20.2	51	0.2
15:06:02	6759	20.2	52	0.2
15:06:17	6759	20.2	52	0.2
15:06:32	6759	20.2	52	0.2
15:06:47	6759	20.2	52	0.2
Avgs	**6759**	**20.2**	**52**	**0.2**

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 4**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 08:20

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	8
10.1	SG9168283BAL	3287
19.5	CC454190	6576

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
336.7	-31	0.9998

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	5
10.2	SG9168283BAL	3276
20.4	CC454190	6722

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
329.3	-20	0.9999

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 4**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 08:20

O_2

Method: EPA 3A
Span Conc. 19.5 %
Slope 336.7 **Intercept** -31.5

Standard %	**Response** mv	**Result** %	**Difference** %	**Error** %	**Status**
Zero	8	0.1	0.1	0.5 ✓	Pass
10.1	3287	9.9	-0.2	-1.0 ✓	Pass
19.5	6576	19.6	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A
Span Conc. 20.4 %
Slope 329.3 **Intercept** -19.9

Standard %	**Response** mv	**Result** %	**Difference** %	**Error** %	**Status**
Zero	5	0.1	0.1	0.5 ✓	Pass
10.2	3276	10.0	-0.2	-1.0 ✓	Pass
20.4	6722	20.5	0.1	0.5 ✓	Pass

AW

METHODS AND ANALYZERS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 4**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

File: C:\Users\Trailer 271\Documents\New Indy\6-25-21b.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: DESKTOP-GQ0I9UV **Trailer:** 271
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.5**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.4**

VENT 6

New Indy
Catawba, SC

15730.001.008
No. 6 Hood Exhaust
Paper Machine Vent 6

EMISSION CALCULATIONS

	Run 1	Run 2	Run 3	Mean
Date	6/25/21	6/25/21	6/25/21	---
Time Began	1555	1715	1820	---
Time Ended	1655	1816	1920	---
Volumetric Flow Rate, (Qs), DSCFM	4.18E+04	4.18E+04	4.21E+04	4.19E+04
BWS	0.254	0.264	0.219	0.245
% Oxygen	20.2	20.2	20.2	20.2

Total Reduced Sulfur (TRS MW)=	34.08				
Concentration, ppm		0.57	0.59	0.59	0.58
Emission Rate, lb/hr		0.13	0.13	0.13	0.13

New Indy
Catawba, SC

15730.001.008
No. 6 Hood Exhaust

Paper Machine Vent 6

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/25/21	6/25/21	6/25/21	---
Time Began		1555	1715	1820	---
Time Ended		1659	1808	1914	---
INPUT DATA					
Sampling Time, min	(Theta)	48.0	48	48	48
Stack Diameter, in.	(Dia.)	52	52	52	52
Barometric Pressure, in. Hg	(Pb)	29.68	29.68	29.68	29.68
Static Pressure, in. H2O	(Pg)	-0.75	-0.75	-0.75	-0.75
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	1.0030	1.0030	1.0030	1.0030
Orifice Calibration Value	(Delta H@)	1.8000	1.8000	1.8000	1.8000
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	30.737	31.150	31.398	31.095
Meter Temperature, °F	(Tm)	87.9	92.5	91.9	90.8
Meter Temperature, °R	(Tm-R)	547.9	552.5	551.9	550.8
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	213.5	226.0	178.5	206.0
CO2 Concentration, %	(CO2)	0.2	0.2	0.2	0.2
O2 Concentration, %	(O2)	20.2	20.2	20.2	20.2
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	1.196	1.210	1.158	1.188
Stack Temperature, °F	(Ts)	191.3	191.2	190.3	190.9
Stack Temperature, °R	(Ts-R)	651.3	651.2	650.3	650.9
Moisture Fraction (at Saturation)	(BWS)	0.660	0.659	0.646	0.655
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	14.75	14.75	14.75	14.75
Stack Pressure, in. Hg	(Ps)	29.62	29.62	29.62	29.62
Meter Pressure, in. Hg	(Pm)	29.78	29.78	29.78	29.78
Standard Meter Volume, ft^3	(Vmstd)	29.554	29.702	29.971	29.742
Standard Water Volume, ft^3	(Vwstd)	10.049	10.638	8.402	9.696
Moisture Fraction (Measured)	(BWS)	0.254	0.264	0.219	0.245
Moisture Fraction (lower sat/meas)	(BWS)	0.254	0.264	0.219	0.245
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	28.84	28.84	28.84	28.84
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	26.09	25.98	26.47	26.18
Average Stack Gas Velocity, ft/sec	(Vs)	78.85	79.90	75.73	78.16
Stack Gas Flow, actual, ft^3/min	(Qa)	69772	70706	67009	69162
Stack Gas Flow, Std , ft^3/min	(Qs)	41777	41778	42058	41871

Calibration check	(Yqa)	1.0196	1.0103	1.0018	1.011
Percent difference from Y					0.76%

AW

No. 6 Hood Exhaust

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source 6 ~~No. 1~~ Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 1
Date 6/25/21
Test Personnel BEA/ BE
Sample Time 48 min.

Console ID A023
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length PR6C- 6'
Liner Material SS
Pitot ID/Coeff. P77 0.84
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 81 °F
Baro. Pressure* 29.68 in. Hg
Static Pressure -.75 in. H_2O
Impinger Gain 204.7 mL
Silica Gel Gain 8.9 g
Stack Area 19.75 ft²
Total Traverse Points 16

K Factor N/A

Leak Checks

	Initial	Final
Volume, ft³	0.002	0.000
@ Vac., in. Hg	12"	5"
Pitot	Good	Good

Filter ID N/A
Sample ID Run 1

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	15:55			913.344									
A-1	3		1.7	1.3	915.1	189	N/A	87	243	252	N/A	65	2	
2	6		1.4	1.3	917.0	192		87	243	254		62	2	
3	9		1.2	1.3	919.0	192		87	242	250		56	2	
4	12		1.4	1.3	920.9	193		87	242	253		56	2	
5	15		1.5	1.3	922.8	192		87	241	256		58	2	
6	18		1.4	1.3	924.7	192		87	244	249		60	2	
7	21		1.6	1.3	926.7	192		87	245	254		61	2	
8	24		1.6	1.3	928.6	191		88	241	253		61	2	
B-1	27		1.2	1.3	930.5	189		88	241	250		66	2	
2	30		1.1	1.3	932.5	190		88	240	251		64	2	
3	33		1.1	1.3	934.4	191		88	243	253		66	2	
4	36		1.4	1.3	936.3	191		89	241	256		64	2	
5	39		1.5	1.3	938.2	191		89	242	247		61	2	
6	42		1.7	1.3	940.2	193		89	240	247		61	2	
7	45		1.6	1.3	942.1	192		90	243	257		61	2	
8	48	16:59	1.6	1.3	944.081	191		89	242	295		59	2	
*Barometric Pressure is at port elevation			Avg √Δp 1.1961	Avg ΔH 1.300	Total Volume 30.737	Avg T_s 191.3		Avg T_m 87.9	Min/Max 240/245	Min/Max 245/257	Min/Max	Max Temp 66	Max Vac 2	
			1.4375	Avg √ΔH 1.1402										

Vm-std, scf
Qs, dscfm
% Isokinetic
Calculated by
QC by

Flue Gas Composition
Oxygen, % 20.2
Carbon Dioxide, % 0.2
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Comments

WESTON SOLUTIONS
Integrated Air Services

No.6 Hood Exhaust

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source 6 ~~No. 4~~ Hood Exhaust
Sample Location
W. O. Number 15730.001.008
Run Number 2
Date 6/25/21
Test Personnel BEA/BE
Sample Time 48 min.

Console ID A023
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length PR6C-6'
Liner Material SS
Pitot ID/Coeff. P77 0.84
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 82 °F
Baro. Pressure* 29.68 in. Hg
Static Pressure -.75 in. H_2O
Impinger Gain 218.6 mL
Silica Gel Gain 7.4 g
Stack Area 14.75 ft^2
Total Traverse Points 16

K Factor N/A

Leak Checks

	Initial	Final
Volume, ft^3	.004	.000
@ Vac., in. Hg	12"	6"
Pitot	Good	Good

Filter ID N/A
Sample ID run 2

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	17:15			945.144									
A-1	3		1.3	1.3	947.1	191	N/A	90	245	249	N/A	65	~~3~~ 4	
2	6		1.2	1.3	949.0	191		91	241	255		65	~~3~~ 4	BE
3	9		1.2	1.3	951.0	191		91	244	255		65	~~3~~ 4	
4	12		1.1	1.3	953.0	191		91	243	250		63	4	
5	15		1.5	1.3	954.8	191		92	242	254		64	4	
6	18		1.5	1.3	956.8	192		92	244	256		64	4	
7	21		1.7	1.3	958.7	192		93	240	246		65	4	
8	24		1.7	1.3	960.6	192		93	241	249		65	4	
B-1	27		1.5	1.3	962.6	190		92	242	257		67	4	
2	30		1.5	1.3	964.5	192		93	244	246		61	4	
3	33		1.5	1.3	966.5	192		93	243	251		59	4	
4	36		1.6	1.3	968.4	192		94	244	256		57	4	
5	39		1.5	1.3	970.3	191		93	243	255		55	4	
6	42		1.5	1.3	972.3	191		94	244	243		54	4	
7	45		1.6	1.3	974.2	190		94	244	245		55	4	
8	48	18:08	1.6	1.3	976.294	190		94	241	243		55	4	

*Barometric Pressure is at port elevation

Avg √Δp	Avg ΔH	Total Volume	Avg T_s	Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac
1.2097	1.300	31.15	191.2	92.5	240/245	243/257		67	4
1.4688	Avg √ΔH 1.1402								

V_{m-std}, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by

Flue Gas Composition
Oxygen, % 20.2
Carbon Dioxide, % 0.2
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F 87
Ref. Temp, °F 87
Result

Comments

WESTON SOLUTIONS
Integrated Air Services

No. 6 Hood Exhaust

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source 6 ~~No. 4~~ Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 3
Date 6/25/21
Test Personnel BEA/DE
Sample Time 48 min.

Console ID A023
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length PRGC-6"
Liner Material SS
Pitot ID/Coeff. ~~PRGC-6~~ 0.84 P77
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 82 °F
Baro. Pressure* 29.68 in. Hg
Static Pressure -.75 in. H_2O
Impinger Gain 170.9 mL
Silica Gel Gain 7.6 g
Stack Area 14.75 ft^2
Total Traverse Points 16

K Factor N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.002	0.000
@ Vac., in. Hg	12"	5"
Pitot	Good	Good

Filter ID N/A
Sample ID run 3

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	18:20			976.578									
A-1	3		1.6	1.3	978.7	191	N/A	92	243	295	N/A	66	2	
2	6		1.6	1.3	980.7	191		92	245	248		59	2	
3	9		1.6	1.3	982.7	191		92	244	252		55	2	
4	12		1.5	1.3	984.6	191		72	246	245		52	2	
5	15		1.6	1.3	986.6	191		93	245	251		53	2	
6	18		1.5	1.3	988.5	191		92	245	256		53	2	
7	21		1.6	1.3	990.4	191		92	241	258		53	2	
8	24		1.6	1.3	992.3	190		92	241	249		53	2	
B-1	27		1.2	1.3	994.3	188		92	239	250		57	2	
2	30		1.3	1.3	996.2	189		92	242	250		54	2	
3	33		1.3	1.3	998.1	189		92	240	246		53	2	
4	36		.71	1.3	1000.1	190		92	242	251		54	2	
5	39		.70	1.3	1002.0	190		91	246	250		55	2	
6	42		.68	1.3	1003.9	190		92	241	251		54	2	
7	45		1.7	1.3	1005.9	191		91	241	249		55	2	
8	48	19:14	1.7	1.3	1007.976	191		91	242	244		56	2	
*Barometric Pressure is at port elevation			Avg √Δp 1.1579 1.368	Avg ΔH 1.300 Avg √ΔH 1.1402	Total Volume 31.398	Avg T_s 190.2	Avg T_m	91.9	Min/Max 239/246	Min/Max 244/258	Min/Max	Max Temp 66	Max Vac 2	$V_{m\text{-}std}$, scf

Flue Gas Composition
Oxygen, % 20.2
Carbon Dioxide, % 0.2
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp., °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by

WESTON SOLUTIONS®
Integrated Air Services

Comments

Sample Recovery Field Data

Method: EPA 4, Moisture

Client New Indy
Location/Plant Catawba, SC

Source No. 3 Hood Exhaust
W.O. Number 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample ID
Sample Date 6/25/21
Filter ID N/A
Recovery Date 6/25/21
Analyst BEA/BE

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents					▨	grams	▨
Final	881.3	878.9	671.8			868.6	
Initial	753.7	815.1	658.5		✓	859.8	
Gain	~~8~~127.6 ✓	63.8 ✓	13.3 ✓		204.7	8.8 ✓	213.5 ✓

Impinger Color Clear
Silica Gel Condition Good
Labled? ✓
Sealed? ✓

Run No. 2
Sample ID
Sample Date 6/25/21
Filter ID N/A
Recovery Date 6/25/21
Analyst BEA/BE

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents					▨	grams	▨
Final	945.2	711.1	558.6			908.4	
Initial	775.7	666.8	553.8		✓	901.0	
Gain	169.5 ✓	44.3 ✓	4.8 ✓		218.6	7.4 ✓	226

Impinger Color Clear
Silica Gel Condition Good
Labled? ✓
Sealed? ✓

Run No. 3
Sample ID
Sample Date 6/25/21
Filter ID N/A
Recovery Date 6/25/21
Analyst BEA/BE

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents					▨	grams	▨
Final	857.8	783.2	637.4			873.4	
Initial	714.5	759.7	633.3		✓	865.8	
Gain	143.3 ✓	23.5 ✓	4.1 ✓		170.9	7.6 ✓	178.5 ✓

Impinger Color Clear
Silica Gel Condition Good
Labled? ✓
Sealed? ✓

Check COC for Sample IDs of Media Blanks

AW

WESTON SOLUTIONS®
Integrated Air Services

Sample and Velocity Traverse Point Data Sheet - Method 1

Client: New Indy

Loaction/Plant: Catawba, SC

Source: No. 6 Hood Exhaust

Operator: VD / LF

Date: 15-Jun-21

W.O. Number: 15730.001.008

Duct Type ☑ Circular ☐ Rectangular Duct — Indicate appropriate type

Traverse Type ☐ Particulate Traverse ☑ Velocity Traverse

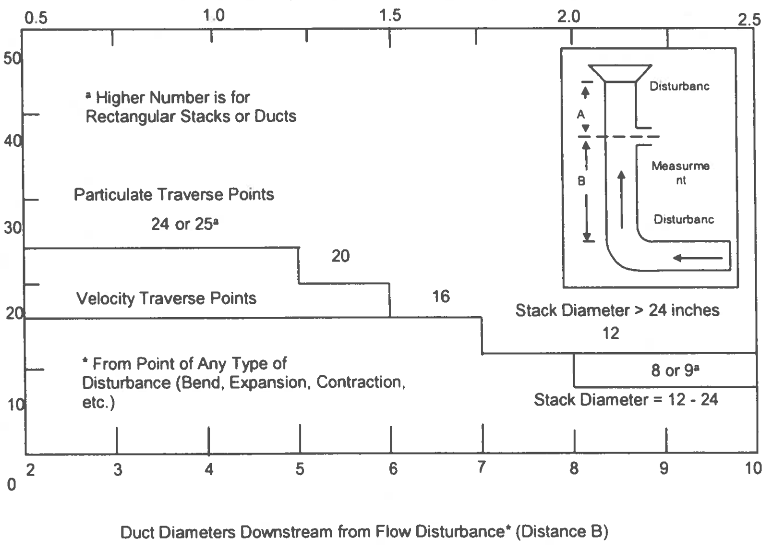
Distance from far wall to outside of port (in.) = C	52.125
Port Depth (in.) = D	0.125
Depth of Duct, diameter (in.) = C-D	52
Area of Duct (ft^2)	14.75
Total Traverse Points	16
Total Traverse Points per Port	8
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

Flow Disturbances	
Upstream - A (ft)	4.330
Downstream - B (ft)	25.0
Upstream - A (duct diameters)	1.00
Downstream - B (duct diameters)	5.77

Diagram of Stack

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	1 1/2	2
2	10.5	5 1/2	5 1/2
3	19.4	10	10
4	32.3	17	17
5	67.7	35	35 1/2
6	80.6	42	42
7	89.5	46 1/2	46 1/2
8	96.8	50 1/2	50 1/2
9			
10			
11			
12			



Equivalent Diameter = (2*L*W)/(L+W)

Traverse Point Location Percent of Stack -Circular

Traverse Point Location	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Point Location	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Port Diam. (in) = 4

Number of Ports = 2

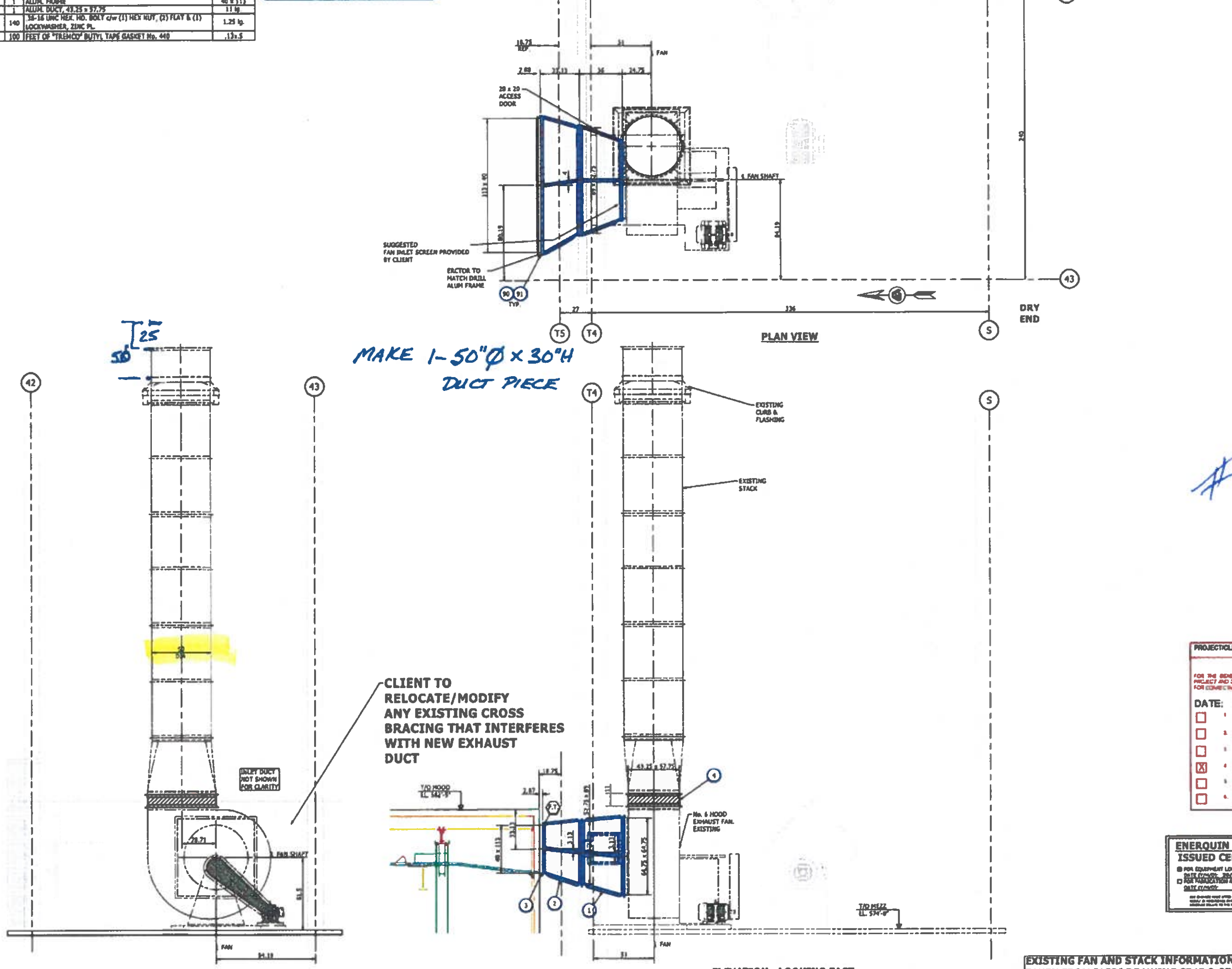
Tape Measure I.D. # TM-07

Method 1 Version 2

BILL OF MATERIAL

No.	TAG	QTY	DESCRIPTION	SIZE
1	153-1	1	ALUM REDUCER, 64.75 x 64.75 TO 52.75 x 89 c/w ACCESS DOOR	36 lg.
2	153-2	1	ALUM REDUCER, 52.75 x 89 TO 40 x 113 c/w F.T.	-
3	216-4	1	ALUM. FRAME	40 x 113
4	153-3	1	ALUM. DUCT, 43.25 x 57.75	11 lg.
90	153-90	140	.38-16 UNC HEX. HD. BOLT c/w (1) HEX NUT, (2) FLAT & (1) LOCKWASHER, ZINC PL.	1.25 lg.
91	153-91	100	FEET OF "TREMCO" BUTYL TAPE GASKET No. 440	.13x.5

RECEIVED Reference# 218002
By Patricia Hembree at 05:30 pm, Apr 14 2020



25
50

MAKE 1-50"Ø x 30"H DUCT PIECE

CLIENT TO RELOCATE/MODIFY ANY EXISTING CROSS BRACING THAT INTERFERES WITH NEW EXHAUST DUCT

#6

NOTES:

FAN: (EXISTING) ONE (1) "WESTINGHOUSE" CENTRIFUGAL FAN SIZE 3054, CLASS I, ARR'T 1, UPBLAST DISCHARGE, CAPACITY 46500 CFM @ 2" S.P.

MOTOR: (EXISTING) ONE (1) MOTOR 50 HP @ 1800 RPM , 326T FRAME

DUCTWORK: ALL DUCTWORK TO BE FABRICATED FROM ALUM SHEET AND BRACING AS PER EDS-038 & 078.

DUCT AT FAN DISCHARGE (SHOWN SHADED) TO BE FABRICATED AS PER EDS-078

EACH FLANGE TO BE BOLTED WITH A .38 BOLT ASSEMBLY

EACH FLANGE TO BE GASKETED

ALL HARDWARE TO BE IMPERIAL UNC STANDARD

ALL HARDWARE TO BE TYPE ZINC PL.

ALL HARDWARE SUPPLIED BY FABRICATOR

F.T. DENOTES "FIELD TRIM": FABRICATOR TO SUPPLY 6" ADDITIONAL DUCTWORK c/w LOOSE FLANGE. ERECTOR TO TRIM DUCT IF NECESSARY, INSTALL FLANGE & MAKE VANSTONE. PER DETAIL C/311

ITEMS PROVIDED BY CLIENT:
- ALL NECESSARY ELECTRICAL WIRING & EXTERNAL PIPING.
- ALL SUPPORT BASES, CONCRETE PADS & DRAINS.
- SUPPLY OF ELECTRIC MOTOR & SLIDE BASE.
- RELOCATION OF EXISTING EQUIPMENT, PIPING, ETC. WHICH INTERFERES WITH THE NEW AIR SYSTEM.

PROJECT/CLIENT: 203829 – Project Columbia

REVIEWED by Wood

FOR THE GENERAL COMPLIANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND CONTRACT DOCUMENTS. NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS OF DIMENSIONS OR DETAILS

DATE: 4/27/2020 Sherry Krebs

☐ 1. NOT ACCEPTABLE - NOT RELEASED FOR PRODUCTION REVISE AND RESUBMIT
☐ 2. SUBJECT TO REVISION AS INDICATED. RELEASED FOR PRODUCTION - SUBMIT CERTIFIED DRAWING
☐ 3. NO EXCEPTION TAKEN - RELEASED FOR PRODUCTION - SUBMIT CERTIFIED DRAWING
☒ 4. CERTIFIED DRAWING ACCEPTED - RELEASED FOR PRODUCTION
☐ 5. REVIEWED FOR INFORMATION ONLY. THIS DRAWING NOT REQUIRED BY CONSULTANT FOR ENGINEERING DESIGN
☐ 6. SUPERSEDED

ENERQUIN AIR INC.
ISSUED CERTIFIED
● FOR EQUIPMENT LOCATION ONLY
DATE (Y/M/D): 20/04/13
☐ FOR FABRICATION AND/OR ERECTION
DATE (Y/M/D):

SYSTEM HOOD EXHAUST
EQUIPMENT TAG No.
SYSTEM No.: HOOD EXHAUST NO. 6
FAN No.: 3941-6789
MOTOR No.: 4941-6179

EXISTING FAN AND STACK INFORMATION
TAKEN FROM "AER" DRAWING 874B & 874B1

REFERENCE DRAWINGS	No.
BILL OF MATERIAL	S-168-153-BM
HOOD EXHAUST DUCT ERECTION DETAILS	19-168-311
HOOD EXHAUST DUCT DETAILS - SHT 1	19-168-312
HOOD EXHAUST DUCT DETAILS - SHT 2	19-168-313
HOOD EXHAUST DUCT DETAILS - SHT 3	19-168-314

No.	REVISION
1	DRAWING FINALIZED & CHECKED
0	INITIAL ISSUE

FABRICATION TOLERANCES TO BE AS PER THE FOLLOWING CHART UNLESS NOTED OTHERWISE ON DRAWING (DO NOT SCALE DRAWING). ANGLES TO BE ± 0.5 DEGREES.
0.0 TO 60.0 ± 1/16 INCHES
OVER 60.0 ± 1/8 INCHES
0.0 TO 1500.0 ± 1.5 MILLIMETERS
OVER 1500.0 ± 3.0 MILLIMETERS

DIMENSIONS ARE IN: INCHES: ☒ MILLIMETERS: ☐

INTERNAL USE REF.
DRAWING No.:
CONTRACT No.:

THIS DRAWING TO BE RELEASED ONLY TO "X"

CUSTOMER	FABRICATION	ERECTION
X	X	X

ENERQUIN AIR Inc.

DRAWN BY: N.A.B.
PROJECT MANAGER: N.S.T.
DATE: Nov. 20,2019
SCALE: 3/8=1'0

P.A.S. FOR No. 3 P.M
No. 6 HOOD EXHAUST
FAN AND DUCT LAYOUT
NEW INDY
CATAWBA SOUTH CAROLINA

CONTRACT No.: 19-4705
CLIENT'S No.:
DWG. No. 19-168-153
REV. 1

RUN SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 6

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time 15:55 **End Time** 16:55

Average Measured TRS Conc.	0.56 **ppm**
Recovery No. 5	98.2 **%**
TRS Corrected for Recovery	0.57 **ppm**

RUN SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 6

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time 17:15 **End Time** 18:16

Average Measured TRS Conc.	0.58 **ppm**
Recovery No. 5	98.2 **%**
TRS Corrected for Recovery	0.59 **ppm**

RUN SUMMARY

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 6

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time 18:20 **End Time** 19:20

Average Measured TRS Conc.	0.57 **ppm**
Recovery No. 5	98.2 **%**
TRS Corrected for Recovery	0.59 **ppm** ✓

RUN DATA
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 4

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
15:55	46	0.37	26	0.31	<2	<0.07	15	0.07	0.83
15:58	<2	<0.07	14	0.23	16	0.21	<2	<0.02	0.44
16:01	21	0.25	<2	<0.08	<2	<0.07	19	0.08	0.41
16:04	111	0.59	<2	<0.08	39	0.35	<2	<0.02	0.94
16:07	<2	<0.07	<2	<0.08	14	0.20	37	0.12	0.43
16:10	<2	<0.07	15	0.23	95	0.56	<2	<0.02	0.79
16:13	23	0.26	<2	<0.08	11	0.18	3	0.03	0.49
16:16	7	0.14	<2	<0.08	<2	<0.07	<2	<0.02	0.14
16:19	<2	<0.07	<2	<0.08	9	0.16	<2	<0.02	0.16
16:22	43	0.36	24	0.30	39	0.35	<2	<0.02	1.00
16:25	<2	<0.07	<2	<0.08	25	0.27	54	0.14	0.56
16:28	<2	<0.07	<2	<0.08	28	0.29	<2	<0.02	0.29
16:31	21	0.25	<2	<0.08	20	0.24	50	0.14	0.76
16:34	9	0.16	18	0.26	<2	<0.07	<2	<0.02	0.41
16:37	42	0.35	<2	<0.08	74	0.49	26	0.10	1.04
16:40	<2	<0.07	<2	<0.08	17	0.22	19	0.08	0.38
16:43	41	0.35	<2	<0.08	13	0.19	23	0.09	0.72
16:46	21	0.25	<2	<0.08	<2	<0.07	32	0.11	0.46
16:49	29	0.29	<2	<0.08	7	0.14	<2	<0.02	0.43
16:52	<2	<0.07	<2	<0.08	63	0.45	8	0.05	0.55
Average		**0.18**		**<0.08**		**0.22**		**0.05**	**0.56**

SH

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 6

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
17:15	<2	<0.07	21	0.28	16	0.22	16	0.07	0.65
17:18	14	0.19	49	0.44	<2	<0.07	<2	<0.02	0.63
17:21	9	0.16	61	0.49	41	0.36	19	0.08	1.17
17:24	<2	<0.07	4	0.12	14	0.20	18	0.08	0.47
17:27	<2	<0.07	<2	<0.08	<2	<0.07	<2	<0.02	-
17:30	<2	<0.07	<2	<0.08	14	0.20	6	0.04	0.29
17:33	10	0.16	<2	<0.08	<2	<0.07	<2	<0.02	0.16
17:36	5	0.12	31	0.34	<2	<0.07	27	0.10	0.66
17:39	9	0.15	6	0.15	<2	<0.07	<2	<0.02	0.30
17:42	38	0.34	<2	<0.08	<2	<0.07	<2	<0.02	0.34
17:45	21	0.24	35	0.37	19	0.23	<2	<0.02	0.85
17:48	21	0.25	10	0.19	<2	<0.07	30	0.10	0.64
17:52	63	0.44	<2	<0.08	<2	<0.07	<2	<0.02	0.44
17:55	4	0.10	<2	<0.08	37	0.34	24	0.09	0.62
17:58	19	0.23	61	0.49	12	0.19	<2	<0.02	0.91
18:01	52	0.40	39	0.39	<2	<0.07	20	0.08	0.95
18:04	15	0.21	49	0.44	<2	<0.07	<2	<0.02	0.65
18:07	89	0.53	<2	<0.08	37	0.34	<2	<0.02	0.86
18:10	51	0.39	<2	<0.08	<2	<0.07	70	0.16	0.72
18:13	10	0.17	<2	<0.08	<2	<0.07	16	0.07	0.32
Average		**0.20**		**0.18**		**0.10**		**0.04**	**0.58** ✓

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 6

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
18:20	8	0.14	<2	<0.08	10	0.17	30	0.10	0.52
18:23	<2	<0.07	22	0.29	<2	<0.07	<2	<0.02	0.29
18:26	10	0.16	<2	<0.08	27	0.28	19	0.08	0.61
18:29	9	0.16	<2	<0.08	11	0.18	40	0.12	0.57
18:32	8	0.15	<2	<0.08	<2	<0.07	45	0.13	0.40
18:35	33	0.31	14	0.23	27	0.28	19	0.08	0.98
18:38	17	0.22	<2	<0.08	<2	<0.07	<2	<0.02	0.22
18:41	8	0.15	15	0.24	31	0.30	111	0.21	1.11
18:44	<2	<0.07	7	0.16	29	0.30	33	0.11	0.67
18:47	14	0.20	<2	<0.08	23	0.26	36	0.11	0.69
18:50	31	0.30	<2	<0.08	<2	<0.07	17	0.08	0.46
18:53	<2	<0.07	<2	<0.08	51	0.40	14	0.07	0.54
18:56	8	0.15	<2	<0.08	22	0.25	9	0.05	0.51
18:59	12	0.18	<2	<0.08	11	0.18	29	0.10	0.56
19:02	56	0.41	8	0.17	<2	<0.07	<2	<0.02	0.58
19:05	68	0.46	13	0.22	4	0.10	<2	<0.02	0.78
19:08	<2	<0.07	<2	<0.08	<2	<0.07	<2	<0.02	-
19:11	97	0.55	<2	<0.08	<2	<0.07	72	0.17	0.89
19:14	42	0.35	<2	<0.08	20	0.24	<2	<0.02	0.59
19:17	14	0.20	13	0.22	6	0.12	<2	<0.02	0.54
Average		**0.20**		**<0.08**		**0.15**		**0.07**	**0.57**55 ✓

RUN DATA

Number 14

Client:	**New Indy**			Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Method	**16**	Operator:	**VD**
Source:	**Paper Machine Vent ~~1~~** 6	Calibration	**1**	Date:	**25 Jun 2021**

Time	**H₂S** area	**H₂S** ppm	**MeSH** area	**MeSH** ppm	**DMS** area	**DMS** ppm	**DMDS** area	**DMDS** ppm	**TRS** ppm
				Calibration drift check					
20:16	14345	7.84	<2	<0.08	<2	<0.07	<2	<0.02	7.84
20:19	14713	7.94	<2	<0.08	<2	<0.07	<2	<0.02	7.94
20:22	14122	7.77	<2	<0.08	<2	<0.07	<2	<0.02	7.77
Average		**7.85**		**<0.08**		**<0.07**		**<0.02**	**7.85** ✓

SK

RECOVERY DATA

Number 4

Client: New Indy
Location: Catawba, SC
Source: Paper Machine Vent ~~1~~ 6

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

After Run 10 **Before Run** 11
Start Time 15:41 **End Time** 15:52

Recovery Gas to Probe, Time 15:41

Peak Areas, mv-sec			Average	ppm
13485	14713	15050	14416	7.86

Recovery Gas to GC, Time 15:48

Peak Areas, mv-sec			Average	ppm
15015	14984	15595	15198	8.08

Recovery 97.2% ✓

RECOVERY DATA

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~ 6**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

After Run 13 **Before Run** 14
Start Time 19:19 **End Time** 19:29

Recovery Gas to Probe, Time 19:19

Peak Areas, mv-sec			**Average**	**ppm**
13784	14634	14808	14409	7.85

Recovery Gas to GC, Time 19:26

Peak Areas, mv-sec			**Average**	**ppm**
14826	14809	15121	14918	8.00

Recovery 98.2% ✓

SH

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 6

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	460	457	298	232
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **42.9** mL/Min	**10.7** ppm	**10.7** ppm	**6.95** ppm	**5.41** ppm
Time: 06:02		**Peak Areas, mv-sec**		
	25099	20594	10407	44232
	24750	21533	10445	46016
	25597	21979	10703	45950
Average Area	**25149**	**21369**	**10519** ✓	**45399**

2 Flow = **82.8** mL/Min	**5.56** ppm	**5.52** ppm	**3.60** ppm	**2.80** ppm
Time: 06:53		**Peak Areas, mv-sec**		
	7926	6406	2923	14068
	7950	6306	2884	13591
	8444	6460	2990	14698
Average Area	**8107**	**6390** ✓	**2932**	**14119**

3 Flow = **130** mL/Min	**3.54** ppm	**3.52** ppm	**2.29** ppm	**1.79** ppm
Time: 07:08		**Peak Areas, mv-sec**		
	3069	2599	1371	5786
	3064	2578	1331	5729
	3088	2512	1340	5842
Average Area	**3074** ✓	**2563**	**1347**	**5786**

SH

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~** 6
Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

H_2S	**1**	**2**	**3**
Time	06:02	06:53	07:08
Concentration, ppm	10.7	5.56	3.54
Area, mv-sec	25149	8107	3074
Calc. Conc., ppm	10.6	5.79	3.46
% Error	-1.6	4.2	-2.4

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8847	2.4717	0.9980	2	0.07

MeSH	**1**	**2**	**3**
Time	06:02	06:53	07:08
Concentration, ppm	10.7	5.52	3.52
Area, mv-sec	21369	6390	2563
Calc. Conc., ppm	10.6	5.62	3.48
% Error	-0.7	1.8	-1.1

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9089	2.3742	0.9996	2	0.08

DMS	**1**	**2**	**3**
Time	06:02	06:53	07:08
Concentration, ppm	6.95	3.60	2.29
Area, mv-sec	10519	2932	1347
Calc. Conc., ppm	7.00	3.53	2.32
% Error	0.8	-2.0	1.2

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8617	2.4483	0.9995	2	0.07

DMDS	**1**	**2**	**3**
Time	06:02	06:53	07:08
Concentration, ppm	5.41	2.80	1.79
Area, mv-sec	45399	14119	5786
Calc. Conc., ppm	5.37	2.86	1.77
% Error	-0.8	2.0	-1.2

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8537	3.3043	0.9995	2	0.02

CALIBRATION DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~ 6**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	460	457	298	232
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **43.6** mL/Min	**10.5** ppm	**10.5** ppm	**6.82** ppm	**5.31** ppm
Time: 19:32	**Peak Areas, mv-sec**			
	23668	22380	10086	46114
	24884	23771	10653	47622
	24624	24375	10810	50274
Average Area	**24392**	**23509**	**10516**	**48003**

2 Flow = **65.8** mL/Min	**6.99** ppm	**6.95** ppm	**4.53** ppm	**3.53** ppm
Time: 19:43	**Peak Areas, mv-sec**			
	14069	11744	5164	24545
	13746	12537	5293	24899
	13905	12112	5280	24958
Average Area	**13907**	**12131**	**5246**	**24800**

3 Flow = **123** mL/Min	**3.74** ppm	**3.71** ppm	**2.42** ppm	**1.88** ppm
Time: 19:59	**Peak Areas, mv-sec**			
	4288	3691	1547	7409
	4623	3823	1561	7662
	4672	3745	1545	7541
Average Area	**4527**	**3753**	**1551**	**7538**

SH

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent** #6

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

H_2S	**1**	**2**	**3**
Time	19:32	19:43	19:59
Concentration, ppm	10.5	6.99	3.74
Area, mv-sec	24392	13907	4527
Calc. Conc., ppm	10.3	7.29	3.68
% Error	-2.5	4.3	-1.6

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.6380	2.7299	0.9976	2	0.03

MeSH	**1**	**2**	**3**
Time	19:32	19:43	19:59
Concentration, ppm	10.5	6.95	3.71
Area, mv-sec	23509	12131	3753
Calc. Conc., ppm	10.3	7.11	3.68
% Error	-1.4	2.4	-0.9

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7779	2.5690	0.9992	2	0.05

DMS	**1**	**2**	**3**
Time	19:32	19:43	19:59
Concentration, ppm	6.82	4.53	2.42
Area, mv-sec	10516	5246	1551
Calc. Conc., ppm	6.73	4.63	2.40
% Error	-1.3	2.2	-0.9

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8539	2.4865	0.9993	2	0.07

DMDS	**1**	**2**	**3**
Time	19:32	19:43	19:59
Concentration, ppm	5.31	3.53	1.88
Area, mv-sec	48003	24800	7538
Calc. Conc., ppm	5.23	3.62	1.86
% Error	-1.6	2.7	-1.0

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7949	3.3916	0.9990	2	0.02

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent** 16
Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	25.0	35.0	63.0	132.0
Peak Detection Window, sec	10.0	10.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	3.0	3.0
Ending Peak Width, sec	2.0	3.0	5.0	5.0
Permeation Device ID	T-51831	33-50536	89-50725	89-53405
Permeation Rate, ng/min	642 ✓	901 ✓	758 ✓	895 ✓
Permeation Rate, nL/min*	460	457	298	232

Barometric Pressure: 29.70 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 642 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.70)$$
$$= 460 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~1~~ 6**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

File: E:\6-25-21.trs
Program Version: 2.0, built 21 Feb 2015 **File Version:** 2.0
Computer: JWS-PROGRAMMING **Trailer:** 271

Analog Input Device: Keithley KUSB-3108 **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: GC-8A **Serial No.** C10494419420SA
Detector Range: 10

Gases

	Press. psi	Flow mL/min
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 100
Detector: 120

Columns

Primary: 3'
Secondary:
Sample Loop: 6" unlined

Injection Cycle

Total Length: 180 sec **Sampling Time:** 160 sec **Load/Backflush Time:** 85 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 5 mv-sec **Minimum peak height** 5 mv above baseline

Dynacalibrator

Chamber Temperature 130.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.70 in. Hg

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 6**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
PM vent 6 Run 1				
17:56:59	6779	20.2	34	0.2
17:57:14	6779	20.2	35	0.2
17:57:29	6780	20.2	34	0.2
17:57:44	6781	20.2	34	0.2
17:57:59	6779	20.2	35	0.2
17:58:14	6781	20.2	35	0.2
17:58:29	6781	20.2	34	0.2
17:58:44	6778	20.2	35	0.2
17:58:59	6780	20.2	34	0.2
17:59:14	6780	20.2	36	0.2
17:59:29	6780	20.2	34	0.2
17:59:44	6779	20.2	36	0.2
17:59:59	6779	20.2	37	0.2
18:00:14	6780	20.2	36	0.2
18:00:29	6779	20.2	37	0.2
18:00:44	6781	20.2	37	0.2
18:00:59	6780	20.2	38	0.2
18:01:14	6779	20.2	37	0.2
18:01:29	6781	20.2	37	0.2
18:01:44	6779	20.2	37	0.2
18:01:59	6778	20.2	36	0.2
18:02:14	6779	20.2	38	0.2
18:02:29	6774	20.2	41	0.2
18:02:44	6772	20.2	41	0.2
18:02:59	6771	20.2	41	0.2
Avgs	**6779**	**20.2**	**36**	**0.2**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 6**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
PM vent 6 Run 2				
18:28:22	6777	20.2	34	0.2
18:28:37	6778	20.2	35	0.2
18:28:52	6775	20.2	33	0.2
18:29:07	6778	20.2	33	0.2
18:29:22	6778	20.2	35	0.2
18:29:37	6779	20.2	35	0.2
18:29:52	6778	20.2	34	0.2
18:30:07	6777	20.2	32	0.2
18:30:22	6779	20.2	34	0.2
18:30:37	6778	20.2	35	0.2
18:30:52	6778	20.2	34	0.2
18:31:07	6778	20.2	33	0.2
18:31:22	6779	20.2	34	0.2
18:31:37	6778	20.2	34	0.2
Avgs	**6778**	**20.2**	**34**	**0.2**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 6**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
	PM vent 6		**Run 3**	
19:27:17	6777	20.2	34	0.2
19:27:32	6777	20.2	37	0.2
19:27:47	6777	20.2	34	0.2
19:28:02	6778	20.2	34	0.2
19:28:17	6777	20.2	34	0.2
19:28:32	6777	20.2	36	0.2
19:28:47	6778	20.2	36	0.2
19:29:02	6779	20.2	37	0.2
19:29:17	6777	20.2	38	0.2
19:29:32	6777	20.2	37	0.2
19:29:47	6777	20.2	37	0.2
19:30:02	6777	20.2	35	0.2
19:30:17	6777	20.2	36	0.2
19:30:32	6779	20.2	34	0.2
19:30:47	6778	20.2	33	0.2
Avgs	**6777**	**20.2**	**35**	**0.2**

RUN DATA

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 6**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
19:44:04	3363	10.1	3207	9.8
19:44:19	3314	9.9	3241	9.9
19:44:34	3314	9.9	3247	9.9
SG9168283BAL	**10.12 - O2**		**10.16 - CO2**	
19:44:49	3313	9.9	3246	9.9
19:45:04	3311	9.9	3247	9.9
19:45:19	3312	9.9	3250	9.9
19:45:34	3312	9.9	3248	9.9
19:45:49	3311	9.9	3249	9.9
19:46:04	3311	9.9	3249	9.9
19:46:19	3312	9.9	3251	9.9
19:46:34	3311	9.9	3251	9.9
19:46:49	3311	9.9	3250	9.9
19:47:04	3310	9.9	3248	9.9
19:47:19	3311	9.9	3248	9.9
Avgs	**3315**	**9.9**	**3245**	**9.9**

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 6**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 08:20

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	8
10.1 ✓	SG9168283BAL	3287
19.5 ✓	CC454190	6576

Curve Coefficients

Slope	Intercept	Corr. Coeff.
336.7 ✓	-31 ✓	0.9998 ✓

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	5
10.2 ✓	SG9168283BAL	3276
20.4 ✓	CC454190	6722

Curve Coefficients

Slope	Intercept	Corr. Coeff.
329.3 ✓	-20 ✓	0.9999 ✓

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 6**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 08:20

O_2

Method: EPA 3A
Span Conc. 19.5 %
Slope 336.7 **Intercept** -31.5

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	8	0.1	0.1	0.5	Pass
10.1	3287	9.9	-0.2	-1.0	Pass
19.5	6576	19.6	0.1	0.5	Pass

CO_2

Method: EPA 3A
Span Conc. 20.4 %
Slope 329.3 **Intercept** -19.9

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	5	0.1	0.1	0.5	Pass
10.2	3276	10.0	-0.2	-1.0	Pass
20.4	6722	20.5	0.1	0.5	Pass

METHODS AND ANALYZERS

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**Paper Machine vent 6**	Date:	**25 Jun 2021**

File: C:\Users\Trailer 271\Documents\New Indy\6-25-21c.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: DESKTOP-GQ0I9UV **Trailer:** 271
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.5**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.4**

VENT 7

New Indy
Catawba, SC

15730.001.008
No. 7 Hood Exhaust
Paper Machine Vent 7

EMISSION CALCULATIONS

	Run 1	Run 2	Run 3	Mean
Date	**6/26/21**	**6/26/21**	**6/26/21**	---
Time Began	**945**	**1050**	**1155**	---
Time Ended	**1046**	**1150**	**1255**	---
Volumetric Flow Rate, (Qs), DSCFM	6.40E+04	6.42E+04	6.52E+04	6.45E+04
BWS	0.261	0.242	0.254	0.252
% Oxygen	20.2	20.2	20.2	20.2
Total Reduced Sulfur (TRS MW)= 34.08				
Concentration, ppm	0.42	0.43	0.52	0.46
Emission Rate, lb/hr	0.14	0.15	0.18	0.16

AB for SH ✓

New Indy
Catawba, SC

15730.001.008
No. 7 Hood Exhaust

Paper Machine Vent 7

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/26/21	6/26/21	6/26/21	---
Time Began		945	1050	1155	---
Time Ended		1037	1145	1249	---
INPUT DATA					
Sampling Time, min	(Theta)	48.0	48	48	48
Stack Diameter, in.	(Dia.)	66	66	66	66
Barometric Pressure, in. Hg	(Pb)	29.68	29.68	29.68	29.68
Static Pressure, in. H2O	(Pg)	-0.30	-0.30	-0.30	-0.30
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	1.0030	1.0030	1.0030	1.0030
Orifice Calibration Value	(Delta H@)	1.8000	1.8000	1.8000	1.8000
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	30.393	30.677	30.480	30.517
Meter Temperature, °F	(Tm)	79.3	86.1	92.1	85.8
Meter Temperature, °R	(Tm-R)	539.3	546.1	552.1	545.8
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	223.0	201.0	210.4	211.5
CO2 Concentration, %	(CO2)	0.2	0.1	0.2	0.2
O2 Concentration, %	(O2)	20.2	20.2	20.2	20.2
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	1.144	1.122	1.157	1.141
Stack Temperature, °F	(Ts)	187.7	188.2	189.9	188.6
Stack Temperature, °R	(Ts-R)	647.7	648.2	649.9	648.6
Moisture Fraction (at Saturation)	(BWS)	0.610	0.617	0.640	0.622
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	23.76	23.76	23.76	23.76
Stack Pressure, in. Hg	(Ps)	29.66	29.66	29.66	29.66
Meter Pressure, in. Hg	(Pm)	29.78	29.78	29.78	29.78
Standard Meter Volume, ft^3	(Vmstd)	29.690	29.594	29.084	29.456
Standard Water Volume, ft^3	(Vwstd)	10.497	9.461	9.904	9.954
Moisture Fraction (Measured)	(BWS)	0.261	0.242	0.254	0.252
Moisture Fraction (lower sat/meas)	(BWS)	0.261	0.242	0.254	0.252
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	28.84	28.82	28.84	28.83
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	26.01	26.20	26.09	26.10
Average Stack Gas Velocity, ft/sec	(Vs)	75.29	73.59	76.12	75.00
Stack Gas Flow, actual, ft^3/min	(Qa)	107321	104899	108506	106908
Stack Gas Flow, Std , ft^3/min	(Qs)	64044	64155	65159	64452

Calibration check	(Yqa)	1.0230	1.0202	1.0322	1.025
Percent difference from Y					2.21%

AB for SH ✓

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 7 Hood Exhaust
Sample Location: Roof
W. O. Number: 15730.001.008
Run Number: 1
Date: 6/26/21
Test Personnel: BEA/BE
Sample Time: 48 min.

Console ID: A023
Meter Corr., Y: 1.003
Console ΔH@: 1.800
Probe ID/Length: PR6C-6'
Liner Material: SS
Pitot ID/Coeff.: P77 0.84
Thermo ID: A023
Nozzle ID/Diams.:
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 73 °F
Baro. Pressure*: 29.68 in. Hg
Static Pressure: -.30 in. H_2O
Impinger Gain: 214.9 mL
Silica Gel Gain: 8.1 g 223.0
Stack Area: 23.76 ft^2
Total Traverse Points: 16

K Factor: N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.001	0.000
@ Vac., in. Hg	12"	5"
Pitot	Good	Good

Filter ID: N/A
Sample ID: run 1

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	09:45			8.350									
A-1	3		1.2	1.3	10.5	190	N/A	76	246	252	N/A	61	3	
2	6		1.2	1.3	12.2	190		77	245	251		51	3	
3	9		1.3	1.3	14.0	190		77	244	254		51	3	
4	12		1.3	1.3	15.9	189		78	245	250		51	3	
5	15		1.1	1.3	17.7	189		78	248	253		51	3	
6	18		1.1	1.3	19.6	189		79	244	252		53	3	
7	21		1.3	1.3	21.5	188		79	242	254		54	3	
8	24		1.2	1.3	23.4	188		79	243	255		55	3	
B-1	27		1.5	1.3	25.3	186		79	242	252		59	3	
2	30		1.5	1.3	27.2	187		80	247	252		58	3	
3	33		1.4	1.3	29.2	187		80	245	255		60	3	
4	36		1.5	1.3	31.1	187		80	245	252		62	3	
5	39		1.5	1.3	33.0	187		81	247	254		62	3	
6	42		1.4	1.3	34.9	187		81	245	255		64	3	
7	45		1.3	1.3	36.8	187		82	243	254		64	3	
8	48	10:37	1.2	1.3	38.743	182	↓	82	246	256	↓	66	3	

*Barometric Pressure is at port elevation

Avg √Δp	Avg ΔH	Total Volume	Avg T_s	Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac
1.1441 1,3125	1.300	30.393	187.7	79.3	242/248	250/256		66	3

Avg √ΔH: 1.1402

V_{m-std}, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by

Flue Gas Composition
Oxygen, %: 20.2
Carbon Dioxide, %: 0.2
Moisture, %:

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F: 192
Ref. Temp, °F: 191.6
Result: 99%

WESTON SOLUTIONS
Integrated Air Services

Comments

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 7 Hood Exhaust
Sample Location: Roof
W. O. Number: 15730.001.008
Run Number: 2
Date: 6/26/21
Test Personnel: BEA / BC
Sample Time: 48 min.

Console ID: A023
Meter Corr., Y: 1.003
Console ΔH@: 1.800
Probe ID/Length: PR6C-6'
Liner Material: SS
Pitot ID/Coeff.: P77 | 0.84
Thermo ID: A023
Nozzle ID/Diams.:
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 75 °F
Baro. Pressure*: 29.68 in. Hg
Static Pressure: -.30 in. H2O
Impinger Gain: 195.0 mL
Silica Gel Gain: 6.0 g
Stack Area: 23.76 ft²
Total Traverse Points: 16

K Factor: N/A

Leak Checks

	Initial	Final
Volume, ft³	0.004	0.000
@ Vac., in. Hg	12"	5"
Pitot	Good	Good

Filter ID: N/A
Sample ID: Run 2

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H2O)	ORIFICE PRESSURE ΔH (in. H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	10:50			39.009									
A-1	3		1.1	1.3	40.9	188	N/A	82	247	253	N/A	67	2	
2	6		1.1	1.3	42.8	188		83	246	253		62	2	
3	9		1.1	1.3	44.7	188		83	247	254		57	2	
4	12		1.1	1.3	46.7	189		86	245	253		56	2	
5	15		1.1	1.3	48.6	188		85	243	252		56	2	
6	18		1.3	1.3	50.5	188		85	242	251		56	2	
7	21		1.2	1.3	52.4	189		86	242	252		54	2	
8	24		1.3	1.3	54.4	188		86	243	255		55	2	
B-1	27		1.5	1.3	56.3	187		88	244	253		61	2	
2	30		1.4	1.3	58.2	188		87	247	253		56	2	
3	33		1.5	1.3	60.1	188		87	248	253		55	2	
4	36		1.4	1.3	62.0	188		86	245	252		56	2	
5	39		1.3	1.3	63.9	188		88	247	251		58	2	
6	42		1.2	1.3	65.8	189		87	244	253		56	2	
7	45		1.3	1.3	67.7	189		89	246	254		57	2	
8	48	1145	1.3	1.3	69.686	188		89	243	253		58	2	
*Barometric Pressure is at port elevation			Avg √Δp 1.1220	Avg ΔH 1.300	Total Volume 30.677	Avg Ts 188.2	Avg Tm 86.1		Min/Max 242/248	Min/Max 251/255	Min/Max	Max Temp 67	Max Vac 2	

Avg √Δp: 1.2625
Avg √ΔH: 1.1902

Comments

Flue Gas Composition
Oxygen, %: 20.2
Carbon Dioxide, %: 0.1
Moisture, %:

O2/CO2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Vm-std, scf
Qs, dscfm
% Isokinetic
Calculated by
QC by

WESTON SOLUTIONS®
Integrated Air Services

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 7 Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 3
Date 6/24/21
Test Personnel BEAT BE
Sample Time 48 min.

Console ID A023
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length PR6C-6'
Liner Material SS
Pitot ID/Coeff. P77 0.84
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 79 °F
Baro. Pressure* 29.68 in. Hg
Static Pressure -.30 in. H_2O
Impinger Gain 202.2 mL
Silica Gel Gain 8.2 g
Stack Area 23.76 ft²
Total Traverse Points 16

K Factor N/A

Leak Checks

	Initial	Final
Volume, ft³	0.000	0.000
@ Vac., in. Hg	12"	5"
Pitot	Good	Good

Filter ID N/A
Sample ID Run 3

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	11:55			70.079									
A-1	3		1.1	1.3	71.9	189	N/A	91	245	252	N/A	67	3	
2	6		1.2	1.3	73.8	191		91	245	251		58	3	
3	9		1.2	1.3	75.7	191		91	247	250		56	3	
4	12		1.3	1.3	77.6	192		92	244	253		56	3	
5	15		1.1	1.3	79.5	190		92	243	252		56	3	
6	18		1.1	1.3	81.4	190		94	243	252		57	3	
7	21		1.4	1.3	83.2	190		93	241	253		57	3	
8	24		1.4	1.3	85.1	191		92	241	253		58	3	
B-1	27		1.6	1.3	87.1	187		92	241	256		57	3	
2	30		1.5	1.3	89.0	190		92	246	252		62	3	
3	33		1.6	1.3	91.0	190		93	242	252		62	3	
4	36		1.5	1.3	93.0	191		93	245	252		64	3	
5	39		1.5	1.3	94.8	191		92	244	253		66	3	
6	42		1.5	1.3	96.7	190		92	240	251		67	3	
7	45		1.4	1.3	98.6	191		91	243	251		66	3	
8	48	1249	1.1	1.3	100.559	185		92	245	251		66	3	
*Barometric Pressure is at port elevation			Avg √Δp 1.1565 1.2438	Avg ΔH 1.300 Avg √ΔH 1.1902	Total Volume 30.48	Avg T_s 189.5	Avg T_m 92.1		Min/Max 240/247	Min/Max 250/256	Min/Max	Max Temp 67	Max Vac 3	

Flue Gas Composition
Oxygen, % 20.2
Carbon Dioxide, % 0.2
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

$V_{m\text{-std}}$, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by ZW

Comments

WESTON SOLUTIONS®
Integrated Air Services

Sample Recovery Field Data

Method: EPA 4, Moisture

Client: New Indy
Location/Plant: Catawba, SC

Source: No. 7 Hood Exhaust
W.O. Number: 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample Date 6/26/21
Recovery Date 6/26/21
Sample ID
Filter ID N/A
Analyst BEA/BE

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents						grams	
Final	928.4	700.8	562.9			916.6	
Initial	774.4	664.3	538.5			908.5	
Gain	154 ✓	36.5 ✓	24.4 ✓		214.9	8.1 ✓	223 ✓

Impinger Color: Clear
Silica Gel Condition: Good
Labled? ✓
Sealed? ✓

Run No. 2
Sample Date 6/26/21
Recovery Date 6/26/21
Sample ID
Filter ID N/A
Analyst BEA/BE

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents						grams	
Final	900.8	808.5	640.8			879.4	
Initial	734.5	783.2	637.4			873.4	
Gain	166.3 ✓	25.3 ✓	3.4 ✓		195 ✓	6 ✓	201 ✓

Impinger Color: Clear
Silica Gel Condition: Good
Labled? ✓
Sealed? ✓

Run No. 3
Sample Date 6/26/21
Recovery Date 6/26/21
Sample ID
Filter ID N/A
Analyst BEA/BE

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents						grams	
Final	931.4	727.2	569.3			924.8	
Initial	780.9	681.9	562.9			916.6	
Gain	150.5 ✓	45.3 ✓	6.4 ✓		202.2 ✓	8.2 ✓	210.4 ✓

Impinger Color: Clear
Silica Gel Condition: Good
Labled? ✓
Sealed? ✓

Check COC for Sample IDs of Media Blanks

WESTON SOLUTIONS
Integrated Air Services

Sample and Velocity Traverse Point Data Sheet - Method 1

Client New Indy
Loaction/Plant Catawba, SC
Source No. 7 Hood Exhaust
Operator VD / LF
Date 15-Jun-21
W.0. Number 15730.001.008

Duct Type	☑	Circular	☐	Rectangular Duct	Indicate appropriate type
Traverse Type	☐	Particulate Traverse	☑	Velocity Traverse	

Distance from far wall to outside of port (in.) = C	66.125
Port Depth (in.) = D	0.125
Depth of Duct, diameter (in.) = C-D	66
Area of Duct (ft^2)	23.76
Total Traverse Points	16
Total Traverse Points per Port	8

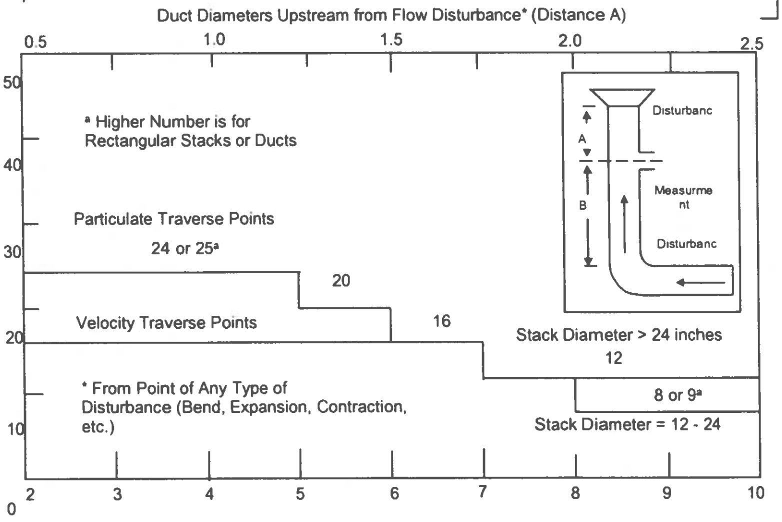
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

Flow Disturbances	
Upstream - A (ft)	5.625
Downstream - B (ft)	25.0
Upstream - A (duct diameters)	1.02
Downstream - B (duct diameters)	4.55

Diagram of Stack

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	2	2
2	10.5	7	7
3	19.4	13	13
4	32.3	21 1/2	21 1/2
5	67.7	44 1/2	45
6	80.6	53	53 1/2
7	89.5	59	59
8	96.8	64	64
9			
10			
11			
12			



Duct Diameters Downstream from Flow Disturbance* (Distance B)

Equivalent Diameter = (2*L*W)/(L+W)

Traverse Point Location Percent of Stack -Circular

Traverse Location Point	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Location Point	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

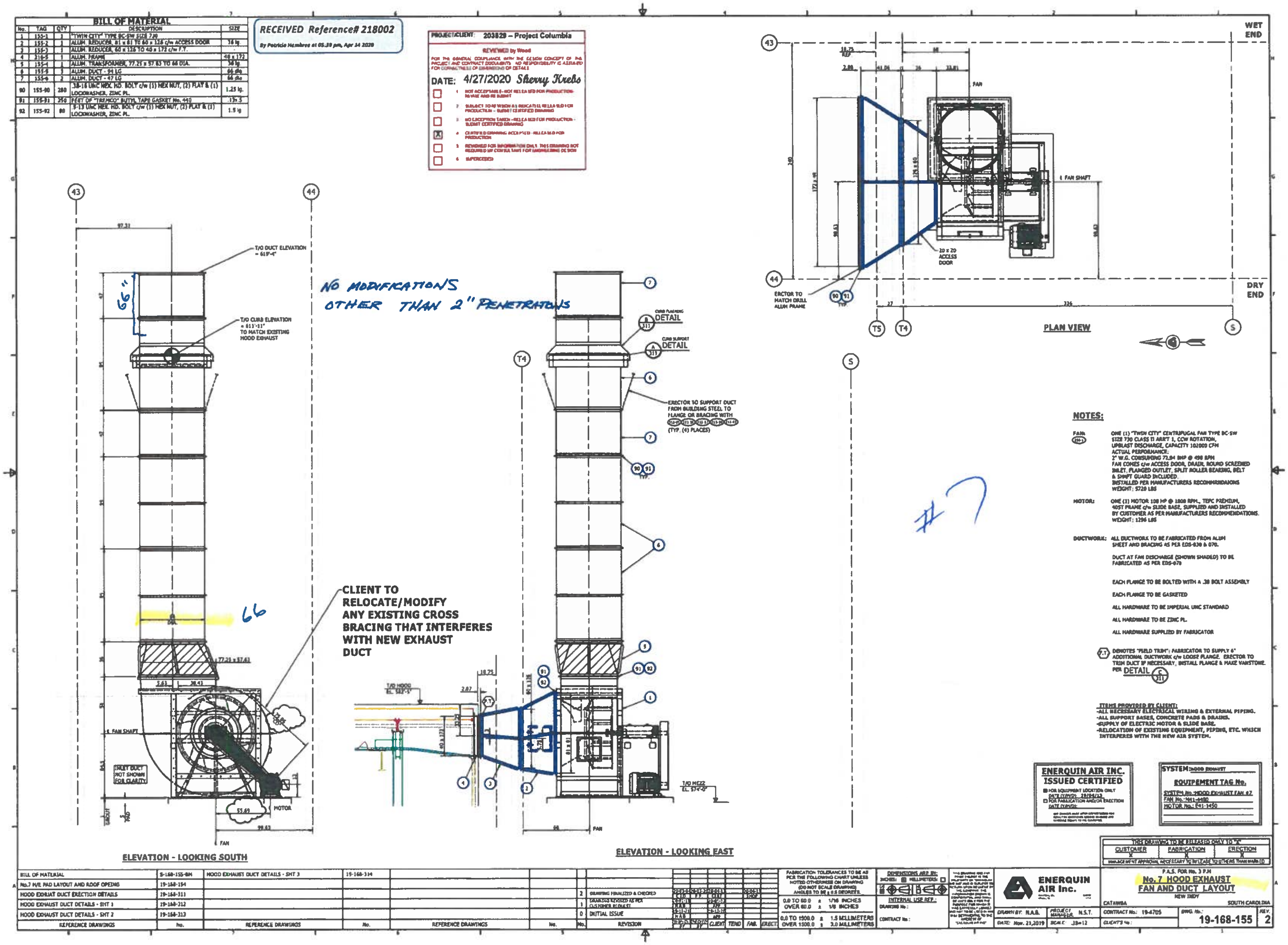
Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Port Diam. (in) = 4
Number of Ports = 2

Tape Measure I.D. # TM-07

Method 1 Version 2

WESTON



BILL OF MATERIAL

No.	TAG	QTY	DESCRIPTION	SIZE
1	155-1	1	"TWIN CITY" TYPE BC-SW SIZE 730	
2	155-2	1	ALUM. REDUCER, 81 x 81 TO 60 x 126 c/w ACCESS DOOR	36 lg.
3	155-3	1	ALUM. REDUCER, 60 x 126 TO 40 x 172 c/w F.T.	
4	216-5	1	ALUM. FRAME	40 x 172
5	155-4	1	ALUM. TRANSFORMER, 77.25 x 57.63 TO 66 DIA.	38 lg.
6	155-5	3	ALUM. DUCT - 94 LG	66 dia
7	155-6	2	ALUM. DUCT - 47 LG	66 dia
90	155-90	280	.38-16 UNC HEX. HD. BOLT c/w (1) HEX NUT, (2) FLAT & (1) LOCKWASHER, ZINC PL.	1.25 lg.
91	155-91	250	FEET OF "TREMCO" BUTYL TAPE GASKET No. 440	.13x.5
92	155-92	80	.5-13 UNC HEX. HD. BOLT c/w (1) HEX NUT, (2) FLAT & (1) LOCKWASHER, ZINC PL.	1.5 lg

RECEIVED Reference# 218002
By Patricia Membres at 05.39 pm, Apr 14 2020

PROJECT/CLIENT: 203829 – Project Columbia

REVIEWED by Wood

FOR THE GENERAL COMPLIANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND CONTRACT DOCUMENTS. NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS OF DIMENSIONS OR DETAILS

DATE: 4/27/2020 Sherry Krebs

☐ 1 NOT ACCEPTABLE - NOT RELEASED FOR PRODUCTION - REVISE AND RE-SUBMIT
☐ 2 SUBJECT TO REVISION AS INDICATED, RELEASED FOR PRODUCTION - SUBMIT CERTIFIED DRAWING
☐ 3 NO EXCEPTION TAKEN - RELEASED FOR PRODUCTION - SUBMIT CERTIFIED DRAWING
☒ 4 CERTIFIED DRAWING ACCEPTED - RELEASED FOR PRODUCTION
☐ 5 REVIEWED FOR INFORMATION ONLY. THIS DRAWING NOT REQUIRED BY CONSULTANT FOR ENGINEERING DESIGN
☐ 6 SUPERCEDED

NO MODIFICATIONS OTHER THAN 2" PENETRATIONS

66"

66

#7

CLIENT TO RELOCATE/MODIFY ANY EXISTING CROSS BRACING THAT INTERFERES WITH NEW EXHAUST DUCT

NOTES:

FAN: ONE (1) "TWIN CITY" CENTRIFUGAL FAN TYPE BC-SW SIZE 730 CLASS II ARR'T 1, CCW ROTATION, UPBLAST DISCHARGE, CAPACITY 102000 CFM
ACTUAL PERFORMANCE:
2" W.G. CONSUMING 72.94 BHP @ 498 RPM
FAN COMES c/w ACCESS DOOR, DRAIN, ROUND SCREENED INLET, FLANGED OUTLET, SPLIT ROLLER BEARING, BELT & SHAFT GUARD INCLUDED.
INSTALLED PER MANUFACTURERS RECOMMENDATIONS
WEIGHT: 5720 LBS

MOTOR: ONE (1) MOTOR 100 HP @ 1800 RPM., TEFC PREMIUM, 405T FRAME c/w SLIDE BASE, SUPPLIED AND INSTALLED BY CUSTOMER AS PER MANUFACTURERS RECOMMENDATIONS.
WEIGHT: 1296 LBS

DUCTWORK: ALL DUCTWORK TO BE FABRICATED FROM ALUM SHEET AND BRACING AS PER EDS-030 & 070.

DUCT AT FAN DISCHARGE (SHOWN SHADED) TO BE FABRICATED AS PER EDS-070

EACH FLANGE TO BE BOLTED WITH A .38 BOLT ASSEMBLY

EACH FLANGE TO BE GASKETED

ALL HARDWARE TO BE IMPERIAL UNC STANDARD

ALL HARDWARE TO BE ZINC PL.

ALL HARDWARE SUPPLIED BY FABRICATOR

F.T. DENOTES "FIELD TRIM": FABRICATOR TO SUPPLY 6" ADDITIONAL DUCTWORK c/w LOOSE FLANGE. ERECTOR TO TRIM DUCT IF NECESSARY, INSTALL FLANGE & MAKE VANSTONE PER DETAIL C 311

ITEMS PROVIDED BY CLIENT:
-ALL NECESSARY ELECTRICAL WIRING & EXTERNAL PIPING.
-ALL SUPPORT BASES, CONCRETE PADS & DRAINS.
-SUPPLY OF ELECTRIC MOTOR & SLIDE BASE.
-RELOCATION OF EXISTING EQUIPMENT, PIPING, ETC. WHICH INTERFERES WITH THE NEW AIR SYSTEM.

ENERQUIN AIR INC.
ISSUED CERTIFIED
■ FOR EQUIPMENT LOCATION ONLY DATE (Y/M/D): 19/04/12
☐ FOR FABRICATION AND/OR ERECTION DATE (Y/M/D):

SYSTEM: HOOD EXHAUST
EQUIPEMENT TAG No.
SYSTEM No.: HOOD EXHAUST FAN #7
FAN No.: 941-4490
MOTOR No.: E41-1450

THIS DRAWING TO BE RELEASED ONLY TO "X"

CUSTOMER	FABRICATION	ERECTION
X	X	X

MANAGEMENT APPROVAL NECESSARY TO RELEASE TO OTHERS THAN MARKED (X)

REFERENCE DRAWINGS	No.	REFERENCE DRAWINGS	No.
BILL OF MATERIAL	9-168-155-BM	HOOD EXHAUST DUCT DETAILS - SHT 3	19-168-314
No.7 H/E PAD LAYOUT AND ROOF OPEING	19-168-154		
HOOD EXHUAT DUCT ERECTION DETAILS	19-168-311		
HOOD EXHAUST DUCT DETAILS - SHT 1	19-168-312		
HOOD EXHAUST DUCT DETAILS - SHT 2	19-168-313		

No.	REVISION
2	DRAWING FINALIZED & CHECKED
1	DRAWING REVISED AS PER CUSTOMER REQUEST
0	INITIAL ISSUE

ENERQUIN AIR Inc.

P.A.S. FOR No. 3 P.M
No. 7 HOOD EXHAUST
FAN AND DUCT LAYOUT
NEW INDY
CATAWBA SOUTH CAROLINA

DRAWN BY: N.A.B.
PROJECT MANAGER: N.S.T.
DATE: Nov. 21,2019
SCALE: .38=12
CONTRACT No.: 19-4705
CLIENT'S No.:
DWG. No.: 19-168-155
REV. 2

RUN SUMMARY

Number 1

Client:	**New Indy**			Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Method	**16**	Operator:	**VD**
Source:	**Paper Machine Vent 7**	Calibration	**1**	Date:	**26 Jun 2021**

Start Time 09:45 **End Time** 10:46

Average Measured TRS Conc.	0.39 **ppm** ✓
Recovery No. 2	93.9 **%** ✓
TRS Corrected for Recovery	0.42 **ppm** ✓

RUN SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time 10:50 **End Time** 11:50

Average Measured TRS Conc.	0.40 **ppm** ✓
Recovery No. 2	93.9 **%**
TRS Corrected for Recovery	0.43 **ppm** ✓

RUN SUMMARY

Number 3

Client:	**New Indy**				Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Method	**16**		Operator:	**VD**
Source:	**Paper Machine Vent 7**	Calibration	**1**		Date:	**26 Jun 2021**

Start Time 11:55 **End Time** 12:55

Average Measured TRS Conc.	0.49 **ppm** ✓
Recovery No. 2	93.9 **%**
TRS Corrected for Recovery	0.52 **ppm** ✓

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
09:45	17	0.11	<2	<0.05	15	0.14	16	0.04	0.34
09:48	26	0.14	6	0.08	10	0.11	<2	<0.02	0.34
09:51	27	0.14	8	0.09	39	0.24	5	0.02	0.53
09:54	9	0.07	6	0.08	39	0.25	<2	<0.02	0.40
09:57	26	0.14	7	0.09	<2	<0.05	<2	<0.02	0.23
10:00	29	0.15	12	0.12	52	0.29	27	0.06	0.68
10:03	<2	<0.04	<2	<0.05	43	0.26	117	0.14	0.55
10:06	32	0.16	<2	<0.05	32	0.22	10	0.03	0.45
10:09	<2	<0.04	<2	<0.05	54	0.29	<2	<0.02	0.29
10:12	36	0.17	14	0.13	21	0.17	<2	<0.02	0.47
10:15	70	0.26	<2	<0.05	21	0.17	45	0.08	0.59
10:18	5	0.05	<2	<0.05	<2	<0.05	34	0.07	0.19
10:22	<2	<0.04	<2	<0.05	<2	<0.05	32	0.07	0.13
10:25	<2	<0.04	<2	<0.05	64	0.33	<2	<0.02	0.33
10:28	7	0.07	<2	<0.05	43	0.26	42	0.08	0.48
10:31	4	0.05	33	0.22	<2	<0.05	<2	<0.02	0.26
10:34	<2	<0.04	18	0.15	22	0.17	<2	<0.02	0.33
10:37	22	0.13	8	0.10	24	0.19	<2	<0.02	0.41
10:40	24	0.14	17	0.15	16	0.15	5	0.02	0.48
10:43	<2	<0.04	13	0.13	12	0.12	26	0.06	0.37
Average		**0.09**		**0.07**		**0.17**		**0.03**	**0.39**

RUN DATA

Number 2

Client:	**New Indy**		Project Number: **15730.001.008**
Location:	**Catawba, SC**	Method **16**	Operator: **VD**
Source:	**Paper Machine Vent 7**	Calibration **1**	Date: **26 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
10:50	34	0.17	41	0.25	38	0.24	21	0.05	0.76
10:53	13	0.09	<2	<0.05	<2	<0.05	<2	<0.02	0.09
10:56	8	0.07	15	0.14	15	0.14	25	0.06	0.46
10:59	<2	<0.04	<2	<0.05	30	0.21	<2	<0.02	0.21
11:02	48	0.21	41	0.25	9	0.10	<2	<0.02	0.55
11:05	<2	<0.04	<2	<0.05	18	0.16	92	0.12	0.41
11:08	9	0.08	21	0.17	46	0.27	<2	<0.02	0.51
11:11	5	0.05	7	0.09	<2	<0.05	41	0.08	0.30
11:14	41	0.19	33	0.22	<2	<0.05	29	0.06	0.53
11:17	<2	<0.04	<2	<0.05	17	0.15	55	0.09	0.33
11:20	<2	<0.04	<2	<0.05	33	0.22	<2	<0.02	0.22
11:23	23	0.13	<2	<0.05	<2	<0.05	10	0.03	0.20
11:26	<2	<0.04	16	0.14	24	0.18	27	0.06	0.45
11:29	5	0.05	<2	<0.05	<2	<0.05	7	0.03	0.11
11:32	57	0.23	10	0.11	30	0.21	17	0.05	0.64
11:35	<2	<0.04	92	0.39	<2	<0.05	<2	<0.02	0.39
11:38	11	0.09	<2	<0.05	<2	<0.05	26	0.06	0.20
11:41	<2	<0.04	33	0.22	28	0.20	13	0.04	0.49
11:44	13	0.09	23	0.18	90	0.40	38	0.07	0.81
11:47	20	0.12	<2	<0.05	25	0.19	18	0.05	0.40
Average		**0.08**		**0.11**		**0.13**		**0.04**	**0.40** ✓

SH

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
11:55	<2	<0.04	44	0.26	<2	<0.05	<2	<0.02	0.26
11:58	42	0.19	5	0.07	17	0.15	21	0.05	0.52
12:01	14	0.10	34	0.22	<2	<0.05	<2	<0.02	0.32
12:04	68	0.25	<2	<0.05	7	0.09	16	0.04	0.43
12:07	57	0.23	33	0.22	19	0.16	<2	<0.02	0.61
12:10	<2	<0.04	18	0.15	72	0.35	<2	<0.02	0.50
12:13	18	0.11	<2	<0.05	18	0.16	<2	<0.02	0.27
12:16	68	0.25	<2	<0.05	191	0.61	<2	<0.02	0.86
12:19	40	0.18	<2	<0.05	11	0.12	22	0.05	0.41
12:22	16	0.11	10	0.11	16	0.15	<2	<0.02	0.36
12:25	<2	<0.04	19	0.16	<2	<0.05	<2	<0.02	0.16
12:28	23	0.13	83	0.37	26	0.19	<2	<0.02	0.69
12:31	76	0.27	<2	<0.05	69	0.34	<2	<0.02	0.61
12:34	12	0.09	20	0.16	15	0.14	26	0.06	0.51
12:37	46	0.20	33	0.22	72	0.35	12	0.04	0.84
12:40	62	0.24	62	0.31	26	0.19	9	0.03	0.81
12:43	<2	<0.04	<2	<0.05	12	0.12	13	0.04	0.20
12:46	87	0.30	28	0.20	<2	<0.05	39	0.07	0.64
12:49	53	0.22	4	0.07	<2	<0.05	<2	<0.02	0.29
12:52	10	0.08	51	0.28	12	0.12	11	0.04	0.55
Average		**0.15**		**0.14**		**0.16**		**0.02**	**0.49**

SH

RECOVERY DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Before Run 1
Start Time 08:19 **End Time** 08:31

Recovery Gas to Probe, Time 08:19

Peak Areas, mv-sec			Average	ppm
15757	15082	15526	15455	6.94

Recovery Gas to GC, Time 08:27

Peak Areas, mv-sec			Average	ppm
17789	17071	17094	17318	7.43

Recovery 93.3% ✓

SH

RECOVERY DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

After Run 3 **Before Run** 4
Start Time 12:55 **End Time** 13:09

Recovery Gas to Probe, Time 12:55

Peak Areas, mv-sec			Average	ppm
16925	16900	17033	16953	7.34

Recovery Gas to GC, Time 13:06

Peak Areas, mv-sec			Average	ppm
18883	18581	18955	18807	7.82

Recovery 93.9% ✓

SH

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	460	457	298	232
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **48.0** mL/Min	**9.58** ppm	**9.52** ppm	**6.20** ppm	**4.83** ppm
Time: 07:01	**Peak Areas, mv-sec**			
	25119	23385	10987	48706
	25616	23496	10706	47186
	25021	22672	10690	48066
Average Area	**25252**	**23184**	**10794**	**47986**

2 Flow = **81.6** mL/Min	**5.64** ppm	**5.60** ppm	**3.65** ppm	**2.84** ppm
Time: 07:34	**Peak Areas, mv-sec**			
	11971	9531	4072	19617
	11666	9535	4189	19344
	11820	9242	4068	20012
Average Area	**11819**	**9436**	**4110**	**19658**

3 Flow = **151** mL/Min	**3.05** ppm	**3.02** ppm	**1.97** ppm	**1.54** ppm
Time: 07:49	**Peak Areas, mv-sec**			
	3892	3195	1507	6761
	3898	3136	1468	6767
	3818	3182	1462	6752
Average Area	**3869**	**3171**	**1479**	**6760**

SH

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

H_2S	**1**	**2**	**3**		
Time	07:01	07:34	07:49		
Concentration, ppm	9.58	5.64	3.05		
Area, mv-sec	25252	11819	3869		
Calc. Conc., ppm	9.36	5.89	2.98		
% Error	-2.4	4.5	-2.0 ✓		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.6414	2.8084	0.9978	2	0.04

MeSH	**1**	**2**	**3**		
Time	07:01	07:34	07:49		
Concentration, ppm	9.52	5.60	3.02		
Area, mv-sec	23184	9436	3171		
Calc. Conc., ppm	9.47	5.65	3.01		
% Error	-0.5	0.9	-0.4 ✓		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7368	2.6693	0.9999	2	0.05

DMS	**1**	**2**	**3**		
Time	07:01	07:34	07:49		
Concentration, ppm	6.20	3.65	1.97		
Area, mv-sec	10794	4110	1479		
Calc. Conc., ppm	6.26	3.59	1.99		
% Error	0.9	-1.7	0.8 ✓		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7325	2.6531	0.9997	2	0.05

DMDS	**1**	**2**	**3**		
Time	07:01	07:34	07:49		
Concentration, ppm	4.83	2.84	1.54		
Area, mv-sec	47986	19658	6760		
Calc. Conc., ppm	4.82	2.86	1.53		
% Error	-0.3	0.6	-0.3 ✓		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7107	3.5133	>0.9999	2	0.02

SN

CALIBRATION DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	460	457	298	232
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **48.0** mL/Min	**9.58** ppm	**9.52** ppm	**6.20** ppm	**4.83** ppm
Time: 16:36		**Peak Areas, mv-sec**		
	26011	25303	11444	51862
	26531	26149	12036	53970
	27302	26754	12114	53372
Average Area	**26615**	**26069**	**11864** ✓	**53068**

2 Flow = **88.9** mL/Min	**5.17** ppm	**5.14** ppm	**3.35** ppm	**2.61** ppm
Time: 16:50		**Peak Areas, mv-sec**		
	9447	7596	3066	16100
	9456	7369	3124	14977
	9570	7546	3109	14905
Average Area	**9491**	**7504** ✓	**3100**	**15327**

3 Flow = **133** mL/Min	**3.45** ppm	**3.43** ppm	**2.23** ppm	**1.74** ppm
Time: 17:14		**Peak Areas, mv-sec**		
	4013	3384	1323	6743
	4015	3427	1344	6741
	3979	3463	1344	6769
Average Area	**4002**	**3425**	**1337** ✓	**6751**

SH

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

H_2S	**1**	**2**	**3**		
Time	16:36	16:50	17:14		
Concentration, ppm	9.58	5.17	3.45		
Area, mv-sec	26615	9491	4002		
Calc. Conc., ppm	9.43	5.38	3.37		
% Error	-1.6	4.1	-2.4 ✓		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8396	2.6323	0.9977	2	0.05

MeSH	**1**	**2**	**3**		
Time	16:36	16:50	17:14		
Concentration, ppm	9.52	5.14	3.43		
Area, mv-sec	26069	7504	3425		
Calc. Conc., ppm	9.54	5.10	3.44		
% Error	0.3	-0.7	0.4 ✓		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9895	2.4671	0.9999	2	0.08

DMS	**1**	**2**	**3**		
Time	16:36	16:50	17:14		
Concentration, ppm	6.20	3.35	2.23		
Area, mv-sec	11864	3100	1337		
Calc. Conc., ppm	6.22	3.32	2.24		
% Error	0.3	-0.8	0.5 ✓		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	2.1400	2.3753	0.9999	2	0.11

DMDS	**1**	**2**	**3**		
Time	16:36	16:50	17:14		
Concentration, ppm	4.83	2.61	1.74		
Area, mv-sec	53068	15327	6751		
Calc. Conc., ppm	4.83	2.61	1.74		
% Error	-0.0	0.1	-0.0 ✓		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	2.0180	3.3447	>0.9999	2	0.03

SY

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	25.0	35.0	63.0	132.0
Peak Detection Window, sec	10.0	10.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	3.0	3.0
Ending Peak Width, sec	2.0	3.0	5.0	5.0
Permeation Device ID	T-51831 ✓	33-50536 ✓	89-50725 ✓	89-53405 ✓
Permeation Rate, ng/min	642	901	758	895
Permeation Rate, nL/min*	460	457	298	232

Barometric Pressure: 29.70 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 642 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.70)$$
$$= 460 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

File: E:\6-26-21.trs
Program Version: 2.0, built 21 Feb 2015 **File Version:** 2.0
Computer: JWS-PROGRAMMING **Trailer:** 271

Analog Input Device: Keithley KUSB-3108 **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: GC-8A **Serial No.** C10494419420SA
Detector Range: 10

Gases

	Press. psi	Flow mL/min
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 100
Detector: 120

Columns

Primary: 3'
Secondary:
Sample Loop: 6" unlined

Injection Cycle

Total Length: 180 sec **Sampling Time:** 160 sec **Load/Backflush Time:** 85 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 5 mv-sec **Minimum peak height** 5 mv above baseline

Dynacalibrator

Chamber Temperature 130.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.70 in. Hg

RUN DATA

Number 7

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	**H_2S**		**MeSH**		**DMS**		**DMDS**		**TRS**
	area	**ppm**	**area**	**ppm**	**area**	**ppm**	**area**	**ppm**	**ppm**
17:44	18765	7.81	<2	<0.05	<2	<0.05	<2	<0.02	7.81
17:47	19416	7.97	<2	<0.05	<2	<0.05	<2	<0.02	7.97
17:50	18473	7.73	<2	<0.05	<2	<0.05	<2	<0.02	7.73
17:53	18357	7.70	<2	<0.05	<2	<0.05	<2	<0.02	7.70
Average		**7.80**		**<0.05**		**<0.05**		**<0.02**	**7.80** ✓

SH

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 7**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
10:49:55	6772	20.2	-2	0.2
10:50:10	6774	20.2	-2	0.2
10:50:25	6773	20.2	-3	0.2
10:50:40	6772	20.2	-2	0.2
10:50:55	6773	20.2	-2	0.2
10:51:10	6773	20.2	-3	0.2
10:51:25	6774	20.2	-2	0.2
10:51:40	6771	20.2	-2	0.2
10:51:55	6771	20.2	-2	0.2
10:52:10	6774	20.2	-3	0.2
10:52:25	6773	20.2	-2	0.2
10:52:40	6772	20.2	-2	0.2
10:52:55	6773	20.2	-3	0.2
10:53:10	6774	20.2	-2	0.2
10:53:25	6774	20.2	-2	0.2
10:53:40	6773	20.2	-2	0.2
10:53:55	6774	20.2	-3	0.2
10:54:10	6773	20.2	-3	0.2
Avgs	**6773**	**20.2**	**-2**	**0.2**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 7**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
12:01:12	6774	20.2	-2	0.2
12:01:27	6773	20.2	-4	0.1
12:01:42	6773	20.2	-3	0.2
12:01:57	6772	20.2	-4	0.1
12:02:12	6773	20.2	-5	0.1
12:02:27	6772	20.2	-4	0.1
12:02:42	6773	20.2	-5	0.1
12:02:57	6772	20.2	-5	0.1
12:03:12	6772	20.2	-5	0.1
12:03:27	6772	20.2	-5	0.1
12:03:42	6772	20.2	-5	0.1
12:03:57	6772	20.2	-4	0.1
12:04:12	6772	20.2	-5	0.1
12:04:27	6773	20.2	-4	0.1
12:04:42	6773	20.2	-5	0.1
12:04:57	6771	20.2	-5	0.1
12:05:12	6772	20.2	-6	0.1
Avgs	**6772**	**20.2**	**-4**	**0.1**

RUN DATA
Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 7**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
13:04:58	6768	20.2	-3	0.2
13:05:13	6768	20.2	-3	0.2
13:05:28	6767	20.2	-2	0.2
13:05:43	6768	20.2	-3	0.2
13:05:58	6768	20.2	-2	0.2
13:06:13	6768	20.2	-2	0.2
13:06:28	6768	20.2	-4	0.1
13:06:43	6768	20.2	-3	0.2
13:06:58	6769	20.2	-3	0.2
13:07:13	6768	20.2	-3	0.2
13:07:28	6769	20.2	-4	0.1
13:07:43	6770	20.2	-5	0.1
13:07:58	6767	20.2	-3	0.2
13:08:13	6767	20.2	-2	0.2
13:08:28	6769	20.2	-2	0.2
13:08:43	6768	20.2	-4	0.1
13:08:58	6768	20.2	-3	0.2
Avgs	**6768**	**20.2**	**-3**	**0.2**

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 7**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time: 08:07

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	8
10.1	SG9168283BAL	3293
19.5	CC454190	6574

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
336.6	-29	0.9998

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	-32
10.2	SG9168283BAL	3417
20.4	CC454190	7035

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
346.4	-56	0.9999

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 7**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time: 08:07

O_2

Method: EPA 3A
Span Conc. 19.5 %
Slope 336.6 **Intercept** -29.2

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	8	0.1	0.1	0.5 ✓	Pass
10.1	3293	9.9	-0.2	-1.0 ✓	Pass
19.5	6574	19.6	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A
Span Conc. 20.4 %
Slope 346.4 **Intercept** -55.6

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-32	0.1	0.1	0.5 ✓	Pass
10.2	3417	10.0	-0.2	-1.0 ✓	Pass
20.4	7035	20.5	0.1	0.5 ✓	Pass

METHODS AND ANALYZERS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 7**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

File: C:\Users\Trailer 271\Documents\New Indy\6-26-21.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: DESKTOP-GQ0I9UV **Trailer:** 271
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.5**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.4**

VENT 8

New Indy
Catawba, SC

15730.001.008
No. 8 Hood Exhaust
Paper Machine Vent 8

EMISSION CALCULATIONS

	Run 1	Run 2	Run 3	Mean
Date	**6/26/21**	**6/26/21**	**6/26/21**	---
Time Began	**1315**	**1420**	**1525**	---
Time Ended	**1415**	**1520**	**1625**	---
Volumetric Flow Rate, (Qs), DSCFM	6.31E+04	6.57E+04	6.27E+04	6.38E+04
BWS	0.238	0.230	0.230	0.233
% Oxygen	20.2	20.2	20.2	20.2

Total Reduced Sulfur (TRS MW)=	34.08				
Concentration, ppm		0.59	0.51	0.56	0.55
Emission Rate, lb/hr		0.20	0.18	0.19	0.19

AB for SHV ✓

New Indy
Catawba, SC

15730.001.008
No. 8 Hood Exhaust

Paper Machine Vent 8

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/26/21	6/26/21	6/26/21	---
Time Began		1315	1420	1525	---
Time Ended		1405	1510	1615	---
	INPUT DATA				
Sampling Time, min	(Theta)	48.0	48	48	48
Stack Diameter, in.	(Dia.)	66	66	66	66
Barometric Pressure, in. Hg	(Pb)	29.68	29.68	29.68	29.68
Static Pressure, in. H2O	(Pg)	-0.71	-0.71	-0.71	-0.71
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	1.0030	1.0030	1.0030	1.0030
Orifice Calibration Value	(Delta H@)	1.8000	1.8000	1.8000	1.8000
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	30.745	30.782	30.346	30.624
Meter Temperature, °F	(Tm)	94.9	96.0	92.1	94.3
Meter Temperature, °R	(Tm-R)	554.9	556.0	552.1	554.3
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	194.0	184.6	184.1	187.6
CO2 Concentration, %	(CO2)	0.1	0.1	0.1	0.1
O2 Concentration, %	(O2)	20.2	20.2	20.2	20.2
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	1.096	1.130	1.079	1.102
Stack Temperature, °F	(Ts)	183.6	184.2	184.0	183.9
Stack Temperature, °R	(Ts-R)	643.6	644.2	644.0	643.9
Moisture Fraction (at Saturation)	(BWS)	0.559	0.566	0.564	0.563
	CALCULATED DATA				
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	23.76	23.76	23.76	23.76
Stack Pressure, in. Hg	(Ps)	29.63	29.63	29.63	29.63
Meter Pressure, in. Hg	(Pm)	29.78	29.78	29.78	29.78
Standard Meter Volume, ft^3	(Vmstd)	29.189	29.166	28.958	29.105
Standard Water Volume, ft^3	(Vwstd)	9.132	8.689	8.666	8.829
Moisture Fraction (Measured)	(BWS)	0.238	0.230	0.230	0.233
Moisture Fraction (lower sat/meas)	(BWS)	0.238	0.230	0.230	0.233
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	28.82	28.82	28.82	28.82
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	26.24	26.34	26.33	26.31
Average Stack Gas Velocity, ft/sec	(Vs)	71.60	73.73	70.40	71.91
Stack Gas Flow, actual, ft^3/min	(Qa)	102063	105108	100356	102509
Stack Gas Flow, Std , ft^3/min	(Qs)	63130	65700	62685	63838

Calibration check	(Yqa)	1.0261	1.0259	1.0370	1.030
Percent difference from Y					2.66%

AB for SH ✓

✓

Static Pressure: -.71

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 8 Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 1
Date 6/26/21
Test Personnel BEA / BE
Sample Time 48 min.

Console ID NA023
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length PRGC-6'
Liner Material SS
Pitot ID/Coeff. 977 0.84
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 81 °F
Baro. Pressure* 29.68 in. Hg
Static Pressure BE ~~.30~~ in. H_2O
Impinger Gain 178.7 mL
Silica Gel Gain 15.9 g
Stack Area 23.76 ft^2
Total Traverse Points 16

K Factor N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.000	0.000
@ Vac., in. Hg	12"	5"
Pitot	Good	Good

Filter ID N/A
Sample ID Run 1

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	13:15			100.831									
A-1	3		1.2	1.3	102.7	183	N/A	92	245	253	N/A	67	2	
2	6		1.1	1.3	104.6	183		92	244	259		59	2	
3	9		1.2	1.3	BE ~~106.5~~ 106.5	183		93	244	252		56	2	
4	12		.97	1.3	108.4	184		92	244	257		55	2	
5	15		.98	1.3	110.3	184		94	245	253		56	2	
6	18		.96	1.3	112.2	185		94	244	266		56	2	
7	21		1.1	1.3	114.1	183		94	241	253		58	2	
8	24		1.0	1.3	116.0	182		95	240	251		58	2	
B-1	27		1.3	1.3	117.9	182		96	241	251		61	2	
2	30		1.4	1.3	119.8	183		96	244	253		57	2	
3	33		1.3	1.3	121.8	184		96	242	252		56	2	
4	36		1.4	1.3	123.7	185		97	245	254		55	2	
5	39		1.5	1.3	125.6	184		97	245	252		56	2	
6	42		1.3	1.3	127.5	183		97	241	259		58	2	
7	45		1.3	1.3	129.5	185		97	243	251		59	2	
8	48	14:05	1.3	1.3	131.576	185		96	247	252		60	2	
			Avg √Δp ~~1.0930~~ JWM	Avg ΔH 1.300 ✓ Avg √ΔH 1.1402	Total Volume 30.745	Avg T_s 183.6		Avg T_m 94.9	Min/Max 240/247	Min/Max 251/266	Min/Max	Max Temp 67	Max Vac 2	V_{m-std}, scf

*Barometric Pressure is at port elevation

~~BA 1.2006~~
1.2006

Comments
1.0959
1.2068

Flue Gas Composition
Oxygen, % 20.2
Carbon Dioxide, % 0.1
Moisture, % 23.9

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by

WESTON SOLUTIONS
Integrated Air Services

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 8 Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 2
Date 6/26/21
Test Personnel BEA/BE
Sample Time 48 min.

Console ID A023
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length PR6C-6'
Liner Material SS
Pitot ID/Coeff. P77 0.84
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 84 °F
Baro. Pressure* 29.68 in. Hg
Static Pressure -.71 in. H_2O
Impinger Gain 179.5 mL
Silica Gel Gain 5.1 g
Stack Area 23.76 ft²
Total Traverse Points 16

K Factor N/A

Leak Checks

	Initial	Final
Volume, ft³	0.000	0.000
@ Vac., in. Hg	12"	5"
Pitot	Good	Good

Filter ID N/A
Sample ID Run 2

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	14:20			131.774									
A-1	3		1.1	1.3	133.7	183	N/A	96	243	253	N/A	65	3	
2	6		1.2	1.3	135.6	184		97	243	252		60	3	
3	9		1.2	1.3	137.5	183		96	241	253		58	3	
4	12		1.1	1.3	139.4	183		96	245	254		56	3	
5	15		1.2	1.3	141.3	186		96	244	255		55	3	
6	18		1.3	1.3	143.2	185		98	241	254		56	3	
7	21		1.1	1.3	145.1	185		96	242	255		54	3	
8	24		1.1	1.3	147.0	185		95	244	251		53	3	
B-1	27		1.5	1.3	149.0	183		95	244	253		57	3	
2	30		1.4	1.3	150.9	184		96	243	253		52	3	
3	33		1.4	1.3	152.9	184		97	245	252		52	3	
4	36		1.3	1.3	154.8	184		97	246	252		53	3	
5	39		1.5	1.3	156.7	185		95	243	252		54	3	
6	42		1.4	1.3	158.7	185		96	244	254		55	3	
7	45		1.5	1.3	160.6	184		95	248	252		56	3	
8	48	15:10	1.2	1.3	162.556	184		95	244	253		~~55~~ 56	3	
*Barometric Pressure is at port elevation			Avg √Δp 1.301 1.2812	Avg ΔH 1.300 Avg √ΔH 1.1402	Total Volume 30.782	Avg T_s 184.2		Avg T_m 96.0	Min/Max 241/248	Min/Max 251/255	Min/Max	Max Temp 65	Max Vac 3	

WESTON SOLUTIONS®
Integrated Air Services

Comments ______

Flue Gas Composition
Oxygen, % ______
Carbon Dioxide, % ______
Moisture, % ______

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run ______
Post-run ______

Thermocouple Check
Meter Temp., °F ______
Ref. Temp, °F ______
Result ______

$V_{m\text{-std}}$, scf ______
Q_s, dscfm ______
% Isokinetic ______
Calculated by ______
QC by ______

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 8 Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 3
Date 6/26/21
Test Personnel BEA/BE
Sample Time 48 min.

Console ID A023
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length PR6C-6'
Liner Material SS
Pitot ID/Coeff. P77 0.84
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 86 °F
Baro. Pressure* 29.68 in. Hg
Static Pressure -.71 in. H_2O
Impinger Gain 178 mL
Silica Gel Gain 6.1 g
Stack Area 23.76 ft^2
Total Traverse Points 16

K Factor	N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.002	~~0.004~~ 0.001
@ Vac., in. Hg	12"	7"
Pitot	Good	Good

Filter ID N/A
Sample ID Run 3

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	15:25			162.998									
A-1	3		1.0	1.3	164.9	184	N/A	91	242	253	N/A	67	2	
2	6		1.1	1.3	166.7	184		90	242	252		58	2	
3	9		1.0	1.3	168.6	183		90	244	253		55	2	
4	12		1.1	1.3	170.5	183		89	245	251		53	2	
5	15		1.2	1.3	172.4	185		89	248	255		51	2	
6	18		1.1	1.3	174.3	185		90	293	252		51	2	
7	21		1.1	1.3	176.1	185		90	244	253		52	2	
8	24		1.1	1.3	178.0	185		92	245	262		53	2	
B-1	27		1.2	1.3	179.8	184		93	243	254		58	2	
2	30		1.4	1.3	181.8	184		94	246	252		53	2	
3	33		1.3	1.3	183.7	184		94	246	251		52	2	
4	36		1.4	1.3	185.6	184		93	245	251		52	2	
5	39		1.2	1.3	187.5	184		94	246	254		53	2	
6	42		1.2	1.3	189.5	184		96	245	253		53	2	
7	45		1.2	1.3	191.4	183		94	244	253		54	2	
8	48	16:15	1.1	1.3	193.344	183		94	292	251		54	2	
*Barometric Pressure is at port elevation			Avg √Δp 1.079 1.168	Avg ΔH 1.300 Avg √ΔH 1.1402	Total Volume 30.346	Avg T_s 184	Avg T_m 92.06		Min/Max 242/248	Min/Max 251/255	Min/Max	Max Temp 67	Max Vac 2	

$V_{m\text{-std}}$, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by

Flue Gas Composition
Oxygen, % 20.2
Carbon Dioxide, % 0.1
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A 255
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

WESTON SOLUTIONS®
Integrated Air Services

Comments

Sample Recovery Field Data

Method: EPA 4, Moisture

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 8 Hood Exhaust
W.O. Number: 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample Date 6/26/21
Recovery Date 6/26/21
Sample ID
Filter ID N/A
Analyst BEA/BE

	Impingers						
Contents	1	2	3		Imp.Total	Silica Gel grams	Total
Final	915.9	833.3	643.6			844.7	
Initial	764.9	808.4	640.8			829.4	
Gain	151 ✓	24.9 ✓	2.8 ✓			15.3 ✓	194

Impinger Color Clear
Silica Gel Condition Good
Labled? ✓
Sealed? ✓

Run No. 2
Sample Date 6/26/21
Recovery Date 6/26/21
Sample ID
Filter ID N/A
Analyst BEA/BE

	Impingers						
Contents	1	2	3		Imp.Total	Silica Gel grams	Total
Final	936.5	704.6	554.8			929.9	
Initial	780.3	682.5	553.6			924.8	
Gain	156.2 ✓	22.1 ✓	1.2 ✓		179.5	5.1 ✓	184.6 ✓

Impinger Color Clear
Silica Gel Condition Good
Labled? ✓
Sealed? ✓

Run No. 3
Sample Date 6/26/21
Recovery Date 6/26/21
Sample ID
Filter ID N/A
Analyst BEA/BE

	Impingers						
Contents	1	2	3		Imp.Total	Silica Gel grams	Total
Final	907.5	830.8	633.4			890.8	
Initial	773.4	789.5	630.8			884.7	
Gain	134.1 ✓	41.3 ✓	2.6 ✓		178 ✓	6.1 ✓	184.1 ✓

Impinger Color Clear
Silica Gel Condition Good
Labled? ✓
Sealed? ✓

Check COC for Sample IDs of Media Blanks

RW

Integrated Air Services

Sample and Velocity Traverse Point Data Sheet - Method 1

Client New Indy
Loaction/Plant Catawba, SC
Source No. 8 Hood Exhaust
Operator VD / LF
Date 15-Jun-21
W.O. Number 15730.001.008

Duct Type	☑ Circular	☐ Rectangular Duct	Indicate appropriate type
Traverse Type	☐ Particulate Traverse	☑ Velocity Traverse	

Distance from far wall to outside of port (in.) = C	66.125
Port Depth (in.) = D	0.125
Depth of Duct, diameter (in.) = C-D	66
Area of Duct (ft^2)	23.76
Total Traverse Points	16
Total Traverse Points per Port	8

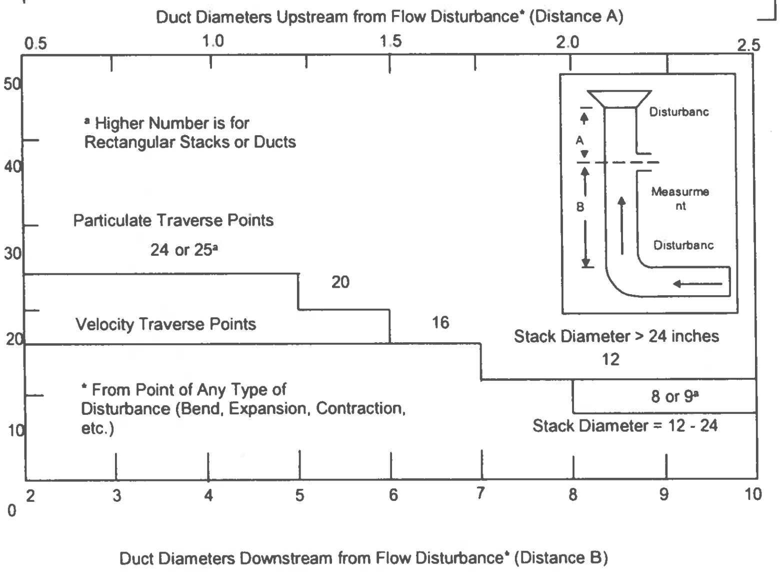
Flow Disturbances	
Upstream - A (ft)	5.5
Downstream - B (ft)	25.0
Upstream - A (duct diameters)	1.00
Downstream - B (duct diameters)	4.55

Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

Diagram of Stack

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	2	2
2	10.5	7	7
3	19.4	13	13
4	32.3	21 1/2	21 1/2
5	67.7	44 1/2	45
6	80.6	53	53 1/2
7	89.5	59	59
8	96.8	64	64
9			
10			
11			
12			



Equivalent Diameter = (2*L*W)/(L+W)

Traverse Point Location Percent of Stack -Circular

Traverse Location Point	1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

(Number of Traverse Points)

Traverse Point Location Percent of Stack -Rectangular

Traverse Location Point	1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

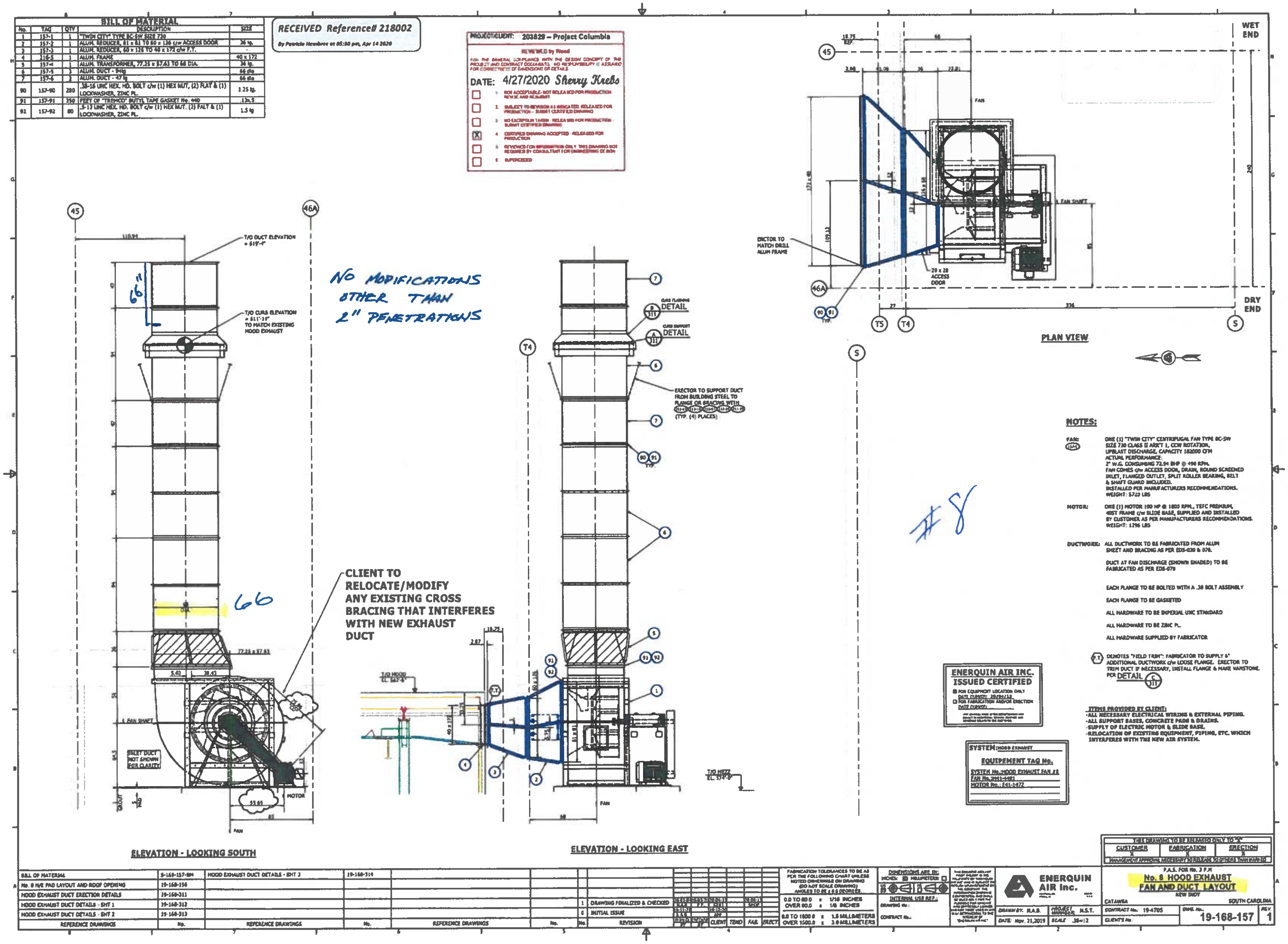
(Number of Traverse Points)

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Port Diam. (in) = 4
Number of Ports = 2

Tape Measure I.D. # TM-07

Method 1 Version 2



BILL OF MATERIAL

No.	TAG	QTY	DESCRIPTION	SIZE
1	157-1	1	"TWIN CITY" TYPE BC-SW SIZE 730	
2	157-2	1	ALUM. REDUCER, 81 x 81 TO 60 x 126 c/w ACCESS DOOR	36 kg.
3	157-3	1	ALUM. REDUCER, 60 x 126 TO 40 x 172 c/w F.T.	
4	216-5	1	ALUM. FRAME	40 x 172
5	157-4	1	ALUM. TRANSFORMER, 77.25 x 57.63 TO 66 DIA.	36 kg.
6	157-5	3	ALUM. DUCT - 94kg	66 dia
7	157-6	2	ALUM. DUCT - 47 kg	66 dia
90	157-90	280	.38-16 UNC HEX. HD. BOLT c/w (1) HEX NUT, (2) FLAT & (1) LOCKWASHER, ZINC PL.	1.25 lg.
91	157-91	250	FEET OF "TREMCO" BUTYL TAPE GASKET No. 440	.12x.5
92	157-92	80	.5-13 UNC HEX. HD. BOLT c/w (1) HEX NUT, (2) FALT & (1) LOCKWASHER, ZINC PL.	1.5 lg

RECEIVED Reference# 218002
By Patricia Newbree at 05:30 pm, Apr 14 2020

PROJECT/CLIENT: 203829 – Project Columbia
REVIEWED by Wood
FOR THE GENERAL COMPLIANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND CONTRACT DOCUMENTS. NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS OF DIMENSIONS OR DETAILS
DATE: 4/27/2020 Sherry Krebs
☐ 1 NOT ACCEPTABLE - NOT RELEASED FOR PRODUCTION REVISE AND RESUBMIT
☐ 2 SUBJECT TO REVISION AS INDICATED. RELEASED FOR PRODUCTION – SUBMIT CERTIFIED DRAWING
☐ 3 NO EXCEPTION TAKEN - RELEASED FOR PRODUCTION - SUBMIT CERTIFIED DRAWING
☒ 4 CERTIFIED DRAWING ACCEPTED - RELEASED FOR PRODUCTION
☐ 5 REVIEWED FOR INFORMATION ONLY. THIS DRAWING NOT REQUIRED BY CONSULTANT FOR ENGINEERING DESIGN
☐ 6 SUPERCEDED

NO MODIFICATIONS OTHER THAN 2" PENETRATIONS

66"

66

#8

CLIENT TO RELOCATE/MODIFY ANY EXISTING CROSS BRACING THAT INTERFERES WITH NEW EXHAUST DUCT

ELEVATION - LOOKING SOUTH

ELEVATION - LOOKING EAST

PLAN VIEW

NOTES:

FAN: ONE (1) "TWIN CITY" CENTRIFUGAL FAN TYPE BC-SW SIZE 730 CLASS II ARR'T 1, CCW ROTATION, UPBLAST DISCHARGE. CAPACITY 182000 CFM ACTUAL PERFORMANCE: 2" W.G. CONSUMING 72.94 BHP @ 498 RPM. FAN COMES c/w ACCESS DOOR, DRAIN, ROUND SCREENED INLET, FLANGED OUTLET, SPLIT ROLLER BEARING, BELT & SHAFT GUARD INCLUDED. INSTALLED PER MANUFACTURERS RECOMMENDATIONS. WEIGHT: 5720 LBS

MOTOR: ONE (1) MOTOR 100 HP @ 1800 RPM., TEFC PREMIUM, 405T FRAME c/w SLIDE BASE, SUPPLIED AND INSTALLED BY CUSTOMER AS PER MANUFACTURERS RECOMMENDATIONS. WEIGHT: 1296 LBS

DUCTWORK: ALL DUCTWORK TO BE FABRICATED FROM ALUM SHEET AND BRACING AS PER EDS-020 & 070.

DUCT AT FAN DISCHARGE (SHOWN SHADED) TO BE FABRICATED AS PER EDS-070

EACH FLANGE TO BE BOLTED WITH A .38 BOLT ASSEMBLY

EACH FLANGE TO BE GASKETED

ALL HARDWARE TO BE IMPERIAL UNC STANDARD

ALL HARDWARE TO BE ZINC PL.

ALL HARDWARE SUPPLIED BY FABRICATOR

F.T. DENOTES "FIELD TRIM": FABRICATOR TO SUPPLY 6" ADDITIONAL DUCTWORK c/w LOOSE FLANGE. ERECTOR TO TRIM DUCT IF NECESSARY, INSTALL FLANGE & MAKE VANSTONE. PER DETAIL C/311

ITEMS PROVIDED BY CLIENT:
- ALL NECESSARY ELECTRICAL WIRING & EXTERNAL PIPING.
- ALL SUPPORT BASES, CONCRETE PADS & DRAINS.
- SUPPLY OF ELECTRIC MOTOR & SLIDE BASE.
- RELOCATION OF EXISTING EQUIPMENT, PIPING, ETC. WHICH INTERFERES WITH THE NEW AIR SYSTEM.

ENERQUIN AIR INC.
ISSUED CERTIFIED
■ FOR EQUIPMENT LOCATION ONLY
DATE (Y/M/D): 20/04/13
☐ FOR FABRICATION AND/OR ERECTION
DATE (Y/M/D):

SYSTEM: HOOD EXHAUST
EQUIPEMENT TAG No.
SYSTEM No.: HOOD EXHAUST FAN #8
FAN No. 2001-4481
MOTOR No.: E41-1472

REFERENCE DRAWINGS	No.	REFERENCE DRAWINGS	No.
BILL OF MATERIAL	S-168-157-BM	HOOD EXHAUST DUCT DETAILS - SHT 3	19-168-314
No. 8 H/E PAD LAYOUT AND ROOF OPENING	19-168-156		
HOOD EXHAUST DUCT ERECTION DETAILS	19-168-311		
HOOD EXHAUST DUCT DETAILS - SHT 1	19-168-312		
HOOD EXHAUST DUCT DETAILS - SHT 2	19-168-313		

No.	REVISION
1	DRAWING FINALIZED & CHECKED
0	INITIAL ISSUE

FABRICATION TOLERANCES TO BE AS PER THE FOLLOWING CHART UNLESS NOTED OTHERWISE ON DRAWING (DO NOT SCALE DRAWING) ANGLES TO BE ± 0.5 DEGREES
0.0 TO 80.0 ± 1/16 INCHES
OVER 80.0 ± 1/8 INCHES
0.0 TO 1600.0 ± 1.5 MILLIMETERS
OVER 1500.0 ± 3.0 MILLIMETERS

DIMENSIONS ARE IN: INCHES ■ MILLIMETERS ☐

INTERNAL USE REF.:

THIS DRAWING TO BE RELEASED ONLY TO "X"
CUSTOMER X FABRICATION X ERECTION X

ENERQUIN AIR Inc.

P.A.S. FOR No. 3 P.M
No. 8 HOOD EXHAUST FAN AND DUCT LAYOUT
NEW INDY
CATAWBA SOUTH CAROLINA
DRAWN BY: N.A.B. PROJECT MANAGER: N.S.T.
DATE: Nov. 21,2019 SCALE: .38=12
CONTRACT No.: 19-4705
CLIENT'S No.:
DWG. No.: 19-168-157
REV.: 1

RUN SUMMARY

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~7~~ 8**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time 13:15 **End Time** 14:15

Average Measured TRS Conc.	0.54 **ppm** ✓
Recovery No. 3	91.1 **%** ✓
TRS Corrected for Recovery	0.59 **ppm** ✓

SH

RUN SUMMARY
Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~7~~** 8

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time 14:20 **End Time** 15:20

Average Measured TRS Conc.	0.46 **ppm** ✓
Recovery No. 3	91.1 **%** ✓
TRS Corrected for Recovery	0.51 **ppm** ✓

SH

RUN SUMMARY

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~7~~** 8

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time 15:25 **End Time** 16:25

Average Measured TRS Conc.	0.51 **ppm** ✓
Recovery No. 3	91.1 **%** ✓
TRS Corrected for Recovery	0.56 **ppm** ✓

SH

RUN DATA

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~7~~** 8

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
				PM vent 8	**Run 1**				
13:15	49	0.21	28	0.20	31	0.21	38	0.07	0.77
13:18	202	0.49	<2	<0.05	55	0.30	<2	<0.02	0.79
13:21	<2	<0.04	<2	<0.05	<2	<0.05	22	0.05	0.11
13:24	<2	<0.04	27	0.19	10	0.11	43	0.08	0.47
13:27	96	0.31	<2	<0.05	8	0.10	48	0.08	0.58
13:30	57	0.23	32	0.22	18	0.16	35	0.07	0.74
13:33	<2	<0.04	<2	<0.05	67	0.33	<2	<0.02	0.33
13:36	<2	<0.04	<2	<0.05	23	0.18	<2	<0.02	0.18
13:39	25	0.14	36	0.23	44	0.26	<2	<0.02	0.63
13:42	<2	<0.04	<2	<0.05	22	0.17	<2	<0.02	0.17
13:45	7	0.06	<2	<0.05	23	0.18	<2	<0.02	0.24
13:48	<2	<0.04	69	0.33	54	0.29	98	0.13	0.88
13:51	<2	<0.04	<2	<0.05	46	0.27	14	0.04	0.35
13:54	9	0.07	<2	<0.05	14	0.14	47	0.08	0.38
13:57	9	0.07	113	0.44	12	0.12	<2	<0.02	0.64
14:00	54	0.22	49	0.27	24	0.18	35	0.07	0.82
14:03	<2	<0.04	<2	<0.05	<2	<0.05	16	0.04	0.09
14:06	7	0.07	<2	<0.05	123	0.47	<2	<0.02	0.54
14:09	10	0.08	<2	<0.05	142	0.51	19	0.05	0.69
14:12	52	0.22	29	0.20	334	0.84	19	0.05	1.36
Average		**0.11**		**0.10**		**0.24**		**0.04**	**0.54** ✓

SY

RUN DATA
Number ~~5~~ 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~7~~ 8**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	H2S area	H2S ppm	MeSH area	MeSH ppm	DMS area	DMS ppm	DMDS area	DMDS ppm	TRS ppm
14:20	15	0.10	<2	<0.05	24	0.19	<2	<0.02	0.29
14:23	58	0.23	15	0.14	31	0.21	20	0.05	0.68
14:26	31	0.16	11	0.11	<2	<0.05	<2	<0.02	0.27
14:29	13	0.09	<2	<0.05	31	0.22	53	0.09	0.49
14:32	15	0.10	<2	<0.05	30	0.21	<2	<0.02	0.31
14:35	16	0.10	11	0.11	<2	<0.05	<2	<0.02	0.22
14:38	<2	<0.04	<2	<0.05	71	0.34	<2	<0.02	0.34
14:41	<2	<0.04	<2	<0.05	81	0.37	47	0.08	0.54
14:44	13	0.09	17	0.15	<2	<0.05	56	0.09	0.42
14:47	<2	<0.04	16	0.15	94	0.41	58	0.10	0.74
14:50	14	0.10	53	0.28	6	0.08	30	0.07	0.60
14:53	<2	<0.04	91	0.39	34	0.23	<2	<0.02	0.62
14:56	9	0.08	59	0.30	17	0.15	34	0.07	0.67
14:59	<2	<0.04	31	0.21	19	0.16	106	0.13	0.64
15:02	<2	<0.04	40	0.24	<2	<0.05	<2	<0.02	0.24
15:05	9	0.07	<2	<0.05	56	0.30	23	0.05	0.48
15:08	15	0.10	<2	<0.05	<2	<0.05	29	0.06	0.23
15:11	64	0.24	<2	<0.05	91	0.40	<2	<0.02	0.64
15:14	<2	<0.04	<2	<0.05	59	0.31	25	0.06	0.43
15:17	15	0.10	14	0.13	9	0.11	10	0.03	0.41
Average		**0.08**		**0.11**		**0.18**		**0.04**	**0.46** ✓

RUN DATA

Number ~~6~~ 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~7~~ 8**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	H_2S area	H_2S ppm	MeSH area	MeSH ppm	DMS area	DMS ppm	DMDS area	DMDS ppm	TRS ppm
15:25	<2	<0.04	11	0.12	<2	<0.05	18	0.05	0.21
15:28	67	0.25	7	0.09	11	0.12	<2	<0.02	0.46
15:31	44	0.20	11	0.12	13	0.13	<2	<0.02	0.44
15:34	<2	<0.04	<2	<0.05	13	0.13	27	0.06	0.25
15:37	17	0.11	5	0.07	23	0.18	78	0.11	0.59
15:40	25	0.14	74	0.35	22	0.18	17	0.05	0.75
15:43	29	0.15	9	0.10	10	0.11	<2	<0.02	0.36
15:46	83	0.29	<2	<0.05	9	0.11	94	0.13	0.65
15:49	7	0.07	12	0.12	4	0.07	37	0.07	0.40
15:52	<2	<0.04	71	0.34	<2	<0.05	22	0.05	0.45
15:55	10	0.08	29	0.20	24	0.18	67	0.10	0.67
15:58	14	0.10	25	0.18	<2	<0.05	12	0.04	0.36
16:01	21	0.13	15	0.14	28	0.20	9	0.03	0.53
16:04	<2	<0.04	35	0.23	14	0.14	<2	<0.02	0.36
16:07	8	0.07	<2	<0.05	21	0.17	<2	<0.02	0.24
16:10	14	0.10	11	0.12	135	0.50	81	0.12	0.94
16:13	67	0.25	<2	<0.05	<2	<0.05	29	0.06	0.38
16:16	14	0.10	25	0.18	249	0.71	<2	<0.02	0.99
16:19	16	0.10	38	0.24	84	0.38	<2	<0.02	0.72
16:22	<2	<0.04	121	0.46	<2	<0.05	<2	<0.02	0.46
Average		**0.11**		**0.15**		**0.16**		**0.04**	**0.51** ✓

SH

RECOVERY DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~7~~** 8

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

After Run 3 **Before Run** 4
Start Time 12:55 **End Time** 13:09

Recovery Gas to Probe, Time 12:55

Peak Areas, mv-sec			Average	ppm
16925	16900	17033	16953	7.34

Recovery Gas to GC, Time 13:06

Peak Areas, mv-sec			Average	ppm
18883	18581	18955	18807	7.82

Recovery 93.9% ✓

RECOVERY DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent ~~7~~ 8**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

After Run 6 **Before Run** 7
Start Time 16:25 **End Time** 16:35

Recovery Gas to Probe, Time 16:25

Peak Areas, mv-sec			Average	ppm
15588	15927	16534	16016	7.09

Recovery Gas to GC, Time 16:31

Peak Areas, mv-sec			Average	ppm
18437	18819	18738	18664	7.78

Recovery 91.1% ✓

SH

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	460	457	298	232
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **48.0** mL/Min	**9.58** ppm	**9.52** ppm	**6.20** ppm	**4.83** ppm
Time: 07:01		**Peak Areas, mv-sec**		
	25119	23385	10987	48706
	25616	23496	10706	47186
	25021	22672	10690	48066
Average Area	**25252** ✓	**23184**	**10794**	**47986**

2 Flow = **81.6** mL/Min	**5.64** ppm	**5.60** ppm	**3.65** ppm	**2.84** ppm
Time: 07:34		**Peak Areas, mv-sec**		
	11971	9531	4072	19617
	11666	9535	4189	19344
	11820	9242	4068	20012
Average Area	**11819**	**9436** ✓	**4110**	**19658**

3 Flow = **151** mL/Min	**3.05** ppm	**3.02** ppm	**1.97** ppm	**1.54** ppm
Time: 07:49		**Peak Areas, mv-sec**		
	3892	3195	1507	6761
	3898	3136	1468	6767
	3818	3182	1462	6752
Average Area	**3869**	**3171**	**1479** ✓	**6760**

SH

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

H_2S	**1**	**2**	**3**
Time	07:01	07:34	07:49
Concentration, ppm	9.58	5.64	3.05
Area, mv-sec	25252	11819	3869
Calc. Conc., ppm	9.36	5.89	2.98
% Error	-2.4	4.5	-2.0 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.6414	2.8084	0.9978	2	0.04

MeSH	**1**	**2**	**3**
Time	07:01	07:34	07:49
Concentration, ppm	9.52	5.60	3.02
Area, mv-sec	23184	9436	3171
Calc. Conc., ppm	9.47	5.65	3.01
% Error	-0.5	0.9	-0.4 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7368	2.6693	0.9999	2	0.05

DMS	**1**	**2**	**3**
Time	07:01	07:34	07:49
Concentration, ppm	6.20	3.65	1.97
Area, mv-sec	10794	4110	1479
Calc. Conc., ppm	6.26	3.59	1.99
% Error	0.9	-1.7	0.8 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7325	2.6531	0.9997	2	0.05

DMDS	**1**	**2**	**3**
Time	07:01	07:34	07:49
Concentration, ppm	4.83	2.84	1.54
Area, mv-sec	47986	19658	6760
Calc. Conc., ppm	4.82	2.86	1.53
% Error	-0.3	0.6	-0.3 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7107	3.5133	>0.9999	2	0.02

CALIBRATION DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	460	457	298	232
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **48.0** mL/Min	**9.58** ppm	**9.52** ppm	**6.20** ppm	**4.83** ppm
Time: 16:36		**Peak Areas, mv-sec**		
	26011	25303	11444	51862
	26531	26149	12036	53970
	27302	26754	12114	53372
Average Area	**26615**	**26069**	**11864**	**53068**

2 Flow = **88.9** mL/Min	**5.17** ppm	**5.14** ppm	**3.35** ppm	**2.61** ppm
Time: 16:50		**Peak Areas, mv-sec**		
	9447	7596	3066	16100
	9456	7369	3124	14977
	9570	7546	3109	14905
Average Area	**9491**	**7504**	**3100**	**15327**

3 Flow = **133** mL/Min	**3.45** ppm	**3.43** ppm	**2.23** ppm	**1.74** ppm
Time: 17:14		**Peak Areas, mv-sec**		
	4013	3384	1323	6743
	4015	3427	1344	6741
	3979	3463	1344	6769
Average Area	**4002**	**3425**	**1337**	**6751**

SH

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

H_2S	1	2	3
Time	16:36	16:50	17:14
Concentration, ppm	9.58	5.17	3.45
Area, mv-sec	26615	9491	4002
Calc. Conc., ppm	9.43	5.38	3.37
% Error	-1.6	4.1	-2.4 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8396	2.6323	0.9977	2	0.05

MeSH	1	2	3
Time	16:36	16:50	17:14
Concentration, ppm	9.52	5.14	3.43
Area, mv-sec	26069	7504	3425
Calc. Conc., ppm	9.54	5.10	3.44
% Error	0.3	-0.7	0.4 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9895	2.4671	0.9999	2	0.08

DMS	1	2	3
Time	16:36	16:50	17:14
Concentration, ppm	6.20	3.35	2.23
Area, mv-sec	11864	3100	1337
Calc. Conc., ppm	6.22	3.32	2.24
% Error	0.3	-0.8	0.5 ✓

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	2.1400	2.3753	0.9999	2	0.11

DMDS	1	2	3
Time	16:36	16:50	17:14
Concentration, ppm	4.83	2.61	1.74
Area, mv-sec	53068	15327	6751
Calc. Conc., ppm	4.83	2.61	1.74 ✓
% Error	-0.0	0.1	-0.0

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	2.0180	3.3447	>0.9999	2	0.03

SH

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	25.0	35.0	63.0	132.0
Peak Detection Window, sec	10.0	10.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	3.0	3.0
Ending Peak Width, sec	2.0	3.0	5.0	5.0
Permeation Device ID	T-51831	33-50536	89-50725	89-53405
Permeation Rate, ng/min	642 ✓	901 ✓	758 ✓	895 ✓
Permeation Rate, nL/min*	460	457	298	232

Barometric Pressure: 29.70 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 642 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.70)$$
$$= 460 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

File: E:\6-26-21.trs
Program Version: 2.0, built 21 Feb 2015 **File Version:** 2.0
Computer: JWS-PROGRAMMING **Trailer:** 271

Analog Input Device: Keithley KUSB-3108 **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: GC-8A **Serial No.** C10494419420SA
Detector Range: 10

Gases

	Press. psi	Flow mL/min
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 100
Detector: 120

Columns

Primary: 3'
Secondary:
Sample Loop: 6" unlined

Injection Cycle

Total Length: 180 sec **Sampling Time:** 160 sec **Load/Backflush Time:** 85 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 5 mv-sec **Minimum peak height** 5 mv above baseline

Dynacalibrator

Chamber Temperature 130.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.70 in. Hg

RUN DATA
Number 7

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vent 7**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	H$_2$S area	H$_2$S ppm	MeSH area	MeSH ppm	DMS area	DMS ppm	DMDS area	DMDS ppm	TRS ppm
17:44	18765	7.81	<2	<0.05	<2	<0.05	<2	<0.02	7.81
17:47	19416	7.97	<2	<0.05	<2	<0.05	<2	<0.02	7.97
17:50	18473	7.73	<2	<0.05	<2	<0.05	<2	<0.02	7.73
17:53	18357	7.70	<2	<0.05	<2	<0.05	<2	<0.02	7.70
Average		**7.80**		**<0.05**		**<0.05**		**<0.02**	**7.80** ✓

SH

RUN DATA
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 8**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
14:21:27	6775	20.2	-11	0.1
14:21:42	6776	20.2	-11	0.1
14:21:57	6776	20.2	-11	0.1
14:22:12	6777	20.2	-11	0.1
14:22:27	6777	20.2	-11	0.1
14:22:42	6777	20.2	-12	0.1
14:22:57	6777	20.2	-11	0.1
14:23:12	6776	20.2	-11	0.1
14:23:27	6778	20.2	-12	0.1
14:23:42	6777	20.2	-10	0.1
14:23:57	6777	20.2	-10	0.1
14:24:12	6777	20.2	-11	0.1
14:24:27	6778	20.2	-11	0.1
14:24:42	6777	20.2	-11	0.1
14:24:57	6777	20.2	-10	0.1
14:25:12	6778	20.2	-9	0.1
14:25:27	6778	20.2	-11	0.1
14:25:42	6778	20.2	-10	0.1
Avgs	**6777**	**20.2**	**-11**	**0.1**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 8**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
15:30:53	6776	20.2	-11	0.1
15:31:08	6777	20.2	-10	0.1
15:31:23	6777	20.2	-11	0.1
15:31:38	6776	20.2	-10	0.1
15:31:53	6777	20.2	-11	0.1
15:32:08	6778	20.2	-11	0.1
15:32:23	6775	20.2	-11	0.1
15:32:38	6777	20.2	-12	0.1
15:32:53	6777	20.2	-12	0.1
15:33:08	6777	20.2	-14	0.1
15:33:23	6776	20.2	-13	0.1
15:33:38	6777	20.2	-14	0.1
15:33:53	6777	20.2	-16	0.1
15:34:08	6776	20.2	-13	0.1
15:34:23	6777	20.2	-13	0.1
15:34:38	6778	20.2	-14	0.1
15:34:53	6777	20.2	-12	0.1
Avgs	**6777**	**20.2**	**-12**	**0.1**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 8**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
16:29:58	6779	20.2	-9	0.1
16:30:13	6778	20.2	-8	0.1
16:30:28	6778	20.2	-7	0.1
16:30:43	6779	20.2	-7	0.1
16:30:58	6780	20.2	-8	0.1
16:31:13	6780	20.2	-8	0.1
16:31:28	6778	20.2	-8	0.1
16:31:43	6779	20.2	-7	0.1
16:31:58	6778	20.2	-8	0.1
16:32:13	6779	20.2	-7	0.1
16:32:28	6779	20.2	-8	0.1
16:32:43	6781	20.2	-8	0.1
16:32:58	6778	20.2	-8	0.1
16:33:13	6777	20.2	-8	0.1
16:33:28	6780	20.2	-7	0.1
16:33:43	6779	20.2	-9	0.1
16:33:58	6779	20.2	-8	0.1
16:34:13	6779	20.2	-8	0.1
16:34:28	6780	20.2	-8	0.1
16:34:43	6779	20.2	-8	0.1
16:34:58	6779	20.2	-8	0.1
16:35:13	6778	20.2	-7	0.1
16:35:28	6780	20.2	-9	0.1
16:35:43	6780	20.2	-9	0.1
16:35:58	6779	20.2	-8	0.1
Avgs	**6779**	**20.2**	**-8**	**0.1**

RUN DATA

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 8**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
16:38:22	3393	10.2	3339	9.8
16:38:37	3316	9.9	3407	10.0
16:38:52	3315	9.9	3412	10.0
SG9168283BAL	**O2=10.12**		**CO2= 10.16**	
16:39:07	3312	9.9	3413	10.0
16:39:22	3312	9.9	3416	10.0
16:39:37	3311	9.9	3418	10.0
16:39:52	3310	9.9	3416	10.0
16:40:07	3311	9.9	3417	10.0
16:40:22	3311	9.9	3417	10.0
16:40:37	3309	9.9	3417	10.0
16:40:52	3311	9.9	3418	10.0
16:41:07	3309	9.9	3418	10.0
16:41:22	3310	9.9	3418	10.0
16:41:37	3310	9.9	3417	10.0
16:41:52	3311	9.9	3417	10.0
16:42:07	3311	9.9	3418	10.0
16:42:22	3312	9.9	3416	10.0
16:42:37	3313	9.9	3416	10.0
16:42:52	3315	9.9	3413	10.0
16:43:07	3317	9.9	3411	10.0
16:43:22	3316	9.9	3410	10.0
16:43:37	3321	10.0	3407	10.0
16:43:52	3334	10.0	3395	10.0
16:44:07	3363	10.1	3365	9.9
Avgs	**3319**	**9.9**	**3409**	**10.0**

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 8**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time: 08:07

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	8
10.1 ✓	SG9168283BAL	3293
19.5 ✓	CC454190	6574

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
336.6 ✓	-29 ✓	0.9998 ✓

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	-32
10.2 ✓	SG9168283BAL	3417
20.4 ✓	CC454190	7035

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
346.4 ✓	-56 ✓	0.9999 ✓

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vent 8**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Start Time: 08:07

O_2

Method: EPA 3A
Span Conc. 19.5 %
Slope 336.6 **Intercept** -29.2

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	8	0.1	0.1	0.5 ✓	Pass
10.1	3293	9.9	-0.2	-1.0 ✓	Pass
19.5	6574	19.6	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A
Span Conc. 20.4 %
Slope 346.4 **Intercept** -55.6

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-32	0.1	0.1	0.5 ✓	Pass
10.2	3417	10.0	-0.2	-1.0 ✓	Pass
20.4	7035	20.5	0.1	0.5 ✓	Pass

METHODS AND ANALYZERS

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**Paper Machine vent 8**	Date:	**26 Jun 2021**

File: C:\Users\Trailer 271\Documents\New Indy\6-26-21b.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: DESKTOP-GQ0I9UV **Trailer:** 271
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.5**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.4**

VENT 1
(VOIDED DATA)

RUN SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vents**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time 15:00 **End Time** 16:00

Average Measured TRS Conc.	0.67 **ppm** ✓
Recovery No. 2	98.7 **%** ✓
TRS Corrected for Recovery	0.68 **ppm** ✓

RUN SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vents**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time 16:02 **End Time** 17:02

Average Measured TRS Conc.	0.91 **ppm** ✓
Recovery No. 2	98.7 **%** ✓
TRS Corrected for Recovery	0.92 **ppm** ✓

RUN SUMMARY

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vents**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time 17:04 **End Time** 18:04

Average Measured TRS Conc.	0.92 **ppm**
Recovery No. 2	98.7 **%**
TRS Corrected for Recovery	0.93 **ppm**

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vents**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	**H_2S**		**MeSH**		**DMS**		**DMDS**		**TRS**
	area	**ppm**	**area**	**ppm**	**area**	**ppm**	**area**	**ppm**	**ppm**
15:00	15	0.28	13	0.32	<2	<0.12	<2	<0.037	0.60
15:03	132	0.83	<2	<0.13	<2	<0.12	<2	<0.037	0.83
15:06	11	0.24	18	0.37	<2	<0.12	<2	<0.037	0.61
15:09	38	0.45	67	0.69	<2	<0.12	<2	<0.037	1.14
15:12	69	0.60	5	0.21	<2	<0.12	<2	<0.037	0.81
15:15	16	0.29	39	0.53	<2	<0.12	<2	<0.037	0.82
15:18	10	0.23	<2	<0.13	<2	<0.12	<2	<0.037	0.23
15:21	7	0.19	<2	<0.13	<2	<0.12	<2	<0.037	0.19
15:24	10	0.23	23	0.42	<2	<0.12	<2	<0.037	0.64
15:27	52	0.52	19	0.37	<2	<0.12	<2	<0.037	0.90
15:30	18	0.31	29	0.47	<2	<0.12	<2	<0.037	0.77
15:33	13	0.27	21	0.39	<2	<0.12	<2	<0.037	0.66
15:36	50	0.51	31	0.48	<2	<0.12	<2	<0.037	0.99
15:39	9	0.23	<2	<0.13	<2	<0.12	<2	<0.037	0.23
15:42	5	0.16	19	0.38	<2	<0.12	<2	<0.037	0.54
15:45	24	0.36	6	0.21	<2	<0.12	<2	<0.037	0.57
15:48	30	0.40	<2	<0.13	<2	<0.12	<2	<0.037	0.40
15:51	<2	<0.10	<2	<0.13	<2	<0.12	<2	<0.037	-
15:54	17	0.30	167	1.07	<2	<0.12	<2	<0.037	1.37
15:57	44	0.48	52	0.61	<2	<0.12	<2	<0.037	1.09
Average		**0.34**		**0.33**		**<0.12**		**<0.037**	**0.67**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vents**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	**H_2S**		**MeSH**		**DMS**		**DMDS**		**TRS**
	area	**ppm**	**area**	**ppm**	**area**	**ppm**	**area**	**ppm**	**ppm**
16:02	17	0.30	<2	<0.13	<2	<0.12	<2	<0.037	0.30
16:05	<2	<0.10	<2	<0.13	<2	<0.12	<2	<0.037	-
16:08	7	0.19	<2	<0.13	<2	<0.12	<2	<0.037	0.19
16:11	113	0.77	<2	<0.13	194	1.05	<2	<0.037	1.82
16:14	<2	<0.10	12	0.31	<2	<0.12	42	0.17	0.65
16:17	9	0.22	13	0.32	5	0.18	<2	<0.037	0.72
16:20	11	0.24	<2	<0.13	<2	<0.12	45	0.18	0.59
16:23	35	0.43	4	0.19	81	0.69	8	0.07	1.46
16:26	37	0.44	6	0.22	20	0.35	75	0.23	1.47
16:29	16	0.29	<2	<0.13	<2	<0.12	18	0.11	0.51
16:32	5	0.16	10	0.28	96	0.75	<2	<0.037	1.20
16:35	<2	<0.10	77	0.74	<2	<0.12	19	0.12	0.97
16:38	46	0.49	<2	<0.13	<2	<0.12	11	0.08	0.66
16:41	<2	<0.10	31	0.48	45	0.52	34	0.15	1.31
16:44	21	0.34	21	0.39	63	0.61	16	0.10	1.55
16:47	21	0.34	36	0.51	6	0.20	87	0.24	1.54
16:50	6	0.19	26	0.44	<2	<0.12	45	0.18	0.98
16:53	13	0.26	<2	<0.13	<2	<0.12	11	0.09	0.43
16:56	15	0.28	<2	<0.13	13	0.28	54	0.19	0.95
16:59	79	0.64	4	0.18	<2	<0.12	<2	<0.037	0.82
Average		**0.28**		**0.20**		**0.23**		**0.10**	**0.91** ✓

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vents**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
17:04	59	0.56	<2	<0.13	<2	<0.12	<2	<0.037	0.56
17:07	24	0.36	20	0.39	39	0.48	<2	<0.037	1.23
17:10	22	0.34	16	0.35	34	0.45	<2	<0.037	1.15
17:13	25	0.36	31	0.48	<2	<0.12	27	0.14	1.11
17:16	27	0.38	13	0.32	<2	<0.12	<2	<0.037	0.69
17:19	66	0.59	<2	<0.13	<2	<0.12	<2	<0.037	0.59
17:22	10	0.23	33	0.50	<2	<0.12	46	0.18	1.08
17:25	<2	<0.10	<2	<0.13	19	0.35	<2	<0.037	0.35
17:28	<2	<0.10	8	0.26	57	0.58	<2	<0.037	0.84
17:31	4	0.14	37	0.52	23	0.38	<2	<0.037	1.04
17:34	46	0.49	<2	<0.13	72	0.65	<2	<0.037	1.14
17:37	5	0.17	5	0.20	53	0.56	20	0.12	1.17
17:40	<2	<0.10	16	0.35	59	0.59	10	0.08	1.11
17:43	44	0.48	20	0.39	32	0.44	16	0.11	1.53
17:46	17	0.30	<2	<0.13	26	0.40	27	0.14	0.98
17:49	24	0.36	<2	<0.13	<2	<0.12	99	0.26	0.88
17:52	<2	<0.10	13	0.32	12	0.28	<2	<0.037	0.60
17:55	15	0.28	4	0.18	10	0.25	24	0.13	0.96
17:58	26	0.37	5	0.20	21	0.36	36	0.16	1.25
18:01	<2	<0.10	<2	<0.13	<2	<0.12	16	0.10	0.21
Average		**0.27**		**0.22**		**0.29**		**0.07**	**0.92** ✓

RECOVERY DATA

Number 1

Client: **New Indy**		Project Number:	**15730.001.008**
Location: **Catawba, SC**	Method **16**	Operator:	**VD**
Source: **Paper Machine Vents**	Calibration **1**	Date:	**23 Jun 2021**

Before Run 1

Start Time 08:11 **End Time** 08:31

Recovery Gas to Probe, Time 08:11

Peak Areas, mv-sec			Average	ppm
10815	11212	10554	10860	7.38 ✓

Recovery Gas to GC, Time 08:26

Peak Areas, mv-sec			Average	ppm
12058	12718	12683	12486 ✓	7.91

Recovery 93.3% ✓

RECOVERY DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vents**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

After Run 3
Start Time 18:08 **End Time** 18:27

Recovery Gas to Probe, Time 18:08

Peak Areas, mv-sec			**Average**	**ppm**
13435	13768	13995	13733 ✓	8.29

Recovery Gas to GC, Time 18:22

Peak Areas, mv-sec			**Average**	**ppm**
13868	14119	14335	14107 /	8.41

Recovery 98.7% /

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vents**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **22 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.30 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51831	33-50536	89-50725	89-53405
Perm. Rate, nL/min	466	463	302	235
Ret. Time, sec	25.0	35.0	63.0	132.0

1 Flow = **42.9** mL/Min	**10.9** ppm	**10.8** ppm	**7.04** ppm	**5.48** ppm
Time: 06:01	**Peak Areas, mv-sec**			
	23855	22293	10526	42673
	23215	21931	9998	42671
	22458	20868	9790	39883
Average Area	**23176** ✓	**21697** ✓	**10105** ✓	**41742** ✓

2 Flow = **73.0** mL/Min	**6.39** ppm	**6.34** ppm	**4.13** ppm	**3.22** ppm
Time: 07:11	**Peak Areas, mv-sec**			
	8465	7583	3422	15009
	8597	7440	3304	15088
	8224	7258	3241	15119
Average Area	**8429** ✓	**7427** ✓	**3322** ✓	**15072** ✓

3 Flow = **160** mL/Min	**2.91** ppm	**2.89** ppm	**1.89** ppm	**1.47** ppm
Time: 07:27	**Peak Areas, mv-sec**			
	1616	1350	665	3068
	1680	1357	629	2997
	1609	1367	669	3070
Average Area	**1635** ✓	**1358** ✓	**655** ✓	**3045** ✓

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vents**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **22 Jun 2021**

H_2S	1	2	3		
Time	06:01	07:11	07:27		
Concentration, ppm	10.9	6.39	2.91		
Area, mv-sec	23176	8429	1635		
Calc. Conc., ppm	10.7	6.51	2.89		
% Error	-1.2	2.0	-0.8		
Calibration Curve	Slope	Intercept	Corr. Coeff.	Min. Area	Det. Lim.
	2.0185	2.2831	0.9997	2	0.10

MeSH	1	2	3		
Time	06:01	07:11	07:27		
Concentration, ppm	10.8	6.34	2.89		
Area, mv-sec	21697	7427	1358		
Calc. Conc., ppm	10.7	6.44	2.88		
% Error	-0.9	1.5	-0.6		
Calibration Curve	Slope	Intercept	Corr. Coeff.	Min. Area	Det. Lim.
	2.1084	2.1655	0.9998	2	0.13

DMS	1	2	3		
Time	06:01	07:11	07:27		
Concentration, ppm	7.04	4.13	1.89		
Area, mv-sec	10105	3322	655		
Calc. Conc., ppm	7.05	4.13	1.89		
% Error	0.1	-0.2	0.1		
Calibration Curve	Slope	Intercept	Corr. Coeff.	Min. Area	Det. Lim.
	2.0770	2.2430	>0.9999	2	0.12

DMDS	1	2	3		
Time	06:01	07:11	07:27		
Concentration, ppm	5.48	3.22	1.47		
Area, mv-sec	41742	15072	3045		
Calc. Conc., ppm	5.44	3.26	1.46		
% Error	-0.8	1.3	-0.5		
Calibration Curve	Slope	Intercept	Corr. Coeff.	Min. Area	Det. Lim.
	1.9911	3.1557	0.9999	2	0.037

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vents**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **22 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	25.0	35.0	63.0	132.0
Peak Detection Window, sec	15.0	15.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	3.0	3.0
Ending Peak Width, sec	2.0	3.0	5.0	5.0
Permeation Device ID	T-51831	33-50536	89-50725	89-53405
Permeation Rate, ng/min	642 ✓	901	✓758	✓ 895 ✓
Permeation Rate, nL/min*	461	458	299	233

Barometric Pressure: 29.60 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 642 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.60)$$
$$= 461 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine Vents**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **22 Jun 2021**

File: E:\New Indy\6-23-21.trs
Program Version: 2.0, built 15 May 2017 **File Version:** 2.0
Computer: JWS-PROGRAMMING **Trailer:** 271

Analog Input Device: Keithley KUSB-3108 **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: GC-8A **Serial No.** C10494419420SA
Detector Range: 10

Gases

	Press. psi	Flow mL/min
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 100
Detector: 120

Columns

Primary: 3'
Secondary:
Sample Loop: 6" unlined

Injection Cycle

Total Length: 180 sec **Sampling Time:** 160 sec **Load/Backflush Time:** 85 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 2 mv-sec **Minimum peak height** 1 mv above baseline

Dynacalibrator

Chamber Temperature 130.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.60 in. Hg

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 1 Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 3
Date 6/23/21
Test Personnel BEA/BE
Sample Time 48 min.

Console ID A23
Meter Corr., Y 1.003
Console ΔH@ 1.800
Probe ID/Length PK6C-6'
Liner Material SS
Pitot ID/Coeff. P77 0.84
Thermo ID A23
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 84 °F
Baro. Pressure* 29.58 in. Hg
Static Pressure -.01 in. H_2O
Impinger Gain 150.4 mL
Silica Gel Gain 7.5 g
Stack Area 13.64 ft^2
Total Traverse Points 16

K Factor N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.037	0.001
@ Vac., in. Hg	14"	6"
Pitot	Good	Good

Filter ID N/A
Sample ID Run 3

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	16:04			513.550									
A-1	3		.04	1.3	515.6	173	NA	89	253	261	NA	59	3	
2	6		.03	1.3	517.4	174		89	256	263		53	3	
3	9		.04	1.3	519.3	174		88	256	263		54	3	
4	12		.04	1.3	521.3	174		89	253	264		51	3	
5	15		.04	1.3	523.2	172		89	253	268		52	3	
6	18		.04	1.3	525.1	172		88	252	267		53	3	
7	21		.03	1.3	526.9	172		90	252	268		54	3	
8	24		.03	1.3	528.864	171		90	253	267		55	3	
B-1	27		.04	1.3	530.8	169		90	249	267		57	3	
2	30		.04	1.3	532.8	172		90	250	264		66	3	
3	33		.04	1.3	534.7	173		90	251	264		57	3	
4	36		.03	1.3	536.7	173		90	252	261		57	3	
5	39		.02	1.3	538.6	173		90	251	266		58	3	
6	42		.03	1.3	540.5	173		89	253	267		58	3	
7	45		.03	1.3	542.5	173		90	252	267		59	3	
8	48	1654	.04	1.3	544.528	173		90	253	266		58	3	
*Barometric Pressure is at port elevation			Avg √Δp 0.1863 .035	Avg ΔH 1.300 Avg √ΔH 1.1402	Total Volume 30.978	Avg T_s 172.56	Avg T_m 89.4		Min/Max 249/256	Min/Max 261/268	Min/Max	Max Temp 59	Max Vac 3	V_{m-std}, scf

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by

Comments

WESTON SOLUTIONS®
Integrated Air Services

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 1 Hood Exhaust
Sample Location: Roof
W. O. Number: 15730.001.008
Run Number: 1
Date: 6/23/21
Test Personnel: BEA/BE
Sample Time: 48 min.

Console ID: A023
Meter Corr., Y: 1.003
Console ΔH@: 1.800
Probe ID/Length: 6'
Liner Material: SS
Pitot ID/Coeff.: 0.84
Thermo ID: A023
Nozzle ID/Diams.:
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 81 °F
Baro. Pressure*: 29.58 in. Hg
Static Pressure: -.01 in. H_2O
Impinger Gain: 125.8 mL
Silica Gel Gain: 8.1 g
Stack Area: 1364 ft²
Total Traverse Points: 16

K Factor: N/A

Leak Checks

	Initial	Final
Volume, ft³	0.006	0.000
@ Vac., in. Hg	12	5
Pitot	Good	

Filter ID: N/A
Sample ID: Run 1

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	15:00			450.550									
A-1	3		.04	1.3	452.6	185	NA	89	253	260	N/A	56	3	
2	6		.04	1.3	454.5	187		89	266	261		56	3	
3	9		.05	1.3	456.4	190		90	261	264		53	3	
4	12		.04	1.3	458.2	190		90	264	263		54	3	
5	15		.03	1.3	460.1	179		91	253	264		54	3	
6	18		.03	1.3	462.0	180		92	254	262		54	3	
7	21		.03	1.3	464.0	179		92	256	268		56	3	
8	24		.02	1.3	466.0	175		93	254	267		57	3	
B-1	27		.05	1.3	467.9	177		94	253	264		60	3	
2	30		.04	1.3	469.8	180		94	252	264		60	3	
3	33		.04	1.3	471.8	180		95	255	265		59	3	
4	36		.03	1.3	473.7	181		96	254	266		55	3	
5	39		.04	1.3	475.8	181		96	256	266		59	3	
6	42		.04	1.3	477.7	177		96	251	265		61	3	
7	45		.03	1.3	479.8	176		95	253	266		63	3	
8	48		.03	1.3	481.733	173		95	255	264		64	3	
			Avg √Δp .1892	Avg ΔH 1.3000	Total Volume 31.183	Avg T_s 180.6		Avg T_m 92.9	Min/Max 251/266	Min/Max 260/268	Min/Max	Max Temp 64	Max Vac 3	
			.0363	Avg √ΔH 1.1402										

*Barometric Pressure is at port elevation

Integrated Air Services

Comments ____________________

Flue Gas Composition
Oxygen, % ________
Carbon Dioxide, % ________
Moisture, % ________

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run ________
Post-run ________

Thermocouple Check
Meter Temp., °F ________
Ref. Temp, °F ________
Result ________

V_{m-std}, scf ________
Q_s, dscfm ________
% Isokinetic ________
Calculated by ________
QC by AB

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 1 Hood Exhaust
Sample Location Roof
W. O. Number 15730.001.008
Run Number 2
Date 6/23/21
Test Personnel BEA/BE
Sample Time 48 min.

Console ID A623
Meter Corr., Y 1.063
Console ΔH@ 1.8000
Probe ID/Length PR-6C 6'
Liner Material SS
Pitot ID/Coeff. 0.84
Thermo ID A023
Nozzle ID/Diams.
Avg. Nozzle Diam. .250 in.

Ambient Temp. 81 °F
Baro. Pressure* 29.58 in. Hg
Static Pressure -.81 in. H_2O
Impinger Gain 160.8 mL
Silica Gel Gain 11.1 g
Stack Area 13.64 ft^2
Total Traverse Points 16

K Factor	N/A

Leak Checks

	Initial	Final
Volume, ft^3	0.002	0.002
@ Vac., in. Hg	12"	7
Pitot	Good	Good

Filter ID N/A
Sample ID Run 2

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	1602			481.900									
A-1	3		.04	1.3	483.8	173	N/A	91	254	260	N/A	65	3	
2	6		.05	1.3	485.8	179		90	252	263		63	3	
3	9		.04	1.3	487.6	177		90	255	260		62	3	
4	12		.05	1.3	489.5	177		88	252	265		60	3	
5	15		.04	1.3	491.6	176		88	254	265		60	3	
6	18		.04	1.3	493.2	176		87	257	264		56	3	
7	21		.02	1.3	495.5	174		88	254	265		66	3	
8	24		.02	1.3	497.4	162		88	254	263		67	3	
B-1	27		.04	1.3	499.3	170		89	253	266		64	3	
2	30		.03	1.3	501.2	175		89	255	265		65	3	
3	33		.03	1.3	503.1	175		90	254	266		63	3	
4	36		.03	1.3	505.1	175		89	252	265		63	3	
5	39		.04	1.3	507.1	174		89	252	266		63	3	
6	42		.04	1.3	509.0	172		90	253	265		63	3	
7	45		.03	1.3	511.0	172		89	253	266		64	3	
8	48	1652	.03	1.3	512.981	172		89	252	265		65	3	
*Barometric Pressure is at port elevation			Avg √Δp .1873 .03563	Avg ΔH 1.3000 Avg √ΔH 1.1402	Total Volume 31.081	Avg T_s 173.7		Avg T_m 89.0	Min/Max 252/257	Min/Max 260/266	Min/Max	Max Temp 67	Max Vac 3	

Flue Gas Composition
Oxygen, % ______
Carbon Dioxide, % ______
Moisture, % ______

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run ______
Post-run ______

Thermocouple Check
Meter Temp., °F ______
Ref. Temp, °F ______
Result ______

V_{m-std}, scf ______
Q_s, dscfm ______
% Isokinetic ______
Calculated by ______
QC by AM

Comments ______

WESTON SOLUTIONS® Integrated Air Services

Sample Recovery Field Data

Method: EPA 4, Moisture

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 1 Hood Exhaust
W.O. Number: 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample ID:
Sample Date:
Recovery Date:
Filter ID: N/A
Analyst: BEA/BE

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents	H2O	H2O	Empty		▨	grams	▨
Final	848.6	661.6	550.0			901.6	
Initial	752.4	635.8	546.2		✓	893.5	
Gain	96.2 ✓	25.8 ✓	3.8 ✓		125.8	8.1	133.9

Impinger Color: Clear
Silica Gel Condition: Good
Labled? ✓ ✓ ✓
Sealed? ✓

Run No. 2
Sample ID:
Sample Date:
Recovery Date:
Filter ID: N/A
Analyst: BEA/BE

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents	H2O	H2O	Empty		▨	grams	▨
Final	850.8	849.2	637.9			868.9	
Initial	745.0	804.1	628.0			857.8	
Gain	105.8 ✓	45.1 ✓	9.9 ✓			11.1	171.9

Impinger Color: Clear
Silica Gel Condition: Good
Labled? ✓ ✓
Sealed? ✓

Run No. 3
Sample ID:
Sample Date:
Recovery Date:
Filter ID: N/A
Analyst: BEA/BE

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents	H2O	H2O	Empty		▨	grams	▨
Final	913.3	647.2	554.0			909.1	
Initial	784.0	630.1	550.0		✓	901.6	
Gain	129.3 ✓	17.1 ✓	4.0 ✓		150.4	7.5 ✓	157.9 ✓

Impinger Color:
Silica Gel Condition:
Labled? ✓
Sealed? ✓

Check COC for Sample IDs of Media Blanks

AW

WESTON SOLUTIONS
Integrated Air Services

Small Hot Box
Nozzle Box
Ratchet Strap
Cooler + Watch

	Delta P	Angle	Temp
1.	.02	7	~~184~~ ~~284~~ 184
2.	.00	0	~~280~~ 190
3.	.00	0	~~280~~ 192
4.	.00	0	192
5.	-.02	6	193
6.	-.02	6	192
7.	.04	12	190
8.	.05	14	194
9.	.02	7	194
10.	.04	12	193
11.	.05	15	193
12.	.00	0	193

450.~~135~~
.550

RUN DATA

Number 1

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**Paper Machine vents**	Date:	**23 Jun 2021**

Calibration **1**

AB 6/29 ✓

Time	O_2		CO_2	
	mv	%	mv	%
Paper Machine Vent 1 Run 1				
16:35:26	6778	20.2	0	0.2
16:35:41	6781	20.2	-2	0.2
16:35:56	6780	20.2	-2	0.2
16:36:11	6781	20.2	-1	0.2
16:36:26	6782	20.2	-4	0.2
16:36:41	6782	20.2	-3	0.2
16:36:56	6782	20.2	-5	0.2
16:37:11	6785	20.2	-4	0.2
16:37:26	6782	20.2	-4	0.2
16:37:41	6783	20.2	-4	0.2
16:37:56	6783	20.2	-5	0.2
16:38:11	6782	20.2	-2	0.2
16:38:26	6783	20.2	-4	0.2
16:38:41	6783	20.2	-3	0.2
16:38:56	6781	20.2	-2	0.2
Avgs	**6782**	**20.2**	**-3**	**0.2**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vents**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
19:02:02	6782	20.2	-4	0.2
Paper Machine Vent 1 Run 2				
19:02:17	6781	20.2	-5	0.2
19:02:32	6778	20.2	-6	0.2
19:02:47	6781	20.2	-4	0.2
19:03:02	6782	20.2	-5	0.2
19:03:17	6781	20.2	-1	0.2
19:03:32	6781	20.2	-3	0.2
19:03:47	6780	20.2	-3	0.2
19:04:02	6780	20.2	-5	0.2
19:04:17	6781	20.2	-5	0.2
19:04:32	6777	20.2	-4	0.2
19:04:47	6781	20.2	-5	0.2
19:05:02	6780	20.2	-2	0.2
19:05:17	6780	20.2	-3	0.2
19:05:32	6778	20.2	-1	0.2
19:05:47	6762	20.2	12	0.2
Avgs	**6779**	**20.2**	**-3**	**0.2**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vents**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
19:06:16	6780	20.2	-1	0.2
Paper Machine Vent 1 Run 3				
19:06:31	6780	20.2	-2	0.2
19:06:46	6781	20.2	-2	0.2
19:07:01	6780	20.2	-2	0.2
19:07:16	6781	20.2	-2	0.2
19:07:31	6782	20.2	-2	0.2
19:07:46	6781	20.2	-2	0.2
19:08:01	6781	20.2	-2	0.2
19:08:16	6780	20.2	-3	0.2
19:08:31	6779	20.2	1	0.2
19:08:46	6780	20.2	1	0.2
19:09:01	6782	20.2	-0	0.2
19:09:16	6781	20.2	-0	0.2
19:09:31	6780	20.2	1	0.2
19:09:46	6781	20.2	2	0.2
19:10:01	6781	20.2	4	0.2
19:10:16	6781	20.2	1	0.2
19:10:31	6781	20.2	-1	0.2
19:10:46	6781	20.2	1	0.2
19:11:01	6779	20.2	1	0.2
19:11:16	6780	20.2	2	0.2
Avgs	**6781**	**20.2**	**-0**	**0.2**

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vents**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 13:37

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	46
10.1	SG9168283BAL	3296
19.5	CC454190	6582

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
335.0	3	0.9997

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	-36
10.2	SG9168283BAL	3110
20.4	CC454190	6430

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
317.0	-61	0.9999

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **Paper Machine vents**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 13:37

O_2

Method: EPA 3A
Span Conc. 19.5 %
Slope 335.0 **Intercept** 2.5

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	46	0.1	0.1	0.5 ✓	Pass
10.1	3296	9.8	-0.3	-1.5 ✓	Pass
19.5	6582	19.6	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A
Span Conc. 20.4 %
Slope 317.0 **Intercept** -60.9

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-36	0.1	0.1	0.5 ✓	Pass
10.2	3110	10.0	-0.2	-1.0 ✓	Pass
20.4	6430	20.5	0.1	0.5 ✓	Pass

METHODS AND ANALYZERS

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**Paper Machine vents**	Date:	**23 Jun 2021**

File: C:\Users\Trailer 271\Documents\New Indy\6-23-21.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: DESKTOP-GQ0I9UV **Trailer:** 271
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**19.5**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**CAI 600 SN E07015-M**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.4**

APPENDIX E
FIELD DATA – NO. 2 AND 3 SMELT DISSOLVING TANK VENTS

New Indy
Catawba, SC

15730.001.008
No. 2 & 3 SDTV

EMISSION CALCULATIONS

	Run 1	Run 2	Run 3	Mean
Date	**6/27/21**	**6/27/21**	**6/27/21**	---
Time Began	**1100**	**1222**	**1344**	---
Time Ended	**1210**	**1331**	**1454**	---
Volumetric Flow Rate, (Qs), DSCFM	2.60E+04	2.61E+04	2.54E+04	2.58E+04
BWS	0.392	0.412	0.409	0.404
% Oxygen	20.1	20.0	20.3	20.1
Total Reduced Sulfur (TRS MW)= 34.08				
Concentration, ppm	7.36	9.23	8.20	8.26
Emission Rate, lb/hr	1.02	1.28	1.10	1.13

AB for SH ✓

New Indy
Catawba, SC

15730.001.008
No. 2 & 3 SDTV

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/27/21	6/27/21	6/27/21	---
Time Began		1100	1222	1344	---
Time Ended		1208	1332	1451	---
INPUT DATA					
Sampling Time, min	(Theta)	64.0	64	64	64
Stack Diameter, in.	(Dia.)	71	71	71	71
Barometric Pressure, in. Hg	(Pb)	29.40	29.40	29.40	29.40
Static Pressure, in. H2O	(Pg)	-0.16	-0.16	-0.16	-0.16
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	1.0000	1.0000	1.0000	1.0000
Orifice Calibration Value	(Delta H@)	2.0490	2.0490	2.0490	2.0490
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	39.637	39.229	39.027	39.298
Meter Temperature, °F	(Tm)	103.3	101.8	98.8	101.3
Meter Temperature, °R	(Tm-R)	563.3	561.8	558.8	561.3
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	519.8	541.0	558.9	539.9
CO2 Concentration, %	(CO2)	0.0	0.0	0.0	0.0
O2 Concentration, %	(O2)	20.1	20.0	20.3	20.1
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	0.469	0.486	0.469	0.475
Stack Temperature, °F	(Ts)	167.5	170.1	169.4	169.0
Stack Temperature, °R	(Ts-R)	627.5	630.1	629.4	629.0
Moisture Fraction (at Saturation)	(BWS)	0.392	0.416	0.409	0.406
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	27.49	27.49	27.49	27.49
Stack Pressure, in. Hg	(Ps)	29.39	29.39	29.39	29.39
Meter Pressure, in. Hg	(Pm)	29.50	29.50	29.50	29.50
Standard Meter Volume, ft^3	(Vmstd)	36.615	36.331	36.342	36.429
Standard Water Volume, ft^3	(Vwstd)	24.467	25.465	26.307	25.413
Moisture Fraction (Measured)	(BWS)	0.401	0.412	0.420	0.411
Moisture Fraction (lower sat/meas)	(BWS)	0.392	0.412	0.409	0.404
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	28.80	28.80	28.81	28.81
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	24.57	24.35	24.39	24.44
Average Stack Gas Velocity, ft/sec	(Vs)	31.40	32.72	31.59	31.90
Stack Gas Flow, actual, ft^3/min	(Qa)	51795	53982	52110	52629
Stack Gas Flow, Std , ft^3/min	(Qs)	26017	26110	25364	25830

Calibration check	(Yqa)	1.0072	1.0165	1.0187	1.014
Percent difference from Y					1.41%

AB for SHV ✓

Isokinetic Field Data

Method: EPA 4, Moisture

Client New Indy
Location/Plant Catawba, SC
Source SDTV
Sample Location Stack outlet
W. O. Number 15730.001.008
Run Number 1
Date 6/27/21
Test Personnel ATR/CL/BE
Sample Time 64 min.

Console ID A025
Meter Corr., Y 1.000
Console ΔH@ 2.044
Probe ID/Length ~~PR8L~~ 8'
Liner Material SS
Pitot ID/Coeff. P320 0.84
Thermo ID A025
Nozzle ID/Diams. .250 | .250 | .250 | .250
Avg. Nozzle Diam. .250 in.

Ambient Temp. 98 °F
Baro. Pressure* ATR ~~29.50~~ in. Hg 29.40
Static Pressure -.16 in. H_2O
Impinger Gain 509.5 mL 519.8
Silica Gel Gain 10.3 g
Stack Area 27.49 ft^2
Total Traverse Points 16

K Factor	NA

Leak Checks

	Initial	Final
Volume, ft^3	.005	.000
@ Vac., in. Hg	8	5
Pitot	.000	.000

Filter ID NA
Sample ID Run 1

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	11:00			991.700									
~~A~~-1 B	4		.17	1.3	994.3	166		102	260	265		67	2.5	
2	8		.18	1.3	996.6	164		102	264	261		66	2.5	
3	12		.19	1.3	998.7	164		103	265	260		66	2.5	
4	16		.20	1.3	1001.7	163		104	265	262		65	3	
5	20		.24	1.3	1004.1	164		104	264	262		65	3	
6	24		.26	1.3	1006.6	166		104	263	268		63	3	
7	28		.24	1.3	1009.1	169		104	262	267		61	3	
8	32	11:32	.22	1.3	1011.5	167		103	264	265		60	3	
~~B~~-1 A	36	11:36	.21	1.3	1014.1	169		103	263	263		65	3	
2	40		.23	1.3	1017.1	169		103	265	262		58	3	
3	44		.23	1.3	1018.9	169		103	247	267		58	3	
4	48		.23	1.3	1021.3	170		103	252	265		59	4	
5	52		.24	1.3	1023.9	170		104	252	264		58	4	+end
6	56		.24	1.3	1026.5	171		103	253	261		59	4	volume
7	60		.22	1.3 ~~1031.337~~	1028.8	170		103	254	265		63	4	1031.337
8	64	12:04	.23	1.3	AB ~~1031.337~~	169		104	252	263		61	4	

*Barometric Pressure is at port elevation

Avg √Δp .4689 90 ✓ AB 6/27	Avg ΔH 1.3 ✓	Total Volume ~~40.637~~ 39.637 AB 6/28	Avg T_s 167.5 ✓	Avg T_m 103.25	Min/Max 247/265 ✓	Min/Max 264/268	Min/Max ✓	Max Temp 67 ✓	Max Vac 4 ✓
.2266 ✓	Avg √ΔH 1.140 ✓								

Flue Gas Composition
Oxygen, % ______
Carbon Dioxide, % ______
Moisture, % ______

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run ______
Post-run ______

Thermocouple Check
Meter Temp., °F ______
Ref. Temp, °F ______
Result ______

V_{m-std}, scf ______
Q_s, dscfm ______
% Isokinetic ______
Calculated by ______
QC by An

WESTON SOLUTIONS® Integrated Air Services

Comments ______

DW SCDHEC 6/27

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: SDTV
Sample Location: Stack outlet
W. O. Number: 15730.001.008
Run Number: 2
Date: 6/27/21
Test Personnel: ATR/CL/BE
Sample Time: 64 min.

Console ID: A025
Meter Corr., Y: 1.008
Console ΔH@: 2.049
Probe ID/Length: PR8L 8'
Liner Material: SS
Pitot ID/Coeff.: P320 0.84
Thermo ID: A025
Nozzle ID/Diams.: .250 .250 .250 .250
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 80 °F
Baro. Pressure*: 29.40 in. Hg
Static Pressure: -.16 in. H_2O
Impinger Gain: 526.5 mL 541
Silica Gel Gain: 14.5 g
Stack Area: 27.49 ft^2
Total Traverse Points: 16

K Factor: NA

Leak Checks

	Initial	Final
Volume, ft^3	.005	.003
@ Vac., in. Hg	8	6
Pitot	.000	.000

Filter ID: NA
Sample ID: Run 2

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	12:22			31.660									
A-1	4		.22	1.3	33.8	167		104	246	262		66	3	
2	8		.23	1.3	36.5	170		104	248	263		57	3	
3	12		.23	1.3	39.0	173		104	249	264		55	3	
4	16		.25	1.3	42.1	170		104	250	265		55	3.5	
5	20		.25	1.3	44.3	172		105	251	264		56	3.5	
6	24		.25	1.3	46.5	173		105	250	263		58	3.5	
7	28		.27	1.3	49.0	175		105	251	267		58	3.5	
8	32	12:54	.25	1.3	51.3	173		104	250	266		61	4	
B-1	36	13:00	.20	1.3	53.7	170		100	238	265		65	4	
2	40		.20	1.3	56.3	170		101	258	264		64	4	
3	44		.20	1.3	58.7	171		100	254	268		63	4	
4	48		.23	1.3	61.1	168		96	260	267		63	4	
5	52		.25	1.3	63.8	169		97	258	266		64	4.5	
6	56		.26	1.3	65.9	167		98	254	265		64	4.5	
7	60		.25	1.3	68.4	167		101	238	264		65	5	
8	64	13:32	.24	1.3	70.829	167		101	258	264		66	5	
			Avg √Δp .48556	Avg ΔH 1.3	Total Volume 39.224	Avg T_s 170.12		Avg T_m 101.81	Min/Max 246/259	Min/Max 262/268	Min/Max	Max Temp 66	Max Vac 5	$V_{m\text{-std}}$, scf
			.23623	Avg √ΔH 1.140										

*Barometric Pressure is at port elevation

Comments AB 6/30

Flue Gas Composition
Oxygen, % ______
Carbon Dioxide, % ______
Moisture, % ______

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run ______
Post-run ______

Thermocouple Check
Meter Temp., °F ______
Ref. Temp, °F ______
Result ______

Q_s, dscfm ______
% Isokinetic ______
Calculated by ______
QC by AU

WESTON SOLUTIONS®
Integrated Air Services

DW SCDHEC
6/27

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: SDTV
Sample Location: stack outlet
W. O. Number: 15730.001.008
Run Number: 3
Date: 6/27/21
Test Personnel: ATR/CL/BE
Sample Time: 64 min.

Console ID: A025
Meter Corr., Y: 1.000
Console ΔH@: 2.649
Probe ID/Length: PR8L 8'
Liner Material: SS
Pitot ID/Coeff.: P320 0.84
Thermo ID: A025
Nozzle ID/Diams.: .250 | .250 | .250 | .250
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 45 °F
Baro. Pressure*: 29.40 in. Hg
Static Pressure: -.16 in. H_2O
Impinger Gain: 548.9 mL 559.2
Silica Gel Gain: 10.3 g
Stack Area: 27.49 ft²
Total Traverse Points: 16

K Factor: NA

Leak Checks

	Initial	Final
Volume, ft³	.007	.003
@ Vac., in. Hg	8	6
Pitot	.008	.008

Filter ID: NA
Sample ID: Run 3

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	~~DGM INLET TEMP (°F)~~	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	13:44			71.100									
A-1	4		.19	1.3	73.8	167		98	256	257		64	4	
2	8		.19	1.3	76.2	170		99	257	254		62	4	
3	12		.20	1.3	78.9	170		97	256	261		55	4	
4	16		.22	1.3	81.6	176		97	257	260		56	4	
5	20		.23	1.3	83.2.	170		98	256	266		56	4	
6	24		.23	1.3	85.7	169		98	255	261		58	4	
7	28		.24	1.3	88.5	169		97	254	260		58	4	
8	32	14:16	.23	1.3	90.6	170		98	253	261		60	4.5	
B-1	36	14:19	.23	1.3	93.3	164		99	254	262		65	4.5	
2	40		.22	1.3	95.5	169		99	255	263		61	4.5	
3	44		.22	1.3	98.9	169		101	256	262		60	4.5	
4	48		.24	1.3	100.9	176		100	257	261		64	4.5	
5	52		.23	1.3	102.9	170		101	258	262		64	5	
6	56		.22	1.3	105.1	171		100	256	263		64	5	
7	60		.22	1.3	107.8	169		99	255	264		65	5.5	
8	64	14:51	.22 ✓	1.3	110.127 ✓	164 ✓	✓	99 ✓	256 ✓	263 ✓		65	5.5	
*Barometric Pressure is at port elevation			Avg √Δp .4644 ✓ .2206 ✓	Avg ΔH 1.3 ✓	Total Volume 39.027 ✓	Avg T_s 169.484 AB 6/30		Avg T_m 98.25 ✓	Min/Max 253/258 ✓	Min/Max 257/264	Min/Max ✓	Max Temp 65 ✓	Max Vac 5.5 ✓	$V_{m\text{-std}}$, scf
				Avg √ΔH 1.140 ✓										

Flue Gas Composition
Oxygen, % ______
Carbon Dioxide, % ______
Moisture, % ______

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run ______
Post-run ______

Thermocouple Check
Meter Temp., °F ______
Ref. Temp, °F ______
Result ______

Q_s, dscfm ______
% Isokinetic ______
Calculated by ______
QC by ______

Comments ______

WESTON SOLUTIONS®
Integrated Air Services

DW
SCDHEC
6/27

Sample Recovery Field Data

Method: EPA 4, Moisture

Client New Indy
Location/Plant Catawba, SC
Source SDTV
W.O. Number 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample ID Run 1
Sample Date 6/27/21
Filter ID NA
Recovery Date 6/27/21
Analyst ATR

	Impingers						
	1	2	3	4	Imp.Total	Silica Gel	Total
Contents	DI	DI	empty	empty	▨	grams	▨
Final	918.4	1622.6	707.8	608.2		933.3	
Initial	711.1	783.9	646.4	605.6	✓	923.0	
Gain	207.3 ✓	238.7 ✓	60.4 ✓	2.6 ✓	509.5	10.3 ✓	519.8 ✓

Impinger Color clear
Silica Gel Condition used
Labled? ✓
Sealed? ✓

Run No. 2
Sample ID Run 2
Sample Date 6/27/21
Filter ID NA
Recovery Date 6/27/21
Analyst ATR

	Impingers						
	1	2	3	4	Imp.Total	Silica Gel	Total
Contents	DI	DI	empty	empty	▨	grams	▨
Final	981.4	1014.7	730.6	668.6		855.7	
Initial	774.0	779.7	649.9	665.2	✓	841.2	
Gain	207.4 ✓	235 ✓	80.7 ✓	3.4 ✓	526.5	14.5 ✓	541 ✓

Impinger Color clear
Silica Gel Condition used
Labled? ✓
Sealed? ✓

Run No. 3
Sample ID Run 3
Sample Date 6/27/21
Filter ID NA
Recovery Date 6/27/21
Analyst ATR

	Impingers						
	1	2	3	4	Imp.Total	Silica Gel	Total
Contents	DI	DI	empty	empty	▨	grams	▨
Final	923.0	973.1	714.3	595.9	AB 613 ✓	909.6	
Initial	663.4	758.0	643.0	593.3	548.6	899.3	
Gain	259.6 ✓	215.1 ✓	71.3 ✓	~~2.9~~	~~548.4~~	10.3 ✓	~~559.2~~

2.6 AB 613 ✓

558.9 ✓ AB 613 ✓

Impinger Color clear
Silica Gel Condition used
Labled? ✓
Sealed? ✓

Check COC for Sample IDs of Media Blanks

WESTON SOLUTIONS®
Integrated Air Services

Sample and Velocity Traverse Points - Method 1

6/27/19

Client	New-Indy	Source	SDTV 2 & 3
Loaction/Plant	Catawba, SC	W.O. Number	15730.001.001
Operator	JWS/JW	Date	3/27/2019

Duct Type ☑ Circular ☐ Rectangular

Traverse Type ☐ Particulate Traverse ☑ Velocity Traverse ☐ Stratific ıtion Traverse

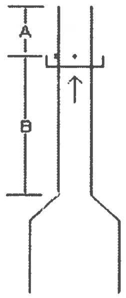
Depth, far wall to outside of port (in) = C	77.75
Port Depth (in) = D	6.75
Depth of Duct, diameter (in) = C - D	71
Area of Duct (ft^3)	27.49
Number of Ports	2
Traverse Points per Port	8
Total Traverse Points	16

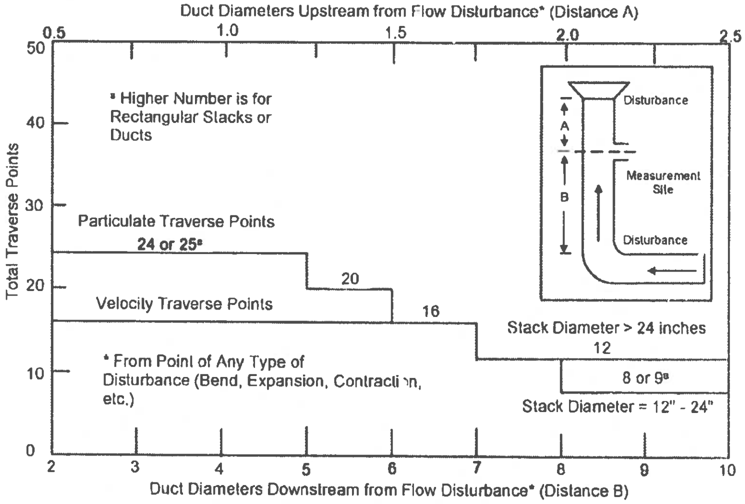
Rectangular Ducts Only	
Width of Duct (in)	
Equivalent Diameter (in)	

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	2.3	9.0
2	10.5	7.4	14.2
3	19.4	13.8	20.5
4	32.3	22.9	29.7
5	67.7	48.1	54.8
6	80.6	57.2	64.0
7	89.5	63.6	70.3
8	96.8	68.7	75.5

Flow Disturbances	
Upstream - A (ft)	10
Downstream - B (ft)	38
Upstream - A (duct diameters)	1.7
Downstream - B (duct diameters)	6.4

Diagram of Stack





Traverse Point Location % of Stack - Circular

Traverse Point Location	1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25.0		14.6		10.5		8.2		6.7
3				75.0		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25.0
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75.0
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location % of Stack - Rectangular

Traverse Point Location	1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix	
9 -	3 x 3
12 -	4 x 3
16 -	4 x 4
20 -	5 x 4
25 -	5 x 5
30 -	6 x 5
36 -	6 x 6
42 -	7 x 6
49 -	7 x 7

Tape measure ID ____________________

RUN SUMMARY
Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **2 & 3 SDTV**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

Start Time 11:00 **End Time** 12:10

Average Measured TRS Conc.	6.76 **ppm** ✓
Recovery No. 2	91.9 **%** ✓
TRS Corrected for Recovery	7.36 **ppm** ✓

RUN SUMMARY

Number 2

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, NC**	Operator:	**VD**
Source:	**2 & 3 SDTV**	Date:	**27 Jun 2021**

Method **16**
Calibration **1**

Start Time 12:22 **End Time** 13:31

Average Measured TRS Conc.	8.48 **ppm** ✓
Recovery No. 2	91.9 **%** ✓
TRS Corrected for Recovery	9.23 **ppm** ✓

RUN SUMMARY

Number 3

Client: **New Indy**
Location: **Catawba, NC**
Source: **2 & 3 SDTV**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

Start Time 13:44 **End Time** 14:54

Average Measured TRS Conc.	7.54 **ppm**	✓
Recovery No. 2	91.9 **%**	
TRS Corrected for Recovery	8.20 **ppm**	✓

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **2 & 3 SDTV**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

Time	**H_2S**		**MeSH**		**DMS**		**DMDS**		**TRS**
	area	**ppm**	**area**	**ppm**	**area**	**ppm**	**area**	**ppm**	**ppm**
11:00	9746	6.75	79	0.83	<2	<0.078	3	0.04	7.67
11:03	10033	6.85	101	0.95	<2	<0.078	5	0.06	7.92
11:06	9112	6.51	107	0.97	<2	<0.078	3	0.05	7.58
11:09	7501	5.87	115	1.01	<2	<0.078	5	0.06	6.99
11:12	5842	5.14	115	1.01	<2	<0.078	5	0.06	6.27
11:15	5372	4.91	117	1.02	3	0.09	5	0.06	6.14
11:18	4418	4.43	105	0.96	2	0.08	5	0.06	5.59
11:21	4580	4.51	110	0.99	<2	<0.078	3	0.04	5.59
11:24	4551	4.50	111	0.99	<2	<0.078	5	0.06	5.61
11:27	4210	4.31	99	0.94	3	0.09	3	0.05	5.43
Paused for Port Change									
11:40	4222	4.32	107	0.97	<2	<0.078	4	0.05	5.40
11:43	5768	5.10	113	1.01	<2	<0.078	4	0.05	6.22
11:46	5698	5.07	122	1.04	7	0.16	6	0.07	6.40
11:49	6812	5.57	138	1.12	<2	<0.078	5	0.06	6.81
11:52	7585	5.90	155	1.19	<2	<0.078	6	0.06	7.21
11:55	8396	6.23	162	1.21	<2	<0.078	5	0.06	7.56
11:58	8694	6.35	166	1.23	<2	<0.078	6	0.06	7.70
12:01	9023	6.47	173	1.25	<2	<0.078	6	0.06	7.86
12:04	9097	6.50	169	1.24	<2	<0.078	7	0.07	7.89
12:07	7770	5.98	165	1.23	<2	<0.078	6	0.06	7.33
Average		**5.56**		**1.06**		**<0.078**		**0.06**	**6.76**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **2 & 3 SDTV**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
12:22	5222	4.84	150	1.17	2	0.09	5	0.06	6.21
12:25	7380	5.82	164	1.22	3	0.09	5	0.06	7.24
12:28	8350	6.21	193	1.33	3	0.10	3	0.05	7.73
12:31	11724	7.44	192	1.32	4	0.11	5	0.06	8.99
12:34	13839	8.13	213	1.40	5	0.12	7	0.07	9.79
12:37	13568	8.04	206	1.37	3	0.10	7	0.07	9.66
12:40	10733	7.10	199	1.35	4	0.11	6	0.07	8.69
12:43	10057	6.86	192	1.32	3	0.10	4	0.05	8.39
12:46	13409	7.99	207	1.38	4	0.12	7	0.07	9.63
12:49	13864	8.14	220	1.42	4	0.12	7	0.07	9.82
Paused for Port Change									
13:01	18795	9.57	181	1.28	3	0.10	7	0.07	11.1
13:04	16648	8.97	173	1.25	4	0.12	6	0.06	10.5
13:07	14072	8.20	190	1.32	3	0.10	6	0.06	9.75
13:10	10289	6.94	155	1.18	4	0.11	4	0.05	8.34
13:13	9917	6.81	167	1.23	3	0.10	7	0.07	8.28
13:16	9314	6.58	170	1.24	<2	<0.078	4	0.05	7.93
13:19	7425	5.84	158	1.20	4	0.12	5	0.06	7.27
13:22	6575	5.47	152	1.17	4	0.11	2	0.04	6.83
13:25	6676	5.51	153	1.17	3	0.10	5	0.06	6.91
13:28	6242	5.32	149	1.16	<2	<0.078	5	0.06	6.60
Average		**6.99**		**1.28**		**0.10**		**0.06**	**8.48**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, NC**
Source: **2 & 3 SDTV**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
13:44	6773	5.56	145	1.14	3	0.09	5	0.06	6.91
13:47	7079	5.69	149	1.16	<2	<0.078	5	0.06	6.97
13:50	8284	6.19	161	1.21	<2	<0.078	5	0.06	7.52
13:53	9347	6.60	157	1.19	3	0.10	5	0.06	8.00
13:56	11430	7.34	154	1.18	<2	<0.078	4	0.05	8.62
13:59	11137	7.24	81	0.84	3	0.09	6	0.06	8.30
14:02	9753	6.75	84	0.86	3	0.09	5	0.06	7.82
14:05	12285	7.63	74	0.80	2	0.08	6	0.06	8.64
14:08	10527	7.03	77	0.82	3	0.10	4	0.06	8.06
14:11	10419	6.99	72	0.80	<2	<0.078	4	0.05	7.89
			Paused for Port Change						
14:24	4752	4.60	52	0.67	<2	<0.078	2	0.04	5.35
14:27	6627	5.49	51	0.66	<2	<0.078	5	0.06	6.27
14:30	7671	5.94	56	0.69	3	0.10	4	0.05	6.84
14:33	7875	6.02	111	0.99	<2	<0.078	5	0.06	7.13
14:36	9158	6.53	60	0.72	3	0.10	4	0.05	7.45
14:39	9894	6.80	134	1.10	<2	<0.078	5	0.06	8.01
14:42	9132	6.52	118	1.03	2	0.09	5	0.06	7.75
14:45	8684	6.34	114	1.01	5	0.13	4	0.06	7.60
14:48	8526	6.28	124	1.05	2	0.08	6	0.06	7.54
14:51	10818	7.13	68	0.77	<2	<0.078	7	0.07	8.05
Average		**6.43**		**0.94**		**<0.078**		**0.06**	**7.54**

RUN DATA

Number 0

Client: **New Indy**
Location: **Catawba, NC**
Source: **2 & 3 SDTV**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

Time	**H_2S**		**MeSH**		**DMS**		**DMDS**		**TRS**
	area	**ppm**	**area**	**ppm**	**area**	**ppm**	**area**	**ppm**	**ppm**
CC416806 7.257 ppm ✓									
16:31	12652	7.69	<2	<0.12	<2	<0.078	<2	<0.036	7.69
16:34	13142	7.85	<2	<0.12	<2	<0.078	<2	<0.036	7.85
16:37	13429	7.94	<2	<0.12	<2	<0.078	<2	<0.036	7.94
Average		**7.83**		**<0.12**		**<0.078**		**<0.036**	**7.83**

RECOVERY DATA

Number 1

Client:	**New Indy**			Project Number:	**15730.001.008**
Location:	**Catawba, NC**	Method	**16**	Operator:	**VD**
Source:	**2 & 3 SDTV**	Calibration	**1**	Date:	**27 Jun 2021**

Before Run 1

Start Time 09:25 **End Time** 09:39

Recovery Gas to Probe, Time 09:25

Peak Areas, mv-sec			Average	ppm
11108	11283	11482	11291 ✓	7.30

Recovery Gas to GC, Time 09:37

Peak Areas, mv-sec			Average	ppm
13285	13216	13267	13256 ✓	7.95

Recovery 91.8% ✓

RECOVERY DATA

Number 2

Client:	**New Indy**			Project Number:	**15730.001.008**
Location:	**Catawba, NC**	Method	**16**	Operator:	**VD**
Source:	**2 & 3 SDTV**	Calibration	**1**	Date:	**27 Jun 2021**

After Run 3 **Before Run** 4
Start Time 14:56 **End Time** 15:17

Recovery Gas to Probe, Time 14:56

Peak Areas, mv-sec			Average	ppm
11388	11667	11619	11558 ✓	7.39

Recovery Gas to GC, Time 15:13

Peak Areas, mv-sec			Average	ppm
13585	13587	13493	13555 ✓	8.04

Recovery 91.9% ✓

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **2 & 3 SDTV**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.70 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51828	33-53274	89-53332	89-53266
Perm. Rate, nL/min	346	363	470	238
Ret. Time, sec	16.0	22.5	48.0	127.0

1 Flow = **37.1** mL/Min	**9.32** ppm	**9.79** ppm	**12.7** ppm	**6.41** ppm
Time: 07:00		**Peak Areas, mv-sec**		
	17531	8727	27825	33485
	17951	8703	27443	33712
	18066	8758	27669	33342
Average Area	**17849**	**8730**	**27646**	**33513**

2 Flow = **78.5** mL/Min	**4.41** ppm	**4.63** ppm	**5.99** ppm	**3.03** ppm
Time: 08:24		**Peak Areas, mv-sec**		
	4366	2153	6888	8191
	4464	2149	6729	8050
	4361	2131	6827	8110
Average Area	**4397**	**2145**	**6815**	**8117**

3 Flow = **172** mL/Min	**2.01** ppm	**2.11** ppm	**2.73** ppm	**1.38** ppm
Time: 08:47		**Peak Areas, mv-sec**		
	1026	464	1561	1864
	980	466	1558	1873
	996	463	1569	1872
Average Area	**1001**	**464**	**1563**	**1870**

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **2 & 3 SDTV**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

H_2S	**1**	**2**	**3**		
Time	07:00	08:24	08:47		
Concentration, ppm	9.32	4.41	2.01		
Area, mv-sec	17849	4397	1001		
Calc. Conc., ppm	9.31	4.42	2.01		
% Error	-0.1	0.2	-0.1		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8784	2.4316	>0.9999	2	0.073

MeSH	**1**	**2**	**3**		
Time	07:00	08:24	08:47		
Concentration, ppm	9.79	4.63	2.11		
Area, mv-sec	8730	2145	464		
Calc. Conc., ppm	9.74	4.68	2.10		
% Error	-0.5	1.0	-0.5		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9131	2.0496	0.9999	2	0.12

DMS	**1**	**2**	**3**		
Time	07:00	08:24	08:47		
Concentration, ppm	12.7	5.99	2.73		
Area, mv-sec	27646	6815	1563		
Calc. Conc., ppm	12.7	6.00	2.73		
% Error	-0.1	0.1	-0.1		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8729	2.3765	>0.9999	2	0.078

DMDS	**1**	**2**	**3**		
Time	07:00	08:24	08:47		
Concentration, ppm	6.41	3.03	1.38		
Area, mv-sec	33513	8117	1870		
Calc. Conc., ppm	6.42	3.02	1.38		
% Error	0.1	-0.3	0.1		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8815	3.0064	>0.9999	2	0.036

CALIBRATION DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **2 & 3 SDTV**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.45 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51828	33-53274	89-53332	89-53266
Perm. Rate, nL/min	349	366	474	240
Ret. Time, sec	16.0	22.5	48.0	127.0

1 Flow = **35.7** mL/Min	**9.77** ppm	**10.3** ppm	**13.3** ppm	**6.71** ppm
Time: 15:25		**Peak Areas, mv-sec**		
	19473	9508	30148	36336
	19160	9600	30169	36878
	19488	9629	30467	36382
Average Area	**19374** ✓	**9579** ✓	**30261** ✓	**36532** ✓

2 Flow = **76.0** mL/Min	**4.59** ppm	**4.82** ppm	**6.24** ppm	**3.15** ppm
Time: 15:41		**Peak Areas, mv-sec**		
	4986	2412	7781	9320
	5080	2405	7724	9106
	5033	2355	7680	9257
Average Area	**5033** ✓	**2391** ✓	**7728** ✓	**9228** ✓

3 Flow = **170** mL/Min	**2.06** ppm	**2.16** ppm	**2.80** ppm	**1.41** ppm
Time: 16:10		**Peak Areas, mv-sec**		
	1092	517	1666	1995
	1079	522	1692	1998
	1108	504	1661	1964
Average Area	**1093** ✓	**514** ✓	**1673** ✓	**1986** ✓

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **2 & 3 SDTV**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

H_2S	**1**	**2**	**3**		
Time	15:25	15:41	16:10		
Concentration, ppm	9.77	4.59	2.06		
Area, mv-sec	19374	5033	1093		
Calc. Conc., ppm	9.68	4.67	2.04		
% Error	-0.9	1.7	-0.8		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8461	2.4668	0.9998	2	0.067

MeSH	**1**	**2**	**3**		
Time	15:25	15:41	16:10		
Concentration, ppm	10.3	4.82	2.16		
Area, mv-sec	9579	2391	514		
Calc. Conc., ppm	10.2	4.87	2.15		
% Error	-0.6	1.1	-0.5		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8776	2.0870	0.9999	2	0.11

DMS	**1**	**2**	**3**		
Time	15:25	15:41	16:10		
Concentration, ppm	13.3	6.24	2.80		
Area, mv-sec	30261	7728	1673		
Calc. Conc., ppm	13.2	6.33	2.78		
% Error	-0.7	1.4	-0.7		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8592	2.3984	0.9999	2	0.074

DMDS	**1**	**2**	**3**		
Time	15:25	15:41	16:10		
Concentration, ppm	6.71	3.15	1.41		
Area, mv-sec	36532	9228	1986		
Calc. Conc., ppm	6.67	3.20	1.41		
% Error	-0.7	1.3	-0.6		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8700	3.0217	0.9999	2	0.035

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, NC**
Source: **2 & 3 SDTV**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	16.0	22.5	48.0	127.0
Peak Detection Window, sec	3.0	7.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	2.0	3.0
Ending Peak Width, sec	2.0	6.0	4.0	5.0
Permeation Device ID	T-51828	33-53274	89-53332	89-53266
Permeation Rate, ng/min	483 ✓	716 ✓	1197 ✓	918 ✓
Permeation Rate, nL/min*	349	366	474	240

Barometric Pressure: 29.45 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 483 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.45)$$
$$= 349 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, NC**
Source: **2 & 3 SDTV**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

File: C:\Data\210627 New Indy Catawba SDTV.trs
Program Version: 2.0, built 15 May 2017 **File Version:** 2.0
Computer: WLT5 **Trailer:** 281

Analog Input Device: MCC USB-1608G **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: Shimadzu GC8-A **Serial No.** C10493615061
Detector Range: 10

Gases	Press. psi	Flow mL/min
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 140
Detector: 140

Columns

Primary: Carbopack
Secondary: N/A
Sample Loop: 4"

Injection Cycle

Total Length: 180 sec **Sampling Time:** 170 sec **Load/Backflush Time:** 80 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 2 mv-sec **Minimum peak height** 1 mv above baseline

Dynacalibrator

Chamber Temperature 50.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.45 in. Hg

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **2 &3 SDTV**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
12:12:06	6857	20.1	-5	0.0
12:12:16	6859	20.1	-5	0.0
12:12:26	6858	20.1	-7	0.0
12:12:36	6858	20.1	-8	0.0
12:12:46	6858	20.1	-8	0.0
12:12:56	6859	20.1	-8	0.0
12:13:06	6859	20.1	-6	0.0
12:13:16	6858	20.1	-5	0.0
12:13:26	6859	20.1	-5	0.0
12:13:36	6859	20.1	-5	0.0
12:13:46	6858	20.1	-6	0.0
12:13:56	6856	20.1	-7	0.0
Avgs	**6858**	**20.1**	**-6**	**0.0**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **2 &3 SDTV**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %
13:35:44	6803	20.0	-5	0.0
13:35:54	6804	20.0	-5	0.0
13:36:04	6804	20.0	-6	0.0
13:36:14	6802	20.0	-8	0.0
13:36:24	6803	20.0	-8	0.0
13:36:34	6804	20.0	-8	0.0
13:36:44	6803	20.0	-6	0.0
13:36:54	6805	20.0	-5	0.0
13:37:04	6802	20.0	-5	0.0
13:37:14	6803	20.0	-5	0.0
13:37:24	6807	20.0	-5	0.0
13:37:34	6946	20.4	-8	0.0
Avgs	**6816**	**20.0**	**-6**	**0.0**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **2 &3 SDTV**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

Time	O_2		CO_2	
	mv	%	mv	%
14:57:38	6920	20.3	-8	0.0
14:57:48	6922	20.3	-6	0.0
14:57:58	6921	20.3	-5	0.0
14:58:08	6920	20.3	-6	0.0
14:58:18	6920	20.3	-5	0.0
14:58:28	6919	20.3	-7	0.0
14:58:38	6918	20.3	-8	0.0
14:58:48	6920	20.3	-8	0.0
14:58:58	6920	20.3	-8	0.0
14:59:08	6918	20.3	-6	0.0
14:59:18	6918	20.3	-5	0.0
14:59:28	6920	20.3	-5	0.0
Avgs	**6920**	**20.3**	**-6**	**0.0**

CALIBRATION DATA

Number 1

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**2 &3 SDTV**	Date:	**27 Jun 2021**

Start Time: 10:20

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	-2
10.1 ✓	XC013544B	3438
20.2 ✓	CC275468	6897

Curve Coefficients

Slope	Intercept	Corr. Coeff.
340.9 ✓	-7 ✓	>0.9999 ✓

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero ✓	-	-8
10.2 ✓	XC013544B	4174
20.3	CC275468	8060

Curve Coefficients

Slope	Intercept	Corr. Coeff.
398.0 ✓	38 ✓	0.9998 ✓

CALIBRATION ERROR DATA

Number 1

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**2 &3 SDTV**	Date:	**27 Jun 2021**

Calibration **1**

Start Time: 10:20

O_2

Method: EPA 3A

Span Conc. 20.2 %

Slope 340.9 **Intercept** -7.4

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-2	0.0	0.0	0.0 ✓	Pass
10.1	3438	10.1	0.0	0.0 ✓	Pass
20.2	6897	20.3	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A

Span Conc. 20.3 %

Slope 398.0 **Intercept** 37.9

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-8	-0.1	-0.1	-0.5 ✓	Pass
10.2	4174	10.4	0.2	1.0 ✓	Pass
20.3	8060	20.2	-0.1	-0.5 ✓	Pass

CALIBRATION ERROR DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **2 &3 SDTV**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

Start Time: 15:13

O_2

Method: EPA 3A
Span Conc. 20.2 %
Slope 340.9 **Intercept** -7.4

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-2	0.0	0.0	0.0 ✓	Pass
10.1	3438	10.1	0.0	0.0 ✓	Pass
20.2	6897	20.3	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A
Span Conc. 20.3 %
Slope 398.0 **Intercept** 37.9

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-8	-0.1	-0.1	-0.5 ✓	Pass
10.2	4174	10.4	0.2	1.0 ✓	Pass
20.3	8060	20.2	-0.1	-0.5 ✓	Pass

METHODS AND ANALYZERS

Client: **New Indy**
Location: **Catawba, SC**
Source: **2 &3 SDTV**

Project Number: **15730.001.008**
Operator: **VD**
Date: **27 Jun 2021**

File: C:\Data\210627 New Indy Catawba SDTV.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: WSAUBCHEMLABGC1 **Trailer:** 281
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T802 s/n: 172**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.2**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T802 s/n: 172**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.3**

APPENDIX F
FIELD DATA – NO. 1 AND 2 COMBINATION BOILERS

NO. 1 COMBINATION BOILER (CONDITION 1: NCG AND SOG GASES)

New Indy
Catawba, SC

15730.001.008
No. 1 Combination Boiler
Condition 1: NCGs & SOGs

EMISSION CALCULATIONS

		Run 1	Run 2	Run 3	Mean
Date		6/23/21 ✓	6/23/21 ✓	6/23/21 ✓	---
Time Began		1158 ✓	1400 ✓	1541 ✓	---
Time Ended		1258 ✓	1500 ✓	1641 ✓	---
Volumetric Flow Rate, (Qs), DSCFM		1.35E+05 ✓	1.31E+05 ✓	1.33E+05 ✓	1.33E+05
BWS		0.174 ✓	0.177 ✓	0.160 ✓	0.170
% Oxygen		12.1 ✓	11.4 ✓	12.0 ✓	11.8
Sulfur Dioxide	MW= 64.06				
Concentration, ppm		195.0 ✓	278.0 ✓	344.0 ✓	272.3
Emission Rate, lb/hr		262.7	362.5	457.4	360.9
Total Reduced Sulfur	(TRS MW)= 34.08				
Concentration, ppm		0.78 ✓	0.71 ✓	0.70 ✓	0.73
Emission Rate, lb/hr		0.56	0.49	0.50	0.52

New Indy
Catawba, SC

15730.001.008
No. 1 Combination Boiler

Condition 1: NCGs & SOGs

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/23/21	6/23/21	6/23/21	---
Time Began		1158	1400	1541	---
Time Ended		1326	1525	1710	---
INPUT DATA					
Sampling Time, min	(Theta)	64.0	64	64	64
Stack Diameter, in.	(Dia.)	120.00	120.00	120.00	120.00
Barometric Pressure, in. Hg	(Pb)	29.45	29.45	29.45	29.45
Static Pressure, in. H2O	(Pg)	-0.64	-0.66	-0.65	-0.65
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	0.9880	0.9880	0.9880	0.9880
Orifice Calibration Value	(Delta H@)	1.7320	1.7320	1.7320	1.7320
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	41.974	42.371	42.570	42.305
Meter Temperature, °F	(Tm)	88.0	92.5	97.3	92.6
Meter Temperature, °R	(Tm-R)	548.0	552.5	557.3	552.6
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	176.5	179.9	159.3	171.9
CO2 Concentration, %	(CO2)	7.8	8.4	7.7	8.0
O2 Concentration, %	(O2)	12.1	11.4	12.0	11.8
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	0.786	0.765	0.765	0.772
Stack Temperature, °F	(Ts)	414.6	418.3	415.3	416.1
Stack Temperature, °R	(Ts-R)	874.6	878.3	875.3	876.1
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	78.54	78.54	78.54	78.54
Stack Pressure, in. Hg	(Ps)	29.40	29.40	29.40	29.40
Meter Pressure, in. Hg	(Pm)	29.55	29.55	29.55	29.55
Standard Meter Volume, ft^3	(Vmstd)	39.441	39.490	39.333	39.421
Standard Water Volume, ft^3	(Vwstd)	8.308	8.468	7.498	8.091
Moisture Fraction (Measured)	(BWS)	0.174	0.177	0.160	0.170
Moisture Fraction (lower sat/meas)	(BWS)	0.174	0.177	0.160	0.170
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	29.73	29.80	29.71	29.75
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	27.69	27.72	27.84	27.75
Average Stack Gas Velocity, ft/sec	(Vs)	58.52	57.06	56.84	57.47
Stack Gas Flow, actual, ft^3/min	(Qa)	275752	268902	267850	270835
Stack Gas Flow, Std , ft^3/min	(Qs)	135073	130750	133309	133044
Calibration check	(Yqa)	1.0034	0.9969	0.9980	0.999
Percent difference from Y					1.16%

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 1 Combination Boiler
Sample Location Stack outlet
W. O. Number 15730.001.008
Run Number 1
Date 6/23/21
Test Personnel AR / CL
Sample Time 64 min.

Console ID A010
Meter Corr., Y .988
Console ΔH@ 1.732
Probe ID/Length PR5B / 5'
Liner Material SS
Pitot ID/Coeff. P172 0.84
Thermo ID A010
Nozzle ID/Diams. .250 | .250 | .250 | .250
Avg. Nozzle Diam. .250 in.

Ambient Temp. 80 °F
Baro. Pressure* 29.45 in. Hg
Static Pressure -.64 in. H_2O
Impinger Gain 160.5 mL
Silica Gel Gain 16 g 176.5
Stack Area 78.54 ft²
Total Traverse Points 16

K Factor	NA

Leak Checks

	Initial	Final
Volume, ft³	.012	.005
@ Vac., in. Hg	16	6
Pitot	.000	.000

Filter ID NA
Sample ID Run 1 NCG + SOG

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp * (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F) AR	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	11:58			834.906									
~~A~~-1 D	4		.75	1.3	841.9	418		88 ~~234~~	234	244		67	1	
2	8		.70	1.3	845.3	417		88	235	245		65	1	
3	12		.67	1.3	848.1	416		88	236	249		64	1.5	
4	16	12:14	.54	1.3	851.7	416		89	237	248		64	1.5	
~~B~~-1 A	20	12:22	.65	1.3	853.3	415		88	237	250		65	1.5	
2	24		.54	1.3	855.7	416		88	238	250		65	1.5	
3	28		.59	1.3	858.2	415		88	239	250		64	1.5	
4	32	12:36	.36	1.3	860.8	415		88	240	251		63	1.5	
~~C~~-1 B	36	12:44	.61	1.3	863.4	412		87	241	252		64	1.5	
2	40	~~13:~~ AR	.63	1.3	866.1	413		87	241	251		59	1.5	
3	44		.66	1.3	868.8	412		88	242	250		58	1.5	
4	48	13:06	.47	1.3	871.4	409		88	241	251		58	1.5	
~~D~~-1 C	52	13:16	.77	1.3	874.2	413		89	240	252		63	1.5	
2	56		.75	1.3	876.6	415		89	242	253		61	1.5	
3	60	13:26	.71	1.3	879.2	416		86	241 AR ~~2441~~	252		59	1.5	
4	64	13:46	.57	1.3	881.874	416		87	240	252		58	1.5	

*Barometric Pressure is at port elevation

Avg √Δp	Avg ΔH	Total Volume	Avg T_s	Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac	V_{m-std}, scf
.786 ✓ .7862 AR 7/11	1.3 ✓	41.974 ✓	414.683 ✓ AB 7/11	86 ✓	234/242 ✓	244/253 ✓		67 ✓	1.5 ✓	

.6231 ✓

Avg √ΔH 1.140 ✓

Comments w/ NCG's + SOG's

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by AR

WESTON SOLUTIONS®
Integrated Air Services

15730.001.008
Pulp Dryer, #3 Paper Machine, #2-3 SDTs, & #1-2 CBs
Emission Report

Isokinetic Field Data

Method: EPA 4, Moisture

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Client New Indy
Location/Plant Catawba, SC
Source No. 1 Combination Boiler
Sample Location Stack outlet
W. O. Number 15730.001.008
Run Number 2
Date 6/23/21
Test Personnel ATR/CL
Sample Time 64 min.

Console ID A010
Meter Corr., Y .988
Console ΔH@ 1.732
Probe ID/Length PR5B / 5'
Liner Material SS
Pitot ID/Coeff. P172 0.84
Thermo ID A010
Nozzle ID/Diams. .250 .250 .250 .250
Avg. Nozzle Diam. .250 in.

Ambient Temp. 85 °F
Baro. Pressure* 29.45 in. Hg
Static Pressure -.66 in. H_2O
Impinger Gain 168.6 mL 179.2
Silica Gel Gain 10.6 g
Stack Area 78.54 ft²
Total Traverse Points 16

K Factor NA

Leak Checks

	Initial	Final
Volume, ft³	.004	.003
@ Vac., in. Hg	8	5
Pitot	.000	.000

Filter ID NA
Sample ID Run 2 NCG + SOG

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	14:06			882.000									
~~A~~-1 B	4		.60	1.3	884.1	420		92	234	245		65	1.5	
2	8		.61	1.3	887.3	420		91	235	246		64	1.5	
3	12		ATR .64	1.3	889.4	417		91	236	244		62	1.5	
4	16	14:16	.44, ~~.64~~	1.3	892.6	417		93	236	243		60	1.5	
~~B~~-1 A	20	14:24	.66	1.3	895.2	417		92	237	241		62	1.5	
2	24		.53	1.3	897.4	416		92	236	242		60	2.0	
3	28		.45	1.3	900.6	418		91	235	244		57	2.0	
4	32	14:40	.36	1.3	903.2	417		92	234	245		58	2.0	
~~C~~-1 D	36	14:46	.77	1.3	905.8	420		93	233	250		64	2.0	
2	40		.69	1.3	908.4	420		94	236	250		61	2.0	
3	44		.50	1.3	911.0	418		92	237	254		66	2.0	
4	48	15:02	.39	1.3	913.7	415		92	236	252		62	2.0	
~~D~~-1 L	52	15:09	.80	1.3	916.4	416		93	232	250		65	2.0	
2	56		.75	1.3	919.1	420		94	235	249		65	2.0	
3	60		.74	1.3	921.8	422		94	233	251		64	2.0	
4	64	15:25	.57	1.3	924.371	420		94	234	250		66	2.0	
*Barometric Pressure is at port elevation			Avg √Δp .76534 .59388	Avg ΔH 1.3 Avg √ΔH 1.140	Total Volume 42.371	Avg T_s 418.31		Avg T_m 92.5	Min/Max 232/238	Min/Max 241/254	Min/Max	Max Temp 66	Max Vac 2.0	

NB 7/1

Integrated Air Services

Comments with NCGs + SOGs.

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

$V_{m\text{-std}}$, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by AM

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 1 Combination Boiler
Sample Location ~~stack outlet~~
W. O. Number 15730.001.008
Run Number 3
Date 6/23/21
Test Personnel ATL/LF
Sample Time 64 min.

Console ID A010
Meter Corr., Y .988
Console ΔH@ 1.732
Probe ID/Length PR5B 5'
Liner Material SS
Pitot ID/Coeff. P172 0.84
Thermo ID A010
Nozzle ID/Diams. .250 .250 .250 .250
Avg. Nozzle Diam. .250 in.

Ambient Temp. 90 °F
Baro. Pressure* 29.45 in. Hg
Static Pressure -.65 in. H_2O
Impinger Gain ~~168.6~~ mL 146.5 ~~179.2~~
Silica Gel Gain ~~10.6~~ 12.5 g AR 159.3
Stack Area 78.54 ft^2
Total Traverse Points 16

K Factor NA

Leak Checks

	Initial	Final
Volume, ft^3	.005	.002
@ Vac., in. Hg	8	6
Pitot	.000	.000

Filter ID NA
Sample ID ~~#~~ Run 3 NCG+SOG

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	15:41			924.700									
~~A~~-1 B	4		.59	1.3	927.4	416		95	235	237		66	1.5	
2	8		.62	1.3	929.9	416		95	237	254		64	1.5	
3	12		.60	1.3	932.8	415		95	238	253		63	1.5	
4	16	15:57	.48	1.3	935.3	414		96	239	253		64	1.5	
~~B~~-1 A	20	16:06	.61	1.3	938.1	412		96	235	255		65	1.5	
2	24		.55	1.3	940.1	414		96	236	256		63	1.5	
3	28		.50	1.3	943.5	414		97	235	255		61	1.5	
4	32	16:22	.35	1.3	946.0	414		97	237	256		62	1.5	
~~C~~-1 D	36	16:29	.74	1.3	948.5	417		98	234	252		65	1.5	
2	40		.69	1.3	952.0	416		98	242	251		63	1.5	
3	44		.48	1.3	954.3	416		99	238	254		63	1.5	
4	48	16:45	.46	1.3	956.6	414		100	237	254		64	1.5	
~~D~~-1 C	52	16:54	.77	1.3	959.2	417		100	239	258		66	1.5	
2	56		.75	1.3	962.6	417		99	240	255		64	1.5	
3	60		.72	1.3	964.6	419		98	238	253		64	1.5	
4	64	17:10	.60	1.3	967.270	413		98	237	253		63	2.0	

*Barometric Pressure is at port elevation

Avg √Δp	Avg ΔH	Total Volume	Avg T_s		Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac
.76534 ✓	1.3 ✓	42.570 ✓	41525 ✓	✓	97.31 ✓	235/242 ✓	237/258 ✓	✓	66 ✓	2.0 ✓
.5925 ✓	Avg √ΔH 1.146 ✓									

AR 7/11

Integrated Air Services

Comments ~~+~~ NCG + SOG

Flue Gas Composition
Oxygen, % ______
Carbon Dioxide, % ______
Moisture, % ______

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run ______
Post-run ______

Thermocouple Check
Meter Temp., °F ______
Ref. Temp, °F ______
Result ______

V_{m-std}, scf ______
Q_s, dscfm ______
% Isokinetic ______
Calculated by ______
QC by ______

Sample Recovery Field Data

Method: EPA 4, Moisture

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 1 Combination Boiler
W.O. Number: 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample Date: 6/23/21
Recovery Date: 6/23/21
Sample ID: Run 4 w/ NCG + SOG
Filter ID: NA
Analyst: ATR

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents	DI	DI	empty		▨	grams	▨
Final	770.1	806.4	643.4			945.5	
Initial	641.1	779.8	638.5			929.5	
Gain	129 ✓	26.6 ✓	4.9 ✓		160.5	16	176.5

Impinger Color: clear
Silica Gel Condition: used
Labled? ✓ ✓ ✓
Sealed? ✓

Run No. 2
Sample Date: 6/23/21
Recovery Date: 6/23/21
Sample ID: Run 2 w/ NCG + SOG
Filter ID: NA
Analyst: ATR

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents	DI	DI	empty		▨	grams	▨
Final	914.3	828.2	646.7			933.1	
Initial	770.1	806.4	643.4		169.3	922.5	
Gain	144.2 ✓	21.8 ✓	~~2.6~~ 3.3 AB 7/1 ✓		~~168.6~~	10.6	~~178.2~~ 179.9 AB 7/1

Impinger Color: clear
Silica Gel Condition: good
Labled? AB 7/1 ✓ — ✓
Sealed? —

Run No. 3
Sample Date: 6/23/21
Recovery Date: 6/23/21
Sample ID: Run 3 w/ NCG + SOG
Filter ID: NA
Analyst: ATR

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents	DI	DI	empty		▨	grams	▨
Final	879.3	788.9	635.2			801.7	
Initial	763.9	763.8	628.9		✓	789.2	
Gain	115.4 ✓	25.1 ✓	6.3 ✓		146.8	12.5 ✓	159.3 ✓

Impinger Color: clear
Silica Gel Condition: used
Labled? —
Sealed? ✓

Check COC for Sample IDs of Media Blanks

WESTON SOLUTIONS®
Integrated Air Services

Sample and Velocity Traverse Points - Method 1

Client	New Indy	Source	No. 1 Combination Boiler
Loaction/Plant	Catawba, SC	W.O. Number	15730.001.008
Operator	VD	Date	6/23/21

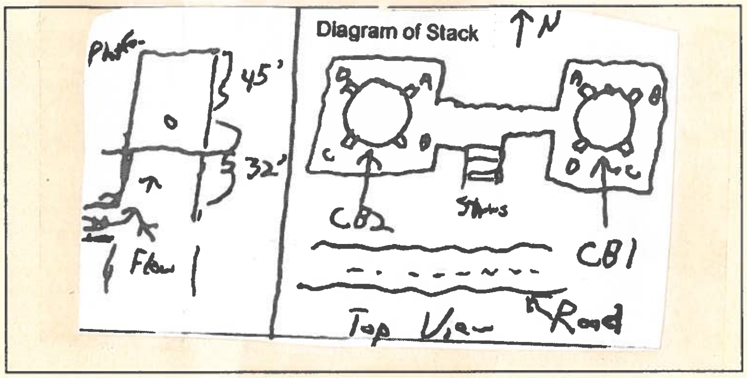
Duct Type ☑ Circular ☐ Rectangular
Traverse Type ☐ Particulate Traverse ☑ Velocity Traverse ☐ Stratification Traverse

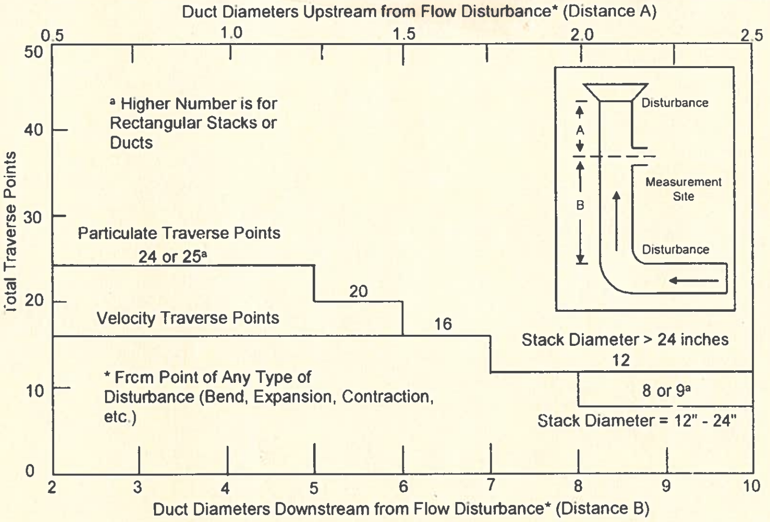
Depth, far wall to outside of port (in) = C	127.5
Port Depth (in) = D	7.5
Depth of Duct, diameter (in) = C - D	120
Area of Duct (ft^3)	78.54
Number of Ports	4
Traverse Points per Port	4
Total Traverse Points	16

Rectangular Ducts Only	
Width of Duct (in)	
Equivalent Diameter (in)	

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	3.9	11.4
2	10.5	12.6	20.1
3	19.4	23.3	30.8
4	32.3	38.8	46.3

Flow Disturbances	
Upstream - A (ft)	45
Downstream - B (ft)	32
Upstream - A (duct diameters)	4.5
Downstream - B (duct diameters)	3.2





Traverse Point Location % of Stack - Circular

Traverse Point Location	Number of Traverse Points 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25.0		14.6		10.5		8.2		6.7
3				75.0		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25.0
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75.0
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location % of Stack - Rectangular

Traverse Point Location	Number of Traverse Points 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Tape measure ID ____________________

Integrated Air Services

RUN SUMMARY

Number 1

Client:	**New Indy**			Project Number:	**15730.001.008**
Location:	**Catawba, NC**	Method	**16**	Operator:	**VD**
Source:	**#1 Combination Boiler**	Calibration	**1**	Date:	**23 Jun 2021**

Start Time 11:58 **End Time** 12:58

Average Measured TRS Conc.	0.67 **ppm** ✓
Recovery No. 2	86.2 **%** ✓
TRS Corrected for Recovery	0.78 **ppm** ✓

AM

RUN SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time 14:00 **End Time** 15:00

Average Measured TRS Conc.	0.61 **ppm** ✓
Recovery No. 2	86.2 **%** ✓
TRS Corrected for Recovery	0.71 **ppm** ✓

AW

RUN SUMMARY

Number 3

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time 15:41 **End Time** 16:41

Average Measured TRS Conc.	0.60 **ppm** ✓
Recovery No. 2	86.2 **%** ✓
TRS Corrected for Recovery	0.70 **ppm** ✓

RUN DATA
Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
11:58	4	0.09	37	0.54	<2	<0.16	<2	<0.071	0.64
12:01	3	0.08	35	0.53	<2	<0.16	<2	<0.071	0.61
12:04	3	0.08	35	0.53	<2	<0.16	<2	<0.071	0.62
12:07	3	0.07	36	0.54	<2	<0.16	<2	<0.071	0.61
12:10	3	0.09	37	0.54	<2	<0.16	<2	<0.071	0.63
12:13	3	0.07	37	0.54	<2	<0.16	2	0.08	0.77
12:16	3	0.08	37	0.55	<2	<0.16	<2	<0.071	0.63
12:19	3	0.08	38	0.55	<2	<0.16	<2	<0.071	0.64
12:22	3	0.08	37	0.55	<2	<0.16	<2	<0.071	0.63
12:25	2	0.07	38	0.55	2	0.17	<2	<0.071	0.79
12:28	3	0.08	39	0.56	<2	<0.16	<2	<0.071	0.64
12:31	2	0.07	40	0.57	<2	<0.16	<2	<0.071	0.63
12:34	2	0.07	41	0.58	<2	<0.16	<2	<0.071	0.65
12:37	3	0.07	39	0.56	<2	<0.16	<2	<0.071	0.63
12:40	4	0.09	39	0.56	2	0.17	<2	<0.071	0.82
12:43	3	0.08	40	0.57	2	0.17	<2	<0.071	0.82
12:46	3	0.08	39	0.56	<2	<0.16	<2	<0.071	0.64
12:49	2	0.07	41	0.57	<2	<0.16	2	0.07	0.79
12:52	2	0.07	41	0.57	<2	<0.16	<2	<0.071	0.64
12:55	2	0.07	38	0.55	<2	<0.16	<2	<0.071	0.62
Average		**0.08**		**0.55**		**<0.16**		**<0.071**	**0.67** ✓

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
14:00	<2	<0.064	34	0.52	<2	<0.16	<2	<0.071	0.52
14:03	3	0.08	35	0.53	<2	<0.16	<2	<0.071	0.61
14:06	<2	<0.064	34	0.52	<2	<0.16	<2	<0.071	0.52
14:09	3	0.08	36	0.54	<2	<0.16	<2	<0.071	0.62
14:12	4	0.09	36	0.54	<2	<0.16	5	0.12	0.87
14:15	2	0.07	37	0.55	<2	<0.16	<2	<0.071	0.61
14:18	4	0.09	37	0.55	<2	<0.16	<2	<0.071	0.64
14:21	3	0.09	35	0.53	<2	<0.16	<2	<0.071	0.61
14:24	2	0.07	35	0.53	3	0.20	<2	<0.071	0.80
14:27	<2	<0.064	35	0.53	<2	<0.16	3	0.09	0.72
14:30	<2	<0.064	36	0.54	<2	<0.16	<2	<0.071	0.54
14:33	<2	<0.064	35	0.53	<2	<0.16	<2	<0.071	0.53
14:36	3	0.08	37	0.55	<2	<0.16	<2	<0.071	0.62
14:39	<2	<0.064	35	0.53	<2	<0.16	<2	<0.071	0.53
14:42	<2	<0.064	34	0.52	<2	<0.16	<2	<0.071	0.52
14:45	<2	<0.064	36	0.54	<2	<0.16	<2	<0.071	0.54
14:48	<2	<0.064	34	0.52	<2	<0.16	<2	<0.071	0.52
14:51	2	0.07	34	0.52	<2	<0.16	<2	<0.071	0.59
14:54	3	0.08	37	0.55	<2	<0.16	<2	<0.071	0.62
14:57	<2	<0.064	34	0.52	<2	<0.16	3	0.08	0.69
Average		**<0.064**		**0.53**		**<0.16**		**<0.071**	**0.61** ✓

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
15:41	3	0.08	32	0.51	<2	<0.16	<2	<0.071	0.58
15:44	<2	<0.064	29	0.48	<2	<0.16	<2	<0.071	0.48
15:47	4	0.09	28	0.47	<2	<0.16	<2	<0.071	0.57
15:50	<2	<0.064	29	0.48	<2	<0.16	<2	<0.071	0.48
15:53	<2	<0.064	31	0.50	3	0.19	<2	<0.071	0.69
15:56	5	0.11	29	0.48	<2	<0.16	<2	<0.071	0.59
15:59	10	0.15	29	0.48	<2	<0.16	<2	<0.071	0.64
16:02	15	0.19	30	0.49	<2	<0.16	<2	<0.071	0.68
16:05	9	0.15	30	0.49	<2	<0.16	3	0.09	0.81
16:08	5	0.11	28	0.47	<2	<0.16	<2	<0.071	0.58
16:11	7	0.13	30	0.49	<2	<0.16	<2	<0.071	0.61
16:14	8	0.14	29	0.48	<2	<0.16	<2	<0.071	0.62
16:17	11	0.17	29	0.48	<2	<0.16	3	0.08	0.82
16:20	3	0.08	30	0.49	<2	<0.16	<2	<0.071	0.58
16:23	<2	<0.064	30	0.49	<2	<0.16	3	0.08	0.65
16:26	3	0.08	30	0.49	<2	<0.16	<2	<0.071	0.56
16:29	<2	<0.064	30	0.49	<2	<0.16	<2	<0.071	0.49
16:32	3	0.08	29	0.48	<2	<0.16	<2	<0.071	0.56
16:35	<2	<0.064	30	0.49	<2	<0.16	<2	<0.071	0.49
16:38	3	0.08	29	0.48	<2	<0.16	<2	<0.071	0.56
Average		**0.08**		**0.49**		**<0.16**		**<0.071**	**0.60** ✓

RUN DATA
Number 7

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **2**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	H2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
CC416806 7.257 ppm ✓									
12:28	14344	7.79	<2	<0.12	<2	<0.077	<2	<0.036	7.79
12:31	14847	7.94	<2	<0.12	<2	<0.077	<2	<0.036	7.94
12:34	15003	7.98	<2	<0.12	2	0.09	<2	<0.036	8.07
Average		**7.90** ✓		**<0.12** ✓		**<0.077** ✓		**<0.036** ✓	**7.93** ✓

RECOVERY DATA

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Before Run 1
Start Time 08:30 **End Time** 08:43

Recovery Gas to Probe, Time 08:30

Peak Areas, mv-sec			Average	ppm
11433	11272	11506	11403 ✓	7.65

Recovery Gas to GC, Time 08:40

Peak Areas, mv-sec			Average	ppm
13047	13101	13148	13098 ✓	8.26

✓

Recovery 92.6%

RECOVERY DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

After Run 3 **Before Run** 4
Start Time 16:45 **End Time** 17:12

Recovery Gas to Probe, Time 16:45

Peak Areas, mv-sec			Average	ppm
10559	10796	10726	10694 ✓	7.38

Recovery Gas to GC, Time 17:07

Peak Areas, mv-sec			Average	ppm
14018	13986	14003	14002 ✓	8.57

Recovery 86.2% ✓

RECOVERY DATA

Number 3

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

After Run 6 **Before Run** 7
Start Time 23:08 **End Time** 23:33

Recovery Gas to Probe, Time 23:08

Peak Areas, mv-sec			Average	ppm
12008	11871	12366	12082 ✓	7.90

Recovery Gas to GC, Time 23:30

Peak Areas, mv-sec			Average	ppm
14235	14081	14105	14141 ✓	8.62

Recovery 91.7% ✓

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **22 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.25 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51828	33-53274	89-53332	89-53266
Perm. Rate, nL/min	351	369	477	241
Ret. Time, sec	16.0	22.5	48.0	127.0

1 Flow = **27.4** mL/Min	**12.8** ppm	**13.5** ppm	**17.4** ppm	**8.81** ppm
Time: 06:00		**Peak Areas, mv-sec**		
	28200	16074	not used	not used
	27714	15989		
	27544	15970		
Average Area	**27819** ✓	**16011** ✓		
2 Flow = **59.5** mL/Min	**5.90** ppm	**6.20** ppm	**8.02** ppm	**4.06** ppm
Time: 06:49		**Peak Areas, mv-sec**		
	7504	3841	12348	15296
	7611	3774	12960	15012
	7641	3823	12909	15325
Average Area	**7585** ✓	**3813** ✓	**12739** ✓	**15211** ✓
3 Flow = **131** mL/Min	**2.68** ppm	**2.82** ppm	**3.64** ppm	**1.84** ppm
Time: 07:28		**Peak Areas, mv-sec**		
	1734	856	2868	3422
	1702	845	2771	3379
	1690	846	2788	3411
Average Area	**1709** ✓	**849** ✓	**2809** ✓	**3404** ✓
4 Flow = **271** mL/Min	**1.30** ppm	**1.36** ppm	**1.76** ppm	**0.89** ppm
Time: 07:53		**Peak Areas, mv-sec**		
	440	204	681	847
	433	209	682	842
	472	206	671	834
Average Area	**448** ✓	**206** ✓	**678** ✓	**841** ✓

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **22 Jun 2021**

H₂S	**1**	**2**	**3**	**4**		
Time	06:00	06:49	07:28	07:53		
Concentration, ppm	12.8	5.90	2.68	1.30		
Area, mv-sec	27819	7585	1709	448		
Calc. Conc., ppm	12.5	6.11	2.68	1.28		
% Error	-2.3	3.5	0.0	-1.2		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**		**Min. Area**	**Det. Lim.**
	1.8102	2.4572	0.9997		2	0.064

MeSH	**1**	**2**	**3**	**4**		
Time	06:00	06:49	07:28	07:53		
Concentration, ppm	13.5	6.20	2.82	1.36		
Area, mv-sec	16011	3813	849	206		
Calc. Conc., ppm	13.3	6.26	2.84	1.35		
% Error	-0.9	1.0	0.9	-0.9		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**		**Min. Area**	**Det. Lim.**
	1.8989	2.0680	0.9999		2	0.12

DMS	**1**	**2**	**3**		
Time	06:49	07:28	07:53		
Concentration, ppm	8.02	3.64	1.76		
Area, mv-sec	12739	2809	678		
Calc. Conc., ppm	17.6	7.86	3.68		
% Error	119.4	115.7	109.0		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8747	1.7700	0.9997	2	0.16

DMDS	**1**	**2**	**3**		
Time	06:49	07:28	07:53		
Concentration, ppm	4.06	1.84	0.89		
Area, mv-sec	15211	3404	841		
Calc. Conc., ppm	8.91	3.97	1.86		
% Error	119.6	115.3	109.2		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8501	2.4250	0.9997	2	0.071

CALIBRATION DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.25 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51828	33-53274	89-53332	89-53266
Perm. Rate, nL/min	351	369	477	241
Ret. Time, sec	16.0	22.5	48.0	127.0

1 Flow = **37.6** mL/Min	**9.34** ppm	**9.81** ppm	**12.7** ppm	**6.42** ppm
Time: 07:00	**Peak Areas, mv-sec**			
	19790	9921	31382	38948
	20319	10076	31742	38693
	19852	9986	30214	37936
Average Area	**19987** ✓	**9995** ✓	**31113** ✓	**38526** ✓

2 Flow = **82.8** mL/Min	**4.24** ppm	**4.46** ppm	**5.77** ppm	**2.92** ppm
Time: 11:03	**Peak Areas, mv-sec**			
	4788	2266	7435	8918
	4588	2209	7188	8687
	4419	2218	7198	8791
Average Area	**4598** ✓	**2231** ✓	**7274** ✓	**8798** ✓

3 Flow = **180** mL/Min	**1.95** ppm	**2.05** ppm	**2.66** ppm	**1.34** ppm
Time: 11:47	**Peak Areas, mv-sec**			
	998	492	1607	1968
	985	496	1607	1963
	982	497	1614	1971
Average Area	**988** ✓	**495** ✓	**1609** ✓	**1967** ✓

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

H_2S	1	2	3
Time	07:00	11:03	11:47
Concentration, ppm	9.34	4.24	1.95
Area, mv-sec	19987	4598	988
Calc. Conc., ppm	9.26	4.31	1.94
% Error	-0.8	1.6	-0.8

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9212	2.4433	0.9998	2	0.077

MeSH	1	2	3
Time	07:00	11:03	11:47
Concentration, ppm	9.81	4.46	2.05
Area, mv-sec	9995	2231	495
Calc. Conc., ppm	9.79	4.48	2.05
% Error	-0.3	0.5	-0.3

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9203	2.0975	>0.9999	2	0.12

DMS	1	2	3
Time	07:00	11:03	11:47
Concentration, ppm	12.7	5.77	2.66
Area, mv-sec	31113	7274	1609
Calc. Conc., ppm	12.6	5.85	2.64
% Error	-0.7	1.4	-0.7

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8927	2.4098	0.9999	2	0.077

DMDS	1	2	3
Time	07:00	11:03	11:47
Concentration, ppm	6.42	2.92	1.34
Area, mv-sec	38526	8798	1967
Calc. Conc., ppm	6.39	2.94	1.34
% Error	-0.4	0.8	-0.4

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9009	3.0543	>0.9999	2	0.036

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**
Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **22 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	16.0	22.5	48.0	127.0
Peak Detection Window, sec	3.0	7.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	2.0	3.0
Ending Peak Width, sec	2.0	6.0	4.0	5.0
Permeation Device ID	T-51828	33-53274	89-53332	89-53266
Permeation Rate, ng/min	483 ✓	716 ✓	1197 ✓	918 ✓
Permeation Rate, nL/min*	351	369	477	241

Barometric Pressure: 29.25 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 483 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.25)$$
$$= 351 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **22 Jun 2021**

File: C:\Data\210623 New Indy Catawba No. 1 CB.trs
Program Version: 2.0, built 15 May 2017 **File Version:** 2.0
Computer: WLT5 **Trailer:** 281

Analog Input Device: MCC USB-1608G **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: Shimadzu GC8-A **Serial No.** C10493615061
Detector Range: 10

Gases	**Press. psi**	**Flow mL/min**
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 140
Detector: 140

Columns

Primary: Carbopack
Secondary: N/A
Sample Loop: 4"

Injection Cycle

Total Length: 180 sec **Sampling Time:** 170 sec **Load/Backflush Time:** 80 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 2 mv-sec **Minimum peak height** 1 mv above baseline

Dynacalibrator

Chamber Temperature 50.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.25 in. Hg

RUN SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 11:58 to 12:58

Run Averages

	11.9	7.8	190

Pre-run Bias at 10:56

Zero Bias	0.0	0.0	6
Span Bias	10.0	10.1	234
Span Gas	10.1	10.2	242

Post-run Bias at 13:01

Zero Bias	0.0	0.0	3
Span Bias	10.0	10.2	235
Span Gas	10.1	10.2	242

Run averages corrected for the average of the pre-run and post-run bias

	12.1 ✓	7.8 ✓	195 ✓

RUN SUMMARY
Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 14:00 to 15:00

Run Averages

11.3	8.4	267

Pre-run Bias at 13:01

Zero Bias	0.0	0.0	3
Span Bias	10.0	10.2	235
Span Gas	10.1	10.2	242

Post-run Bias at 15:04

Zero Bias	0.0	0.0	5
Span Bias	10.0	10.2	232
Span Gas	10.1	10.2	242

Run averages corrected for the average of the pre-run and post-run bias

11.4 ✓	8.4 ✓	278 ✓

RUN SUMMARY

Number 3

Client: New Indy
Location: Catawba, SC
Source: No. 1 Combination Boiler

Calibration **1**

Project Number: 15730.001.008
Operator: VD
Date: 23 Jun 2021

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 15:41 to 16:41

Run Averages

11.9	7.7	328

Pre-run Bias at 15:04

Zero Bias	0.0	0.0	5
Span Bias	10.0	10.2	232
Span Gas	10.1	10.2	242

Post-run Bias at 16:43

Zero Bias	0.0	0.0	8
Span Bias	10.0	10.1	234
Span Gas	10.1	10.2	242

Run averages corrected for the average of the pre-run and post-run bias

12.0 ✓	7.7 ✓	344 ✓

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %	SO_2 mv	SO_2 ppm
			With NCGs & SOGs			
11:59	3900	11.7	3282	8.1	1867	187
12:00	3863	11.6	3222	8.0	1924	193
12:01	3790	11.4	3276	8.1	1958	196
12:02	3761	11.3	3348	8.3	1906	191
12:03	3751	11.3	3375	8.4	2086	209
12:04	3680	11.1	3408	8.4	2212	221
12:05	3691	11.1	3474	8.6	2000	200
12:06	3760	11.3	3448	8.5	1798	180
12:07	3833	11.5	3382	8.4	1847	185
12:08	3834	11.5	3295	8.2	2034	204
12:09	3821	11.5	3293	8.2	1797	180
12:10	3851	11.6	3318	8.2	1571	157
12:11	3980	12.0	3262	8.1	1774	178
12:12	3983	12.0	3137	7.8	2126	213
12:13	3919	11.8	3133	7.8	1792	179
12:14	3885	11.7	3214	8.0	1646	165
12:15	3860	11.6	3254	8.1	1719	172
12:16	3866	11.6	3283	8.1	2175	218
12:17	3926	11.8	3265	8.1	1905	191
12:18	3922	11.8	3213	8.0	1762	176
12:19	3964	11.9	3196	7.9	1725	173
12:20	3881	11.7	3159	7.8	2045	205
12:21	3855	11.6	3258	8.1	1724	173
12:22	3833	11.5	3284	8.1	1640	164
12:23	3786	11.4	3320	8.2	1587	159
12:24	3736	11.2	3393	8.4	1703	171
12:25	3781	11.4	3417	8.5	1742	174
12:26	3832	11.5	3385	8.4	2014	202
12:27	3915	11.8	3304	8.2	2371	237
12:28	3987	12.0	3201	7.9	2116	212
12:29	4032	12.1	3129	7.7	1853	186
12:30	4020	12.1	3071	7.6	1840	184
12:31	4069	12.2	3094	7.7	1730	173
12:32	4170	12.5	3022	7.5	1955	196
12:33	4165	12.5	2923	7.2	2007	201
12:34	4124	12.4	2922	7.2	2005	201
12:35	4074	12.2	2964	7.3	1810	181
12:36	3934	11.8	3074	7.6	1686	169
12:37	4072	12.2	3177	7.9	1563	157
12:38	4120	12.4	3031	7.5	1849	185

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
12:39	4123	12.4	2977	7.4	1979	198
12:40	4133	12.4	2988	7.4	2012	201
12:41	4185	12.6	2968	7.3	2015	202
12:42	4155	12.5	2913	7.2	2126	213
12:43	4172	12.5	2937	7.3	1950	195
12:44	4138	12.4	2910	7.2	1824	183
12:45	4104	12.3	2957	7.3	1653	166
12:46	4044	12.2	3000	7.4	1704	171
12:47	4064	12.2	3066	7.6	1845	185
12:48	4058	12.2	3025	7.5	2033	204
12:49	4059	12.2	3032	7.5	2065	207
12:50	3992	12.0	3048	7.5	2185	219
12:51	3995	12.0	3098	7.7	1898	190
12:52	3948	11.9	3120	7.7	1851	185
12:53	3920	11.8	3168	7.8	1716	172
12:54	4018	12.1	3188	7.9	1784	179
12:55	4016	12.1	3083	7.6	1767	177
12:56	4035	12.1	3093	7.7	2146	215
12:57	4119	12.4	3045	7.5	2036	204
12:58	3998	12.0	2974	7.4	2112	211
Avgs	**3958**	**11.9**	**3163**	**7.8**	**1893**	**190**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
			With NCGs & SOGs			
14:01	3839	11.5	3272	8.1	2531	253
14:02	3807	11.4	3265	8.1	2546	255
14:03	3771	11.3	3316	8.2	2586	259
14:04	3824	11.5	3336	8.3	2244	225
14:05	3869	11.6	3286	8.1	2280	228
14:06	3857	11.6	3237	8.0	2369	237
14:07	3877	11.7	3252	8.1	2484	249
14:08	3817	11.5	3243	8.0	2715	272
14:09	3876	11.6	3274	8.1	2888	289
14:10	3924	11.8	3230	8.0	2684	269
14:11	3921	11.8	3177	7.9	2684	269
14:12	3909	11.7	3190	7.9	2553	255
14:13	3937	11.8	3191	7.9	2517	252
14:14	3899	11.7	3186	7.9	2571	257
14:15	3890	11.7	3216	8.0	2628	263
14:16	3916	11.8	3216	8.0	2624	263
14:17	3953	11.9	3184	7.9	2827	283
14:18	3882	11.7	3161	7.8	2785	279
14:19	3926	11.8	3241	8.0	2595	260
14:20	3954	11.9	3188	7.9	2549	255
14:21	3913	11.8	3179	7.9	2660	266
14:22	3826	11.5	3223	8.0	2581	258
14:23	3841	11.5	3305	8.2	2659	266
14:24	3790	11.4	3301	8.2	2699	270
14:25	3718	11.2	3369	8.3	2726	273
14:26	3711	11.2	3451	8.5	2690	269
14:27	3692	11.1	3459	8.6	2695	270
14:28	3734	11.2	3475	8.6	2680	268
14:29	3804	11.4	3419	8.5	2589	259
14:30	3777	11.4	3364	8.3	2496	250
14:31	3773	11.3	3404	8.4	2606	261
14:32	3757	11.3	3415	8.5	2632	263
14:33	3727	11.2	3442	8.5	2919	292
14:34	3736	11.2	3444	8.5	2571	257
14:35	3781	11.4	3449	8.5	2658	266
14:36	3750	11.3	3409	8.4	2695	270
14:37	3754	11.3	3435	8.5	2600	260
14:38	3764	11.3	3425	8.5	2717	272
14:39	3729	11.2	3411	8.4	2657	266
14:40	3712	11.2	3456	8.6	2841	284

RUN DATA
Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %	SO_2 mv	SO_2 ppm
14:41	3705	11.1	3477	8.6	2668	267
14:42	3704	11.1	3502	8.7	2632	263
14:43	3614	10.9	3515	8.7	2647	265
14:44	3571	10.7	3595	8.9	2726	273
14:45	3562	10.7	3663	9.1	2741	274
14:46	3616	10.9	3663	9.1	2750	275
14:47	3573	10.7	3607	8.9	2798	280
14:48	3562	10.7	3656	9.1	2813	281
14:49	3547	10.7	3674	9.1	2724	273
14:50	3566	10.7	3677	9.1	2747	275
14:51	3524	10.6	3670	9.1	2747	275
14:52	3546	10.7	3692	9.1	2775	278
14:53	3562	10.7	3665	9.1	2816	282
14:54	3647	11.0	3638	9.0	2834	283
14:55	3675	11.0	3551	8.8	2831	283
14:56	3719	11.2	3517	8.7	2870	287
14:57	3702	11.1	3465	8.6	2874	287
14:58	3633	10.9	3502	8.7	2843	284
14:59	3574	10.7	3585	8.9	2752	275
15:00	3555	10.7	3653	9.0	2685	269
Avgs	**3752**	**11.3**	**3408**	**8.4**	**2672**	**267**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
			With NCGs & SOGs			
15:42	4136	12.4	2870	7.1	3026	303
15:43	4071	12.2	2928	7.2	3074	307
15:44	4049	12.2	3004	7.4	3120	312
15:45	4035	12.1	3027	7.5	3280	328
15:46	4047	12.2	3040	7.5	3270	327
15:47	4051	12.2	3019	7.5	3290	329
15:48	4015	12.1	3040	7.5	3264	326
15:49	4082	12.3	3054	7.6	3137	314
15:50	4117	12.4	2977	7.4	3095	310
15:51	4104	12.3	2957	7.3	3214	321
15:52	4135	12.4	2964	7.3	3224	322
15:53	4140	12.4	2932	7.3	3344	334
15:54	4138	12.4	2915	7.2	3399	340
15:55	4106	12.3	2932	7.3	3363	336
15:56	4063	12.2	2994	7.4	3173	317
15:57	4114	12.4	3005	7.4	3187	319
15:58	4132	12.4	2957	7.3	3179	318
15:59	4110	12.3	2944	7.3	3291	329
16:00	4076	12.2	2962	7.3	3350	335
16:01	4024	12.1	2991	7.4	3535	354
16:02	3989	12.0	3045	7.5	3492	349
16:03	3964	11.9	3078	7.6	3329	333
16:04	3894	11.7	3119	7.7	3219	322
16:05	3891	11.7	3203	7.9	3140	314
16:06	3890	11.7	3201	7.9	3140	314
16:07	3924	11.8	3199	7.9	3199	320
16:08	3909	11.7	3164	7.8	3403	340
16:09	3980	12.0	3167	7.8	3447	345
16:10	4005	12.0	3080	7.6	3467	347
16:11	3861	11.6	3083	7.6	3388	339
16:12	3879	11.7	3229	8.0	3208	321
16:13	3969	11.9	3183	7.9	3121	312
16:14	3971	11.9	3125	7.7	3072	307
16:15	3936	11.8	3132	7.8	3222	322
16:16	3807	11.4	3166	7.8	3439	344
16:17	3780	11.4	3260	8.1	3402	340
16:18	3834	11.5	3267	8.1	3296	330
16:19	3881	11.7	3195	7.9	3290	329
16:20	3837	11.5	3164	7.8	3238	324
16:21	3863	11.6	3204	7.9	3166	317

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %	SO_2 mv	SO_2 ppm
16:22	3910	11.7	3171	7.8	3172	317
16:23	3944	11.9	3114	7.7	3336	334
16:24	3939	11.8	3081	7.6	3447	345
16:25	3907	11.7	3099	7.7	3383	338
16:26	3911	11.8	3120	7.7	3174	317
16:27	3901	11.7	3127	7.7	3171	317
16:28	3942	11.8	3118	7.7	3189	319
16:29	3912	11.8	3090	7.6	3130	313
16:30	3878	11.7	3125	7.7	3413	341
16:31	3870	11.6	3148	7.8	3486	349
16:32	3793	11.4	3185	7.9	3451	345
16:33	3776	11.3	3259	8.1	3293	329
16:34	3811	11.5	3273	8.1	3258	326
16:35	3879	11.7	3232	8.0	3214	321
16:36	3893	11.7	3160	7.8	3237	324
16:37	3862	11.6	3146	7.8	3276	328
16:38	3858	11.6	3180	7.9	3413	341
16:39	3853	11.6	3181	7.9	3370	337
16:40	3856	11.6	3182	7.9	3339	334
16:41	3808	11.4	3190	7.9	3338	334
Avgs	**3955**	**11.9**	**3099**	**7.7**	**3276**	**328**

BIAS
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 08:43

O_2
Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	4	0.0	0.0	0.0	Pass
Span	10.1	3346	10.1	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	24	0.0	0.0	0.0	Pass
Span	10.2	4072	10.1	-0.1	-0.5	Pass

SO_2
Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	80	8	7	1.5	Pass
Span	239	2334	234	-5	-1.1	Pass

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 10:56

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	**Cal. %**	**Response mv**	**Bias %**	**Difference %**	**Error %**	**Status**
Zero	0.0	9	0.0	0.0	0.0 ✓	Pass
Span	10.1	3325	10.0	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard	**Initial***	**Final**		**Difference**	**Drift**	
Gas	**%**	**mv**	**%**	**%**	**%**	**Status**
Zero	0.0	9	0.0	0.0	0.0 ✓	Pass
Span	10.1	3325	10.0	-0.1	-0.5 ✓	Pass

*Bias No. 1

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	**Cal. %**	**Response mv**	**Bias %**	**Difference %**	**Error %**	**Status**
Zero	0.0	7	0.0	0.0	0.0 ✓	Pass
Span	10.2	4076	10.1	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard	**Initial***	**Final**		**Difference**	**Drift**	
Gas	**%**	**mv**	**%**	**%**	**%**	**Status**
Zero	0.0	7	0.0	0.0	0.0 ✓	Pass
Span	10.1	4076	10.1	0.0	0.0 ✓	Pass

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 10:56

SO_2
Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %		Status
Zero	1	52	6	5	1.1	✓	Pass
Span	239	2334	234	-5	-1.1	✓	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %		Status
Zero	8	52	6	-2	-0.4	✓	Pass
Span	234	2334	234	0	0.0	✓	Pass

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 13:01

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard	Cal.	Response	Bias	Difference	Error	
Gas	%	mv	%	%	%	Status
Zero	0.0	9	0.0	0.0	0.0 ✓	Pass
Span	10.1	3337	10.0	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	%	mv	%	%	%	Status
Zero	0.0	9	0.0	0.0	0.0 ✓	Pass
Span	10.0	3337	10.0	0.0	0.0 ✓	Pass

*Bias No. 2

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard	Cal.	Response	Bias	Difference	Error	
Gas	%	mv	%	%	%	Status
Zero	0.0	17	0.0	0.0	0.0 ✓	Pass
Span	10.2	4108	10.2	0.0	0.0 ✓	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	%	mv	%	%	%	Status
Zero	0.0	17	0.0	0.0	0.0 ✓	Pass
Span	10.1	4108	10.2	0.1	0.5 ✓	Pass

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 13:01

SO_2
Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	23	3	2	0.4 ✓	Pass
Span	239	2346	235	-4	-0.9 ✓	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	6	23	3	-3	-0.7 ✓	Pass
Span	234	2346	235	1	0.2 ✓	Pass

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 15:04

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard	Cal.	Response	Bias	Difference	Error	
Gas	**%**	**mv**	**%**	**%**	**%**	**Status**
Zero	0.0	9	0.0	0.0	0.0 ✓	Pass
Span	10.1	3341	10.0	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	**%**	**mv**	**%**	**%**	**%**	**Status**
Zero	0.0	9	0.0	0.0	0.0 ✓	Pass
Span	10.0	3341	10.0	0.0	0.0 ✓	Pass

*Bias No. 3

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard	Cal.	Response	Bias	Difference	Error	
Gas	**%**	**mv**	**%**	**%**	**%**	**Status**
Zero	0.0	8	0.0	0.0	0.0 ✓	Pass
Span	10.2	4109	10.2	0.0	0.0 ✓	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	**%**	**mv**	**%**	**%**	**%**	**Status**
Zero	0.0	8	0.0	0.0	0.0 ✓	Pass
Span	10.2	4109	10.2	0.0	0.0 ✓	Pass

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 15:04

SO_2
Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %		Status
Zero	1	41	5	4	0.9	✓	Pass
Span	239	2322	232	-7	-1.5	✓	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %		Status
Zero	3	41	5	2	0.4	✓	Pass
Span	235	2322	232	-3	-0.7	✓	Pass

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 16:43

O2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	6	0.0	0.0	0.0 ✓	Pass
Span	10.1	3335	10.0	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	6	0.0	0.0	0.0 ✓	Pass
Span	10.0	3335	10.0	0.0	0.0 ✓	Pass

*Bias No. 4

CO2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	12	0.0	0.0	0.0 ✓	Pass
Span	10.2	4067	10.1	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	12	0.0	0.0	0.0 ✓	Pass
Span	10.2	4067	10.1	-0.1	-0.5 ✓	Pass

*Bias No. 4

BIAS AND CALIBRATION DRIFT

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 16:43

SO_2

Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	79	8	7	1.5 ✓	Pass
Span	239	2341	234	-5	-1.1 ✓	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	**ppm**	**mv**	**ppm**	**ppm**	**%**	**Status**
Zero	5	79	8	3	0.7 ✓	Pass
Span	232	2341	234	2	0.4 ✓	Pass

*Bias No. 4

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 08:37

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero ✓	-	3
10.1	XC013544B	3354
20.2 ✓	CC275468	6750

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
333.3 ✓	-7 ✓	>0.9999 ✓

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero ✓	-	4
10.2	XC013544B	4128
20.3 ✓	CC275468	8145

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
401.6 ✓	18 ✓	>0.9999 ✓

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 08:37

SO_2

Method: EPA 6C
Calibration Type: Linear Regression

Calibration Results

ppm	Cylinder ID	Result, mv
Zero	-	9
242	CC234516	2392
458	EB0108003	4596

Curve Coefficients

Slope	Intercept	Corr. Coeff.
10.01	-5	0.9999

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 08:37

O_2

Method: EPA 3A
Span Conc. 20.2 %
Slope 333.3 **Intercept** -6.7

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	3	0.0	0.0	0.0 ✓	Pass
10.1	3354	10.1	0.0	0.0 ✓	Pass
20.2	6750	20.3	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A
Span Conc. 20.3 %
Slope 401.6 **Intercept** 18.5

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	4	0.0	0.0	0.0 ✓	Pass
10.2	4128	10.2	0.0	0.0 ✓	Pass
20.3	8145	20.2	-0.1	-0.5 ✓	Pass

SO_2

Method: EPA 6C
Span Conc. 458 ppm
Slope 10.01 **Intercept** -5

Standard ppm	Response mv	Result ppm	Difference ppm	Error %	Status
Zero	9	1	1	0.2 ✓	Pass
242	2392	239	-3	-0.7 ✓	Pass
458	4596	459	1	0.2 ✓	Pass

METHODS AND ANALYZERS

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 1 Combination Boiler**	Date:	**23 Jun 2021**

File: K:\15730 New Indy\001 Catawba SC\008\Data\210623 New Indy Catawba No. 1 CBb.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: WSAUBCHEMLABGC1 **Trailer:** 281
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T802 s/n: 172**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.2**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T802 s/n: 172**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.3**

Channel 5

Analyte	**SO_2**
Method	**EPA 6C**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T100H SN 374**
Full-Scale Output, mv	**10000**
Analyzer Range, ppm	**500**
Span Concentration, ppm	**458**

NO. 1 COMBINATION BOILER
(CONDITION 2: NCG GASES ONLY)

New Indy
Catawba, SC

15730.001.008
No. 1 Combination Boiler
Condition 2: NCGs only

EMISSION CALCULATIONS

		Run 1	**Run 2**	**Run 3**	**Mean**
Date		**6/23/21**	**6/23/21**	**6/23/21**	---
Time Began		**1824**	**2019**	**2202**	---
Time Ended		**1924**	**2119**	**2302**	---
Volumetric Flow Rate, (Qs), DSCFM		1.30E+05	1.31E+05	1.30E+05	1.30E+05
BWS		0.164	0.163	0.171	0.166
% Oxygen		11.4	11.9	11.6	11.6
Sulfur Dioxide	MW= 64.06				
Concentration, ppm		313.0	348.0	349.0	336.7
Emission Rate, lb/hr		404.4	452.9	450.8	436.1
Total Reduced Sulfur	(TRS MW)= 34.08				
Concentration, ppm		0.63	0.60	0.67	0.63
Emission Rate, lb/hr		0.43	0.42	0.46	0.44

New Indy
Catawba, SC

15730.001.008
No. 1 Combination Boiler

Condition 2: NCGs only

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/23/21	6/23/21	6/23/21	---
Time Began		1824	2019	2202	---
Time Ended		1951	2145	2325	---
INPUT DATA					
Sampling Time, min	(Theta)	64.0	64	64	64
Stack Diameter, in.	(Dia.)	120.00	120.00	120.00	120.00
Barometric Pressure, in. Hg	(Pb)	29.45	29.45	29.45	29.45
Static Pressure, in. H2O	(Pg)	-0.65	-0.65	-0.65	-0.65
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	0.9880	0.9880	0.9880	0.9880
Orifice Calibration Value	(Delta H@)	1.7320	1.7320	1.7320	1.7320
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	42.643	42.125	41.764	42.177
Meter Temperature, °F	(Tm)	94.1	85.2	77.6	85.6
Meter Temperature, °R	(Tm-R)	554.1	545.2	537.6	545.6
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	165.5	165.0	175.8	168.8
CO2 Concentration, %	(CO2)	8.3	7.8	8.1	8.1
O2 Concentration, %	(O2)	11.4	11.9	11.6	11.6
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	0.748	0.750	0.753	0.750
Stack Temperature, °F	(Ts)	415.7	411.3	415.1	414.0
Stack Temperature, °R	(Ts-R)	875.7	871.3	875.1	874.0
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	78.54	78.54	78.54	78.54
Stack Pressure, in. Hg	(Ps)	29.40	29.40	29.40	29.40
Meter Pressure, in. Hg	(Pm)	29.55	29.55	29.55	29.55
Standard Meter Volume, ft^3	(Vmstd)	39.631	39.788	40.006	39.808
Standard Water Volume, ft^3	(Vwstd)	7.790	7.767	8.275	7.944
Moisture Fraction (Measured)	(BWS)	0.164	0.163	0.171	0.166
Moisture Fraction (lower sat/meas)	(BWS)	0.164	0.163	0.171	0.166
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	29.78	29.72	29.76	29.76
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	27.85	27.81	27.74	27.80
Average Stack Gas Velocity, ft/sec	(Vs)	55.53	55.61	55.97	55.70
Stack Gas Flow, actual, ft^3/min	(Qa)	261702	262033	263755	262497
Stack Gas Flow, Std , ft^3/min	(Qs)	129539	130503	129526	129856
Calibration check	(Yqa)	0.9922	0.9973	0.9983	0.996
Percent difference from Y					0.80%

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 1 Combination Boiler
Sample Location Stack outlet
W. O. Number 15730.001.008
Run Number 1
Date 6/23/21
Test Personnel AK/LC
Sample Time 64 min.

Console ID A010
Meter Corr., Y .988
Console ΔH@ 1.732
Probe ID/Length PR5B 5'
Liner Material SS
Pitot ID/Coeff. P172 0.84
Thermo ID A010
Nozzle ID/Diams. .250 .250 .250 .250
Avg. Nozzle Diam. .250 in.

Ambient Temp. 85 °F
Baro. Pressure* 29.45 in. Hg
Static Pressure -.65 in. H_2O
Impinger Gain 156.2 mL 165.5
Silica Gel Gain 9.3 g
Stack Area 78.54 ft²
Total Traverse Points 16

K Factor NA

Leak Checks

	Initial	Final
Volume, ft³	.004	.002
@ Vac., in. Hg	8	5
Pitot	.000	.000

Filter ID NA
Sample ID Run 1 NCG only

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	18:24			967.500									
A-1 B	4		.59	1.3	970.1	416		95	237	250		66	2	
2	8		.60	1.3	972.8	416		95	238	252		63	2	
3	12		.61	1.3	975.5	415		95	238	255		63	2	
4	16	18:40	.43 ~~.50~~ AK	1.3	978.1	415		95	238	254		61	2	
~~B~~-1 A	20	18:46	.55	1.3	981.0	416		96	237	250		64	2.5	
2	24		.49	1.3	983.4	416		96	238	251		62	2.5	
3	28		.43	1.3	986.1	415		96	239	252		63	2.5	
4	32	19:02	.37	1.3	988.8	415		95	240	251		64	2.5	
~~C~~-1 D	36	19:08	.70	1.3	991.5	415		94	235	250		66	2.5	
2	40		.69	1.3	994.1	417		94	236	251		65	2.5	
3	44		.48	1.3	997.3	417		94	235	250		66	2.5	
4	48	19:24	.40	1.3	999.5	415		94	236	252		65	2.5	
~~D~~-1 C	52	19:35	.74	1.3	1002.3	417		92	238	255		64	2.5	
2	56		.72	1.3	1004.7	416		92	239	256		63	2.5	
3	60		.70	1.3	1007.4	416		91	239	257		64	2.5	
4	64	19:51	.55	1.3	1016.143	414		91	240	256		64	3	

*Barometric Pressure is at port elevation

Avg √Δp .7478 ✓
.5656 ✓
AB 7/11
Avg ΔH 1.3 ✓
Avg √ΔH 1.146 ✓
Total Volume 42.643 ✓
Avg T_s 415.689 ✓
AB 7/11
Avg T_m 94.06 ✓
Min/Max 235/240 ✓
Min/Max 250/257 ✓
Min/Max ✓
Max Temp 66 ✓
Max Vac 3 ✓
V_{m-std}, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp., °F
Result

Comments NCG only

WESTON SOLUTIONS®
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Isokinetic Field Data

Method: EPA 4, Moisture

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Client	New Indy	Console ID	A010
Location/Plant	Catawba, SC	Meter Corr., Y	.988
Source	No. 1 Combination Boiler	Console ΔH@	1.732
Sample Location	stack outlet	Probe ID/Length	PR5B 5'
W. O. Number	15730.001.008	Liner Material	SS
Run Number	2	Pitot ID/Coeff.	P172 0.84
Date	6/23/21	Thermo ID	A010
Test Personnel	AtR / LL	Nozzle ID/Diams.	.256 .250 .250 .256
Sample Time	64 min.	Avg. Nozzle Diam.	.250 in.

Ambient Temp. 80 °F
Baro. Pressure* 29.45 in. Hg
Static Pressure -.65 in. H_2O
Impinger Gain 153 mL
Silica Gel Gain 12 g 165
Stack Area 78.54 ft^2
Total Traverse Points 16

K Factor NA

Leak Checks

	Initial	Final
Volume, ft^3	.005	.003
@ Vac., in. Hg	8	5
Pitot	.000	.000

Filter ID NA
Sample ID Run 2 NCG only

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0 AtR	8:19			10.400									
~~A~~-1 B	4	20:19	.58	1.3	13.0	412		89	236	257		65	2	
2	8		.54	1.3	15.4	411		84	237	257		64	2	
3	12		.60	1.3	18.4	410		88	238	256		61	2	
4	16	20:35	.46	1.3	21.2	410		88	234	255		56	2	
~~B~~-1 A	AtR 20	20:41 ~~20:35~~	.51	1.3	23.4 ~~22.4~~ AtR	413		87	238	254		57	2	
2	24		.50	1.3	26.6	413		87	239	255		55	2	
3	28		.45	1.3	28.9	411		86	239	256		56	2	
4	32	20:57	.36	1.3	31.5	410		86	240	255		56	2	
~~C~~-1 D	36	21:02	.71	1.3	34.3	412		86	236	256		62	2	
2	40		.69	1.3	36.9	412		86	235	255		59	2	
3	44		.48	1.3	39.5	413		84	236	253		58	2	
4	48	21:18	.39	1.3	42.6	410		83	235	254		59	2	
~~D~~-1 C	52	21:29	.75	1.3	45.1	411		81	236	253		59	2	
2	56		.71	1.3	47.5	411		81	235	254		60	2	
3	60	21:45	.71	1.3	49.9	412		81	235	255		66	2	
4	64	~~21:48~~	.53	1.3	52.525	416		81	236	256		61	2	
*Barometric Pressure is at port elevation AtR			Avg √Δp .7501	Avg ΔH 1.3	Total Volume 42.125	Avg T_s 411.31		Avg T_m 85.19	Min/Max 235/240	Min/Max 253/257	Min/Max	Max Temp 65	Max Vac 2	V_{m-std}, scf
			AM 711 .56878	Avg √ΔH 1.140										

Comments NCG only

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A AM 711
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by AM

WESTON SOLUTIONS®
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Isokinetic Field Data

Method: EPA 4, Moisture

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Client New Indy
Location/Plant Catawba, SC
Source No. 1 Combination Boiler
Sample Location stack outlet
W. O. Number 15730.001.008
Run Number 3
Date 6/23/21
Test Personnel ATR / CL
Sample Time 64 min.

Console ID A010
Meter Corr., Y .988
Console ΔH@ 1.732
Probe ID/Length PR5B 5'
Liner Material SS
Pitot ID/Coeff. P172 0.84
Thermo ID A010
Nozzle ID/Diams. .250 | .250 | .250 | .250
Avg. Nozzle Diam. .250 in.

Ambient Temp. 75 °F
Baro. Pressure* 29.45 in. Hg
Static Pressure -.65 in. H_2O
Impinger Gain 166 mL
Silica Gel Gain 9.8 g 175.8
Stack Area 78.54 ft²
Total Traverse Points 16

K Factor	NA

Leak Checks

	Initial	Final
Volume, ft³	.002	.000
@ Vac., in. Hg	8	5
Pitot	.000	.000

Filter ID NA
Sample ID Run 3 NCG only

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	22:02			52.800									
~~A~~-1 B	4		.60	1.3	55.5	417		78	~~250~~ 230	255		62	2	
2	8		.61	1.3	58.1	416		78	234	253		59	2	
3	12		.59	1.3	60.6	415		78	235	253		57	2	
4	16	22:18	.45	1.3	63.3	411		78	235	254		57	2	
~~B~~-1 A	20	22:25	.57	1.3	65.8	415		79	236	253		64	2	
2	24		.50	1.3	68.3	415		78	237	252		58	2	
3	28		.43	1.3	71.1	416		78	239	253		58	2	
4	32	22:41	.39	1.3	73.7	412		77	240	253		58	2	
~~C~~-1 D	36	22:47	.73	1.3	76.2	417		77	240	256		63	2	
2	40		.70	1.3	79.0	418		78	237	255		54	2	
3	44		.48	1.3	81.6	417		78	238	254		54	2	
4	48	23:03	.42	1.3	84.1	416		78	239	255		55	2	
~~D~~-1 C	52	23:09	.73	1.3	86.7	416		77	240	256		60	2	
2	56		.70	1.3	89.3	415		77	242	255		57	2	
3	60		.68	1.3	92.0	414		76	240	256		56	2	
4	64	23:25	.57	1.3	94.564	412		76	239	255		56	2	

*Barometric Pressure is at port elevation

Avg √Δp	Avg ΔH	Total Volume	Avg T_s		Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac
.75295	1.3	41.764	415.13		77.56	230/242	252/256		64	2
.57189	Avg √ΔH 1.140									

AB 7/11

V_{m-std}, scf
Q_s, dscfm
% Isokinetic
Calculated by
QC by AB

Comments NCG only

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

WESTON SOLUTIONS®
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Sample Recovery Field Data

Method: EPA 4, Moisture

Client New Indy
Location/Plant Catawba, SC

Source No. 1 Combination Boiler
W.O. Number 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample ID Run 21 NCG only
Sample Date 6/23/21
Filter ID NA
Recovery Date 6/23/21
Analyst ATR

	Impingers 1	Impingers 2	Impingers 3		Imp.Total	Silica Gel	Total
Contents						grams	
Final	806.1	745.3	651.3			942.4	
Initial	674.8	725.0	646.7		✓	933.1	
Gain	131.3 ✓	20.3 ✓	4.6 ✓		156.2	9.3 ✓	165.5 ✓

Impinger Color clear
Silica Gel Condition used
Labled? ✓
Sealed? ✓

Run No. 2
Sample ID Run 2 NCG only
Sample Date 6/23/21
Filter ID NA
Recovery Date 6/23/21
Analyst ATR

	Impingers 1	Impingers 2	Impingers 3		Imp.Total	Silica Gel	Total
Contents						grams	
Final	898.4	751.2	639.3			897.6	
Initial	770	730.7	635.2		✓	885.6	
Gain	128.4 ✓	20.5 ✓	4.1 ✓		153	12 ✓	165 ✓

Impinger Color Clear
Silica Gel Condition used
Labled? ✓
Sealed? ✓

Run No. 3
Sample ID Run3 NCG Only
Sample Date 6/23/21
Filter ID NA
Recovery Date 6/23/21
Analyst ATR

	Impingers 1	Impingers 2	Impingers 3		Imp.Total	Silica Gel	Total
Contents	843.1					grams	
Final	~~841.8~~	761.2	655.2			891.8	
Initial	696.9	745.3	651.3		✓	882.0	
Gain	146.2 ✓	15.9 ✓	3.9 ✓		166	9.8 ✓	175.8 ✓

Impinger Color Clear
Silica Gel Condition used
Labled? ✓
Sealed? ✓

Check COC for Sample IDs of Media Blanks

WESTON SOLUTIONS
Integrated Air Services

RUN SUMMARY

Number 4

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time 18:24 **End Time** 19:24

Average Measured TRS Conc.	0.58 **ppm**	✓
Recovery No. 3	91.7 **%**	✓
TRS Corrected for Recovery	0.63 **ppm**	✓

RUN SUMMARY

Number 5

Client:	**New Indy**			Project Number:	**15730.001.008**
Location:	**Catawba, NC**	Method	**16**	Operator:	**VD**
Source:	**#1 Combination Boiler**	Calibration	**1**	Date:	**23 Jun 2021**

Start Time 20:19 **End Time** 21:19

Average Measured TRS Conc.	0.55 **ppm** ✓
Recovery No. 3	91.7 **%** ✓
TRS Corrected for Recovery	0.60 **ppm** ✓

✓

RUN SUMMARY

Number 6

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time 22:02 **End Time** 23:02

Average Measured TRS Conc.	0.61 **ppm** ✓
Recovery No. 3	91.7 **%** ✓
TRS Corrected for Recovery	0.67 **ppm** ✓

RUN DATA
Number 4

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	**H_2S**		**MeSH**		**DMS**		**DMDS**		**TRS**
	area	**ppm**	**area**	**ppm**	**area**	**ppm**	**area**	**ppm**	**ppm**
18:24	3	0.07	34	0.52	<2	<0.16	<2	<0.071	0.59
18:27	<2	<0.064	32	0.50	<2	<0.16	<2	<0.071	0.50
18:30	<2	<0.064	32	0.51	<2	<0.16	<2	<0.071	0.51
18:33	<2	<0.064	31	0.49	<2	<0.16	<2	<0.071	0.49
18:36	3	0.07	31	0.50	3	0.21	<2	<0.071	0.78
18:39	<2	<0.064	32	0.51	<2	<0.16	<2	<0.071	0.51
18:42	<2	<0.064	32	0.51	<2	<0.16	<2	<0.071	0.51
18:45	<2	<0.064	33	0.52	<2	<0.16	<2	<0.071	0.52
18:48	<2	<0.064	32	0.50	<2	<0.16	<2	<0.071	0.50
18:51	<2	<0.064	34	0.52	<2	<0.16	4	0.10	0.72
18:54	<2	<0.064	33	0.52	<2	<0.16	<2	<0.071	0.52
18:57	<2	<0.064	34	0.52	<2	<0.16	<2	<0.071	0.52
19:00	2	0.07	36	0.53	<2	<0.16	<2	<0.071	0.60
19:03	<2	<0.064	36	0.54	<2	<0.16	<2	<0.071	0.54
19:06	2	0.06	34	0.53	2	0.18	<2	<0.071	0.77
19:09	3	0.07	35	0.53	<2	<0.16	<2	<0.071	0.60
19:12	<2	<0.064	35	0.53	<2	<0.16	<2	<0.071	0.53
19:15	<2	<0.064	35	0.53	<2	<0.16	<2	<0.071	0.53
19:18	2	0.07	35	0.53	<2	<0.16	2	0.08	0.75
19:21	2	0.07	36	0.54	<2	<0.16	<2	<0.071	0.61
Average		**<0.064**		**0.52**		**<0.16**		**<0.071**	**0.58** ✓

RUN DATA

Number 5

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
20:19	2	0.06	32	0.51	<2	<0.16	<2	<0.071	0.57
20:22	<2	<0.064	29	0.48	<2	<0.16	<2	<0.071	0.48
20:25	<2	<0.064	31	0.50	<2	<0.16	<2	<0.071	0.50
20:28	<2	<0.064	33	0.51	<2	<0.16	<2	<0.071	0.51
20:31	<2	<0.064	33	0.52	<2	<0.16	<2	<0.071	0.52
20:34	<2	<0.064	32	0.51	<2	<0.16	<2	<0.071	0.51
20:37	<2	<0.064	32	0.50	<2	<0.16	<2	<0.071	0.50
20:40	<2	<0.064	33	0.51	<2	<0.16	<2	<0.071	0.51
20:43	<2	<0.064	33	0.52	<2	<0.16	<2	<0.071	0.52
20:46	<2	<0.064	33	0.51	4	0.24	6	0.13	1.01
20:49	<2	<0.064	34	0.52	<2	<0.16	<2	<0.071	0.52
20:52	<2	<0.064	32	0.50	<2	<0.16	<2	<0.071	0.50
20:55	3	0.08	35	0.53	<2	<0.16	<2	<0.071	0.61
20:58	<2	<0.064	34	0.52	<2	<0.16	<2	<0.071	0.52
21:01	<2	<0.064	35	0.53	<2	<0.16	<2	<0.071	0.53
21:04	<2	<0.064	34	0.52	<2	<0.16	<2	<0.071	0.52
21:07	<2	<0.064	36	0.54	<2	<0.16	<2	<0.071	0.54
21:10	<2	<0.064	37	0.54	<2	<0.16	<2	<0.071	0.54
21:13	<2	<0.064	39	0.56	<2	<0.16	<2	<0.071	0.56
21:16	3	0.08	34	0.52	<2	<0.16	<2	<0.071	0.60
Average		**<0.064**		**0.52**		**<0.16**		**<0.071**	**0.55** ✓

RUN DATA

Number 6

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
22:02	<2	<0.064	31	0.49	<2	<0.16	<2	<0.071	0.49
22:05	<2	<0.064	33	0.52	<2	<0.16	<2	<0.071	0.52
22:08	<2	<0.064	32	0.51	<2	<0.16	<2	<0.071	0.51
22:11	<2	<0.064	31	0.50	<2	<0.16	<2	<0.071	0.50
22:14	2	0.07	33	0.51	<2	<0.16	<2	<0.071	0.58
22:17	<2	<0.064	34	0.52	<2	<0.16	<2	<0.071	0.52
22:20	<2	<0.064	34	0.52	<2	<0.16	<2	<0.071	0.52
22:23	<2	<0.064	36	0.54	2	0.17	<2	<0.071	0.71
22:26	<2	<0.064	35	0.53	5	0.28	<2	<0.071	0.81
22:29	<2	<0.064	33	0.52	<2	<0.16	<2	<0.071	0.52
22:32	<2	<0.064	34	0.52	<2	<0.16	<2	<0.071	0.52
22:35	<2	<0.064	35	0.53	<2	<0.16	<2	<0.071	0.53
22:38	3	0.07	35	0.53	<2	<0.16	<2	<0.071	0.60
22:41	2	0.07	35	0.53	<2	<0.16	2	0.08	0.76
22:44	2	0.07	36	0.54	3	0.19	<2	<0.071	0.80
22:47	<2	<0.064	36	0.53	3	0.19	<2	<0.071	0.72
22:50	<2	<0.064	36	0.54	3	0.20	2	0.07	0.88
22:53	<2	<0.064	36	0.54	<2	<0.16	3	0.09	0.72
22:56	<2	<0.064	37	0.54	<2	<0.16	<2	<0.071	0.54
22:59	<2	<0.064	37	0.55	<2	<0.16	<2	<0.071	0.55
Average		**<0.064**		**0.53**		**<0.16**		**<0.071**	**0.61** ✓

RUN DATA

Number 7

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **2**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	**H_2S**		**MeSH**		**DMS**		**DMDS**		**TRS**
	area	**ppm**	**area**	**ppm**	**area**	**ppm**	**area**	**ppm**	**ppm**
					CC416806 7.257 ppm				
12:28	14344	7.79	<2	<0.12	<2	<0.077	<2	<0.036	7.79
12:31	14847	7.94	<2	<0.12	<2	<0.077	<2	<0.036	7.94
12:34	15003	7.98	<2	<0.12	2	0.09	<2	<0.036	8.07
Average		**7.90**		**<0.12**		**<0.077**		**<0.036**	**7.93**

RECOVERY DATA

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Before Run 1
Start Time 08:30 **End Time** 08:43

Recovery Gas to Probe, Time 08:30

Peak Areas, mv-sec			Average	ppm
11433	11272	11506	11403 ✓	7.65

Recovery Gas to GC, Time 08:40

Peak Areas, mv-sec			Average ✓	ppm
13047	13101	13148	13098	8.26

Recovery 92.6% ✓

RECOVERY DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

After Run 3 **Before Run** 4
Start Time 16:45 **End Time** 17:12

Recovery Gas to Probe, Time 16:45

Peak Areas, mv-sec			Average	ppm
10559	10796	10726	10694	7.38

Recovery Gas to GC, Time 17:07

Peak Areas, mv-sec			Average	ppm
14018	13986	14003	14002	8.57

Recovery 86.2%

RECOVERY DATA

Number 3

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

After Run 6 **Before Run** 7
Start Time 23:08 **End Time** 23:33

Recovery Gas to Probe, Time 23:08

Peak Areas, mv-sec			**Average**	**ppm**
12008	11871	12366	12082 ✓	7.90

Recovery Gas to GC, Time 23:30

Peak Areas, mv-sec			**Average** ✓	**ppm**
14235	14081	14105	14141	8.62

Recovery 91.7% ✓

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **22 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.25 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51828	33-53274	89-53332	89-53266
Perm. Rate, nL/min	351	369	477	241
Ret. Time, sec	16.0	22.5	48.0	127.0

1 Flow = **27.4** mL/Min	**12.8** ppm	**13.5** ppm	**17.4** ppm	**8.81** ppm
Time: 06:00	**Peak Areas, mv-sec**			
	28200	16074	not	not
	27714	15989	used	used
	27544	15970		
Average Area	**27819** ✓	**16011** ✓		

2 Flow = **59.5** mL/Min	**5.90** ppm	**6.20** ppm	**8.02** ppm	**4.06** ppm
Time: 06:49	**Peak Areas, mv-sec**			
	7504	3841	12348	15296
	7611	3774	12960	15012
	7641	3823	12909	15325
Average Area	**7585** ✓	**3813** ✓	**12739** ✓	**15211** ✓

3 Flow = **131** mL/Min	**2.68** ppm	**2.82** ppm	**3.64** ppm	**1.84** ppm
Time: 07:28	**Peak Areas, mv-sec**			
	1734	856	2868	3422
	1702	845	2771	3379
	1690	846	2788	3411
Average Area	**1709** ✓	**849** ✓	**2809** ✓	**3404** ✓

4 Flow = **271** mL/Min	**1.30** ppm	**1.36** ppm	**1.76** ppm	**0.89** ppm
Time: 07:53	**Peak Areas, mv-sec**			
	440	204	681	847
	433	209	682	842
	472	206	671	834
Average Area	**448** ✓	**206** ✓	**678** ✓	**841** ✓

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **22 Jun 2021**

H_2S	**1**	**2**	**3**	**4**
Time	06:00	06:49	07:28	07:53
Concentration, ppm	12.8	5.90	2.68	1.30
Area, mv-sec	27819	7585	1709	448
Calc. Conc., ppm	12.5	6.11	2.68	1.28
% Error	-2.3	3.5	0.0	-1.2

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8102	2.4572	0.9997	2	0.064

MeSH	**1**	**2**	**3**	**4**
Time	06:00	06:49	07:28	07:53
Concentration, ppm	13.5	6.20	2.82	1.36
Area, mv-sec	16011	3813	849	206
Calc. Conc., ppm	13.3	6.26	2.84	1.35
% Error	-0.9	1.0	0.9	-0.9

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8989	2.0680	0.9999	2	0.12

DMS	**1**	**2**	**3**
Time	06:49	07:28	07:53
Concentration, ppm	8.02	3.64	1.76
Area, mv-sec	12739	2809	678
Calc. Conc., ppm	17.6	7.86	3.68
% Error	119.4	115.7	109.0

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8747	1.7700	0.9997	2	0.16

DMDS	**1**	**2**	**3**
Time	06:49	07:28	07:53
Concentration, ppm	4.06	1.84	0.89
Area, mv-sec	15211	3404	841
Calc. Conc., ppm	8.91	3.97	1.86
% Error	119.6	115.3	109.2

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8501	2.4250	0.9997	2	0.071

CALIBRATION DATA
Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.25 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51828	33-53274	89-53332	89-53266
Perm. Rate, nL/min	351	369	477	241
Ret. Time, sec	16.0	22.5	48.0	127.0

1 Flow = **37.6** mL/Min	**9.34** ppm	**9.81** ppm	**12.7** ppm	**6.42** ppm
Time: 07:00	**Peak Areas, mv-sec**			
	19790	9921	31382	38948
	20319	10076	31742	38693
	19852	9986	30214	37936
Average Area	**19987**	**9995**	**31113**	**38526**

2 Flow = **82.8** mL/Min	**4.24** ppm	**4.46** ppm	**5.77** ppm	**2.92** ppm
Time: 11:03	**Peak Areas, mv-sec**			
	4788	2266	7435	8918
	4588	2209	7188	8687
	4419	2218	7198	8791
Average Area	**4598**	**2231**	**7274**	**8798**

3 Flow = **180** mL/Min	**1.95** ppm	**2.05** ppm	**2.66** ppm	**1.34** ppm
Time: 11:47	**Peak Areas, mv-sec**			
	998	492	1607	1968
	985	496	1607	1963
	982	497	1614	1971
Average Area	**988**	**495**	**1609**	**1967**

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

H_2S	1	2	3		
Time	07:00	11:03	11:47		
Concentration, ppm	9.34	4.24	1.95		
Area, mv-sec	19987	4598	988		
Calc. Conc., ppm	9.26	4.31	1.94		
% Error	-0.8	1.6	-0.8		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9212	2.4433	0.9998	2	0.077

MeSH	1	2	3		
Time	07:00	11:03	11:47		
Concentration, ppm	9.81	4.46	2.05		
Area, mv-sec	9995	2231	495		
Calc. Conc., ppm	9.79	4.48	2.05		
% Error	-0.3	0.5	-0.3		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9203	2.0975	>0.9999	2	0.12

DMS	1	2	3		
Time	07:00	11:03	11:47		
Concentration, ppm	12.7	5.77	2.66		
Area, mv-sec	31113	7274	1609		
Calc. Conc., ppm	12.6	5.85	2.64		
% Error	-0.7	1.4	-0.7		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8927	2.4098	0.9999	2	0.077

DMDS	1	2	3		
Time	07:00	11:03	11:47		
Concentration, ppm	6.42	2.92	1.34		
Area, mv-sec	38526	8798	1967		
Calc. Conc., ppm	6.39	2.94	1.34		
% Error	-0.4	0.8	-0.4		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9009	3.0543	>0.9999	2	0.036

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **22 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	16.0	22.5	48.0	127.0
Peak Detection Window, sec	3.0	7.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	2.0	3.0
Ending Peak Width, sec	2.0	6.0	4.0	5.0
Permeation Device ID	T-51828	33-53274	89-53332	89-53266
Permeation Rate, ng/min	483	716	1197	918
Permeation Rate, nL/min*	351	369	477	241

Barometric Pressure: 29.25 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:
PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 483 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.25)$$
$$= 351 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:
C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, NC**
Source: **#1 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **22 Jun 2021**

File: C:\Data\210623 New Indy Catawba No. 1 CB.trs
Program Version: 2.0, built 15 May 2017 **File Version:** 2.0
Computer: WLT5 **Trailer:** 281

Analog Input Device: MCC USB-1608G **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: Shimadzu GC8-A **Serial No.** C10493615061
Detector Range: 10

Gases

	Press. psi	Flow mL/min
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 140
Detector: 140

Columns

Primary: Carbopack
Secondary: N/A
Sample Loop: 4"

Injection Cycle

Total Length: 180 sec **Sampling Time:** 170 sec **Load/Backflush Time:** 80 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 2 mv-sec **Minimum peak height** 1 mv above baseline

Dynacalibrator

Chamber Temperature 50.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.25 in. Hg

RUN SUMMARY

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 18:24 to 19:24

Run Averages

	11.2	8.2	304

Pre-run Bias at 16:43

Zero Bias	0.0	0.0	8
Span Bias	10.0	10.1	234
Span Gas	10.1	10.2	242

Post-run Bias at 19:27

Zero Bias	0.0	0.0	7
Span Bias	10.0	10.1	240
Span Gas	10.1	10.2	242

Run averages corrected for the average of the pre-run and post-run bias

	11.4 ✓	8.3 ✓	313 ✓

RUN SUMMARY
Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 20:19 to 21:19

Run Averages

	11.7	7.7	342

Pre-run Bias at 19:27

Zero Bias	0.0	0.0	7
Span Bias	10.0	10.1	240
Span Gas	10.1	10.2	242

Post-run Bias at 21:26

Zero Bias	0.0	0.0	4
Span Bias	10.0	10.1	240
Span Gas	10.1	10.2	242

Run averages corrected for the average of the pre-run and post-run bias

	11.9 ✓	7.8 ✓	348 ✓

RUN SUMMARY

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 22:02 to 23:02

Run Averages

	11.5	8.1	340

Pre-run Bias at 21:26

Zero Bias	0.0	0.0	4
Span Bias	10.0	10.1	240
Span Gas	10.1	10.2	242

Post-run Bias at 23:05

Zero Bias	0.0	0.0	3
Span Bias	10.0	10.2	234
Span Gas	10.1	10.2	242

Run averages corrected for the average of the pre-run and post-run bias

	11.6 ✓	8.1 ✓	349 ✓

RUN DATA
Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %	SO_2 mv	SO_2 ppm
With NCGs						
18:25	3619	10.9	3462	8.6	2834	283
18:26	3597	10.8	3490	8.6	2890	289
18:27	3632	10.9	3514	8.7	3019	302
18:28	3736	11.2	3454	8.6	2939	294
18:29	3743	11.2	3343	8.3	2831	283
18:30	3786	11.4	3340	8.3	2799	280
18:31	3778	11.4	3290	8.1	2774	278
18:32	3808	11.4	3289	8.1	2802	280
18:33	3735	11.2	3268	8.1	2860	286
18:34	3656	11.0	3362	8.3	3089	309
18:35	3609	10.8	3449	8.5	3124	312
18:36	3645	11.0	3484	8.6	3073	307
18:37	3785	11.4	3424	8.5	2834	283
18:38	3777	11.4	3290	8.1	2904	290
18:39	3804	11.4	3285	8.1	2907	291
18:40	3718	11.2	3264	8.1	2895	290
18:41	3690	11.1	3351	8.3	3093	309
18:42	3686	11.1	3407	8.4	3117	312
18:43	3696	11.1	3388	8.4	3011	301
18:44	3722	11.2	3371	8.3	3035	304
18:45	3805	11.4	3340	8.3	2989	299
18:46	3854	11.6	3235	8.0	2951	295
18:47	3785	11.4	3209	7.9	2977	298
18:48	3779	11.4	3286	8.1	2943	294
18:49	3850	11.6	3265	8.1	3179	318
18:50	3762	11.3	3224	8.0	3171	317
18:51	3752	11.3	3303	8.2	3078	308
18:52	3743	11.2	3328	8.2	2932	293
18:53	3767	11.3	3329	8.2	2943	294
18:54	3817	11.5	3300	8.2	2907	291
18:55	3971	11.9	3223	8.0	2931	293
18:56	3965	11.9	3060	7.6	3159	316
18:57	3931	11.8	3059	7.6	3147	315
18:58	3776	11.3	3123	7.7	3151	315
18:59	3823	11.5	3263	8.1	2999	300
19:00	3894	11.7	3204	7.9	2846	285
19:01	3840	11.5	3146	7.8	2853	285
19:02	3800	11.4	3212	8.0	2855	286
19:03	3845	11.6	3258	8.1	3066	307
19:04	3895	11.7	3188	7.9	3102	310

RUN DATA

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
19:05	3903	11.7	3137	7.8	3182	318
19:06	3929	11.8	3117	7.7	3008	301
19:07	3885	11.7	3108	7.7	2900	290
19:08	3825	11.5	3165	7.8	2940	294
19:09	3735	11.2	3242	8.0	2885	289
19:10	3711	11.2	3328	8.2	3079	308
19:11	3631	10.9	3363	8.3	3211	321
19:12	3560	10.7	3452	8.5	3362	336
19:13	3537	10.6	3508	8.7	3482	348
19:14	3508	10.5	3541	8.8	3373	337
19:15	3551	10.7	3564	8.8	3320	332
19:16	3619	10.9	3505	8.7	3287	329
19:17	3665	11.0	3436	8.5	3239	324
19:18	3700	11.1	3387	8.4	3060	306
19:19	3660	11.0	3378	8.4	3177	318
19:20	3705	11.1	3392	8.4	3291	329
19:21	3721	11.2	3370	8.3	3272	327
19:22	3700	11.1	3333	8.3	3148	315
19:23	3610	10.8	3373	8.4	3082	308
19:24	3517	10.6	3499	8.7	3096	310
Avgs	**3742**	**11.2**	**3321**	**8.2**	**3040**	**304**

RUN DATA

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O2		CO2		SO2	
	mv	%	mv	%	mv	ppm
With NCGs						
20:20	3956	11.9	3038	7.5	3579	358
20:21	3924	11.8	3098	7.7	3395	340
20:22	3929	11.8	3122	7.7	3279	328
20:23	4008	12.0	3112	7.7	3315	332
20:24	4084	12.3	3018	7.5	3351	335
20:25	4065	12.2	2954	7.3	3630	363
20:26	4084	12.3	2958	7.3	3573	357
20:27	4072	12.2	2961	7.3	3514	351
20:28	4153	12.5	2959	7.3	3362	336
20:29	4171	12.5	2872	7.1	3369	337
20:30	4044	12.2	2857	7.1	3410	341
20:31	3988	12.0	2950	7.3	3362	336
20:32	3990	12.0	2998	7.4	3267	327
20:33	3969	11.9	2992	7.4	3560	356
20:34	3943	11.8	3019	7.5	3537	354
20:35	3971	11.9	3035	7.5	3592	359
20:36	3934	11.8	3019	7.5	3468	347
20:37	3991	12.0	3044	7.5	3319	332
20:38	4000	12.0	2989	7.4	3404	340
20:39	3953	11.9	2981	7.4	3454	345
20:40	3971	11.9	3036	7.5	3310	331
20:41	4056	12.2	3000	7.4	3318	332
20:42	4112	12.4	2902	7.2	3348	335
20:43	4009	12.0	2864	7.1	3545	355
20:44	4022	12.1	2939	7.3	3770	377
20:45	4027	12.1	2902	7.2	3729	373
20:46	4034	12.1	2870	7.1	3641	364
20:47	3964	11.9	2843	7.0	3487	349
20:48	3886	11.7	2936	7.3	3469	347
20:49	3797	11.4	3030	7.5	3553	355
20:50	3801	11.4	3109	7.7	3451	345
20:51	3768	11.3	3120	7.7	3428	343
20:52	3639	10.9	3223	8.0	3434	343
20:53	3636	10.9	3370	8.3	3400	340
20:54	3766	11.3	3370	8.3	3361	336
20:55	3847	11.6	3259	8.1	3411	341
20:56	3799	11.4	3185	7.9	3420	342
20:57	3728	11.2	3255	8.1	3504	350
20:58	3684	11.1	3338	8.3	3512	351
20:59	3656	11.0	3394	8.4	3477	348

RUN DATA

Number 5

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 1 Combination Boiler**	Date:	**23 Jun 2021**

Calibration **1**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
21:00	3787	11.4	3427	8.5	3314	331
21:01	3885	11.7	3278	8.1	3325	333
21:02	3882	11.7	3206	7.9	3290	329
21:03	3886	11.7	3198	7.9	3331	333
21:04	3864	11.6	3209	7.9	3355	336
21:05	3808	11.4	3226	8.0	3328	333
21:06	3745	11.3	3295	8.2	3338	334
21:07	3685	11.1	3379	8.4	3344	334
21:08	3694	11.1	3433	8.5	3353	335
21:09	3773	11.3	3427	8.5	3305	331
21:10	3853	11.6	3327	8.2	3342	334
21:11	3950	11.9	3240	8.0	3311	331
21:12	4017	12.1	3118	7.7	3392	339
21:13	3936	11.8	3052	7.6	3427	343
21:14	3850	11.6	3122	7.7	3324	332
21:15	3843	11.5	3208	7.9	3376	338
21:16	3806	11.4	3212	8.0	3385	339
21:17	3814	11.5	3259	8.1	3365	337
21:18	3661	11.0	3273	8.1	3347	335
21:19	3639	10.9	3428	8.5	3435	344
Avgs	**3897**	**11.7**	**3121**	**7.7**	**3422**	**342**

RUN DATA
Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %	SO_2 mv	SO_2 ppm
With NCGs						
22:03	3783	11.4	3378	8.4	3499	350
22:04	3827	11.5	3287	8.1	3478	348
22:05	3799	11.4	3284	8.1	3441	344
22:06	3903	11.7	3265	8.1	3620	362
22:07	3885	11.7	3171	7.8	3452	345
22:08	3946	11.9	3173	7.9	3625	362
22:09	3995	12.0	3108	7.7	3377	338
22:10	3937	11.8	3066	7.6	3743	374
22:11	3913	11.8	3121	7.7	3484	348
22:12	3919	11.8	3149	7.8	3695	369
22:13	4001	12.0	3130	7.7	3397	340
22:14	3960	11.9	3053	7.6	3731	373
22:15	3924	11.8	3096	7.7	3490	349
22:16	3988	12.0	3134	7.8	3681	368
22:17	3995	12.0	3061	7.6	3401	340
22:18	3987	12.0	3050	7.5	3693	369
22:19	3942	11.8	3042	7.5	3534	353
22:20	3863	11.6	3099	7.7	3747	375
22:21	3882	11.7	3164	7.8	3551	355
22:22	3836	11.5	3156	7.8	3682	368
22:23	3719	11.2	3226	8.0	3364	336
22:24	3661	11.0	3350	8.3	3814	381
22:25	3671	11.0	3422	8.5	3662	366
22:26	3758	11.3	3379	8.4	3452	345
22:27	3744	11.3	3303	8.2	3443	344
22:28	3664	11.0	3344	8.3	3567	357
22:29	3639	10.9	3427	8.5	3384	338
22:30	3708	11.1	3438	8.5	3441	344
22:31	3762	11.3	3362	8.3	3397	340
22:32	3760	11.3	3302	8.2	3484	348
22:33	3739	11.2	3320	8.2	3207	321
22:34	3794	11.4	3316	8.2	3418	342
22:35	3790	11.4	3259	8.1	3201	320
22:36	3766	11.3	3282	8.1	3358	336
22:37	3843	11.5	3292	8.2	3155	316
22:38	3806	11.4	3222	8.0	3431	343
22:39	3791	11.4	3260	8.1	3226	323
22:40	3770	11.3	3282	8.1	3436	344
22:41	3739	11.2	3297	8.2	3194	319
22:42	3751	11.3	3334	8.3	3436	344

RUN DATA

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
22:43	3700	11.1	3326	8.2	3191	319
22:44	3696	11.1	3400	8.4	3382	338
22:45	3748	11.3	3372	8.3	3201	320
22:46	3738	11.2	3342	8.3	3358	336
22:47	3778	11.4	3339	8.3	3122	312
22:48	3787	11.4	3295	8.2	3252	325
22:49	3747	11.3	3299	8.2	3253	325
22:50	3784	11.4	3320	8.2	3166	317
22:51	3745	11.3	3311	8.2	3005	301
22:52	3796	11.4	3327	8.2	3280	328
22:53	3776	11.3	3279	8.1	3106	311
22:54	3785	11.4	3286	8.1	3386	339
22:55	3843	11.5	3277	8.1	3171	317
22:56	3787	11.4	3233	8.0	3267	327
22:57	3858	11.6	3256	8.1	3106	311
22:58	3805	11.4	3208	7.9	3292	329
22:59	3790	11.4	3271	8.1	3170	317
23:00	3860	11.6	3270	8.1	3222	322
23:01	3883	11.7	3196	7.9	3166	317
23:02	3897	11.7	3187	7.9	3246	325
Avgs	**3816**	**11.5**	**3253**	**8.1**	**3396**	**340**

BIAS AND CALIBRATION DRIFT

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 16:43

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	6	0.0	0.0	0.0 ✓	Pass
Span	10.1	3335	10.0	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	%	Difference %	Drift %	Status
Zero	0.0	6	0.0	0.0	0.0 ✓	Pass
Span	10.0	3335	10.0	0.0	0.0 ✓	Pass

*Bias No. 4

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	12	0.0	0.0	0.0 ✓	Pass
Span	10.2	4067	10.1	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	%	Difference %	Drift %	Status
Zero	0.0	12	0.0	0.0	0.0 ✓	Pass
Span	10.2	4067	10.1	-0.1	-0.5 ✓	Pass

*Bias No. 4

BIAS AND CALIBRATION DRIFT

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 16:43

SO_2
Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	**Cal. ppm**	**Response mv**	**Bias ppm**	**Difference ppm**	**Error %**	**Status**
Zero	1	79	8	7	1.5	Pass
Span	239	2341	234	-5	-1.1	Pass

Calibration Drift

Standard Gas	**Initial* ppm**	**Final mv**	**ppm**	**Difference ppm**	**Drift %**	**Status**
Zero	5	79	8	3	0.7	Pass
Span	232	2341	234	2	0.4	Pass

*Bias No. 4

BIAS AND CALIBRATION DRIFT

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 19:27

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	8	0.0	0.0	0.0 ✓	Pass
Span	10.1	3314	10.0	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	%	mv	%	%	%	Status
Zero	0.0	8	0.0	0.0	0.0 ✓	Pass
Span	10.0	3314	10.0	0.0	0.0 ✓	Pass

*Bias No. 5

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	5	0.0	0.0	0.0 ✓	Pass
Span	10.2	4061	10.1	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	%	mv	%	%	%	Status
Zero	0.0	5	0.0	0.0	0.0 ✓	Pass
Span	10.1	4061	10.1	0.0	0.0 ✓	Pass

*Bias No. 5

BIAS AND CALIBRATION DRIFT

Number 6

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 19:27

SO_2
Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %		Status
Zero	1	70	7	6	1.3	✓	Pass
Span	239	2397	240	1	0.2	✓	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift		
Gas	**ppm**	**mv**	**ppm**	**ppm**	**%**		**Status**
Zero	8	70	7	-1	-0.2	✓	Pass
Span	234	2397	240	6	1.3	✓	Pass

*Bias No. 5

BIAS AND CALIBRATION DRIFT

Number 7

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 21:26

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	2	0.0	0.0	0.0	Pass
Span	10.1	3323	10.0	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	2	0.0	0.0	0.0	Pass
Span	10.0	3323	10.0	0.0	0.0	Pass

*Bias No. 6

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	6	0.0	0.0	0.0	Pass
Span	10.2	4056	10.1	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	6	0.0	0.0	0.0	Pass
Span	10.1	4056	10.1	0.0	0.0	Pass

*Bias No. 6

BIAS AND CALIBRATION DRIFT

Number 7

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 21:26

SO_2

Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	40	4	3	0.7 ✓	Pass
Span	239	2396	240	1	0.2 ✓	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	7	40	4	-3	-0.7 ✓	✓ Pass
Span	240	2396	240	0	0.0	Pass

*Bias No. 6

m

BIAS AND CALIBRATION DRIFT

Number 8

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 23:05

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	8	0.0	0.0	0.0	Pass
Span	10.1	3341	10.0	-0.1	-0.5	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	**%**	**mv**	**%**	**%**	**%**	**Status**
Zero	0.0	8	0.0	0.0	0.0	Pass
Span	10.0	3341	10.0	0.0	0.0	Pass

*Bias No. 7

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	21	0.0	0.0	0.0	Pass
Span	10.2	4100	10.2	0.0	0.0	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	**%**	**mv**	**%**	**%**	**%**	**Status**
Zero	0.0	21	0.0	0.0	0.0	Pass
Span	10.1	4100	10.2	0.1	0.5	Pass

*Bias No. 7

BIAS AND CALIBRATION DRIFT

Number 8

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 23:05

SO_2

Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	1	29	3	2	0.4 ✓	Pass
Span	239	2337	234	-5	-1.1 ✓	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	4	29	3	-1	-0.2 ✓	Pass
Span	240	2337	234	-6	-1.3 ✓	Pass

*Bias No. 7

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 08:37

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	3
10.1 ✓ ✓	XC013544B	3354
20.2 ✓	CC275468	6750

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
333.3 ✓	-7 ✓	>0.9999 ✓

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	4
10.2 ✓	XC013544B	4128
20.3 ✓	CC275468	8145

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
401.6 ✓	18 ✓	>0.9999 ✓

CALIBRATION DATA

Number 1

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 1 Combination Boiler**	Date:	**23 Jun 2021**

Start Time: 08:37

SO_2

Method: EPA 6C

Calibration Type: Linear Regression

Calibration Results

ppm	**Cylinder ID**	**Result, mv**
Zero	-	9
242	CC234516	2392
458	EB0108003	4596

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
10.01	-5	0.9999

AV

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Start Time: 08:37

O_2

Method: EPA 3A
Span Conc. 20.2 %
Slope 333.3 **Intercept** -6.7

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	3	0.0	0.0	0.0 ✓	Pass
10.1	3354	10.1	0.0	0.0 ✓	Pass
20.2	6750	20.3	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A
Span Conc. 20.3 %
Slope 401.6 **Intercept** 18.5

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	4	0.0	0.0	0.0 ✓	Pass
10.2	4128	10.2	0.0	0.0 ✓	Pass
20.3	8145	20.2	-0.1	-0.5 ✓	Pass

SO_2

Method: EPA 6C
Span Conc. 458 ppm
Slope 10.01 **Intercept** -5

Standard ppm	Response mv	Result ppm	Difference ppm	Error %	Status
Zero	9	1	1	0.2 ✓	Pass
242	2392	239	-3	-0.7 ✓	Pass
458	4596	459	1	0.2 ✓	Pass

METHODS AND ANALYZERS

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 1 Combination Boiler**	Date:	**23 Jun 2021**

File: K:\15730 New Indy\001 Catawba SC\008\Data\210623 New Indy Catawba No. 1 CBb.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: WSAUBCHEMLABGC1 **Trailer:** 281
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	O_2
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T802 s/n: 172**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.2**

Channel 2

Analyte	CO_2
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T802 s/n: 172**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.3**

Channel 5

Analyte	SO_2
Method	**EPA 6C**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T100H SN 374**
Full-Scale Output, mv	**10000**
Analyzer Range, ppm	**500**
Span Concentration, ppm	**458**

NO. 2 COMBINATION BOILER
(CONDITION 1: NCG AND SOG GASES)

New Indy
Catawba, SC

15730.001.008
No. 2 Combination Boiler
Condition 1: NCGs & SOGs

EMISSION CALCULATIONS

		Run 1	Run 2	Run 3	Mean
Date		**6/24/21** ✓	**6/24/21** ✓	**6/24/21** ✓	---
Time Began		**1445** ✓	**1630** ✓	**1806** ✓	---
Time Ended		**1545** ✓	**1730** ✓	**1906** ✓	---
Volumetric Flow Rate, (Qs), DSCFM		1.57E+05 ✓	1.56E+05 ✓	1.54E+05 ✓	1.56E+05
BWS		0.135 ✓	0.141 ✓	0.148 ✓	0.141
% Oxygen		13.1 ✓	12.7 ✓	12.3 ✓	12.7
Sulfur Dioxide	MW= 64.06				
Concentration, ppm		324.0 ✓	327.0 ✓	322.0 ✓	324.3
Emission Rate, lb/hr		508.7	507.2	496.1	504.0
Total Reduced Sulfur	(TRS MW)= 34.08				
Concentration, ppm		0.92 ✓	0.76 ✓	0.77 ✓	0.82
Emission Rate, lb/hr		0.77	0.63	0.63	0.68

New Indy
Catawba, SC

15730.001.008
No. 2 Combination Boiler

Condition 1: NCGs & SOGs

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/24/21	6/24/21	6/24/21	---
Time Began		1445	1630	1806	---
Time Ended		1607	1754	1931	---
INPUT DATA					
Sampling Time, min	(Theta)	64.0	64	64	64
Stack Diameter, in.	(Dia.)	120.00	120.00	120.00	120.00
Barometric Pressure, in. Hg	(Pb)	29.65	29.65	29.65	29.65
Static Pressure, in. H2O	(Pg)	-0.60	-0.60	-0.60	-0.60
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	0.9880	0.9880	0.9880	0.9880
Orifice Calibration Value	(Delta H@)	1.7320	1.7320	1.7320	1.7320
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	42.480	42.755	42.602	42.612
Meter Temperature, °F	(Tm)	89.8	95.3	94.8	93.3
Meter Temperature, °R	(Tm-R)	549.8	555.3	554.8	553.3
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	133.3	138.7	147.2	139.7
CO2 Concentration, %	(CO2)	6.6	6.9	7.3	6.9
O2 Concentration, %	(O2)	13.1	12.7	12.3	12.7
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	0.907	0.900	0.904	0.904
Stack Temperature, °F	(Ts)	475.1	473.7	479.1	476.0
Stack Temperature, °R	(Ts-R)	935.1	933.7	939.1	936.0
CALCULATED DATA					
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	78.54	78.54	78.54	78.54
Stack Pressure, in. Hg	(Ps)	29.61	29.61	29.61	29.61
Meter Pressure, in. Hg	(Pm)	29.75	29.75	29.75	29.75
Standard Meter Volume, ft^3	(Vmstd)	40.054	39.919	39.807	39.927
Standard Water Volume, ft^3	(Vwstd)	6.274	6.529	6.929	6.577
Moisture Fraction (Measured)	(BWS)	0.135	0.141	0.148	0.141
Moisture Fraction (lower sat/meas)	(BWS)	0.135	0.141	0.148	0.141
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	29.58	29.61	29.66	29.62
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	28.01	27.98	27.93	27.97
Average Stack Gas Velocity, ft/sec	(Vs)	69.18	68.65	69.21	69.01
Stack Gas Flow, actual, ft^3/min	(Qa)	326023	323490	326155	325223
Stack Gas Flow, Std , ft^3/min	(Qs)	157429	155507	154485	155807
Calibration check	(Yqa)	0.9922	0.9902	0.9925	0.992
Percent difference from Y					0.37%

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 2 Combination Boiler
Sample Location Stack outlet
W. O. Number 15730.001.008
Run Number 1
Date 6/24/21
Test Personnel ATR/CL
Sample Time ~~64~~ ~~48~~ ATR min. 64

Console ID A010
Meter Corr., Y .988
Console ΔH@ 1.732
Probe ID/Length PR5B 5'
Liner Material SS
Pitot ID/Coeff. P172 0.84
Thermo ID A010
Nozzle ID/Diams. .250 | .250 | .250 | .250
Avg. Nozzle Diam. .250 in.

Ambient Temp. 90 °F
Baro. Pressure* 29.65 in. Hg
Static Pressure -.60 in. H_2O
Impinger Gain 120.6 mL
Silica Gel Gain 12.7 g
Stack Area 78.54 ft^2
Total Traverse Points 16

K Factor NA

Leak Checks

	Initial	Final
Volume, ft^3	.004	.001
@ Vac., in. Hg	8	5
Pitot	.000	.000

Filter ID NA
Sample ID Run 1 w/ NCG+SOG

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	~~0~~	14:45			94.900									
~~A~~-1 C	~~3~~ 4		.91	1.3	97.4	485		87	249	256		65	1.5	
2	~~6~~ 8		.89	1.3	100.1	485		86	252	255		63	1.5	
3	~~9~~ 12		.85	1.3	102.7	484		87	253	254		61	1.5	
4	~~12~~ 16	15:61	.78	1.3	105.4	479		87	251	255		61	1.5	
~~B~~-1 D	~~15~~ 20	15:07	.90	1.3	108.1	479		88	252	256		64	1.5	
2	~~18~~ 24		.91	1.3	110.7	480		89	250	255		61	1.5	
3	~~21~~ 28		.89	1.3	113.0	478		89	249	254		60	1.5	
4	~~24~~ 32	15:23	.83	1.3	116.1	475		90	247	255		60	1.5	
~~C~~-1 A	~~27~~ 36	15:27	.87 ~~.86~~ ATR	1.3	118.8	474		90	246	256		64	1.5	
2	~~30~~ 40	.87 ATR	~~.6~~ .85	1.3	121.6	470		91	245	257		62	1.5	
3	~~33~~ 44		.85	1.3	124.1	468		91	246	255		60	1.5	
4	~~36~~ 48	15:43	.75	1.3	126.7	468		91	247	256		61	1.5	
~~D~~-1 B	~~39~~ 52	15:51	.82	1.3	129.6	467		91	248	255		65	1.5	
2	~~42~~ 56		.73	1.3	132.0	469		93	244	256		63	1.5	
3	~~45~~ 60		.70	1.3	134.8	470		93	251	256		64	1.5	
4	~~48~~ 64	16:07	.67	1.3	137.380	470		94	250	257		64	1.5	
*Barometric Pressure is at port elevation			Avg √Δp .9073 ✓	Avg ΔH 1.3 ✓	Total Volume 42.48 ✓	Avg T_s 475.06 ✓	✓	Avg T_m 89.81 ✓	Min/Max 245/253 ✓	Min/Max 254/257 ✓	Min/Max	Max Temp 65 ✓	Max Vac 1.5 ✓	$V_{m\text{-std}}$, scf
			.825 ✓	Avg √ΔH 1.140 ✓										

Comments w/ NCG+SOG

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by

WESTON SOLUTIONS®
Integrated Air Services

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 2 Combination Boiler
Sample Location stack outlet
W. O. Number 15730.001.008
Run Number 2
Date 6/24/21
Test Personnel ATR/CL
Sample Time 48 min.

Console ID A010
Meter Corr., Y .988
Console ΔH@ 1.732
Probe ID/Length PR5B 5'
Liner Material SS
Pitot ID/Coeff. P172 0.84
Thermo ID A610
Nozzle ID/Diams. .250 | .250 | .250 | .250
Avg. Nozzle Diam. .250 in.

Ambient Temp. 90 °F
Baro. Pressure* 29.65 in. Hg
Static Pressure -.60 in. H_2O
Impinger Gain ~~120.6~~ mL 125 138.7
Silica Gel Gain 13.7 g
Stack Area 78.54 ft²
Total Traverse Points 16

K Factor	NA

Leak Checks

	Initial	Final
Volume, ft³	.003	.000
@ Vac., in. Hg	8	5
Pitot	.000	.000

✓

Filter ID NA
Sample ID Run2 w/ NCG+SOG

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	16:30			137.600									
~~A~~-1 C	~~3~~ 4		.90	1.3	139.7	475		94	252	256		64	2	
2	~~6~~ 8		.87	1.3	142.4	474		94	251	255		62	2	
3	~~9~~ 12		.83	1.3	145.6	473		95	250	256		61	2	
4	~~12~~ 16	16:46	.77	1.3	148.2	472		95	252	257		64	2.5	
~~B~~-1 D	~~15~~ 20	16:51	.91	1.3	150.8	471		95	253	256		65	2.5	
2	18 24		.90	1.3	153.6	473		95	255	252		65	2.5	
3	~~21~~ 28		.92	1.3	156.2	474		96	254	250		64	2.5	
4	~~24~~ 32	17:07	.85	1.3	158.9	474		96	255	252		65	2.5	
~~C~~-1 A	~~27~~ 36	17:12	.80	1.3	161.4	473		96	256	253		63	2.5	
2	30 40		.73	1.3	164.3	474		96	257	252		57	2.5	
3	33 44		.77	1.3	167.2	474		95	256	250		55	2.5	
4	~~36~~ 48	17:28	.70	1.3	169.6	474		96	257	250		53	3	
~~D~~-1 B	~~39~~ 52	17:38	.85	1.3	172.4	474		95	256	251		62	3	
2	42 56		.80	1.3	174.9	475		96	256	252		56	3	
3	~~45~~ 60		.72	1.3	177.7	474		95	255	251		55	3	
4	~~48~~ 64	17:54	.68	1.3	180.355	475		95	256	250		55	3	

*Barometric Pressure is at port elevation

Avg √Δp	Avg ΔH	Total Volume	Avg T_s	Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac
.9063 ✓	1.3 ✓	42.755 ✓	473.689 ✓	95.25 ✓	250/257 ✓	250/257 ✓		65 ✓	3 ✓
.8125	Avg √ΔH 1.140 ✓								

AB 7/1

$V_{m\text{-std}}$, scf

Flue Gas Composition AB 7/1 ✓
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by AB

WESTON SOLUTIONS®
Integrated Air Services

Comments w/ NCG+SOG

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 2 Combination Boiler
Sample Location: Stack outlet
W. O. Number: 15730.001.008
Run Number: 3
Date: 6/24/21
Test Personnel: AR / CL
Sample Time: 48 min.

Console ID: AG10
Meter Corr., Y: .988
Console ΔH@: 1.732
Probe ID/Length: PR5B 5'
Liner Material: SS
Pitot ID/Coeff.: P172 0.84
Thermo ID: A010
Nozzle ID/Diams.: .250 .250 .250 .250
Avg. Nozzle Diam.: .250 in.

Ambient Temp.: 95 °F
Baro. Pressure*: 24.65 in. Hg
Static Pressure: -.60 in. H_2O
Impinger Gain: 134.5 mL
Silica Gel Gain: 12.7 g 147.2
Stack Area: 78.54 ft^2
Total Traverse Points: 16

K Factor: NA

Leak Checks

	Initial	Final
Volume, ft^3	.003	.000
@ Vac., in. Hg	8	5
Pitot	.000	.000

Filter ID: NA
Sample ID: Run3 w/ NCG+SOG

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0 ~~4~~	18:06			180.800									
~~A~~-1 C	~~3~~ 4		.40	1.3	182.7	476		94	248	251		64	2	
2	~~6~~ 8		.89	1.3	185.0	477		94	249	252		63	2	
3	~~9~~ 12		.86	1.3	188.7	476		95	250	253		61	2	
4	~~12~~ 16	18:22	.80	1.3	191.3	475		95	251	252		57	2	
~~B~~-1 D	~~15~~ 20	18:28	.88	1.3	193.9	480		96	250	255		63	2	
2	~~18~~ 24		.90	1.3	196.8	481		96	250	256		57	2	
3	~~21~~ 28		.88	1.3	198.9	482		95	249	256		56	2	
4	~~24~~ 32	18:44	.81	1.3	202.3	478		95	250	255		57	2.5	
~~C~~-1 A	~~27~~ 36	18:50	.82	1.3	204.8	479		95	252	257		65	2.5	
2	~~30~~ 40		.82	1.3	207.5	480		94	250	258		59	2.5	
3	~~33~~ 44		.85	1.3	210.3	484		95	250	256		59	2.5	
4	~~36~~ 48	19:06	.70	1.3	212.7	485		96	251	256		60	2.5	
~~D~~-1 B	~~39~~ 52	~~19:12~~	~~AR~~ .80	1.3	215.4	478		95	250	253		63	2.5	
2	~~42~~ 56	19:15	.80	1.3	218.0	479		94	250	253		61	2.5	
3	~~45~~ 60		.70	1.3	220.7	478		94	249	254		63	2.5	
4	~~48~~ 64	19:31	.70	1.3	223.402	478		94	249	255		64	2.5	
*Barometric Pressure is at port elevation			Avg √Δp .9044 ✓	Avg ΔH 1.3 ✓	Total Volume 42.602 ✓	Avg T_s 479.125 ✓		Avg T_m 94.81 ✓	Min/Max 248/251 ✓	Min/Max 251/258	Min/Max ✓	Max Temp 65 ✓	Max Vac 2.5 ✓	V_{m-std}, scf
			AB 7/11 .8195 ✓	Avg √ΔH 1.140		AB 7/11								

WESTON SOLUTIONS®
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Comments: w/ NCG + SOG

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp., °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by AM

Sample Recovery Field Data

Method: EPA 4, Moisture

Client New Indy
Location/Plant Catawba, SC

Source No. 2 Combination Boiler
W.O. Number 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample ID Run 4 w/ NCG+SOG
Sample Date 6/24/21
Filter ID NA
Recovery Date 6/24/21
Analyst ATR

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents	DI	DI	empty		▨	grams	▨
Final	945.1	771.4	643.0			858.1	
Initial	898.4	751.2	639.3		✓	845.4	
Gain	46.7 ✓	20.2 ✓	3.7 ✓		120.6	12.7 ✓	133.3 ✓

Impinger Color clear
Silica Gel Condition used
Labled? —
Sealed? —

Run No. 2
Sample ID Run 2 w/ NCG+SOG
Sample Date 6/24/21
Filter ID NA
Recovery Date 6/24/21
Analyst ATR

	Impingers						
	1 DI	2	3		Imp.Total	Silica Gel	Total
Contents	749.6	DI	empty		▨	grams	▨
Final	~~AR 713.3~~	780.9	657.0			903.4	
Initial	647.0	761.5	654.0		✓	889.7	
Gain	102.6 ✓	19.4 ✓	3 ✓		125	13.7 ✓	138.7 ✓

Impinger Color clear
Silica Gel Condition used
Labled? —
Sealed? —

Run No. 3
Sample ID Run 3 w/ NCG+SOG
Sample Date 6/24/21
Filter ID NA
Recovery Date 6/24/21
Analyst ATR

	Impingers						
	1	2	3		Imp.Total	Silica Gel	Total
Contents	DI	DI	empty		▨	grams	▨
Final	830.5	793.5	646.3			847.3	
Initial	713.3	779.5	643.0		✓	834.6	
Gain	117.2 ✓	14 ✓	3.3 ✓		134.5	12.7 ✓	147.2 ✓

Impinger Color clear
Silica Gel Condition used
Labled? ✓
Sealed? —

Check COC for Sample IDs of Media Blanks

Integrated Air Services

Sample and Velocity Traverse Points - Method 1

Client	New Indy	Source	No. 2 Combination Boiler
Loaction/Plant	Catawba, SC	W.O. Number	15730.001.008
Operator	VD	Date	6/24/21

Duct Type ☑ Circular ☐ Rectangular

Traverse Type ☐ Particulate Traverse ☑ Velocity Traverse ☐ Stratification Traverse

Depth, far wall to outside of port (in) = C	129
Port Depth (in) = D	9
Depth of Duct, diameter (in) = C - D	120
Area of Duct (ft^3)	78.54
Number of Ports	4
Traverse Points per Port	4
Total Traverse Points	16
Rectangular Ducts Only	
Width of Duct (in)	
Equivalent Diameter (in)	

Flow Disturbances	
Upstream - A (ft)	45
Downstream - B (ft)	32
Upstream - A (duct diameters)	4.5
Downstream - B (duct diameters)	3.2

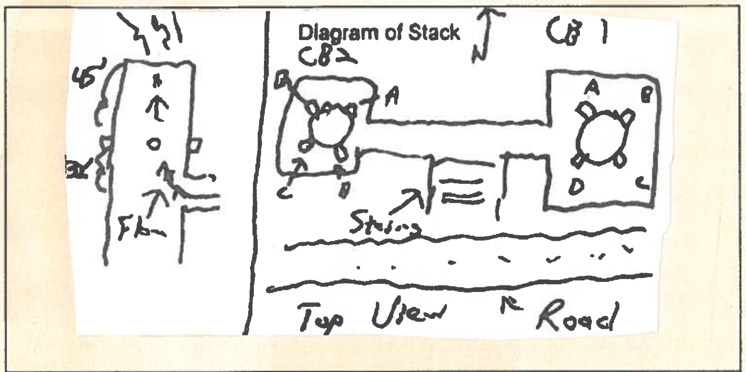
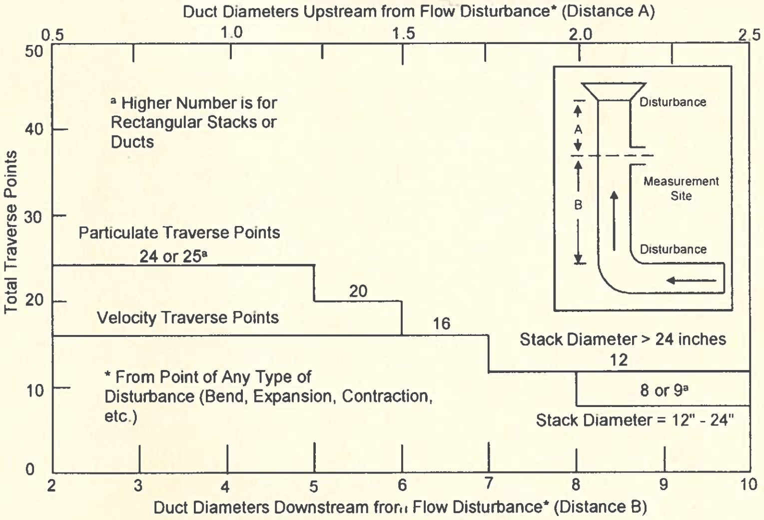


Diagram of Stack

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	3.2	3.9	12.9
2	10.5	12.6	21.6
3	19.4	23.3	32.3
4	32.3	38.8	47.8



Traverse Point Location % of Stack - Circular

Traverse Point Location	1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25.0		14.6		10.5		8.2		6.7
3				75.0		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25.0
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75.0
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location % of Stack - Rectangular

Traverse Point Location	1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix	
9 -	3 x 3
12 -	4 x 3
16 -	4 x 4
20 -	5 x 4
25 -	5 x 5
30 -	6 x 5
36 -	6 x 6
42 -	7 x 6
49 -	7 x 7

Tape measure ID ____________________

RUN SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time 14:45 **End Time** 15:45

Average Measured TRS Conc.	0.82 **ppm** ✓
Recovery No. 2	89.5 **%** ✓
TRS Corrected for Recovery	0.92 **ppm** ✓

RUN SUMMARY
Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time 16:30 **End Time** 17:30

Average Measured TRS Conc.	0.68 **ppm** ✓
Recovery No. 2	89.5 **%** ✓
TRS Corrected for Recovery	0.76 **ppm** ✓

RUN SUMMARY

Number 3

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time 18:06 **End Time** 19:07

Average Measured TRS Conc.	0.69 **ppm** ✓
Recovery No. 2	89.5 **%** ✓
TRS Corrected for Recovery	0.77 **ppm** ✓

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
14:45	2	0.08	59	0.68	<2	<0.077	<2	<0.036	0.76
14:48	3	0.10	57	0.66	<2	<0.077	<2	<0.036	0.76
14:51	2	0.08	57	0.66	<2	<0.077	<2	<0.036	0.74
14:54	3	0.09	58	0.67	<2	<0.077	<2	<0.036	0.76
14:57	<2	<0.077	58	0.67	<2	<0.077	<2	<0.036	0.67
15:00	<2	<0.077	55	0.65	<2	<0.077	<2	<0.036	0.65
15:03	<2	<0.077	56	0.66	<2	<0.077	<2	<0.036	0.66
15:06	<2	<0.077	53	0.64	<2	<0.077	2	0.04	0.72
15:09	2	0.09	59	0.67	<2	<0.077	<2	<0.036	0.76
15:12	3	0.09	62	0.69	<2	<0.077	<2	<0.036	0.78
15:15	<2	<0.077	90	0.84	<2	<0.077	<2	<0.036	0.84
15:18	3	0.09	77	0.78	<2	<0.077	<2	<0.036	0.86
15:21	<2	<0.077	90	0.84	<2	<0.077	<2	<0.036	0.84
15:24	<2	<0.077	144	1.08	<2	<0.077	<2	<0.036	1.08
15:27	3	0.10	115	0.96	<2	<0.077	<2	<0.036	1.06
15:30	<2	<0.077	79	0.79	<2	<0.077	<2	<0.036	0.79
15:33	2	0.08	120	0.98	<2	<0.077	<2	<0.036	1.06
15:36	<2	<0.077	77	0.78	<2	<0.077	<2	<0.036	0.78
15:39	2	0.09	124	1.00	<2	<0.077	<2	<0.036	1.08
15:42	<2	<0.077	77	0.78	<2	<0.077	<2	<0.036	0.78
Average		**<0.077**		**0.77**		**<0.077**		**<0.036**	**0.82** ✓

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
16:30	<2	<0.077	51	0.63	<2	<0.077	<2	<0.036	0.63
16:33	<2	<0.077	41	0.56	<2	<0.077	<2	<0.036	0.56
16:36	<2	<0.077	48	0.61	2	0.08	<2	<0.036	0.68
16:39	<2	<0.077	58	0.67	<2	<0.077	<2	<0.036	0.67
16:42	<2	<0.077	68	0.73	<2	<0.077	<2	<0.036	0.73
16:45	<2	<0.077	89	0.84	<2	<0.077	<2	<0.036	0.84
16:48	2	0.08	51	0.63	2	0.08	<2	<0.036	0.79
16:51	<2	<0.077	42	0.57	<2	<0.077	<2	<0.036	0.57
16:54	4	0.11	44	0.58	<2	<0.077	2	0.04	0.77
16:57	3	0.09	44	0.58	<2	<0.077	4	0.05	0.78
17:00	<2	<0.077	52	0.63	3	0.09	3	0.04	0.81
17:03	<2	<0.077	44	0.58	<2	<0.077	<2	<0.036	0.58
17:06	<2	<0.077	45	0.59	<2	<0.077	<2	<0.036	0.59
17:09	<2	<0.077	46	0.59	<2	<0.077	<2	<0.036	0.59
17:12	<2	<0.077	64	0.70	<2	<0.077	<2	<0.036	0.70
17:15	<2	<0.077	46	0.59	<2	<0.077	<2	<0.036	0.59
17:18	3	0.10	54	0.65	<2	<0.077	<2	<0.036	0.75
17:21	<2	<0.077	61	0.69	<2	<0.077	<2	<0.036	0.69
17:24	<2	<0.077	52	0.63	<2	<0.077	<2	<0.036	0.63
17:27	<2	<0.077	53	0.64	<2	<0.077	<2	<0.036	0.64
Average		**<0.077**		**0.63**		**<0.077**		**<0.036**	**0.68** ✓

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
18:06	<2	<0.077	60	0.68	<2	<0.077	<2	<0.036	0.68
18:09	<2	<0.077	45	0.59	<2	<0.077	<2	<0.036	0.59
18:12	3	0.09	45	0.59	<2	<0.077	<2	<0.036	0.68
18:15	3	0.09	49	0.61	<2	<0.077	2	0.04	0.78
18:18	<2	<0.077	44	0.58	<2	<0.077	<2	<0.036	0.58
18:21	<2	<0.077	49	0.62	<2	<0.077	<2	<0.036	0.62
18:25	<2	<0.077	47	0.60	<2	<0.077	<2	<0.036	0.60
18:28	3	0.09	61	0.69	2	0.08	<2	<0.036	0.86
18:31	<2	<0.077	50	0.62	<2	<0.077	<2	<0.036	0.62
18:34	<2	<0.077	50	0.62	<2	<0.077	<2	<0.036	0.62
18:37	3	0.09	51	0.63	<2	<0.077	<2	<0.036	0.72
18:40	<2	<0.077	88	0.83	<2	<0.077	<2	<0.036	0.83
18:43	<2	<0.077	56	0.66	7	0.15	<2	<0.036	0.80
18:46	<2	<0.077	53	0.64	<2	<0.077	<2	<0.036	0.64
18:49	<2	<0.077	55	0.65	<2	<0.077	3	0.04	0.74
18:52	2	0.08	55	0.65	<2	<0.077	<2	<0.036	0.73
18:55	3	0.09	51	0.63	<2	<0.077	<2	<0.036	0.72
18:58	<2	<0.077	52	0.63	<2	<0.077	<2	<0.036	0.63
19:01	<2	<0.077	52	0.63	<2	<0.077	<2	<0.036	0.63
19:04	<2	<0.077	52	0.63	<2	<0.077	<2	<0.036	0.63
Average		**<0.077**		**0.64**		**<0.077**		**<0.036**	**0.69** ✓

RUN DATA
Number 0

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H$_2$S area	H$_2$S ppm	MeSH area	MeSH ppm	DMS area	DMS ppm	DMDS area	DMDS ppm	TRS ppm
				CC416806 7.257ppm ✓					
09:05	14217	7.76	<2	<0.12	<2	<0.077	<2	<0.036	7.76
09:08	14648	7.88	<2	<0.12	<2	<0.077	<2	<0.036	7.88
Average		**7.82** ✓		**<0.12** ✓		**<0.077** ✓		**<0.036** ✓	**7.82** ✓

RECOVERY DATA

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Before Run 1
Start Time 12:40 **End Time** 12:54

Recovery Gas to Probe, Time 12:40

Peak Areas, mv-sec			Average	ppm
12316	12389	12588	12431 ✓	7.23

Recovery Gas to GC, Time 12:50

Peak Areas, mv-sec			Average	ppm
15122	15025	15294	15147 ✓	8.02

Recovery 90.2% ✓

RECOVERY DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

After Run 3 **Before Run** 4
Start Time 19:07 **End Time** 19:38

Recovery Gas to Probe, Time 19:07

Peak Areas, mv-sec			Average	ppm
11821	11900	11851	11857 ✓	7.06

Recovery Gas to GC, Time 19:36

Peak Areas, mv-sec			Average	ppm
14397	14822	14833	14684 ✓	7.89

Recovery 89.5% ✓

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.25 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51828	33-53274	89-53332	89-53266
Perm. Rate, nL/min	351	369	477	241
Ret. Time, sec	16.0	22.5	48.0	127.0

1 Flow = **37.6** mL/Min	**9.34** ppm	**9.81** ppm	**12.7** ppm	**6.42** ppm
Time: 07:00		**Peak Areas, mv-sec**		
	19790	9921	31382	38948
	20319	10076	31742	38693
	19852	9986	30214	37936
Average Area	**19987** ✓	**9995** ✓	**31113** ✓	**38526** ✓

2 Flow = **82.8** mL/Min	**4.24** ppm	**4.46** ppm	**5.77** ppm	**2.92** ppm
Time: 11:03		**Peak Areas, mv-sec**		
	4788	2266	7435	8918
	4588	2209	7188	8687
	4419	2218	7198	8791
Average Area	**4598** ✓	**2231** ✓	**7274** ✓	**8798** ✓

3 Flow = **180** mL/Min	**1.95** ppm	**2.05** ppm	**2.66** ppm	**1.34** ppm
Time: 11:47		**Peak Areas, mv-sec**		
	998	492	1607	1968
	985	496	1607	1963
	982	497	1614	1971
Average Area	**988** ✓	**495** ✓	**1609** ✓	**1967** ✓

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

H_2S	**1**	**2**	**3**
Time	07:00	11:03	11:47
Concentration, ppm	9.34	4.24	1.95
Area, mv-sec	19987	4598	988
Calc. Conc., ppm	9.26	4.31	1.94
% Error	-0.8	1.6	-0.8

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9212	2.4433	0.9998	2	0.077

MeSH	**1**	**2**	**3**
Time	07:00	11:03	11:47
Concentration, ppm	9.81	4.46	2.05
Area, mv-sec	9995	2231	495
Calc. Conc., ppm	9.79	4.48	2.05
% Error	-0.3	0.5	-0.3

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9203	2.0975	>0.9999	2	0.12

DMS	**1**	**2**	**3**
Time	07:00	11:03	11:47
Concentration, ppm	12.7	5.77	2.66
Area, mv-sec	31113	7274	1609
Calc. Conc., ppm	12.6	5.85	2.64
% Error	-0.7	1.4	-0.7

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8927	2.4098	0.9999	2	0.077

DMDS	**1**	**2**	**3**
Time	07:00	11:03	11:47
Concentration, ppm	6.42	2.92	1.34
Area, mv-sec	38526	8798	1967
Calc. Conc., ppm	6.39	2.94	1.34
% Error	-0.4	0.8	-0.4

Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9009	3.0543	>0.9999	2	0.036

CALIBRATION DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.55 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51828	33-53274	89-53332	89-53266
Perm. Rate, nL/min	348	365	473	239
Ret. Time, sec	16.0	22.5	48.0	127.0

1 Flow = **38.4** mL/Min	**9.05** ppm	**9.51** ppm	**12.3** ppm	**6.22** ppm
Time: 06:02	**Peak Areas, mv-sec**			
	18150	9129	29752	37042
	18234	8899	29635	36567
	17949	9072	29588	35648
Average Area	**18111** ✓	**9034** ✓	**29658** ✓	**36419** ✓

2 Flow = **86.9** mL/Min	**4.00** ppm	**4.20** ppm	**5.44** ppm	**2.75** ppm
Time: 08:24	**Peak Areas, mv-sec**			
	4494	1991	6636	8003
	4478	2048	6673	8033
	4420	2010	6502	8101
Average Area	**4464** ✓	**2016** ✓	**6604** ✓	**8046** ✓

3 Flow = **191** mL/Min	**1.82** ppm	**1.92** ppm	**2.48** ppm	**1.25** ppm
Time: 08:49	**Peak Areas, mv-sec**			
	1072	443	1449	1837
	1039	453	1513	1835
	1077	449	1476	1874
Average Area	**1063** ✓	**448** ✓	**1479** ✓	**1849** ✓

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

H_2S	**1**	**2**	**3**		
Time	06:02	08:24	08:49		
Concentration, ppm	9.05	4.00	1.82		
Area, mv-sec	18111	4464	1063		
Calc. Conc., ppm	8.97	4.07	1.81		
% Error	-0.8	1.7	-0.9		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7702	2.5709	0.9998	2	0.052

MeSH	**1**	**2**	**3**		
Time	06:02	08:24	08:49		
Concentration, ppm	9.51	4.20	1.92		
Area, mv-sec	9034	2016	448		
Calc. Conc., ppm	9.46	4.25	1.91		
% Error	-0.6	1.1	-0.6		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8751	2.1261	0.9999	2	0.11

DMS	**1**	**2**	**3**		
Time	06:02	08:24	08:49		
Concentration, ppm	12.3	5.44	2.48		
Area, mv-sec	29658	6604	1479		
Calc. Conc., ppm	12.2	5.49	2.47		
% Error	-0.5	1.0	-0.5		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8718	2.4355	0.9999	2	0.072

DMDS	**1**	**2**	**3**		
Time	06:02	08:24	08:49		
Concentration, ppm	6.22	2.75	1.25		
Area, mv-sec	36419	8046	1849		
Calc. Conc., ppm	6.21	2.76	1.25		
% Error	-0.2	0.4	-0.2		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8610	3.0854	>0.9999	2	0.032

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**
Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	16.0	22.5	48.0	127.0
Peak Detection Window, sec	3.0	7.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	2.0	3.0
Ending Peak Width, sec	2.0	6.0	4.0	5.0
Permeation Device ID	T-51828	33-53274	89-53332	89-53266
Permeation Rate, ng/min	483 ✓	716 ✓	1197 ✓	918 ✓
Permeation Rate, nL/min*	348	365	473	239

Barometric Pressure: 29.55 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 483 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.55)$$
$$= 348 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

File: C:\Data\210624 New Indy Catawba No. 2 CB.trs
Program Version: 2.0, built 15 May 2017 **File Version:** 2.0
Computer: WLT5 **Trailer:** 281

Analog Input Device: MCC USB-1608G **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: Shimadzu GC8-A **Serial No.** C10493615061
Detector Range: 10

Gases

	Press. psi	Flow mL/min
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 140
Detector: 140

Columns

Primary: Carbopack
Secondary: N/A
Sample Loop: 4"

Injection Cycle

Total Length: 180 sec **Sampling Time:** 170 sec **Load/Backflush Time:** 80 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 2 mv-sec **Minimum peak height** 1 mv above baseline

Dynacalibrator

Chamber Temperature 50.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.55 in. Hg

RUN SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 14:45 to 15:45

Run Averages

	13.0	6.6	320

Pre-run Bias at 14:36

Zero Bias	0.1	0.0	4
Span Bias	10.1	10.2	242
Span Gas	10.1	10.2	242

Post-run Bias at 15:50

Zero Bias	0.0	0.0	4
Span Bias	10.1	10.2	239
Span Gas	10.1	10.2	242

Run averages corrected for the average of the pre-run and post-run bias

	13.1 ✓	6.6 ✓	324 ✓

RUN SUMMARY

Number 2

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 2 Combination Boiler**	Date:	**24 Jun 2021**

Calibration **1**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 16:30 to 17:30

Run Averages

	12.6	6.9	324

Pre-run Bias at 15:50

Zero Bias	0.0	0.0	4
Span Bias	10.1	10.2	239
Span Gas	10.1	10.2	242

Post-run Bias at 17:33

Zero Bias	0.1	0.0	7
Span Bias	10.1	10.1	244
Span Gas	10.1	10.2	242

Run averages corrected for the average of the pre-run and post-run bias

	12.7 ✓	6.9 ✓	327 ✓

RUN SUMMARY

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 18:06 to 19:06

Run Averages

	12.2	7.3	321

Pre-run Bias at 17:33

Zero Bias	0.1	0.0	7
Span Bias	10.1	10.1	244
Span Gas	10.1	10.2	242

Post-run Bias at 19:08

Zero Bias	0.1	0.0	5
Span Bias	10.1	10.2	241
Span Gas	10.1	10.2	242

Run averages corrected for the average of the pre-run and post-run bias

	12.3 ✓	7.3 ✓	322 ✓

RUN DATA
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

With NCGs & SOGs
Traversed @ 16.6%, 50.0%, & 83.3% of duct diameter

Point 1

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
14:46	4108	12.4	2996	7.5	3011	300
14:47	4097	12.3	2991	7.4	3017	300
14:48	3977	12.0	3028	7.5	3055	304
14:49	3987	12.0	3156	7.9	3085	307
14:50	3979	12.0	3132	7.8	3072	306
14:51	3980	12.0	3149	7.8	2913	290
14:52	4083	12.3	3137	7.8	2875	286
14:53	4206	12.7	3007	7.5	2930	292
14:54	4236	12.8	2877	7.2	3006	299
14:55	4218	12.7	2850	7.1	3073	306
14:56	4370	13.2	2810	7.0	3033	302
14:57	4368	13.1	2667	6.6	3136	312
14:58	4294	12.9	2672	6.6	3154	314
14:59	4319	13.0	2752	6.8	3132	312
15:00	4296	12.9	2731	6.8	3223	321
15:01	4316	13.0	2753	6.8	3181	317
15:02	4381	13.2	2710	6.7	3211	320
15:03	4185	12.6	2684	6.7	3173	316
15:04	4069	12.3	2877	7.2	2984	297
15:05	4041	12.2	3001	7.5	3041	303

Point 2

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
15:06	4040	12.2	3033	7.5	3076	306
15:07	4140	12.5	2999	7.5	3038	303
15:08	4235	12.7	2901	7.2	3046	303
15:09	4259	12.8	2783	6.9	3069	306
15:10	4355	13.1	2749	6.8	3154	314
15:11	4384	13.2	2653	6.6	3311	330
15:12	4466	13.4	2604	6.5	3337	332
15:13	4555	13.7	2489	6.2	3276	326
15:14	4534	13.6	2410	6.0	3205	319
15:15	4491	13.5	2421	6.0	3145	313
15:16	4454	13.4	2451	6.1	3196	318
15:17	4454	13.4	2500	6.2	3166	315
15:18	4342	13.1	2515	6.2	3281	327
15:19	4342	13.1	2624	6.5	3244	323
15:20	4463	13.4	2612	6.5	3261	325
15:21	4483	13.5	2474	6.1	3373	336
15:22	4487	13.5	2458	6.1	3366	335

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
15:23	4539	13.7	2438	6.1	3201	319
15:24	4574	13.8	2381	5.9	3191	318
15:25	4521	13.6	2354	5.8	3329	332
			Point 3			
15:26	4507	13.6	2413	6.0	3346	333
15:27	4454	13.4	2435	6.0	3376	336
15:28	4416	13.3	2485	6.2	3524	351
15:29	4404	13.3	2539	6.3	3496	348
15:30	4461	13.4	2540	6.3	3423	341
15:31	4560	13.7	2475	6.1	3252	324
15:32	4510	13.6	2370	5.9	3272	326
15:33	4479	13.5	2425	6.0	3328	332
15:34	4431	13.3	2459	6.1	3328	332
15:35	4429	13.3	2519	6.3	3325	331
15:36	4361	13.1	2540	6.3	3347	333
15:37	4435	13.3	2573	6.4	3340	333
15:38	4422	13.3	2527	6.3	3372	336
15:39	4476	13.5	2509	6.2	3481	347
15:40	4464	13.4	2455	6.1	3535	352
15:41	4395	13.2	2494	6.2	3451	344
15:42	4358	13.1	2563	6.4	3253	324
15:43	4318	13.0	2598	6.5	3260	325
15:44	4310	13.0	2647	6.6	3270	326
15:45	4298	12.9	2666	6.6	3261	325
Avgs	**4335**	**13.0**	**2668**	**6.6**	**3214**	**320**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

With NCGs & SOGs

Traversed @ 16.6%, 50.0%, & 83.3% of duct diameter

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
Point 1						
16:31	4171	12.6	2672	6.6	3216	320
16:32	4119	12.4	2788	6.9	3200	319
16:33	4126	12.4	2856	7.1	3255	324
16:34	4203	12.7	2842	7.1	3239	323
16:35	4294	12.9	2741	6.8	3356	334
16:36	4374	13.2	2640	6.6	3431	342
16:37	4326	13.0	2566	6.4	3322	331
16:38	4338	13.1	2604	6.5	3146	313
16:39	4312	13.0	2606	6.5	3257	324
16:40	4358	13.1	2614	6.5	3196	318
16:41	4456	13.4	2562	6.4	3256	324
16:42	4497	13.5	2454	6.1	3263	325
16:43	4433	13.3	2410	6.0	3234	322
16:44	4408	13.3	2484	6.2	3253	324
16:45	4381	13.2	2513	6.2	3261	325
16:46	4286	12.9	2558	6.4	3171	316
16:47	4296	12.9	2654	6.6	3252	324
16:48	4265	12.8	2651	6.6	3433	342
16:49	4108	12.4	2702	6.7	3304	329
16:50	4012	12.1	2875	7.2	3162	315
Point 2						
16:51	4020	12.1	2971	7.4	3150	314
16:52	4040	12.2	2975	7.4	3140	313
16:53	4117	12.4	2932	7.3	3064	305
16:54	4169	12.6	2860	7.1	3134	312
16:55	4080	12.3	2812	7.0	3235	322
16:56	4024	12.1	2918	7.3	3268	326
16:57	4039	12.2	2965	7.4	3366	335
16:58	4118	12.4	2933	7.3	3460	345
16:59	4178	12.6	2843	7.1	3359	335
17:00	4081	12.3	2796	7.0	3239	323
17:01	4041	12.2	2911	7.2	3179	317
17:02	4127	12.4	2921	7.3	3164	315
17:03	4118	12.4	2865	7.1	3219	321
17:04	4162	12.5	2847	7.1	3337	332
17:05	4157	12.5	2814	7.0	3355	334
17:06	4228	12.7	2798	7.0	3420	341
17:07	4265	12.8	2722	6.8	3258	325

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %	SO_2 mv	SO_2 ppm
17:08	4049	12.2	2716	6.8	3091	308
17:09	3988	12.0	2952	7.3	3184	317
17:10	4218	12.7	2989	7.4	3145	313
Point 3						
17:11	4304	13.0	2738	6.8	3235	322
17:12	4144	12.5	2669	6.6	3288	328
17:13	4077	12.3	2848	7.1	3181	317
17:14	4102	12.3	2902	7.2	3201	319
17:15	4152	12.5	2887	7.2	3242	323
17:16	4200	12.6	2827	7.0	3326	331
17:17	4233	12.7	2760	6.9	3407	339
17:18	4267	12.8	2729	6.8	3435	342
17:19	4334	13.0	2703	6.7	3244	323
17:20	4262	12.8	2622	6.5	3225	321
17:21	4237	12.8	2700	6.7	3205	319
17:22	4242	12.8	2722	6.8	3095	308
17:23	4205	12.7	2711	6.7	3211	320
17:24	4237	12.8	2762	6.9	3277	326
17:25	4220	12.7	2727	6.8	3322	331
17:26	4226	12.7	2731	6.8	3456	344
17:27	4112	12.4	2751	6.8	3471	346
17:28	3963	11.9	2895	7.2	3258	325
17:29	4087	12.3	3036	7.6	3187	317
17:30	4290	12.9	2875	7.2	3147	313
Avgs	**4198**	**12.6**	**2765**	**6.9**	**3256**	**324**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

With NCGs & SOGs

Traversed @ 16.6%, 50.0%, & 83.3% of duct diameter

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
Point 1						
18:07	4211	12.7	2670	6.6	3226	321
18:08	4167	12.5	2744	6.8	3287	327
18:09	4135	12.4	2791	6.9	3381	337
18:10	4078	12.3	2850	7.1	3388	337
18:11	4130	12.4	2872	7.1	3358	334
18:12	4218	12.7	2826	7.0	3176	316
18:13	4226	12.7	2731	6.8	3113	310
18:14	4187	12.6	2729	6.8	3126	311
18:15	4179	12.6	2764	6.9	3202	319
18:16	4163	12.5	2782	6.9	3191	318
18:17	4074	12.3	2813	7.0	3218	321
18:18	4040	12.2	2921	7.3	3165	315
18:19	4079	12.3	2945	7.3	3147	313
18:20	4099	12.3	2894	7.2	3166	315
18:21	4158	12.5	2880	7.2	3209	320
18:22	3944	11.9	2856	7.1	3328	332
18:23	3929	11.8	3056	7.6	3281	327
18:24	3911	11.8	3091	7.7	3245	323
18:25	4003	12.1	3120	7.8	3123	311
18:26	4117	12.4	2988	7.4	3047	303
Point 2						
18:27	4242	12.8	2825	7.0	3183	317
18:28	4129	12.4	2734	6.8	3203	319
18:29	4041	12.2	2845	7.1	3200	319
18:30	4020	12.1	2964	7.4	3329	332
18:31	3939	11.9	2995	7.5	3416	340
18:32	3931	11.8	3074	7.7	3363	335
18:33	3942	11.9	3072	7.6	3140	313
18:34	3967	11.9	3065	7.6	3141	313
18:35	3990	12.0	3043	7.6	3144	313
18:36	4051	12.2	2988	7.4	3136	312
18:37	4050	12.2	2952	7.3	3166	315
18:38	4177	12.6	2911	7.2	3147	313
18:39	4294	12.9	2765	6.9	3269	326
18:40	4135	12.4	2684	6.7	3425	341
18:41	4071	12.3	2854	7.1	3408	339
18:42	4087	12.3	2908	7.2	3243	323
18:43	3982	12.0	2920	7.3	3143	313

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
18:44	3985	12.0	3017	7.5	3084	307
18:45	3917	11.8	3024	7.5	3169	316
18:46	3920	11.8	3099	7.7	3200	319
			Point 3			
18:47	4006	12.1	3072	7.6	3196	318
18:48	4096	12.3	2981	7.4	3334	332
18:49	4079	12.3	2899	7.2	3367	335
18:50	4091	12.3	2902	7.2	3216	320
18:51	4122	12.4	2900	7.2	3076	306
18:52	4122	12.4	2859	7.1	3144	313
18:53	4039	12.2	2873	7.1	3157	314
18:54	4078	12.3	2937	7.3	3167	315
18:55	3970	12.0	2928	7.3	3206	319
18:56	3924	11.8	3051	7.6	3177	316
18:57	4012	12.1	3077	7.7	3221	321
18:58	3967	11.9	2999	7.5	3408	339
18:59	3991	12.0	3032	7.5	3252	324
19:00	4119	12.4	2983	7.4	3119	311
19:01	4028	12.1	2885	7.2	3113	310
19:02	4042	12.2	2965	7.4	3084	307
19:03	3997	12.0	2966	7.4	3159	315
19:04	3963	11.9	3000	7.5	3214	320
19:05	3951	11.9	3036	7.6	3345	333
19:06	3958	11.9	3065	7.6	3360	335
Avgs	**4058**	**12.2**	**2925**	**7.3**	**3220**	**321**

BIAS
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 09:56

O2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %		Status
Zero	0.0	22	0.1	0.1	0.5	✓	Pass
Span	10.1	3355	10.1	0.0	0.0	✓	Pass

CO2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %		Status
Zero	-0.1	35	0.0	0.1	0.5	✓	Pass
Span	10.3	4075	10.2	-0.1	-0.5	✓	Pass

SO2

Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %		Status
Zero	-1	2	0	1	0.2	✓	Pass
Span	244	2376	237	-7	-1.5	✓	Pass

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 14:36

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard	Cal.	Response	Bias	Difference	Error	
Gas	%	mv	%	%	%	Status
Zero	0.0	37	0.1	0.1	0.5 ✓	Pass
Span	10.1	3339	10.1	0.0	0.0 ✓	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	%	mv	%	%	%	Status
Zero	0.1	37	0.1	0.0	0.0 ✓	Pass
Span	10.1	3339	10.1	0.0	0.0 ✓	Pass

*Bias No. 1

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard	Cal.	Response	Bias	Difference	Error	
Gas	%	mv	%	%	%	Status
Zero	-0.1	21	0.0	0.1	0.5 ✓	Pass
Span	10.3	4072	10.2	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	%	mv	%	%	%	Status
Zero	0.0	21	0.0	0.0	0.0 ✓	Pass
Span	10.2	4072	10.2	0.0	0.0 ✓	Pass

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 14:36

SO_2

Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	-1	43	4	5	1.1	Pass
Span	244	2432	242	-2	-0.4	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	ppm	Difference ppm	Drift %	Status
Zero	0	43	4	4	0.9	Pass
Span	237	2432	242	5	1.1	Pass

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 15:50

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	3	0.0	0.0	0.0 ✓	Pass
Span	10.1	3340	10.1	0.0	0.0 ✓	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.1	3	0.0	-0.1	-0.5 ✓	Pass
Span	10.1	3340	10.1	0.0	0.0 ✓	Pass

*Bias No. 2

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	-0.1	6	0.0	0.1	0.5 ✓	Pass
Span	10.3	4078	10.2	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	6	0.0	0.0	0.0 ✓	Pass
Span	10.2	4078	10.2	0.0	0.0 ✓	Pass

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 15:50

SO_2
Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	-1	48	4	5	1.1 ✓	Pass
Span	244	2402	239	-5	-1.1 ✓	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	**ppm**	**mv**	**ppm**	**ppm**	**%**	**Status**
Zero	4	48	4	0	0.0 ✓	Pass
Span	242	2402	239	-3	-0.7 ✓	Pass

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 17:33

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	16	0.1	0.1	0.5 ✓	Pass
Span	10.1	3338	10.1	0.0	0.0 ✓	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	16	0.1	0.1	0.5 ✓	Pass
Span	10.1	3338	10.1	0.0	0.0 ✓	Pass

*Bias No. 3

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	-0.1	6	0.0	0.1	0.5 ✓	Pass
Span	10.3	4045	10.1	-0.2	-1.0 ✓	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	6	0.0	0.0	0.0 ✓	Pass
Span	10.2	4045	10.1	-0.1	-0.5 ✓	Pass

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 17:33

SO_2
Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	-1	77	7	8	1.7 ✓ ✓	Pass
Span	244	2447	244	0	0.0	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	4	77	7	3	0.7 ✓	Pass
Span	239	2447	244	5	1.1 ✓	Pass

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 19:08

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard	Cal.	Response	Bias	Difference	Error	
Gas	%	mv	%	%	%	Status
Zero	0.0	16	0.1	0.1	0.5 ✓ ✓	Pass
Span	10.1	3349	10.1	0.0	0.0	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	%	mv	%	%	%	Status
Zero	0.1	16	0.1	0.0	0.0 ✓ ✓	Pass
Span	10.1	3349	10.1	0.0	0.0	Pass

*Bias No. 4

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard	Cal.	Response	Bias	Difference	Error	
Gas	%	mv	%	%	%	Status
Zero	-0.1	6	0.0	0.1	0.5 ✓	Pass
Span	10.3	4104	10.2	-0.1	-0.5 ✓	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	%	mv	%	%	%	Status
Zero	0.0	6	0.0	0.0	0.0 ✓	Pass
Span	10.1	4104	10.2	0.1	0.5 ✓	Pass

*Bias No. 4

BIAS AND CALIBRATION DRIFT

Number 5

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 19:08

SO_2

Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	-1	50	5	6	1.3 ✓	Pass
Span	244	2418	241	-3	-0.7 ✓	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	7	50	5	-2	-0.4 ✓	Pass
Span	244	2418	241	-3	-0.7 ✓	Pass

*Bias No. 4

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 09:44

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	-2
10.1 ✓	XC013544B	3348
20.2 ✓	CC275468	6739

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
333.1 ✓	-11 ✓	>0.9999 ✓

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	**Cylinder ID**	**Result, mv**
Zero	-	4
10.2 ✓	XC013544B	4116
20.3 ✓	CC275468	8080

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
398.4 ✓	25 ✓	>0.9999 ✓

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 09:44

SO_2

Method: EPA 6C
Calibration Type: Linear Regression

Calibration Results

ppm	**Cylinder ID**	**Result, mv**
Zero	-	-5
242 ✓	CC234516	2450
458 ✓	EB0108003	4587

Curve Coefficients

Slope	**Intercept**	**Corr. Coeff.**
10.03 ✓	3 ✓	>0.9999 ✓

CALIBRATION ERROR DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Start Time: 09:44

O_2

Method: EPA 3A
Span Conc. 20.2 %
Slope 333.1 **Intercept** -11.0

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	-2	0.0	0.0	0.0 ✓	Pass
10.1	3348	10.1	0.0	0.0 ✓	Pass
20.2	6739	20.3	0.1	0.5 ✓	Pass

CO_2

Method: EPA 3A
Span Conc. 20.3 %
Slope 398.4 **Intercept** 25.3

Standard %	Response mv	Result %	Difference %	Error %	Status
Zero	4	-0.1	-0.1	-0.5 ✓	Pass
10.2	4116	10.3	0.1	0.5 ✓	Pass
20.3	8080	20.2	-0.1	-0.5 ✓	Pass

SO_2

Method: EPA 6C
Span Conc. 458 ppm
Slope 10.03 **Intercept** 3

Standard ppm	Response mv	Result ppm	Difference ppm	Error %	Status
Zero	-5	-1	-1	-0.2 ✓	Pass
242	2450	244	2	0.4 ✓	Pass
458	4587	457	-1	-0.2 ✓	Pass

METHODS AND ANALYZERS

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 2 Combination Boiler**	Date:	**24 Jun 2021**

File: C:\Data\210624 New Indy Catawba No. 2 CB.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: WSAUBCHEMLABGC1 **Trailer:** 281
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T802 s/n: 172**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.2**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T802 s/n: 172**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.3**

Channel 5

Analyte	**SO_2**
Method	**EPA 6C**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T100H SN 374**
Full-Scale Output, mv	**10000**
Analyzer Range, ppm	**500**
Span Concentration, ppm	**458**

NO. 2 COMBINATION BOILER
(CONDITION 2: NCG GASES ONLY)

New Indy
Catawba, SC

15730.001.008
No. 2 Combination Boiler
Condition 2: NCGs Only

EMISSION CALCULATIONS

		Run 1	Run 2	Run 3	Mean
Date		6/25/21 ✓	6/25/21 ✓	6/25/21 ✓	---
Time Began		1000 ✓	1135 ✓	1315 ✓	---
Time Ended		1100 ✓	1235 ✓	1415 ✓	---
Volumetric Flow Rate, (Qs), DSCFM		1.56E+05 ✓	1.55E+05 ✓	1.56E+05 ✓	1.56E+05
BWS		0.139 ✓	0.142 ✓	0.139 ✓	0.140
% Oxygen		12.8 ✓	12.7 ✓	12.3 ✓	12.6
Sulfur Dioxide	MW= 64.06				
Concentration, ppm		247.0 ✓	245.0 ✓	235.0 ✓	242.3
Emission Rate, lb/hr		383.2	380.0	366.2	376.4
Total Reduced Sulfur	(TRS MW)= 34.08				
Concentration, ppm		1.04 ✓	0.99 ✓	0.76 ✓	0.93
Emission Rate, lb/hr		0.86	0.82	0.63	0.77

KW

New Indy
Catawba, SC

15730.001.008
No. 2 Combination Boiler

Condition 2: NCGs Only

ISOKINETIC CALCULATIONS

Run Number		1	2	3	Mean
Date		6/25/21	6/25/21	6/25/21	---
Time Began		1000	1135	1315	---
Time Ended		1124	1259	1441	---
	INPUT DATA				
Sampling Time, min	(Theta)	64.0	64	64	64
Stack Diameter, in.	(Dia.)	120.00	120.00	120.00	120.00
Barometric Pressure, in. Hg	(Pb)	29.60	29.60	29.60	29.60
Static Pressure, in. H2O	(Pg)	-0.64	-0.64	-0.64	-0.64
Pitot Tube Coefficient	(Cp)	0.84	0.84	0.84	0.84
Meter Correction Factor	(Y)	0.9880	0.9880	0.9880	0.9880
Orifice Calibration Value	(Delta H@)	1.7320	1.7320	1.7320	1.7320
Nozzle Diameter, in.	(Dn)	0.250	0.250	0.250	0.250
Meter Volume, ft^3	(Vm)	42.272	42.147	42.353	42.257
Meter Temperature, °F	(Tm)	85.8	93.1	95.3	91.4
Meter Temperature, °R	(Tm-R)	545.8	553.1	555.3	551.4
Meter Orifice Pressure, in. H2O	(Delta H)	1.300	1.300	1.300	1.300
Ave Sq Rt Orifice Press, (in. H2O)^½	((Delta H)½)avg)	1.140	1.140	1.140	1.140
Volume H2O Collected, mL	(Vlc)	137.1	138.6	135.0	136.9
CO2 Concentration, %	(CO2)	6.9	6.8	7.3	7.0
O2 Concentration, %	(O2)	12.8	12.7	12.3	12.6
Ave Sq Rt Velo Head, (in. H2O)^½	((Delta P)½)avg)	0.897	0.901	0.908	0.902
Stack Temperature, °F	(Ts)	468.3	470.3	480.9	473.2
Stack Temperature, °R	(Ts-R)	928.3	930.3	940.9	933.2
	CALCULATED DATA				
Nozzle Area, ft^2	(An)	3.41E-04	3.41E-04	3.41E-04	3.41E-04
Stack Area, ft^2	(As)	78.54	78.54	78.54	78.54
Stack Pressure, in. Hg	(Ps)	29.55	29.55	29.55	29.55
Meter Pressure, in. Hg	(Pm)	29.70	29.70	29.70	29.70
Standard Meter Volume, ft^3	(Vmstd)	40.087	39.435	39.477	39.667
Standard Water Volume, ft^3	(Vwstd)	6.453	6.524	6.354	6.444
Moisture Fraction (Measured)	(BWS)	0.139	0.142	0.139	0.140
Moisture Fraction (lower sat/meas)	(BWS)	0.139	0.142	0.139	0.140
Mol. Wt. of Dry Gas, lb/lb-mole	(Md)	29.62	29.60	29.66	29.62
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	28.01	27.95	28.04	28.00
Average Stack Gas Velocity, ft/sec	(Vs)	68.24	68.63	69.48	68.78
Stack Gas Flow, actual, ft^3/min	(Qa)	321588	323402	327406	324132
Stack Gas Flow, Std , ft^3/min	(Qs)	155554	155499	156245	155766
Calibration check	(Yqa)	0.9937	1.0037	0.9996	0.999
Percent difference from Y					1.11%

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 2 Combination Boiler
Sample Location Stack outlet
W. O. Number 15730.001.008
Run Number 1
Date 6/25/21
Test Personnel ATR/LL
Sample Time 64 min.

Console ID A010
Meter Corr., Y .988
Console ΔH@ 1.732
Probe ID/Length PR 5B 5'
Liner Material SS
Pitot ID/Coeff. P172 0.84
Thermo ID A010
Nozzle ID/Diams. .250 .250 .250 .250
Avg. Nozzle Diam. .250 in.

Ambient Temp. 80 °F
Baro. Pressure* 29.60 in. Hg
Static Pressure -.64 ATR in. H2O
Impinger Gain 128.06 mL 137.1
Silica Gel Gain ~~137.1~~ g 8.5 ATR
Stack Area 78.54 ft²
Total Traverse Points 16

K Factor NA

Leak Checks

	Initial	Final
Volume, ft³	.002	.000
@ Vac., in. Hg	8	5
Pitot	.000	.000

Filter ID NA
Sample ID Run 1 NCG only

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H2O)	ORIFICE PRESSURE ΔH (in. H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	~~DGM INLET TEMP (°F)~~	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	10:00			223.860									
~~A~~-1 C	~~3~~ 4		.88	1.3	226.4	466		79	245	247		65	2.5	
2	~~6~~ 8		.85	1.3	229.2	468		79	244	250		63	2.5	
3	~~9~~ 12		.85	1.3	231.7	467		80	245	252		60	2.5	
4	~~12~~ 16	10:16	.77	1.3	234.3	468		81	246	253		58	2.5	
~~B~~-1 D	~~15~~ 20	10:22	.90	1.3	237.0	466		84	245	254		59	2.5	
2	~~18~~ 24		.87	1.3	239.5	466		84	246	255		58	2.5	
3	~~21~~ 28		.85	1.3	242.2	467		85	245	256		55	2.5	
4	~~24~~ 32	10:38	.80	1.3	244.8	471		87	244	256		54	2.5	
~~C~~-1 A	~~27~~ 36	10:42	.80	1.3	247.4	470		89	243	255		60	2.5	
2	~~30~~ 46		.77	1.3	250.3	470		84	243	254		55	2.5	
3	~~33~~ 44		.80	1.3	252.5	469		88	244	255		56	2.5	
4	~~36~~ 48	10:58	.72	1.3	255.5	464		88	245	256		57	2.5	
~~D~~-1 B	~~39~~ 52	11:08	.82	1.3	258.0	468		89	246	255		63	3	
2	~~42~~ 56		.80	1.3	260.~~256.0~~	469		90	245	253		59	3	
3	~~45~~ 60		.72	1.3	ATR 263.3	469		90	246	254		55	3	
4	~~48~~ 64	11:24	.70	1.3	266.072	470		90	245	255		56	3	
*Barometric Pressure is at port elevation			Avg √Δp .8473 ✓	Avg ΔH 1.3 ✓	Total Volume 42.272 ✓	Avg Ts 468.31 ✓		Avg Tm 85.75 ✓	Min/Max 243/246 ✓	Min/Max 247/256 ✓	Min/Max ✓	Max Temp 65 ✓	Max Vac 3 ✓	
			AR 7/1 .80623 ✓	Avg √ΔH 1.140 ✓										

Comments NCG only

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O2/CO2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Vm-std, scf
Qs, dscfm
% Isokinetic
Calculated by
QC by ✓

WESTON SOLUTIONS®
Integrated Air Services

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 2 Combination Boiler
Sample Location stack outlet
W. O. Number 15730.001.008
Run Number 2
Date 6/25/21
Test Personnel ATR
Sample Time 64 min.

Console ID A010
Meter Corr., Y .988
Console ΔH@ 1.732
Probe ID/Length PR5B 5'
Liner Material SS
Pitot ID/Coeff. P172 0.84
Thermo ID A010
Nozzle ID/Diams. .230 .230 .230 .230
Avg. Nozzle Diam. .230 in.

Ambient Temp. 85 °F
Baro. Pressure* 29.60 in. Hg
Static Pressure -.64 in. H_2O
Impinger Gain 126.9 mL 138.6
Silica Gel Gain 11.7 g
Stack Area 78.54 ft^2
Total Traverse Points 16

K Factor NA

Leak Checks

	Initial	Final
Volume, ft^3	.000	.000
@ Vac., in. Hg	8	5
Pitot	.000	.000

Filter ID NA
Sample ID Run 2 NCG only

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	11:35			266.300									
A-1 C	~~3~~ 4		.87	1.3	264.0	467		90	242	250		66	3. 2.5	
2	~~6~~ 8		.89	1.3	271.5	470		90	244	244		64	2.5	
3	~~9~~ 12		.85	1.3	274.2	471		91	245	253		54	2.5	
4	~~12~~ 16	11:51	.75	1.3	276.7	470		91	246	254		57	2.5	
B-1 D	~~15~~ 20	11:57	.92	1.3	274.4	468		92	247	256		64	2.5	
2	~~18~~ 24		.90	1.3	282.0	464		92	248	255		60	2.5	
3	~~21~~ 28		.85	1.3	285.0	464		93	247	256		59	2.5	
4	~~24~~ 32	12 N:13	.83	1.3	287.5	468		93	248	255		60	2.5	
C-1 A	~~27~~ 36	N:18	.85	1.3	290.0	467		94	249	256		65	2.5	
2	~~30~~ 40	12	.80	1.3	293.5	470		95	250	256		63	2.5	
3	~~33~~ 44	12	.80	1.3	295.4	471		94	251	256		61	3	
4	~~36~~ 48	N:34	.65	1.3	297.8	468		94	252	255		61	3	
D-1 B	~~39~~ 52	N:43	.86	1.3	300.6	464		95	244	247		65	3	
2	~~42~~ 56	12	.85	1.3	303.1	475		95	245	249		65	3	
3	~~45~~ 60	12	.69	1.3	305.4	477		95	261	250		64	3.5	
4	~~48~~ 64	N:54	.65	1.3	308.447	478		96	245	250		64	3.5	
			Avg √Δp .9005 .8131	Avg ΔH 1.3	Total Volume 42.147	Avg T_s 470.31		Avg T_m 43.123	Min/Max 242/265	Min/Max 247/256	Min/Max	Max Temp 65 66	Max Vac 3.5	V_{m-std}, scf

*Barometric Pressure is at port elevation

AB 7/11

Avg √ΔH 1.140

AB 7/11

AB 7/11

Comments NCG only

Flue Gas Composition
Oxygen, %
Carbon Dioxide, %
Moisture, %

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run
Post-run

Thermocouple Check
Meter Temp., °F
Ref. Temp, °F
Result

Q_s, dscfm
% Isokinetic
Calculated by
QC by AW

Integrated Air Services

Isokinetic Field Data

Method: EPA 4, Moisture

Page 1 of 1

Client New Indy
Location/Plant Catawba, SC
Source No. 2 Combination Boiler
Sample Location ~~Stack outlet~~
W. O. Number 15730.001.008
Run Number 3
Date 6/25/21
Test Personnel ATR/LL
Sample Time 64 min.

Console ID A010
Meter Corr., Y .988
Console ΔH@ 1.732
Probe ID/Length PR5B 5'
Liner Material SS
Pitot ID/Coeff. P172 0.84
Thermo ID A010
Nozzle ID/Diams. .250 .250 .230 .250
Avg. Nozzle Diam. .256 in.

Ambient Temp. 85 °F
Baro. Pressure* 29.60 in. Hg
Static Pressure -.64 in. H_2O
Impinger Gain ~~126.4~~ mL ATR 125.2
Silica Gel Gain ~~4.7~~ g 4.6
134.8
Stack Area 78.54 ft^2
Total Traverse Points 16

K Factor NA

Leak Checks

	Initial	Final
Volume, ft^3	.003	.001
@ Vac., in. Hg	8	5
Pitot	.000	.000

Filter ID NA
Sample ID Run3 NCG only

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Δp (in. H_2O)	ORIFICE PRESSURE ΔH (in. H_2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	~~DGM INLET TEMP (°F)~~	DGM OUTET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (°F)	FILTER EXIT TEMP (°F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VACUUM (in Hg)	COMMENTS
	0	13:15			308.700									
~~A~~-1 C	~~3~~ 4		.44	1.3	311.4	481		96	250	250		65	3	
2	~~6~~ 8		.40	1.3	313.7	486		96	252	251		61	3	
3	~~9~~ 12		.88	1.3	316.8	485		96	253	250		58	3	
4	~~12~~ 16	13:31	.77	1.3	319.3	485		97	252	253		57	3.5	
~~B~~-1 D	~~15~~ 20	13:37	.95	1.3	322.4	484		96	253	250		55	3.5	
2	~~18~~ 24		.90	1.3	324.6	484		96	252	250		55	3.5	
3	~~21~~ 28		.85	1.3	327.1	484		96	253	251		56	3.5	
4	~~24~~ 32	13:53	.83	1.3	329.8	482		95	254	250		56	3.5	
~~C~~-1 A	~~27~~ 36	ATR ~~13:58~~	.85	1.3	332.4	479		96	253	251		63	3.5	
2	~~30~~ 40	~~14:58~~ 13:54	.75	1.3	335.7	479		96	254	250		58	3.5	
3	~~33~~ 44	14:14	.75	1.3	337.5	478		96	255	249		58	3.5	
4	~~36~~ 48	~~13:14~~	.72	1.3	340.7	478		95	254	248		59	3.5	
~~D~~-1 B	~~39~~ 52	ATR ~~13:25~~	.85	1.3	343.6	475		93	255	247		65	3.5	
2	~~42~~ 56	14:25	~~.88~~ .83 ATR	1.3	345.8	476		93	256	246		63	3.5	
3	~~45~~ 60	14:41	.75	1.3	348.4	480		93	257	248		63	3.5	
4	~~48~~ 64	ATR ~~12:44~~	.70	1.3	351.053	479		94	256	249		64	3.5	

*Barometric Pressure is at port elevation

Avg √Δp	Avg ΔH	Total Volume	Avg T_s	Avg T_m	Min/Max	Min/Max	Min/Max	Max Temp	Max Vac
.9080	1.3	42.353	480.94	95.25	250/257	~~247/253~~ 246/		65	3.5

NB 7/1 .826 RB

Avg √ΔH 1.140

NB 7/1

Comments NCG only

Flue Gas Composition
Oxygen, % ______
Carbon Dioxide, % ______
Moisture, % ______

O_2/CO_2 by Orsat Fyrite M3A
Leak Check, Pre-run ______
Post-run ______

Thermocouple Check
Meter Temp., °F ______
Ref. Temp, °F ______
Result ______

$V_{m\text{-std}}$, scf ______
Q_s, dscfm ______
% Isokinetic ______
Calculated by ______
QC by ______

WESTON SOLUTIONS
Integrated Air Services

Sample Recovery Field Data

Method: EPA 4, Moisture

Client: New Indy
Location/Plant: Catawba, SC
Source: No. 2 Combination Boiler
W.O. Number: 15730.001.008

Impingers 1 - 3 measurements in **grams**

Run No. 1
Sample ID: Run 1 NCG only
Sample Date: 6/25/21
Filter ID: NA
Recovery Date: 6/25/21
Analyst: ATK

	Impingers 1	Impingers 2	Impingers 3	Imp.Total	Silica Gel grams	Total
Contents	DI	DI	empty			
Final	779.7	746.5	660.3		905.3	
Initial	670	780.9	657	✓	896.8	✓
Gain	109.7 ✓	15.6 ✓	3.3 ✓	128.6	8.5 ✓	137.1

Impinger Color: clear
Silica Gel Condition:
Labled? ✓
Sealed? ✓

Run No. 2
Sample ID: Run 2 NCG only
Sample Date: 6/25/21
Filter ID: NA
Recovery Date: 6/25/21
Analyst: ATK

	Impingers 1	Impingers 2	Impingers 3	Imp.Total	Silica Gel grams	Total
Contents	DI	DI	empty			
Final	820.9	818.9	634.7		850.7	
Initial	718.5	747.1	632.0	✓	839.0	
Gain	~~102.7~~ 102.4 ✓	21.8 ✓	2.7 ✓	126.9	11.7 ✓	138.6 ✓

Impinger Color: clear
Silica Gel Condition: used
Labled? ✓
Sealed? ✓

Run No. 3
Sample ID: Run3 NCG only
Sample Date: 6/25/21
Filter ID: ATR
Recovery Date: 6/25/21
Analyst: ATK

	Impingers 1	Impingers 2	Impingers 3	Imp.Total	Silica Gel grams	Total
Contents	DI	DI	empty			
Final	744.7	742.1	645.5		939.4	
Initial	634.4	724.7	643.0	✓	929.6	
Gain	165.3 ✓	17.4 ✓	2.5 ✓	125.2	~~9.6~~ 9.8 ✓	~~134.8~~ 135 ✓

Impinger Color: clear
Silica Gel Condition: used
Labled? ✓
Sealed? ✓

AB 7/1 ✓

Check COC for Sample IDs of Media Blanks

WESTON SOLUTIONS
Integrated Air Services

RUN SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time 10:00 **End Time** 11:00

Average Measured TRS Conc.	0.98 **ppm** ✓
Recovery No. 2	93.5 **%** ✓
TRS Corrected for Recovery	1.04 **ppm** ✓

RUN SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time 11:35 **End Time** 12:35

Average Measured TRS Conc.	0.92 **ppm** ✓
Recovery No. 2	93.5 **%** ✓
TRS Corrected for Recovery	0.99 **ppm** ✓

RUN SUMMARY

Number 3

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time 13:15 **End Time** 14:15

Average Measured TRS Conc.	0.71 **ppm** ✓
Recovery No. 2	93.5 **%** ✓
TRS Corrected for Recovery	0.76 **ppm** ✓

✓

RUN DATA
Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
10:00	<2	<0.052	81	0.76	2	0.08	<2	<0.032	0.84
10:03	2	0.06	84	0.78	<2	<0.072	<2	<0.032	0.84
10:06	2	0.06	93	0.82	<2	<0.072	<2	<0.032	0.88
10:09	2	0.05	132	0.99	<2	<0.072	2	0.03	1.11
10:12	<2	<0.052	123	0.96	<2	<0.072	<2	<0.032	0.96
10:15	<2	<0.052	219	1.30	<2	<0.072	<2	<0.032	1.30
10:18	<2	<0.052	106	0.89	<2	<0.072	<2	<0.032	0.89
10:21	<2	<0.052	126	0.97	<2	<0.072	<2	<0.032	0.97
10:24	<2	<0.052	111	0.91	<2	<0.072	<2	<0.032	0.91
10:27	<2	<0.052	108	0.89	<2	<0.072	<2	<0.032	0.89
10:30	<2	<0.052	105	0.88	<2	<0.072	<2	<0.032	0.88
10:33	<2	<0.052	99	0.85	<2	<0.072	<2	<0.032	0.85
10:36	<2	<0.052	102	0.86	<2	<0.072	4	0.05	0.96
10:39	<2	<0.052	106	0.88	<2	<0.072	<2	<0.032	0.88
10:42	3	0.07	106	0.88	<2	<0.072	<2	<0.032	0.95
10:45	<2	<0.052	132	0.99	<2	<0.072	<2	<0.032	0.99
10:48	<2	<0.052	149	1.06	<2	<0.072	<2	<0.032	1.06
10:51	<2	<0.052	133	1.00	<2	<0.072	<2	<0.032	1.00
10:54	3	0.07	135	1.01	<2	<0.072	<2	<0.032	1.07
10:57	<2	<0.052	171	1.14	9	0.16	<2	<0.032	1.30
Average		**<0.052**		**0.94**		**<0.072**		**<0.032**	**0.98** ✓

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
11:35	<2	<0.052	93	0.82	4	0.11	<2	<0.032	0.93
11:38	<2	<0.052	104	0.87	<2	<0.072	<2	<0.032	0.87
11:41	<2	<0.052	98	0.85	<2	<0.072	<2	<0.032	0.85
11:44	<2	<0.052	85	0.78	<2	<0.072	<2	<0.032	0.78
11:47	<2	<0.052	147	1.05	<2	<0.072	<2	<0.032	1.05
11:50	<2	<0.052	201	1.24	<2	<0.072	<2	<0.032	1.24
11:53	<2	<0.052	160	1.10	<2	<0.072	3	0.04	1.18
11:56	<2	<0.052	105	0.88	<2	<0.072	<2	<0.032	0.88
11:59	<2	<0.052	129	0.98	<2	<0.072	<2	<0.032	0.98
12:02	<2	<0.052	156	1.08	<2	<0.072	<2	<0.032	1.08
12:05	2	0.05	180	1.17	<2	<0.072	<2	<0.032	1.23
12:08	<2	<0.052	132	0.99	<2	<0.072	<2	<0.032	0.99
12:11	<2	<0.052	96	0.84	<2	<0.072	<2	<0.032	0.84
12:14	<2	<0.052	109	0.89	<2	<0.072	<2	<0.032	0.89
12:17	<2	<0.052	81	0.77	<2	<0.072	<2	<0.032	0.77
12:20	<2	<0.052	76	0.74	<2	<0.072	2	0.03	0.81
12:23	<2	<0.052	75	0.73	<2	<0.072	<2	<0.032	0.73
12:26	<2	<0.052	74	0.73	<2	<0.072	<2	<0.032	0.73
12:29	<2	<0.052	105	0.88	<2	<0.072	<2	<0.032	0.88
12:32	<2	<0.052	81	0.77	<2	<0.072	<2	<0.032	0.77
Average		**<0.052**		**0.91**		**<0.072**		**<0.032**	**0.92** ✓

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
13:15	<2	<0.052	68	0.70	<2	<0.072	<2	<0.032	0.70
13:18	<2	<0.052	62	0.66	3	0.09	<2	<0.032	0.75
13:21	<2	<0.052	62	0.67	<2	<0.072	<2	<0.032	0.67
13:24	<2	<0.052	62	0.67	<2	<0.072	<2	<0.032	0.67
13:27	<2	<0.052	62	0.66	<2	<0.072	3	0.04	0.75
13:30	<2	<0.052	63	0.67	<2	<0.072	<2	<0.032	0.67
13:33	<2	<0.052	65	0.68	<2	<0.072	<2	<0.032	0.68
13:36	<2	<0.052	64	0.68	<2	<0.072	<2	<0.032	0.68
13:39	<2	<0.052	68	0.70	<2	<0.072	<2	<0.032	0.70
13:42	<2	<0.052	71	0.71	<2	<0.072	<2	<0.032	0.71
13:45	2	0.05	77	0.74	4	0.10	<2	<0.032	0.90
13:48	<2	<0.052	65	0.68	<2	<0.072	<2	<0.032	0.68
13:51	<2	<0.052	66	0.69	<2	<0.072	<2	<0.032	0.69
13:54	<2	<0.052	73	0.72	<2	<0.072	<2	<0.032	0.72
13:57	<2	<0.052	67	0.69	<2	<0.072	2	0.03	0.76
14:00	<2	<0.052	71	0.71	<2	<0.072	<2	<0.032	0.71
14:03	<2	<0.052	70	0.71	<2	<0.072	<2	<0.032	0.71
14:06	<2	<0.052	71	0.71	<2	<0.072	<2	<0.032	0.71
14:09	<2	<0.052	64	0.67	3	0.09	<2	<0.032	0.76
14:12	<2	<0.052	66	0.69	<2	<0.072	<2	<0.032	0.69
Average		**<0.052**		**0.69**		**<0.072**		**<0.032**	**0.71** ✓

RUN DATA

Number 0

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **26 Jun 2021**

Time	H_2S		MeSH		DMS		DMDS		TRS
	area	ppm	area	ppm	area	ppm	area	ppm	ppm
				CC416806 7.257ppm					
09:05	13721	7.67	<2	<0.11	<2	<0.072	<2	<0.032	7.67
09:08	14535	7.93	<2	<0.11	<2	<0.072	<2	<0.032	7.93
09:11	14516	7.92	<2	<0.11	<2	<0.072	<2	<0.032	7.92
Average		**7.84**		**<0.11**		**<0.072**		**<0.032**	**7.84**

RECOVERY DATA
Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Before Run 1
Start Time 09:13 **End Time** 09:27

Recovery Gas to Probe, Time 09:13

Peak Areas, mv-sec			**Average**	**ppm**
12553	12693	12570	12606 ✓	7.31

Recovery Gas to GC, Time 09:23

Peak Areas, mv-sec			**Average**	**ppm**
15183	15401	15355	15313 ✓	8.16

Recovery 89.6% ✓

RECOVERY DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

After Run 3 **Before Run** 4
Start Time 14:27 **End Time** 15:01

Recovery Gas to Probe, Time 14:27

Peak Areas, mv-sec			Average	ppm
12960	12992	13133	13028 ✓	7.45

Recovery Gas to GC, Time 14:57

Peak Areas, mv-sec			Average	ppm
14768	14713	14525	14669 ✓	7.97

Recovery 93.5% ✓

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.55 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51828	33-53274	89-53332	89-53266
Perm. Rate, nL/min	348	365	473	239
Ret. Time, sec	16.0	22.5	48.0	127.0

1 Flow = **38.4** mL/Min	**9.05** ppm	**9.51** ppm	**12.3** ppm	**6.22** ppm
Time: 06:02	**Peak Areas, mv-sec**			
	18150	9129	29752	37042
	18234	8899	29635	36567
	17949	9072	29588	35648
Average Area	**18111** ✓	**9034** ✓	**29658** ✓	**36419** ✓

2 Flow = **86.9** mL/Min	**4.00** ppm	**4.20** ppm	**5.44** ppm	**2.75** ppm
Time: 08:24	**Peak Areas, mv-sec**			
	4494	1991	6636	8003
	4478	2048	6673	8033
	4420	2010	6502	8101
Average Area	**4464** ✓	**2016** ✓	**6604** ✓	**8046** ✓

3 Flow = **191** mL/Min	**1.82** ppm	**1.92** ppm	**2.48** ppm	**1.25** ppm
Time: 08:49	**Peak Areas, mv-sec**			
	1072	443	1449	1837
	1039	453	1513	1835
	1077	449	1476	1874
Average Area	**1063** ✓	**448** ✓	**1479** ✓	**1849** ✓

CALIBRATION SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

H_2S	**1**	**2**	**3**		
Time	06:02	08:24	08:49		
Concentration, ppm	9.05	4.00	1.82		
Area, mv-sec	18111	4464	1063		
Calc. Conc., ppm	8.97	4.07	1.81		
% Error	-0.8	1.7	-0.9		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.7702	2.5709	0.9998	2	0.052

MeSH	**1**	**2**	**3**		
Time	06:02	08:24	08:49		
Concentration, ppm	9.51	4.20	1.92		
Area, mv-sec	9034	2016	448		
Calc. Conc., ppm	9.46	4.25	1.91		
% Error	-0.6	1.1	-0.6		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8751	2.1261	0.9999	2	0.11

DMS	**1**	**2**	**3**		
Time	06:02	08:24	08:49		
Concentration, ppm	12.3	5.44	2.48		
Area, mv-sec	29658	6604	1479		
Calc. Conc., ppm	12.2	5.49	2.47		
% Error	-0.5	1.0	-0.5		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8718	2.4355	0.9999	2	0.072

DMDS	**1**	**2**	**3**		
Time	06:02	08:24	08:49		
Concentration, ppm	6.22	2.75	1.25		
Area, mv-sec	36419	8046	1849		
Calc. Conc., ppm	6.21	2.76	1.25		
% Error	-0.2	0.4	-0.2		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8610	3.0854	>0.9999	2	0.032

CALIBRATION DATA

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Ambient Temperature: 72°C **Barometric Pressure:** 29.65 in. Hg

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Perm. Device ID	T-51828	33-53274	89-53332	89-53266
Perm. Rate, nL/min	346	364	471	238
Ret. Time, sec	16.0	22.5	48.0	127.0

1 Flow = **38.9** mL/Min	**8.90** ppm	**9.36** ppm	**12.1** ppm	**6.12** ppm
Time: 06:02	**Peak Areas, mv-sec**			
	18368	8795	28785	34758
	18368	8383	27462	34707
	18202	8971	28270	35006
Average Area	**18313** ✓	**8716** ✓	**28172** ✓	**34824** ✓

2 Flow = **82.3** mL/Min	**4.21** ppm	**4.42** ppm	**5.72** ppm	**2.89** ppm
Time: 07:54	**Peak Areas, mv-sec**			
	4753	2023	6969	8481
	4768	2067	7036	8510
	4706	2032	7080	8577
Average Area	**4742** ✓	**2041** ✓	**7028** ✓	**8523** ✓

3 Flow = **175** mL/Min	**1.98** ppm	**2.08** ppm	**2.69** ppm	**1.36** ppm
Time: 08:29	**Peak Areas, mv-sec**			
	1079	476	1619	1945
	1065	464	1599	1933
	1045	467	1556	1954
Average Area	**1063** ✓	**469** ✓	**1591** ✓	**1944** ✓

CALIBRATION SUMMARY

Number 2

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**

Method **16**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

H_2S	**1**	**2**	**3**		
Time	06:02	07:54	08:29		
Concentration, ppm	8.90	4.21	1.98		
Area, mv-sec	18313	4742	1063		
Calc. Conc., ppm	8.80	4.31	1.96		
% Error	-1.2	2.4	-1.2		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.8930	2.4749	0.9996	2	0.071

MeSH	**1**	**2**	**3**		
Time	06:02	07:54	08:29		
Concentration, ppm	9.36	4.42	2.08		
Area, mv-sec	8716	2041	469		
Calc. Conc., ppm	9.35	4.43	2.08		
% Error	-0.1	0.1	-0.1		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9432	2.0539	>0.9999	2	0.13

DMS	**1**	**2**	**3**		
Time	06:02	07:54	08:29		
Concentration, ppm	12.1	5.72	2.69		
Area, mv-sec	28172	7028	1591		
Calc. Conc., ppm	12.0	5.81	2.67		
% Error	-0.8	1.5	-0.8		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9111	2.3864	0.9998	2	0.081

DMDS	**1**	**2**	**3**		
Time	06:02	07:54	08:29		
Concentration, ppm	6.12	2.89	1.36		
Area, mv-sec	34824	8523	1944		
Calc. Conc., ppm	6.09	2.92	1.35		
% Error	-0.5	1.1	-0.5		
Calibration Curve	**Slope**	**Intercept**	**Corr. Coeff.**	**Min. Area**	**Det. Lim.**
	1.9189	3.0366	0.9999	2	0.038

ANALYTES AND STANDARDS

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Analyte	**H_2S**	**MeSH**	**DMS**	**DMDS**
Molecular Weight	34.08	48.11	62.14	94.20
Retention Time, sec	16.0	22.5	48.0	127.0
Peak Detection Window, sec	3.0	7.0	10.0	10.0
Minimum Peak Area, mv-sec	2	2	2	2
Minimum Peak Height, mv	1	1	1	1
Beginning Peak Width, sec	1.0	1.0	2.0	3.0
Ending Peak Width, sec	2.0	6.0	4.0	5.0
Permeation Device ID	T-51828	33-53274	89-53332	89-53266
Permeation Rate, ng/min	483	716	1197	918
Permeation Rate, nL/min*	346	364	471	238

Barometric Pressure: 29.65 in. Hg **Ambient Temperature:** 72 °F
No Oxygen Correction

*Permeation rates are gravimetrically determined by the manufacturer with results by weight in ng/min. Permeation rates by volume, in nL/min, are calculated from the permeation rates by weight as follows:

$$PR_{nl} = PR_{ng} \times (V_{mol} / W_{mol}) \times [(460° + T_a) / T_s] \times (P_s / P_b)$$

Where:

PR_{nl} = Permeation Rate by volume, nL/min
PR_{ng} = Permeation Rate by weight, ng/min
V_{mol} = Molar Volume of any gas @32 °F & 29.92 mm Hg = 22.4 L/mole
W_{mol} = Molecular Weight of compound
T_a = Ambient Temperature, °F
T_s = Standard Temperature = 492°R (32 °F)
P_s = Standard Pressure = 29.92 in Hg
P_b = Barometric Pressure, in Hg

For example, H_2S:

$$PR_{nl} = 483 \times (22.4 / 34.08) \times [(460 + 72) / 492] \times (29.92 / 29.65)$$
$$= 346 \text{ nL/min}$$

To calclate concentrations:

$$C = PR_{nl} / F_d$$

Where:

C = Concentration, ppmv
PR_{nl} = Permeation Rate by volume, nL/min
F_d = Flow rate of diluent, mL/min

INSTRUMENT INFORMATION

Client: **New Indy**
Location: **Catawba, NC**
Source: **#2 Combination Boiler**
Method **16**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

File: C:\Data\210625 New Indy Catawba No. 2 CB.trs
Program Version: 2.0, built 15 May 2017 **File Version:** 2.0
Computer: WLT5 **Trailer:** 281

Analog Input Device: MCC USB-1608G **GC Channel:** 16

Sampling Rate: 0.050 sec. **Data Interval:** 0.5 sec.

Gas Chromatograph: Shimadzu GC8-A **Serial No.** C10493615061
Detector Range: 10

Gases

	Press. psi	**Flow mL/min**
H_2	30	50
Air	30	60
Carrier	50	30

Temperatures, °C

Column: 140
Detector: 140

Columns

Primary: Carbopack
Secondary: N/A
Sample Loop: 4"

Injection Cycle

Total Length: 180 sec **Sampling Time:** 170 sec **Load/Backflush Time:** 80 sec

Default Integration Parameters

Signal Threshold 0.67 mv **Peak detection window** ±10 sec
Minimum peak area 2 mv-sec **Minimum peak height** 1 mv above baseline

Dynacalibrator

Chamber Temperature 50.0°C
Ambient Temperature 72.0°F
Barometric Pressure 29.65 in. Hg

RUN SUMMARY

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 10:00 to 11:00

Run Averages

	12.7	6.9	239

Pre-run Bias at 08:17

Zero Bias	0.1	0.0	0
Span Bias	10.1	10.1	235
Span Gas	10.1	10.2	242

Post-run Bias at 11:02

Zero Bias	0.1	0.0	3
Span Bias	10.1	10.2	234
Span Gas	10.1	10.2	242

Run averages corrected for the average of the pre-run and post-run bias

	12.8	6.9	247

RUN SUMMARY

Number 2

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 2 Combination Boiler** Calibration **1**	Date:	**25 Jun 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 11:35 to 12:35

Run Averages

	12.6	6.8	236

Pre-run Bias at 11:02

Zero Bias	0.1	0.0	3
Span Bias	10.1	10.2	234
Span Gas	10.1	10.2	242

Post-run Bias at 12:37

Zero Bias	0.1	0.0	4
Span Bias	10.1	10.3	233
Span Gas	10.1	10.2	242

Run averages corrected for the average of the pre-run and post-run bias

	12.7	6.8	245

RUN SUMMARY

Number 3

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 2 Combination Boiler** Calibration **1**	Date:	**25 Jun 2021**

	O_2	CO_2	SO_2
Method	EPA 3A	EPA 3A	EPA 6C
Conc. Units	%	%	ppm

Time: 13:15 to 14:15

Run Averages

	12.2	7.4	227

Pre-run Bias at 12:37

Zero Bias	0.1	0.0	4
Span Bias	10.1	10.3	233
Span Gas	10.1	10.2	242

Post-run Bias at 14:18

Zero Bias	0.1	0.0	3
Span Bias	10.1	10.3	235
Span Gas	10.1	10.2	242

Run averages corrected for the average of the pre-run and post-run bias

12.3	7.3	235

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
With NCGs						
Traversed @ 16.6%, 50.0%, & 83.3% of duct diameter						
Point 1						
10:01	4314	13.0	2711	6.8	2231	223
10:02	4127	12.4	2693	6.8	2427	243
10:03	3866	11.6	2882	7.2	3028	303
10:04	4048	12.2	3101	7.8	2931	294
10:05	4371	13.1	2830	7.1	2792	280
10:06	4214	12.7	2598	6.5	2744	275
10:07	4404	13.2	2717	6.8	2549	255
10:08	4432	13.3	2556	6.4	2381	239
10:09	4440	13.3	2525	6.3	2263	227
10:10	4322	13.0	2519	6.3	2158	216
10:11	4328	13.0	2637	6.6	2162	217
10:12	4385	13.2	2626	6.6	2193	220
10:13	4522	13.6	2530	6.3	2241	224
10:14	4412	13.3	2437	6.1	2406	241
10:15	4514	13.6	2516	6.3	2379	238
10:16	4438	13.3	2431	6.1	2199	220
10:17	4257	12.8	2535	6.4	2174	218
10:18	4213	12.7	2737	6.9	2241	224
10:19	4345	13.1	2739	6.9	2209	221
10:20	4343	13.1	2616	6.6	2331	234
Point 2						
10:21	4252	12.8	2645	6.6	2363	237
10:22	4189	12.6	2732	6.9	2403	241
10:23	4205	12.6	2804	7.0	2439	244
10:24	4123	12.4	2800	7.0	2285	229
10:25	4217	12.7	2868	7.2	2134	214
10:26	4152	12.5	2778	7.0	2284	229
10:27	4109	12.4	2854	7.2	2237	224
10:28	4114	12.4	2884	7.2	2323	233
10:29	4040	12.2	2895	7.3	2347	235
10:30	4070	12.2	2951	7.4	2390	239
10:31	3914	11.8	2946	7.4	2766	277
10:32	3838	11.5	3092	7.8	2952	296
10:33	3878	11.7	3148	7.9	2802	281
10:34	3881	11.7	3100	7.8	2829	283
10:35	3805	11.4	3128	7.8	2819	282
10:36	3986	12.0	3176	8.0	2678	268
10:37	4082	12.3	2992	7.5	2502	251

RUN DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %	SO_2 mv	SO_2 ppm
10:38	4118	12.4	2910	7.3	2587	259
10:39	4064	12.2	2896	7.3	2602	261
10:40	4051	12.2	2923	7.3	2579	258
			Point 3			
10:41	4186	12.6	2928	7.3	2285	229
10:42	4176	12.6	2836	7.1	2194	220
10:43	4231	12.7	2826	7.1	2244	225
10:44	4271	12.8	2751	6.9	2227	223
10:45	4322	13.0	2714	6.8	2311	231
10:46	4389	13.2	2648	6.6	2366	237
10:47	4368	13.1	2573	6.5	2239	224
10:48	4347	13.1	2602	6.5	2140	214
10:49	4333	13.0	2620	6.6	2257	226
10:50	4389	13.2	2635	6.6	2143	215
10:51	4232	12.7	2598	6.5	2222	223
10:52	4255	12.8	2745	6.9	2179	218
10:53	4285	12.9	2723	6.8	2198	220
10:54	4371	13.1	2691	6.7	2220	222
10:55	4374	13.2	2595	6.5	2301	230
10:56	4456	13.4	2583	6.5	2244	225
10:57	4396	13.2	2507	6.3	2304	231
10:58	4354	13.1	2561	6.4	2323	233
10:59	4335	13.0	2615	6.6	2320	232
11:00	4399	13.2	2622	6.6	2200	220
Avgs	**4231**	**12.7**	**2747**	**6.9**	**2388**	**239**

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
With NCGs						
Traversed @ 16.6%, 50.0%, & 83.3% of duct diameter						
Point 1						
11:36	4344	13.1	2609	6.5	2261	226
11:37	4302	12.9	2557	6.4	2328	233
11:38	4175	12.6	2622	6.6	2380	238
11:39	4135	12.4	2769	6.9	2403	241
11:40	4229	12.7	2771	7.0	2418	242
11:41	4252	12.8	2693	6.8	2431	244
11:42	4261	12.8	2631	6.6	2427	243
11:43	4153	12.5	2685	6.7	2490	249
11:44	4244	12.8	2730	6.8	2490	249
11:45	4281	12.9	2656	6.7	2413	242
11:46	4400	13.2	2615	6.6	2123	213
11:47	4480	13.5	2486	6.2	2236	224
11:48	4425	13.3	2412	6.0	2247	225
11:49	4445	13.4	2459	6.2	2277	228
11:50	4390	13.2	2462	6.2	2327	233
11:51	4419	13.3	2488	6.2	2313	232
11:52	4366	13.1	2479	6.2	2272	228
11:53	4331	13.0	2541	6.4	2031	203
11:54	4329	13.0	2569	6.4	2137	214
11:55	4207	12.7	2585	6.5	2166	217
Point 2						
11:56	4245	12.8	2684	6.7	2242	225
11:57	4192	12.6	2667	6.7	2295	230
11:58	4263	12.8	2684	6.7	2253	226
11:59	4309	13.0	2615	6.6	2229	223
12:00	4311	13.0	2583	6.5	2253	226
12:01	4327	13.0	2550	6.4	2272	228
12:02	4234	12.7	2559	6.4	2271	227
12:03	4198	12.6	2673	6.7	2349	235
12:04	4358	13.1	2680	6.7	2273	228
12:05	4368	13.1	2534	6.4	2076	208
12:06	4291	12.9	2540	6.4	2099	210
12:07	4292	12.9	2607	6.5	2241	224
12:08	4287	12.9	2607	6.5	2314	232
12:09	4245	12.8	2624	6.6	2453	246
12:10	4182	12.6	2653	6.7	2521	253
12:11	4156	12.5	2744	6.9	2493	250
12:12	4206	12.6	2740	6.9	2592	260

RUN DATA

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
12:13	4209	12.7	2689	6.7	2605	261
12:14	4238	12.7	2684	6.7	2666	267
12:15	4158	12.5	2669	6.7	2715	272
			Point 3			
12:16	4055	12.2	2753	6.9	2751	276
12:17	3990	12.0	2868	7.2	2688	269
12:18	3939	11.8	2950	7.4	2548	255
12:19	3957	11.9	2993	7.5	2572	258
12:20	3826	11.5	3008	7.5	2717	272
12:21	3759	11.3	3146	7.9	2831	284
12:22	3791	11.4	3207	8.0	2823	283
12:23	3992	12.0	3141	7.9	2505	251
12:24	4042	12.2	2991	7.5	2388	239
12:25	4027	12.1	2983	7.5	2136	214
12:26	4021	12.1	2991	7.5	2238	224
12:27	4113	12.4	2988	7.5	2358	236
12:28	4294	12.9	2842	7.1	2311	231
12:29	4137	12.4	2721	6.8	2274	228
12:30	4179	12.6	2858	7.2	2199	220
12:31	4196	12.6	2831	7.1	2153	216
12:32	4211	12.7	2813	7.1	2155	216
12:33	4133	12.4	2811	7.1	2187	219
12:34	4123	12.4	2892	7.3	2167	217
12:35	4132	12.4	2906	7.3	2212	222
Avgs	**4203**	**12.6**	**2722**	**6.8**	**2360**	**236**

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
With NCGs						
Point 1Traversed @ 16.6%, 50.0%, & 83.3% of duct diameter						
Point 1						
13:16	4025	12.1	2990	7.5	2283	229
13:17	4006	12.0	2985	7.5	2344	235
13:18	4014	12.1	3013	7.6	2374	238
13:19	4052	12.2	2989	7.5	2389	239
13:20	4026	12.1	2953	7.4	2531	254
13:21	4003	12.0	2988	7.5	2655	266
13:22	4076	12.3	2998	7.5	2518	252
13:23	4126	12.4	2928	7.3	2216	222
13:24	4036	12.1	2880	7.2	2164	217
13:25	3976	12.0	2977	7.5	2201	220
13:26	4029	12.1	3036	7.6	2207	221
13:27	3877	11.7	3020	7.6	2279	228
13:28	3883	11.7	3156	7.9	2224	223
13:29	3890	11.7	3160	7.9	2165	217
13:30	3945	11.9	3138	7.9	2191	219
13:31	4007	12.1	3072	7.7	2198	220
13:32	3980	12.0	3028	7.6	2190	219
13:33	4062	12.2	3024	7.6	2210	221
13:34	4082	12.3	2955	7.4	2299	230
13:35	4002	12.0	2933	7.4	2245	225
Point 2						
13:36	4004	12.0	3017	7.6	2066	207
13:37	4042	12.2	3000	7.5	2123	213
13:38	4037	12.1	2961	7.4	2120	212
13:39	4072	12.2	2957	7.4	2115	212
13:40	4138	12.4	2912	7.3	2161	216
13:41	4128	12.4	2868	7.2	2192	220
13:42	4223	12.7	2882	7.2	2218	222
13:43	4167	12.5	2797	7.0	2404	241
13:44	4237	12.7	2841	7.1	2304	231
13:45	4204	12.6	2772	7.0	2163	217
13:46	4107	12.4	2820	7.1	2120	212
13:47	4040	12.2	2935	7.4	2206	221
13:48	4047	12.2	3002	7.5	2151	215
13:49	4005	12.0	3011	7.6	2182	219
13:50	4072	12.2	3028	7.6	2200	220
13:51	4137	12.4	2957	7.4	2212	222
13:52	4252	12.8	2874	7.2	2237	224

RUN DATA

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
13:53	4203	12.6	2762	6.9	2299	230
13:54	4079	12.3	2834	7.1	2325	233
13:55	4099	12.3	2931	7.4	2314	232
			Point 3			
13:56	3918	11.8	2960	7.4	2285	229
13:57	4031	12.1	3101	7.8	2072	208
13:58	4012	12.1	3007	7.5	2181	218
13:59	4139	12.4	2984	7.5	2175	218
14:00	4064	12.2	2888	7.2	2212	222
14:01	4020	12.1	2962	7.4	2361	237
14:02	4061	12.2	2999	7.5	2467	247
14:03	4059	12.2	2957	7.4	2321	232
14:04	4063	12.2	2957	7.4	2171	217
14:05	4076	12.3	2967	7.4	2230	223
14:06	4174	12.6	2927	7.3	2244	225
14:07	4149	12.5	2840	7.1	2293	230
14:08	4155	12.5	2860	7.2	2376	238
14:09	3989	12.0	2886	7.2	2434	244
14:10	4063	12.2	3018	7.6	2362	237
14:11	4079	12.3	2977	7.5	2283	229
14:12	4160	12.5	2927	7.3	2279	228
14:13	4188	12.6	2828	7.1	2288	229
14:14	4006	12.0	2839	7.1	2371	238
14:15	3961	11.9	3031	7.6	2439	244
Avgs	**4063**	**12.2**	**2955**	**7.4**	**2264**	**227**

BIAS
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 08:17

O_2
Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	24	0.1	0.1	0.5	Pass
Span	10.1	3365	10.1	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	6	0.0	0.0	0.0	Pass
Span	10.2	4038	10.1	-0.1	-0.5	Pass

SO_2
Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	0	-0	0	0	0.0	Pass
Span	242	2341	235	-7	-1.5	Pass

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 11:02

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	27	0.1	0.1	0.5	Pass
Span	10.1	3356	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.1	27	0.1	0.0	0.0	Pass
Span	10.1	3356	10.1	0.0	0.0	Pass

*Bias No. 1

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	24	0.0	0.0	0.0	Pass
Span	10.2	4048	10.2	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	Final %	Difference %	Drift %	Status
Zero	0.0	24	0.0	0.0	0.0	Pass
Span	10.1	4048	10.2	0.1	0.5	Pass

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 2

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 11:02

SO_2
Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	0	31	3	3	0.7	Pass
Span	242	2334	234	-8	-1.7	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	0	31	3	3	0.7	Pass
Span	235	2334	234	-1	-0.2	Pass

*Bias No. 1

BIAS AND CALIBRATION DRIFT

Number 3

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 2 Combination Boiler** Calibration **1**	Date:	**25 Jun 2021**

Start Time: 12:37

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	13	0.1	0.1	0.5	Pass
Span	10.1	3353	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	%	Difference %	Drift %	Status
Zero	0.1	13	0.1	0.0	0.0	Pass
Span	10.1	3353	10.1	0.0	0.0	Pass

*Bias No. 2

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	3	0.0	0.0	0.0	Pass
Span	10.2	4094	10.3	0.1	0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	%	Difference %	Drift %	Status
Zero	0.0	3	0.0	0.0	0.0	Pass
Span	10.2	4094	10.3	0.1	0.5	Pass

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 3

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 12:37

SO_2

Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	0	35	4	4	0.9	Pass
Span	242	2329	233	-9	-2.0	Pass

Calibration Drift

Standard	Initial*	Final		Difference	Drift	
Gas	**ppm**	**mv**	**ppm**	**ppm**	**%**	**Status**
Zero	3	35	4	1	0.2	Pass
Span	234	2329	233	-1	-0.2	Pass

*Bias No. 2

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 14:18

O_2

Method: EPA 3A
Span Conc. 20.2 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	34	0.1	0.1	0.5	Pass
Span	10.1	3356	10.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	%	Difference %	Drift %	Status
Zero	0.1	34	0.1	0.0	0.0	Pass
Span	10.1	3356	10.1	0.0	0.0	Pass

*Bias No. 3

CO_2

Method: EPA 3A
Span Conc. 20.3 %

Bias Results

Standard Gas	Cal. %	Response mv	Bias %	Difference %	Error %	Status
Zero	0.0	3	0.0	0.0	0.0	Pass
Span	10.2	4085	10.3	0.1	0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final mv	%	Difference %	Drift %	Status
Zero	0.0	3	0.0	0.0	0.0	Pass
Span	10.3	4085	10.3	0.0	0.0	Pass

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 4

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 14:18

SO_2
Method: EPA 6C
Span Conc. 458 ppm

Bias Results

Standard Gas	Cal. ppm	Response mv	Bias ppm	Difference ppm	Error %	Status
Zero	0	30	3	3	0.7	Pass
Span	242	2344	235	-7	-1.5	Pass

Calibration Drift

Standard Gas	Initial* ppm	Final mv	Final ppm	Difference ppm	Drift %	Status
Zero	4	30	3	-1	-0.2	Pass
Span	233	2344	235	2	0.4	Pass

*Bias No. 3

CALIBRATION DATA

Number 1

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 2 Combination Boiler**	Date:	**25 Jun 2021**

Start Time: 08:01

O_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	-2
10.1 ✓	XC013544B	3344
20.2 ✓	CC275468	6752

Curve Coefficients

Slope	Intercept	Corr. Coeff.
333.7	-15	>0.9999

CO_2

Method: EPA 3A
Calibration Type: Linear Regression

Calibration Results

%	Cylinder ID	Result, mv
Zero	-	7
10.2 ✓	XC013544B	4046
20.3 ✓	CC275468	8070

Curve Coefficients

Slope	Intercept	Corr. Coeff.
397.8	6	1.0000

CALIBRATION DATA

Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 08:01

SO_2
Method: EPA 6C
Calibration Type: Linear Regression

Calibration Results

ppm	Cylinder ID	Result, mv
Zero	-	-1
242 ✓	CC234516	2413
458 ✓	EB0108003	4578

Curve Coefficients

Slope	Intercept	Corr. Coeff.
10.00	-4	>0.9999

CALIBRATION ERROR DATA
Number 1

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **25 Jun 2021**

Start Time: 08:01

O_2
Method: EPA 3A
Span Conc. 20.2 %
Slope 333.7 **Intercept** -14.5

Standard %	**Response** mv	**Result** %	**Difference** %	**Error** %	**Status**
Zero	-2	0.0	0.0	0.0	Pass
10.1	3344	10.1	0.0	0.0	Pass
20.2	6752	20.3	0.1	0.5	Pass

CO_2
Method: EPA 3A
Span Conc. 20.3 %
Slope 397.8 **Intercept** 6.2

Standard %	**Response** mv	**Result** %	**Difference** %	**Error** %	**Status**
Zero	7	0.0	0.0	0.0	Pass
10.2	4046	10.2	0.0	0.0	Pass
20.3	8070	20.3	0.0	0.0	Pass

SO_2
Method: EPA 6C
Span Conc. 458 ppm
Slope 10.00 **Intercept** -4

Standard ppm	**Response** mv	**Result** ppm	**Difference** ppm	**Error** %	**Status**
Zero	-1	0	0	0.0	Pass
242	2413	242	0	0.0	Pass
458	4578	458	0	0.0	Pass

METHODS AND ANALYZERS

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 2 Combination Boiler**	Date:	**25 Jun 2021**

File: C:\Users\Dubayv\Desktop\Catawba\210625 New Indy Catawba No. 2 CB.cem
Program Version: 2.2, built 3 Jul 2020 **File Version:** 2.04
Computer: WSAUBCHEMLABGC1 **Trailer:** 281
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	O_2
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T802 s/n: 172**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.2**

Channel 2

Analyte	CO_2
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T802 s/n: 172**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.3**

Channel 5

Analyte	SO_2
Method	**EPA 6C**, Using Bias
Analyzer Make, Model & Serial No.	**Teledyne T100H SN 374**
Full-Scale Output, mv	**10000**
Analyzer Range, ppm	**500**
Span Concentration, ppm	**458**

APPENDIX G
LABORATORY REPORT

ALS
2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

LABORATORY REPORT

July 15, 2021

Daniel Mallett
New-Indy Catawba LLC
5300 Cureton Ferry Road
Catawba, SC 29704

RE: DHEC Order

Dear Daniel:

Enclosed are the results of the samples submitted to our laboratory on June 29, 2021. For your reference, these analyses have been assigned our service request number P2103465.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Sue Anderson
By Sue Anderson at 5:44 pm, Jul 15, 2021

Sue Anderson
Project Manager

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

Client: New-Indy Catawba LLC
Project: DHEC Order
Service Request No: P2103465

CASE NARRATIVE

The samples were received intact under chain of custody on June 29, 2021 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Sulfur Analysis

The samples were analyzed for five sulfur compounds using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). All compounds with the exception of hydrogen sulfide and carbonyl sulfide are quantitated against the initial calibration curve for methyl mercaptan. This method is not included on the laboratory's NELAP or DoD-ELAP scope of accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

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www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1776326
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-008
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: New-Indy Catawba LLC
Project ID: DHEC Order
Service Request: P2103465

Date Received: 6/29/2021
Time Received: 10:20

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Sulfur Liq - Sulfur
3A-TRS 1000	P2103465-001	Water	6/24/2021	10:00	X
3A-TRS 1115	P2103465-002	Water	6/24/2021	11:15	X
3A-TRS 1210	P2103465-003	Water	6/24/2021	12:10	X
3A-TRS 1331	P2103465-004	Water	6/24/2021	13:31	X
3A-TRS 1450	P2103465-005	Water	6/24/2021	14:50	X
2A-TRS 1510	P2103465-006	Water	6/24/2021	15:10	X
2B-TRS 1515	P2103465-007	Water	6/24/2021	15:15	X
3A-TRS 1600	P2103465-008	Water	6/24/2021	16:00	X
2A-TRS 1700	P2103465-009	Water	6/24/2021	17:00	X
2B-TRS 1705	P2103465-010	Water	6/24/2021	17:05	X
2A-TRS 1845	P2103465-011	Water	6/24/2021	18:45	X
2B-TRS 1850	P2103465-012	Water	6/24/2021	18:50	X
3A-TRS Duplicate 1115	P2103465-013	Water	6/24/2021	11:15	X
2A-TRS Duplicate 1510	P2103465-014	Water	6/24/2021	15:10	X
2B-TRS Duplicate 1515	P2103465-015	Water	6/24/2021	15:15	X
3A-TRS 1403	P2103465-016	Water	6/25/2021	14:03	X
3A-TRS 1630	P2103465-017	Water	6/25/2021	16:30	X
3A-TRS 1740	P2103465-018	Water	6/25/2021	17:40	X
3A-TRS 1845	P2103465-019	Water	6/25/2021	18:45	X
3A-TRS 0817	P2103465-020	Water	6/25/2021	08:17	X
3A-TRS 0924	P2103465-021	Water	6/25/2021	09:24	X
3A-TRS 1030	P2103465-022	Water	6/25/2021	10:30	X
2A-TRS 1035	P2103465-023	Water	6/25/2021	10:35	X
2B-TRS 1040	P2103465-024	Water	6/25/2021	10:40	X
2A-TRS 1205	P2103465-025	Water	6/25/2021	12:05	X
2B-TRS 1210	P2103465-026	Water	6/25/2021	12:10	X
3A-TRS 1200	P2103465-027	Water	6/25/2021	12:00	X
3A-TRS 1255	P2103465-028	Water	6/25/2021	12:55	X
2A-TRS 1345	P2103465-029	Water	6/25/2021	13:45	X
2B-TRS 1350	P2103465-030	Water	6/25/2021	13:50	X
3A-TRS 1010	P2103465-031	Water	6/26/2021	10:10	X
3A-TRS 1125	P2103465-032	Water	6/26/2021	11:25	X
3A-TRS 1230	P2103465-033	Water	6/26/2021	12:30	X
3B-TRS 1305	P2103465-034	Water	6/26/2021	13:05	X
3A-TRS 1400	P2103465-035	Water	6/26/2021	14:00	X
3B-TRS 1415	P2103465-036	Water	6/26/2021	14:15	X
3A-TRS 1445	P2103465-037	Water	6/26/2021	14:45	X
3B-TRS 1530	P2103465-038	Water	6/26/2021	15:30	X
3A-TRS 1550	P2103465-039	Water	6/26/2021	15:50	X

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Soil / Water - Chain of Custody Record & Analytical Service Request

Page 1 of 9

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) [✓ 2 Day (75%)] 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No. P2103465

CAS Contact:

Company Name & Address (Reporting Information): New Indy Containe Board

Project Name: DHEC Order

Project Number:

Project Manager: Don Mallett

Phone: (803)981-8010

Fax:

Email Address for Result Reporting: Don.mallett@new-indycb.com

P.O. # / Credit Card / Billing Information:

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Water	Soil	Solid	Other	Analysis			Comments
3A-TRS#1 1000	①	6-24-21	1000	x					Liquid Sulfur		Collection date
3A-TRS#2 1000		6-24-21	1000	x					Liquid Sulfur		and time are
3A-TRS#1 1115	②	6-24-21	1115	x					Liquid Sulfur		crucial for
3A-TRS#2 1115		6-24-21	1115	x					Liquid Sulfur		sample
3A-TRS#1 1210	③	6-24-21	1210	x					Liquid Sulfur		identification
3A-TRS#2 1210		6-24-21	1210	x					Liquid Sulfur		
3A-TRS#1 1331	④	6-24-21	1331	x					Liquid Sulfur		
3A-TRS#2 1331		6-24-21	1331	x					Liquid Sulfur		
3A-TRS#1 1450	⑤	6-24-21	1450	x					Liquid Sulfur		
3A-TRS#2 1450		6-24-21	1450	x					Liquid Sulfur		

Report Tier Levels - please select
Tier I - Results (Default if not specified) _____
Tier II (Results + QC Summaries) _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Data Validation Package) 10% Surcharge _____

EDD required Yes / No
Type: __________

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	6/24/21	1010	Ref Secured Area	6-24-21	1010/1120
	6/24/21	1120 1215	Ref Secured Area	6-24-21	1215/1340
	6/24/21	1340/1445	Ref Secured Area	6-24-21	1445

S 6-29-21 1020 2° nor

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Soil / Water - Chain of Custody Record & Analytical Service Request

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Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) [✓ 2 Day (75%)] 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No.: P2103465

CAS Contact:

Company Name & Address (Reporting Information): New Indy Containr Board

Project Name: DHEC Order

Project Number:

Project Manager: Dan Mallett

Phone: (803)981-8010

Fax:

Email Address for Result Reporting: Dan.mallett@new-indycb.com

P.O. # / Credit Card / Billing Information:

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Water	Soil	Solid	Other	Analysis			Comments
2A-TRS #1 1510	⑥	6-24-21	1510	x					Liquid Sulfur		Collection
2A-TRS #2 1510		6-24-21	1510	x							Date and
2B-TRS #1 1515	⑦	6-24-21	1515	x							time are
2B-TRS #2 1515		6-24-21	1515	x							crucial for
3A-TRS #1 1600	⑧	6-24-21	1600	x							sample
3A-TRS #2 1600		6-24-21	1600	x							identification
2A-TRS #1 1700	⑨	6-24-21	1700	x							
2A-TRS #2 1700		6-24-21	1700	x							
2B-TRS #1 1705	⑩	6-24-21	1705	x							
2B-TRS #2 1705		6-24-21	1705	x					↓		

Report Tier Levels - please select
Tier I - Results (Default if not specified) ____
Tier II (Results + QC Summaries) ____
Tier III (Results + QC & Calibration Summaries) ____
Tier IV (Data Validation Package) 10% Surcharge ____

EDD required Yes / No
Type: ____

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Dale Robinson	6/24/21	1515/1520	Ref Secure Area	6/24/21	1515/1520
AVM Valley	6/24/21	1600	Ref Secure Area	6/24/21	1600
Dale Robinson	6/24/21	1705/1710	Ref Secure Area	6/24/21	1705/1710

6-29-21 1020

Soil / Water - Chain of Custody Record & Analytical Service Request

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Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) [✓ 2 Day (75%)] 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No. P2103465

CAS Contact:

Company Name & Address (Reporting Information): New Indy Container Board

Project Name: DHEC Order

Project Number:

Project Manager: Don Mallett

Phone: (803)981-8010

Fax:

P.O. # / Credit Card / Billing Information:

Email Address for Result Reporting: don.mallett@new-indycb.com

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Water	Soil	Solid	Other	Analysis			Comments
2A-TRS #1 1845	⑪	6-24-21	1845	x					Liquid Sulfur		*Sample
2A-TRS #2 1845		6-24-21	1845	x					↓		date /time
2B-TRS #1 1850	⑫	6-24-21	1850	x					↓		crucial for
2B-TRS #2 1850		6-24-21	1850	x					↓		identification

Report Tier Levels - please select

Tier I - Results (Default if not specified) ____
Tier II (Results + QC Summaries) ____
Tier III (Results + QC & Calibration Summaries) ____
Tier IV (Data Validation Package) 10% Surcharge ____

EDD required Yes / No
Type: ____

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Dale Robinson	6/24/21	1855	Ref Secure Area	6/24/21	1855
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date: 6-29-21	Time: 1020

Soil / Water - Chain of Custody Record & Analytical Service Request

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Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) [✓ 2 Day (75%)] 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No. P2102465

CAS Contact:

Company Name & Address (Reporting Information): New Indy Container Board

Project Name: DHEC Order

Project Number:

Project Manager: Dan Mallett

Phone: (803)981-8010

Fax:

Email Address for Result Reporting: Dan.mallett@new-indycb.com

P.O. # / Credit Card / Billing Information:

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Water	Soil	Solid	Other	Analysis			Comments
3A-TRS #1 Duplicate	13	6-24-21	1115	x				Liq Sulfur Analysis			Duplicate for QA
3A-TRS #2 Duplicate		6-24-21	1115	x							Duplicate for QA
2A-TRS #1 Duplicate	14	6-24-21	1510	x							Duplicate for QA
2A-TRS #2 Duplicate		6-24-21	1510	x							Duplicate for QA
2B-TRS #1 Duplicate	15	6-24-21	1515	x							Duplicate for QA
2B-TRS #2 Duplicate		6-24-21	1515	x							Duplicate for QA
											*Note Sample
											date and time

Report Tier Levels - please select

Tier I - Results (Default if not specified) ____
Tier II (Results + QC Summaries) ____
Tier III (Results + QC & Calibration Summaries) ____
Tier IV (Data Validation Package) 10% Surcharge ____

EDD required Yes / No
Type: ____

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	6-24-21	1120	Ref. Secure Area	6-24-21	1120
Dale Pedersen	6-24-21	1515/1520	Ref Secure Area	6-24-21	1515/1520
				6-29-21	1020

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Soil / Water - Chain of Custody Record & Analytical Service Request

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Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) [✓ 2 Day (75%)] 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No. P2103465

CAS Contact:

Company Name & Address (Reporting Information)
New Indy Container Board
5300 Cureton Ferry Rd
Catawba, SC 29704

Project Manager: Dan Mallett

Phone: (803) 981-8010

Fax:

Email Address for Result Reporting: dan.mallett@new-indycb.com

Project Name: DHEC Order

Project Number:

P.O. # / Credit Card / Billing Information:

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Water	Soil	Solid	Other	Analysis			Comments
3A-TRS #1 1403	⑯	6-25-21	1403	x					Liquid Sulfur		* Collection
3A-TRS #2 1403		6-25-21	1403	x							date and time
3A-TRS #1 1630	⑰	6-25-21	1630	x							are crucial for
3A-TRS #2 1630		6-25-21	1630	x							sample
3A-TRS #1 1740	⑱	6-25-21	1740	x							identification
3A-TRS #2 1740		6-25-21	1740	x							
3A-TRS #1 1845	⑲	6-25-21	1845	x							
3A-TRS #2 1845		6-25-21	1845	x					↓		

Report Tier Levels - please select
Tier I - Results (Default if not specified) ____
Tier II (Results + QC Summaries) ____
Tier III (Results + QC & Calibration Summaries) ____
Tier IV (Data Validation Package) 10% Surcharge ____

EDD required Yes / No
Type: ____

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	6-25-21	1405/1635/1745	Ref Secure Area	6-25-21	1405/1635/1745
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date: 6-28-21	Time: 1020

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Soil / Water - Chain of Custody Record & Analytical Service Request

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Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) [✓ 2 Day (75%)] 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No. P2103465

CAS Contact:

Company Name & Address (Reporting Information)
New Indy Container Board
5300 Cureton Ferry Rd
Catawba, SC 29704

Project Manager: Don Mallett

Phone: (803) 981-8010

Fax:

Email Address for Result Reporting: dan.mallett@new-indycb.com

Project Name: DHEC Order

Project Number:

P.O. # / Credit Card / Billing Information:

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Water	Soil	Solid	Other	Analysis			Comments
3A-TRS #1 0817	⑳	6-25-21	0817	X					Liq. Sulfur Analysis		* Collection
3A-TRS #2 0817		6-25-21	0817								date and time
3A-TRS #1 0924	㉑	6-25-21	0924								are crucial for
3A-TRS #2 0924		6-25-21	0924								sample
3A-TRS #1 1030	㉒	6-25-21	1030								identification
3A-TRS #2 1030		6-25-21	1030								
2A-TRS #1 1035	㉓	6-25-21	1035								
2A-TRS #2 1035		6-25-21	1035								
2B-TRS #1 1040	㉔	6-25-21	1040								
2B-TRS #2 1040		6-25-21	1040								

Report Tier Levels - please select

Tier I - Results (Default if not specified) ____
Tier II (Results + QC Summaries) ____
Tier III (Results + QC & Calibration Summaries) ____
Tier IV (Data Validation Package) 10% Surcharge ____

EDD required Yes / No
Type: ____________

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Kate VanVallegh	6/25/21	0820/0930/1035	ReF Secure Area	6/25/21 0820/0930/1035	
Gale Robinson	6/25/21	1040/1045	ReF Secure Area	6/25/21 1040/1045	
				6-28-21	1020

Soil / Water - Chain of Custody Record & Analytical Service Request

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2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) [✓ 2 Day (75%)] 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No. P2103465

CAS Contact:

Company Name & Address (Reporting Information)
New Indy Container Board
5300 Cureton Ferry Rd
Catawba, SC 29704

Project Manager: Dan Mallett

Phone: (803) 981-8010

Fax:

Email Address for Result Reporting: dan.mallett@new-indycb.com

Project Name: DHEC Order

Project Number:

P.O. # / Credit Card / Billing Information:

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Water	Soil	Solid	Other	Analysis				Comments
2A - TRS # 1 1205	㉕	6-25-21	1205	x					Liquid Sulfur			* Collection
2A - TRS #2 1205		6-25-21	1205	x								date and time
2B - TRS #1 1210	㉖	6-25-21	1210	x								are crucial for
2B - TRS #2 1210		6-25-21	1210	x								sample
3A - TRS # 1 1200	㉗	6-25-21	1200	x								identification
3A - TRS #2 1200		6-25-21	1200	x								
3A - TRS #1 1255	㉘	6-25-21	1255	x								
3A - TRS #2 1255		6-25-21	1255	x								
2A - TRS #1 1345	㉙	6-25-21	1345	x								
2A - TRS #2 1345		6-25-21	1345	x								
2B - TRS #1 1350	㉚	6-25-21	1350	x								
2B - TRS #2 1350		6-25-21	1350	x								

Report Tier Levels - please select

Tier I - Results (Default if not specified) _____
Tier II (Results + QC Summaries) _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Data Validation Package) 10% Surcharge _____

EDD required Yes / No
Type: ______________

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Dale Robinson	6/25/21	1215/1355	Ref Secure Area	6-25-21	1215/1355
	6/25/21	1205/1300	Ref Secure Area	6-25-21	1205/1300
				6-29-21	1020

ALS

Soil / Water - Chain of Custody Record & Analytical Service Request

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2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) [✓ 2 Day (75%)] 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No. P2103465

CAS Contact:

Company Name & Address (Reporting Information)
New Indy Container Board
5300 Cureton Ferry Rd
Catawba, SC 29704

Project Name: DHEC Order

Project Number:

Project Manager: Don Mallett

P.O. # / Credit Card / Billing Information:

Phone: (803) 981-8010

Fax:

Email Address for Result Reporting: dan.mallett@new-indycb.com

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Water	Soil	Solid	Other	Analysis			Comments
3A-TRS #1 1010	㉛	6-26-21	1010	x					Liquid Sulfur		* Collection
3A-TRS #2 1010		6-26-21	1010	x							date and time
3A-TRS #1 1125	㉜	6-26-21	1125	x							are crucial for
3A-TRS #2 1125		6-26-21	1125	x							sample
3A-TRS #1 1230	㉝	6-26-21	1230	x							identification
3A-TRS #2 1230		6-26-21	1230	x							
3B-TRS #1 1305	㉞	6-26-21	1305	x							
3B-TRS #2 1305		6-26-21	1305	x							
3A-TRS #1 1400	㉟	6-26-21	1400	x							
3A-TRS #2 1400		6-26-21	1400	x							
3B-TRS #1 1415	㊱	6-26-21	1415	x							
3B-TRS #2 1415		6-26-21	1415	x							

Report Tier Levels - please select

Tier I - Results (Default if not specified) ____
Tier II (Results + QC Summaries) ____
Tier III (Results + QC & Calibration Summaries) ____
Tier IV (Data Validation Package) 10% Surcharge ____

EDD required Yes / No
Type: ____________

Relinquished by: (Signature) Dale Roberson	Date: 6-26-21	Time: 1015/1130 1235/1310	Received by: (Signature) Ref Secure Area	Date: 6-26-21	Time: 1015/1130 1235/1310
Relinquished by: (Signature) Dale Roberson	Date: 6-26-21	Time: 1405/1420	Received by: (Signature) Ref Secure Area	Date: 6-26-21	Time: 1405/1420
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date: 6-28-21	Time: 1020

Soil / Water - Chain of Custody Record & Analytical Service Request

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2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) [✓ 2 Day (75%)] 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No: P2103465

CAS Contact:

Company Name & Address (Reporting Information)
New Indy Container Board
5300 Cureton Ferry Rd
Catawba, SC 29704

Project Name: DHEC Order

Project Number:

Project Manager: Don Mallett

P.O. # / Credit Card / Billing Information:

Phone: (803) 981-8010

Fax:

Email Address for Result Reporting: dan.mallett@new-indycb.com

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Water	Soil	Solid	Other	Analysis			Comments
3A-TRS #1 1445	47	6-26-21	1445	x					Liquid Sulfur		* Collection
3A-TRS #2 1445		6-26-21	1445	✓							date and time
3B-TRS #1 1530	54	6-26-21	1530	x							are crucial for
3B-TRS #2 1530		6-26-21	1530	x							sample
3A-TRS #1 1550	11	6-26-21	1550	x							identification
3A-TRS #2 1550		6-26-21	1550	x							

Report Tier Levels - please select
Tier I - Results (Default if not specified) ____
Tier II (Results + QC Summaries) ____
Tier III (Results + QC & Calibration Summaries) ____
Tier IV (Data Validation Package) 10% Surcharge ____

EDD required Yes / No
Type: ____________

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	6-26-21	1450/1535	Ref Secure Area	6-26-21	1450/1535
	6-26-21	1555	Ref Secure Area	6-26-21	1555
				6-28-21	1040

ALS Environmental
Sample Acceptance Check Form

Client: New-Indy Catawba LLC
Work order: P2103465
Project: DHEC Order
Sample(s) received on: 6/29/21
Date opened: 6/29/21
by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: 2° C Blank Temperature: ° C	Wet Ic		
8	Were **custody seals** on outside of cooler/Box/Container?	☐	☒	☐
	Location of seal(s)? Sealing Lid?	☐	☒	☐
	Were signature and date included?	☐	☒	☐
	Were seals intact?	☐	☒	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☒	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2103465-001.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-001.02	40mL VOA NP				A	
P2103465-002.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-002.02	40mL VOA NP				A	
P2103465-003.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-003.02	40mL VOA NP				A	
P2103465-004.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-004.02	40mL VOA NP				A	
P2103465-005.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-005.02	40mL VOA NP				A	
P2103465-006.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-006.02	40mL VOA NP				A	
P2103465-007.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-007.02	40mL VOA NP				A	
P2103465-008.01	40mL VOA NP		1	6	A	GG 7/1/21

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental

Sample Acceptance Check Form

Client: New-Indy Catawba LLC
Work order: P2103465
Project: DHEC Order
Sample(s) received on: 6/29/21
Date opened: 6/29/21
by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2103465-008.02	40mL VOA NP				A	
P2103465-009.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-009.02	40mL VOA NP				A	
P2103465-010.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-010.02	40mL VOA NP				A	
P2103465-011.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-011.02	40mL VOA NP				A	
P2103465-012.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-012.02	40mL VOA NP				A	
P2103465-013.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-013.02	40mL VOA NP				A	
P2103465-014.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-014.02	40mL VOA NP				A	
P2103465-015.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-015.02	40mL VOA NP				A	
P2103465-016.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-016.02	40mL VOA NP				A	
P2103465-017.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-017.02	40mL VOA NP				A	
P2103465-018.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-018.02	40mL VOA NP				A	
P2103465-019.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-019.02	40mL VOA NP				A	
P2103465-020.01	40mL VOA NP		1	6	A	GG 7/1/21
P2103465-020.02	40mL VOA NP				A	
P2103465-021.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-021.02	40mL VOA NP				A	
P2103465-022.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-022.02	40mL VOA NP				A	
P2103465-023.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-023.02	40mL VOA NP				A	
P2103465-024.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-024.02	40mL VOA NP				A	
P2103465-025.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-025.02	40mL VOA NP				A	
P2103465-026.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-026.02	40mL VOA NP				A	
P2103465-027.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-027.02	40mL VOA NP				A	
P2103465-028.01	40mL VOA NP		1	6	A	GG 7/9/21

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: New-Indy Catawba LLC   Work order: P2103465

Project: DHEC Order

Sample(s) received on: 6/29/21   Date opened: 6/29/21   by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2103465-028.02	40mL VOA NP				A	
P2103465-029.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-029.02	40mL VOA NP				A	
P2103465-030.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-030.02	40mL VOA NP				A	
P2103465-031.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-031.02	40mL VOA NP				A	
P2103465-032.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-032.02	40mL VOA NP				A	
P2103465-033.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-033.02	40mL VOA NP				A	
P2103465-034.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-034.02	40mL VOA NP				A	
P2103465-035.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-035.02	40mL VOA NP				A	
P2103465-036.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-036.02	40mL VOA NP				A	
P2103465-037.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-037.02	40mL VOA NP				A	
P2103465-038.01	40mL VOA NP		1	6	A	GG 7/9/21
P2103465-038.02	40mL VOA NP				A	
P2103465-039.01	40mL VOA NP		1	6	A	GG 7/15/21
P2103465-039.02	40mL VOA NP				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client:	**New-Indy Catawba LLC**		
Client Sample ID:	**3A-TRS 1000**	ALS Project ID:	P2103465
Client Project ID:	**DHEC Order**	ALS Sample ID:	P2103465-001

Test Code:	GC/SCD Reduced Sulfur Analysis	Date Collected:	6/24/21
Instrument ID:	Agilent 6890A/GC13/SCD	Date Received:	6/29/21
Analyst:	Gilbert Gutierrez	Date Analyzed:	7/1/21
Sample Type:	Water	Liquid Amount:	1.0 ml(s)
Test Notes:		Purge Volume:	0.30 Liter(s)
		Injection Volume(s):	0.050 ml(s)

CAS #	**Compound**	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**200,000**	170	
74-93-1	Methyl Mercaptan	**740**	240	
75-18-3	Dimethyl Sulfide	ND	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	ND	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1115**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-002

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/24/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**210,000**	170	
74-93-1	Methyl Mercaptan	**700**	240	
75-18-3	Dimethyl Sulfide	ND	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	ND	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS
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Client:	**New-Indy Catawba LLC**		
Client Sample ID:	**3A-TRS 1210**	ALS Project ID:	P2103465
Client Project ID:	**DHEC Order**	ALS Sample ID:	P2103465-003

Test Code:	GC/SCD Reduced Sulfur Analysis	Date Collected:	6/24/21
Instrument ID:	Agilent 6890A/GC13/SCD	Date Received:	6/29/21
Analyst:	Gilbert Gutierrez	Date Analyzed:	7/1/21
Sample Type:	Water	Liquid Amount:	1.0 ml(s)
Test Notes:		Purge Volume:	0.30 Liter(s)
		Injection Volume(s):	0.050 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**170,000**	170	
74-93-1	Methyl Mercaptan	**640**	240	
75-18-3	Dimethyl Sulfide	ND	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	ND	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS
Page 1 of 1

Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1331**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-004

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/24/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	**Compound**	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**160,000**	170	
74-93-1	Methyl Mercaptan	**540**	240	
75-18-3	Dimethyl Sulfide	ND	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	ND	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS
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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1450**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-005

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/24/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	**Compound**	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**170,000**	170	
74-93-1	Methyl Mercaptan	**560**	240	
75-18-3	Dimethyl Sulfide	ND	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	ND	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: **New-Indy Catawba LLC**
Client Sample ID: **2A-TRS 1510**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-006

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/24/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**130,000**	170	
74-93-1	Methyl Mercaptan	**14,000**	240	
75-18-3	Dimethyl Sulfide	**16,000**	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	**13,000**	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS
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Client: **New-Indy Catawba LLC**
Client Sample ID: **2B-TRS 1515**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-007

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/24/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.20 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**5,000**	4.2	
74-93-1	Methyl Mercaptan	**200**	5.9	
75-18-3	Dimethyl Sulfide	**2,800**	7.6	
75-15-0	Carbon Disulfide	ND	4.7	
624-92-0	Dimethyl Disulfide	**4,100**	5.8	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1600**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-008

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/24/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**190,000**	170	
74-93-1	Methyl Mercaptan	**830**	240	
75-18-3	Dimethyl Sulfide	**360**	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	**710**	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **2A-TRS 1700**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-009

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/24/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	**Compound**	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**140,000**	170	
74-93-1	Methyl Mercaptan	**17,000**	240	
75-18-3	Dimethyl Sulfide	**18,000**	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	**14,000**	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **2B-TRS 1705**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-010

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/24/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.20 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**7,100**	4.2	
74-93-1	Methyl Mercaptan	**540**	5.9	
75-18-3	Dimethyl Sulfide	**2,900**	7.6	
75-15-0	Carbon Disulfide	ND	4.7	
624-92-0	Dimethyl Disulfide	**3,900**	5.8	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client:	**New-Indy Catawba LLC**
Client Sample ID:	**2A-TRS 1845**
Client Project ID:	**DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-011

Test Code:	GC/SCD Reduced Sulfur Analysis
Instrument ID:	Agilent 6890A/GC13/SCD
Analyst:	Gilbert Gutierrez
Sample Type:	Water
Test Notes:	

Date Collected:	6/24/21
Date Received:	6/29/21
Date Analyzed:	7/1/21
Liquid Amount:	1.0 ml(s)
Purge Volume:	0.30 Liter(s)
Injection Volume(s):	0.050 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**150,000**	170	
74-93-1	Methyl Mercaptan	**19,000**	240	
75-18-3	Dimethyl Sulfide	**18,000**	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	**16,000**	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **2B-TRS 1850**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-012

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/24/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.20 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**8,100**	4.2	
74-93-1	Methyl Mercaptan	**760**	5.9	
75-18-3	Dimethyl Sulfide	**3,000**	7.6	
75-15-0	Carbon Disulfide	ND	4.7	
624-92-0	Dimethyl Disulfide	**4,100**	5.8	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS Duplicate 1115**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-013

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/24/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**190,000**	170	
74-93-1	Methyl Mercaptan	**840**	240	
75-18-3	Dimethyl Sulfide	**310**	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	**680**	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client:	**New-Indy Catawba LLC**		
Client Sample ID:	**2A-TRS Duplicate 1510**	ALS Project ID:	P2103465
Client Project ID:	**DHEC Order**	ALS Sample ID:	P2103465-014

Test Code:	GC/SCD Reduced Sulfur Analysis	Date Collected:	6/24/21
Instrument ID:	Agilent 6890A/GC13/SCD	Date Received:	6/29/21
Analyst:	Gilbert Gutierrez	Date Analyzed:	7/1/21
Sample Type:	Water	Liquid Amount:	1.0 ml(s)
Test Notes:		Purge Volume:	0.30 Liter(s)
		Injection Volume(s):	0.050 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**140,000**	170	
74-93-1	Methyl Mercaptan	**14,000**	240	
75-18-3	Dimethyl Sulfide	**16,000**	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	**17,000**	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **2B-TRS Duplicate 1515**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-015

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/24/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.20 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**3,200**	4.2	
74-93-1	Methyl Mercaptan	**94**	5.9	
75-18-3	Dimethyl Sulfide	**3,000**	7.6	
75-15-0	Carbon Disulfide	ND	4.7	
624-92-0	Dimethyl Disulfide	**4,400**	5.8	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1403**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-016

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**180,000**	170	
74-93-1	Methyl Mercaptan	**1,200**	240	
75-18-3	Dimethyl Sulfide	**400**	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	**840**	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1630**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-017

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**160,000**	170	
74-93-1	Methyl Mercaptan	**1,300**	240	
75-18-3	Dimethyl Sulfide	ND	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	**430**	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1740**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-018

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**170,000**	170	
74-93-1	Methyl Mercaptan	**1,300**	240	
75-18-3	Dimethyl Sulfide	ND	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	**250**	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1845**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-019

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	**Compound**	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**140,000**	170	
74-93-1	Methyl Mercaptan	**1,300**	240	
75-18-3	Dimethyl Sulfide	ND	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	ND	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 0817**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-020

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/1/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**190,000**	170	
74-93-1	Methyl Mercaptan	**790**	240	
75-18-3	Dimethyl Sulfide	ND	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	ND	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 0924**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-021

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.10 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**130,000**	84	
74-93-1	Methyl Mercaptan	**560**	120	
75-18-3	Dimethyl Sulfide	**170**	150	
75-15-0	Carbon Disulfide	ND	93	
624-92-0	Dimethyl Disulfide	ND	120	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1030**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-022

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.10 ml(s)

CAS #	**Compound**	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**150,000**	84	
74-93-1	Methyl Mercaptan	**710**	120	
75-18-3	Dimethyl Sulfide	**170**	150	
75-15-0	Carbon Disulfide	ND	93	
624-92-0	Dimethyl Disulfide	ND	120	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **2A-TRS 1035**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-023

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.10 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**130,000**	84	
74-93-1	Methyl Mercaptan	**12,000**	120	
75-18-3	Dimethyl Sulfide	**12,000**	150	
75-15-0	Carbon Disulfide	ND	93	
624-92-0	Dimethyl Disulfide	**11,000**	120	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **2B-TRS 1040**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-024

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.20 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**3,300**	4.2	
74-93-1	Methyl Mercaptan	**100**	5.9	
75-18-3	Dimethyl Sulfide	**2,400**	7.6	
75-15-0	Carbon Disulfide	ND	4.7	
624-92-0	Dimethyl Disulfide	**3,600**	5.8	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **2A-TRS 1205**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-025

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.10 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**120,000**	84	
74-93-1	Methyl Mercaptan	**10,000**	120	
75-18-3	Dimethyl Sulfide	**12,000**	150	
75-15-0	Carbon Disulfide	ND	93	
624-92-0	Dimethyl Disulfide	**9,600**	120	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **2B-TRS 1210**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-026

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 1.0 ml(s)

CAS #	**Compound**	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**550**	0.84	
74-93-1	Methyl Mercaptan	**4.8**	1.2	
75-18-3	Dimethyl Sulfide	**1,900**	1.5	
75-15-0	Carbon Disulfide	**2.0**	0.93	
624-92-0	Dimethyl Disulfide	**3,000**	1.2	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1200**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-027

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.10 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**130,000**	84	
74-93-1	Methyl Mercaptan	**620**	120	
75-18-3	Dimethyl Sulfide	**340**	150	
75-15-0	Carbon Disulfide	ND	93	
624-92-0	Dimethyl Disulfide	**550**	120	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1255**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-028

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/25/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.10 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**140,000**	84	
74-93-1	Methyl Mercaptan	**730**	120	
75-18-3	Dimethyl Sulfide	**180**	150	
75-15-0	Carbon Disulfide	ND	93	
624-92-0	Dimethyl Disulfide	ND	120	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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Client:	**New-Indy Catawba LLC**		
Client Sample ID:	**2A-TRS 1345**	ALS Project ID:	P2103465
Client Project ID:	**DHEC Order**	ALS Sample ID:	P2103465-029

Test Code:	GC/SCD Reduced Sulfur Analysis	Date Collected:	6/25/21
Instrument ID:	Agilent 6890A/GC13/SCD	Date Received:	6/29/21
Analyst:	Gilbert Gutierrez	Date Analyzed:	7/9/21
Sample Type:	Water	Liquid Amount:	1.0 ml(s)
Test Notes:		Purge Volume:	0.30 Liter(s)
		Injection Volume(s):	0.050 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**190,000**	170	
74-93-1	Methyl Mercaptan	**22,000**	240	
75-18-3	Dimethyl Sulfide	**22,000**	300	
75-15-0	Carbon Disulfide	ND	190	
624-92-0	Dimethyl Disulfide	**23,000**	230	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS
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Client:	**New-Indy Catawba LLC**		
Client Sample ID:	**2B-TRS 1350**	ALS Project ID:	P2103465
Client Project ID:	**DHEC Order**	ALS Sample ID:	P2103465-030

Test Code:	GC/SCD Reduced Sulfur Analysis	Date Collected:	6/25/21
Instrument ID:	Agilent 6890A/GC13/SCD	Date Received:	6/29/21
Analyst:	Gilbert Gutierrez	Date Analyzed:	7/9/21
Sample Type:	Water	Liquid Amount:	10 ml(s)
Test Notes:		Purge Volume:	0.30 Liter(s)
		Injection Volume(s):	0.30 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**3,500**	2.8	
74-93-1	Methyl Mercaptan	**260**	3.9	
75-18-3	Dimethyl Sulfide	**2,500**	5.1	
75-15-0	Carbon Disulfide	ND	3.1	
624-92-0	Dimethyl Disulfide	**4,300**	3.9	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS
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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1010**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-031

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/26/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.20 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**90,000**	42	
74-93-1	Methyl Mercaptan	**1,100**	59	
75-18-3	Dimethyl Sulfide	**420**	76	
75-15-0	Carbon Disulfide	ND	47	
624-92-0	Dimethyl Disulfide	**710**	58	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1125**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-032

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/26/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.10 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**75,000**	84	
74-93-1	Methyl Mercaptan	**1,700**	120	
75-18-3	Dimethyl Sulfide	**180**	150	
75-15-0	Carbon Disulfide	ND	93	
624-92-0	Dimethyl Disulfide	**170**	120	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS
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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1230**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-033

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/26/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.10 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**59,000**	84	
74-93-1	Methyl Mercaptan	**2,000**	120	
75-18-3	Dimethyl Sulfide	**170**	150	
75-15-0	Carbon Disulfide	ND	93	
624-92-0	Dimethyl Disulfide	ND	120	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3B-TRS 1305**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-034

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/26/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 1.0 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**9.4**	0.84	
74-93-1	Methyl Mercaptan	**7.7**	1.2	
75-18-3	Dimethyl Sulfide	**37**	1.5	
75-15-0	Carbon Disulfide	ND	0.93	
624-92-0	Dimethyl Disulfide	**11**	1.2	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1400**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-035

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/26/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.10 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**42,000**	84	
74-93-1	Methyl Mercaptan	**1,500**	120	
75-18-3	Dimethyl Sulfide	**150**	150	
75-15-0	Carbon Disulfide	ND	93	
624-92-0	Dimethyl Disulfide	**170**	120	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS
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Client: **New-Indy Catawba LLC**
Client Sample ID: **3B-TRS 1415**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-036

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/26/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 1.0 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**7.7**	0.84	
74-93-1	Methyl Mercaptan	**5.8**	1.2	
75-18-3	Dimethyl Sulfide	**42**	1.5	
75-15-0	Carbon Disulfide	ND	0.93	
624-92-0	Dimethyl Disulfide	**15**	1.2	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1445**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-037

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/26/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 1.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.10 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**37,000**	84	
74-93-1	Methyl Mercaptan	**1,500**	120	
75-18-3	Dimethyl Sulfide	ND	150	
75-15-0	Carbon Disulfide	ND	93	
624-92-0	Dimethyl Disulfide	**120**	120	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS
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Client: **New-Indy Catawba LLC**
Client Sample ID: **3B-TRS 1530**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-038

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/26/21
Date Received: 6/29/21
Date Analyzed: 7/9/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 1.0 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**5.4**	0.84	
74-93-1	Methyl Mercaptan	**5.9**	1.2	
75-18-3	Dimethyl Sulfide	**47**	1.5	
75-15-0	Carbon Disulfide	ND	0.93	
624-92-0	Dimethyl Disulfide	**17**	1.2	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS
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Client: **New-Indy Catawba LLC**
Client Sample ID: **3A-TRS 1550**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P2103465-039

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: 6/26/21
Date Received: 6/29/21
Date Analyzed: 7/15/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 0.050 ml(s)

CAS #	**Compound**	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	**41,000**	17	
74-93-1	Methyl Mercaptan	**1,700**	24	
75-18-3	Dimethyl Sulfide	**190**	30	
75-15-0	Carbon Disulfide	**22**	19	
624-92-0	Dimethyl Disulfide	**81**	23	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS
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Client: **New-Indy Catawba LLC**
Client Sample ID: **Method Blank**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P210701-MB

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 7/01/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 1.0 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	0.84	
74-93-1	Methyl Mercaptan	ND	1.2	
75-18-3	Dimethyl Sulfide	ND	1.5	
75-15-0	Carbon Disulfide	ND	0.93	
624-92-0	Dimethyl Disulfide	ND	1.2	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

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Client: **New-Indy Catawba LLC**
Client Sample ID: **Method Blank**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P210709-MB

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 7/09/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 1.0 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	0.84	
74-93-1	Methyl Mercaptan	ND	1.2	
75-18-3	Dimethyl Sulfide	ND	1.5	
75-15-0	Carbon Disulfide	ND	0.93	
624-92-0	Dimethyl Disulfide	ND	1.2	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS
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Client: **New-Indy Catawba LLC**
Client Sample ID: **Method Blank**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P210715-MB

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 7/15/21
Liquid Amount: 10 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume(s): 1.0 ml(s)

CAS #	Compound	Result µg/L	MRL µg/L	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	0.84	
74-93-1	Methyl Mercaptan	ND	1.2	
75-18-3	Dimethyl Sulfide	ND	1.5	
75-15-0	Carbon Disulfide	ND	0.93	
624-92-0	Dimethyl Disulfide	ND	1.2	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: **New-Indy Catawba LLC**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P210701-DLCS

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 7/01/21
Liquid Amount: 10.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume: 0.10 ml(s)

		Spike Amount	Result				ALS			
CAS #	**Compound**	LCS / DLCS	LCS	DLCS	**% Recovery**		Acceptance	RPD	RPD	Data
		ug/L	ug/L	ug/L	**LCS**	**DLCS**	Limits		Limit	Qualifier
7783-06-4	Hydrogen Sulfide	413	396	440	**96**	**107**	68-129	11	16	
74-93-1	Methyl Mercaptan	620	631	718	**102**	**116**	69-136	13	17	

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: **New-Indy Catawba LLC**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P210709-DLCS

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 7/09/21
Liquid Amount: 10.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume: 0.10 ml(s)

CAS #	**Compound**	Spike Amount LCS / DLCS ug/L	Result LCS ug/L	Result DLCS ug/L	**% Recovery LCS**	**% Recovery DLCS**	ALS Acceptance Limits	RPD	RPD Limit	Data Qualifier
7783-06-4	Hydrogen Sulfide	413	499	430	**121**	**104**	68-129	15	16	
74-93-1	Methyl Mercaptan	620	822	703	**133**	**113**	69-136	16	17	

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: **New-Indy Catawba LLC**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **DHEC Order**

ALS Project ID: P2103465
ALS Sample ID: P210715-DLCS

Test Code: GC/SCD Reduced Sulfur Analysis
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Gilbert Gutierrez
Sample Type: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 7/15/21
Liquid Amount: 10.0 ml(s)
Purge Volume: 0.30 Liter(s)
Injection Volume: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result LCS ug/L	Result DLCS ug/L	% Recovery LCS	% Recovery DLCS	ALS Acceptance Limits	RPD	RPD Limit	Data Qualifier
7783-06-4	Hydrogen Sulfide	413	483	487	**117**	**118**	68-129	0.9	16	
74-93-1	Methyl Mercaptan	620	815	806	**131**	**130**	69-136	0.8	17	

APPENDIX H
QUALITY CONTROL DATA

EQUIPMENT CALIBRATIONS

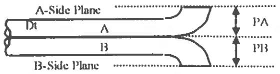
S - Type Pitot Tube Inspection Data Form

Pitot Tube ID NO. P172 Length 5' Probe ID.No. AUB-PR-5B

Inspection Date 1/6/2021 Individual Conducting Inspection DDS

If all Criteria PASS Cp is equal to 0.84

PASS/FAIL



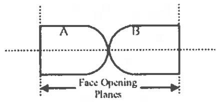
Distance to A Plane (PA) - inches 0.488 PASS

Distance to B Plane (PB) - inches 0.488 PASS

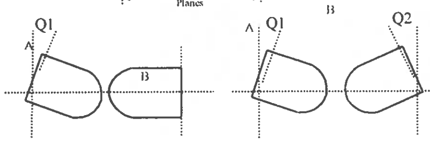
Pitot OD (D_t) - inches 0.375

$1.05\ D_t < P < 1.5\ D_t$

PA must Equal PB



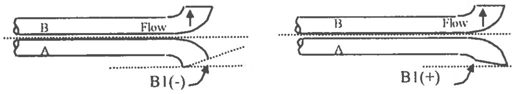
Are Open Faces Aligned Perpendicular to the Tube Axis ● YES ○ NO PASS



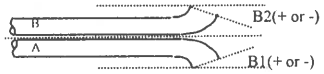
Angle of Q1 from vertical A Tube-degrees (absolute) 1 PASS

Angle of Q2 from vertical B Tube-degrees (absolute) 1 PASS

Q1 and Q2 must be ≤ 10°



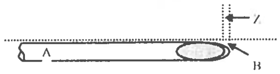
Angle of B1 from vertical A Tube-degrees (absolute) 1 PASS



Angle of B1 from vertical B Tube-degrees (absolute) 0 PASS

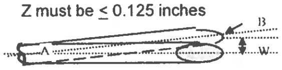
B1 or B2 must be ≤ 5°

Y = 1 O = 1



A = 0.976

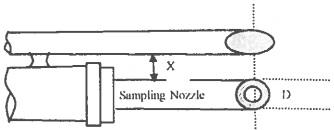
Z must be ≤ 0.125 inches



Z = A sin Y = 0.0170 PASS

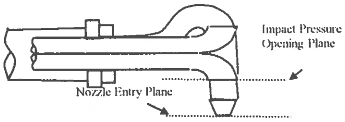
W = A sin O = 0.0170 PASS

W must be ≤ 0.03125 inches

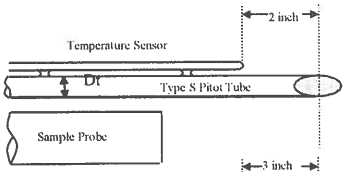


Distance between Sample Nozzle and Pitot (X) - inches N/A PASS

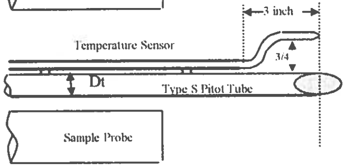
X must be ≥ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane ● YES ○ NO ○ NA PASS



Thermocouple meets the Distance Criteria in the adjacent figure ● YES ○ NO ○ NA PASS



Thermocouple meets the Distance Criteria in the adjacent figure ○ YES ○ NO ● NA

POSTTEST CHECK

Client NewIndy Catawba Work Order Number 15730.001.008

Date 7·16·21 Damage Found? ____ YES ✓ NO

Checked By JUA

Integrated Air Services

Stack Temperature Sensor Calibration Data

Choose Reference Thermometer Below:

☐ Digital Thermometer - Omega Model CL3515R (Serial# 06000183)

☑ Digital Thermometer - Omega Model CL3515R (Serial# 12000230)

Thermocouple Number: AU-PR-5B Length: 5'
Date: 6-Jan-21
Ambient Temperature,°F: 57
Calibrator: DDS

Reference Point Number		Reference Temperature °F	Thermocouple Temperature °F	Temperature Difference %
1 -	A	57	57	0.00
	B	57	57	0.00
	C	57	57	0.00
2 -	A	38	38	0.00
	B	38	38	0.00
	C	38	38	0.00
3 -	A	211	211	0.00
	B	211	210	0.15
	C	211	210	0.15

$$\text{Temp Diff (\%)} = \left| \frac{(\text{Ref Temp, }^{\circ}\text{F} + 460) - (\text{Therm Temp }^{\circ}\text{F} + 460)}{\text{Ref Temp,}^{\circ}\text{ F} + 460} \right| \times 100$$

Are all temperature differences less than +/- 1.5% ? YES

POSTTEST STACK TEMPERATURE SENSOR CALIBRATION DATA

Client: New Indy Catawba
Work Order Number: 15730.001.008
Date: 7-16-21
Calibrator: JJA

Ambient Temp,° F	Reference Temp,° F	Thermocouple Temp,° F	Temperature Diff, %
75	76	76	0

Was a pretest temperature correction used ? ____yes [✓ no]
Is temperature difference within +/- 1.5% [✓ yes] ____no
If no, calculations done once with recorded values and once with corrected values ______

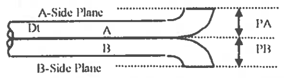
S - Type Pitot Tube Inspection Data Form

Pitot Tube ID NO. P77 Length 6' Probe ID.No. AUB-PR-6C

If all Criteria PASS Cp is equal to 0.84

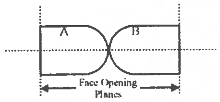
Inspection Date 12/29/2020 Individual Conducting Inspection DDS

PASS/FAIL

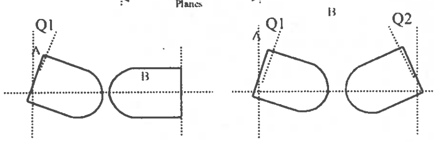


Distance to A Plane (PA) - inches 0.434 PASS
Distance to B Plane (PB) - inches 0.434 PASS
Pitot OD (D_t) - inches 0.375

$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

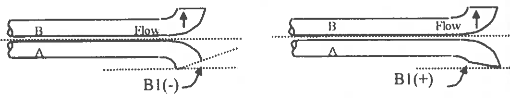


Are Open Faces Aligned Perpendicular to the Tube Axis ● YES ○ NO PASS

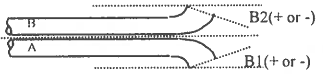


Angle of Q1 from vertical A Tube-degrees (absolute) 1 PASS
Angle of Q2 from vertical B Tube-degrees (absolute) 2 PASS

Q1 and Q2 must be ≤ 10°



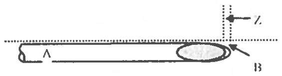
Angle of B1 from vertical A Tube-degrees (absolute) 1 PASS



Angle of B1 from vertical B Tube-degrees (absolute) 1 PASS

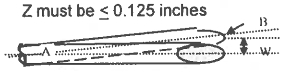
B1 or B2 must be ≤ 5°

Y = 1 O = 1



A = 0.868

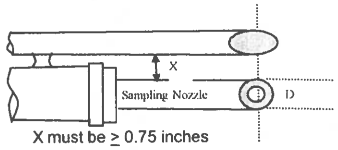
Z must be ≤ 0.125 inches



Z = A sin Y = 0.0151 PASS

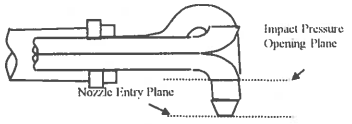
W = A sin O = 0.0151 PASS

W must be ≤ 0.03125 inches

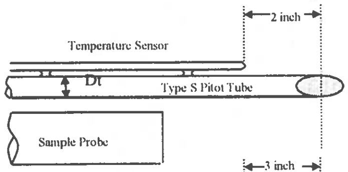


Distance between Sample Nozzle and Pitot (X) - inches N/A PASS

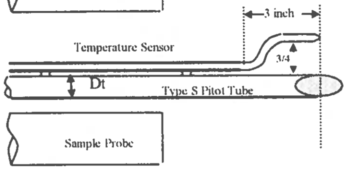
X must be ≥ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane ● YES ○ NO ○ NA PASS



Thermocouple meets the Distance Criteria in the adjacent figure ○ YES ○ NO ● NA



Thermocouple meets the Distance Criteria in the adjacent figure ● YES ○ NO ○ NA PASS

POSTTEST CHECK

Client New Indy Catawba Work Order Number 15730.001.008

Date 7-16-21 Damage Found? ______ YES ✓ NO

Checked By JA

Integrated Air Services

Stack Temperature Sensor Calibration Data

Choose Reference Thermometer Below:

☐ Digital Thermometer - Omega Model CL3515R (Serial# 06000183)

☑ Digital Thermometer - Omega Model CL3515R (Serial# 12000230)

Thermocouple Number: AUB-PR-6C Length: 6'
Date: 29-Dec-20
Ambient Temperature,°F: 65
Calibrator: DDS

Reference Point Number	Reference Temperature ° F	Thermocouple Temperature ° F	Temperature Difference %
1 - A	65	65	0.00
B	65	65	0.00
C	65	65	0.00
2 - A	34	34	0.00
B	34	34	0.00
C	34	34	0.00
3 - A	210	210	0.00
B	210	210	0.00
C	210	210	0.00

$$\text{Temp Diff (\%)} = \left| \frac{(\text{Ref Temp, } ^{\circ}\text{F} + 460) - (\text{Therm Temp } ^{\circ}\text{F} + 460)}{\text{Ref Temp, } ^{\circ}\text{F} + 460} \right| \times 100$$

Are all temperature differences less than +/- 1.5% ? YES

POSTTEST STACK TEMPERATURE SENSOR CALIBRATION DATA

Client: New Indy Catawba
Work Order Number: 15730.001.008
Date: 7-16-21
Calibrator: JA

Ambient Temp,° F	Reference Temp,° F	Thermocouple Temp,° F	Temperature Diff, %
76	76	76	0

Was a pretest temperature correction used ? ____yes _✓_no
Is temperature difference within +/- 1.5% _✓_yes ____no
If no, calculations done once with recorded values and once with corrected values ______

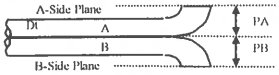
S - Type Pitot Tube Inspection Data Form

Pitot Tube ID NO. P320 Length 8' Probe ID.No. AUB-PR-8L

Inspection Date 1/5/2021 Individual Conducting Inspection DDS

If all Criteria PASS Cp is equal to 0.84

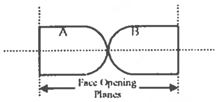
PASS/FAIL



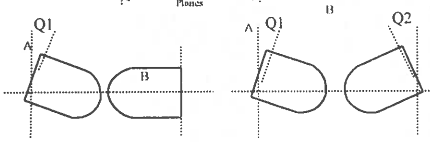
Distance to A Plane (PA) - inches	0.472	PASS
Distance to B Plane (PB) - inches	0.472	PASS
Pitot OD (D_t) - inches	0.375	

$1.05\ D_t < P < 1.5\ D_t$

PA must Equal PB

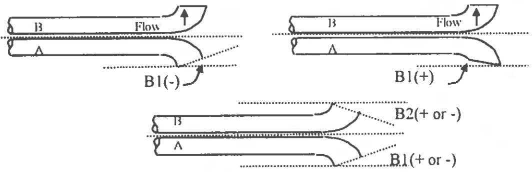


Are Open Faces Aligned Perpendicular to the Tube Axis ● YES ○ NO PASS



Angle of Q1 from vertical A Tube-degrees (absolute)	1	PASS
Angle of Q2 from vertical B Tube-degrees (absolute)	1	PASS

Q1 and Q2 must be ≤ 10°



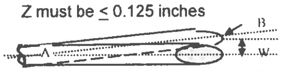
Angle of B1 from vertical A Tube-degrees (absolute)	0	PASS
Angle of B1 from vertical B Tube-degrees (absolute)	0	PASS

B1 or B2 must be ≤ 5°

Y = 1 O = 0

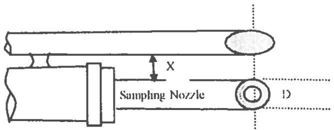
A = 0.943

Z must be ≤ 0.125 inches



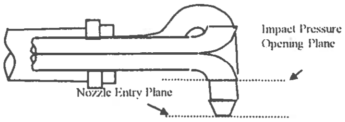
Z = A sin Y =	0.0165	PASS
W = A sin O =	0.0000	PASS

W must be ≤ 0.03125 inches

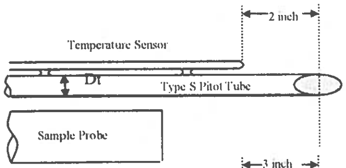


Distance between Sample Nozzle and Pitot (X) - inches N/A PASS

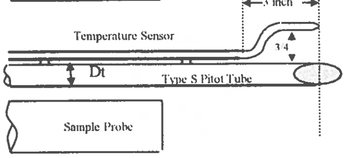
X must be ≥ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane ● YES ○ NO ○ NA PASS



Thermocouple meets the Distance Criteria in the adjacent figure ● YES ○ NO ○ NA PASS



Thermocouple meets the Distance Criteria in the adjacent figure ○ YES ○ NO ● NA

POSTTEST CHECK

Client New Indy Catawba Work Order Number 15730.001.008

Date 7-16-21 Damage Found? ____ YES ✓ NO

Checked By JA

WESTON SOLUTIONS
Integrated Air Services

Stack Temperature Sensor Calibration Data

Choose Reference Thermometer Below:

☐ Digital Thermometer - Omega Model CL3515R (Serial# 06000183)

☑ Digital Thermometer - Omega Model CL3515R (Serial# 12000230)

Thermocouple Number: AUB-PR-8L Length: 8'
Date: 5-Jan-21
Ambient Temperature,°F: 63
Calibrator: DDS

Reference Point Number		Reference Temperature °F	Thermocouple Temperature °F	Temperature Difference %
1 -	A	63	62	0.19
	B	63	62	0.19
	C	63	62	0.19
2 -	A	38	38	0.00
	B	38	38	0.00
	C	38	38	0.00
3 -	A	211	211	0.00
	B	211	211	0.00
	C	211	211	0.00

$$\text{Temp Diff (\%)} = \left| \frac{(\text{Ref Temp. } ^{\circ}\text{F} + 460) - (\text{Therm Temp } ^{\circ}\text{F} + 460)}{\text{Ref Temp,}^{\circ}\text{ F} + 460} \right| \times 100$$

Are all temperature differences less than +/- 1.5% ? YES

POSTTEST STACK TEMPERATURE SENSOR CALIBRATION DATA

Client: New Indy Catawba
Work Order Number: 15730.001.008
Date: 7-16-21
Calibrator: JUA

Ambient Temp,° F	Reference Temp,° F	Thermocouple Temp,° F	Temperature Diff, %
77	77	77	0

Was a pretest temperature correction used ? ____yes [✓ no]
Is temperature difference within +/- 1.5% [✓ yes] ____no
If no, calculations done once with recorded values and once with corrected values ______

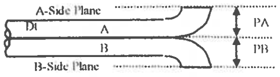
S - Type Pitot Tube Inspection Data Form

Pitot Tube ID NO. P147 Length 6' Probe ID.No. N/A

If all Criteria PASS Cp is equal to 0.84

Inspection Date 1/4/2021 Individual Conducting Inspection DDS

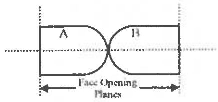
PASS/FAIL



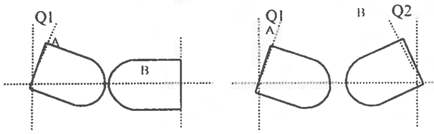
Distance to A Plane (PA) - inches 0.448 PASS
Distance to B Plane (PB) - inches 0.448 PASS
Pitot OD (D_t) - inches 0.375

$1.05\ D_t < P < 1.5\ D_t$

PA must Equal PB

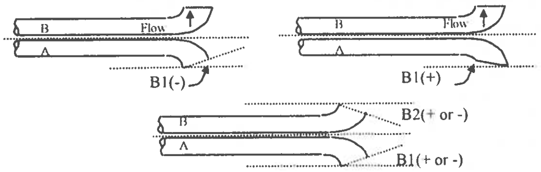


Are Open Faces Aligned Perpendicular to the Tube Axis ● YES ○ NO PASS



Angle of Q1 from vertical A Tube-degrees (absolute) 1 PASS
Angle of Q2 from vertical B Tube-degrees (absolute) 1 PASS

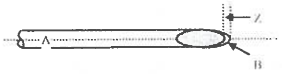
Q1 and Q2 must be ≤ 10°



Angle of B1 from vertical A Tube-degrees (absolute) 1 PASS
Angle of B1 from vertical B Tube-degrees (absolute) 1 PASS

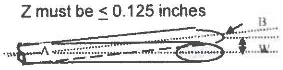
B1 or B2 must be ≤ 5°

Y = 1 O = 1



A = 0.896

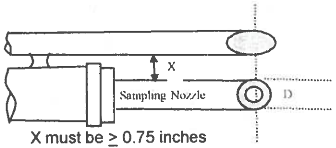
Z must be ≤ 0.125 inches



Z = A sin Y = 0.0156 PASS

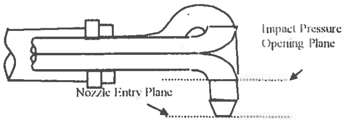
W must be ≤ 0.03125 inches

W = A sin O = 0.0156 PASS

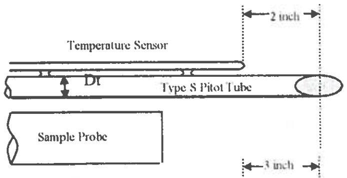


Distance between Sample Nozzle and Pitot (X) - inches N/A PASS

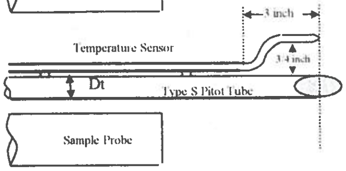
X must be ≥ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane ○ YES ○ NO ● NA



Thermocouple meets the Distance Criteria in the adjacent figure ● YES ○ NO ○ NA PASS



Thermocouple meets the Distance Criteria in the adjacent figure ○ YES ○ NO ● NA

POSTTEST CHECK

Client New Indy Catawba Work Order Number 15730.001.008

Date 7-16-21 Damage Found? ______ YES ✓ NO

Checked By AB for JLH ✓

WESTON SOLUTIONS
Integrated Air Services

METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

WESTON SOLUTIONS
Integrated Air Services

1) Select three critical orifices to calibrate the dry gas meter which bracket the expected operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record readings in colored boxes below, other columns are automatically calculated.

DATE: 6-May-2021
METER PART #: AO10
METER SERIAL #: 1557659
CRITICAL ORIFICE SET SERIAL #: 1331s & 1825

	INITIAL	FINAL	AVG (P_{bar})
BAROMETRIC PRESSURE (in Hg):	29.41	29.44	29.43
Calibrated by:	LoF		

Barometer ID: 200567181

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	FINAL	NET (V_m)	AMBIENT F°	DGM F° INITIAL	FINAL	Avg DGM F° T_m	ELAPSED TIME (MIN) θ	DGM ΔH (in H_2O)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	(4) $\Delta H_@$
8	1	0.2300	21	610.700	622.158	11.458	65	65	67	66	38	0.26	11.321	11.227	0.992	1.657
12	2	0.3326	23	711.400	724.636	13.236	69	70	71	71	30	0.54	12.976	12.769	0.984	1.646
16	3	0.4379	22	698.255	711.015	12.760	68	69	69	69	22	0.97	12.558	12.34	0.983	1.711
19	4	0.5162	21	686.356	697.885	11.529	67	69	69	69	17	1.40	11.359	11.251	0.991	1.778
25	5	0.6846	19	650.247	685.402	35.155	67	69	69	69	39	2.50	34.730	34.233	0.986	1.815
31	6	0.8304	17	624.604	649.402	24.798	66	67	69	68	23	3.60	24.612	24.511	0.996	1.786
														AVG =	**0.988**	**1.732**

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:
The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

Individual Y's .02 from average?	**PASS**
Individual $\Delta H_@$ values 0.15 from average?	**PASS**
Average Y value +/-.02 of 1.000?	**PASS**

(1) $V_m\text{ (std)} = K_1\ V_m\ \dfrac{P_{bar} + (\Delta H/13.6)}{T_m}$ = Net volume of gas sample passed through DGM, corrected to standard conditions

K_1 = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)
T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $V_{cr}\text{ (std)} = K'\ \sqrt{\dfrac{P_{bar}\ \theta}{T_{amb}}}$ = Volume of gas sample passed through the critical orifice, corrected to standard conditions

T_{amb} = Absolute ambient temperature (°R - English, °K - Metric)
K' = Average K' factor from Critical Orifice Calibration

(3) $Y = \dfrac{V_{cr}\text{ (std)}}{V_m\text{ (std)}}$ = DGM calibration factor

(4) $\Delta H_@ = \dfrac{\Delta H\ 0.0319\ T_m\ \theta^2}{P_{bar}\ Y^2\ V_m^{\ 2}}$

Next Calibration Due By:	5/6/2022

AO10-6pt-5-6-2021

METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

Integrated Air Services

1) Select three critical orifices to calibrate the dry gas meter which bracket the expected operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record readings in colored boxes below, other columns are automatically calculated.

DATE: 4-May-2021
METER PART #: **AO23**
METER SERIAL #: 6842580
CRITICAL ORIFICE SET SERIAL #: 1331s & 1825

	INITIAL	FINAL	AVG (P_{bar})	Barometer ID
BAROMETRIC PRESSURE (in Hg):	29.27	29.21	29.24	200567181
Calibrated by:	LoF			

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	FINAL	NET (V_m)	AMBIENT F°	DGM F° INITIAL	FINAL	Avg DGM F° T_m	ELAPSED TIME (MIN) θ	DGM ΔH (in H_2O)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	(4) $\Delta H_@$
8	1	0.2300	24	936.000	945.384	9.384	79	79	80	80	31	0.26	8.983	8.983	1.000	1.669
12	2	0.3326	21	970.300	976.463	6.163	82	83	83	83	14	0.57	5.866	5.85	0.997	1.751
16	3	0.4379	21	978.531	984.290	5.759	83	83	84	84	10	1.03	5.483	5.496	1.002	1.831
19	4	0.5162	20	919.000	935.661	16.661	77	78	79	79	25	1.40	16.024	16.288	1.016	1.791
25	5	0.6846	17	963.500	969.840	6.340	82	82	83	83	7	2.60	6.071	6.021	0.992	1.906
31	6	0.8304	16	948.400	959.124	10.724	81	81	82	82	10	3.70	10.316	10.442	1.012	1.854
														AVG =	**1.003**	**1.800**

Individual Y's .02 from average?	**PASS**
Individual $\Delta H_@$ values 0.15 from average?	**PASS**
Average Y value +/-.02 of 1.000?	**PASS**

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:
The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

(1) $V_m\text{ (std)} = K_1\ V_m\ \dfrac{P_{bar} + (\Delta H/13.6)}{T_m}$ = Net volume of gas sample passed through DGM, corrected to standard conditions

K_1 = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)
T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $V_{cr}\text{ (std)} = K'\ \sqrt{\dfrac{P_{bar}\ \theta}{T_{amb}}}$ = Volume of gas sample passed through the critical orifice, corrected to standard conditions

T_{amb} = Absolute ambient temperature (°R - English, °K - Metric)
K' = Average K' factor from Critical Orifice Calibration

(3) $Y = \dfrac{V_{cr}\text{ (std)}}{V_m\text{ (std)}}$ = DGM calibration factor

(4) $\Delta H_@ = \dfrac{\Delta H\ 0.0319\ T_m\ \theta^2}{P_{bar}\ Y^2\ V_m{}^2}$

Next Calibration Due By: **5/4/2022**

AO23-6pt-5-4-2021

METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

WESTON SOLUTIONS Integrated Air Services

1) Select three critical orifices to calibrate the dry gas meter which bracket the expected operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record readings in colored boxes below, other columns are automatically calculated.

DATE: 14-May-2021

METER PART #: **AO25**

METER SERIAL #: 9717.61

CRITICAL ORIFICE SET SERIAL #: 1331s & 1825

	INITIAL	FINAL	AVG (P_{bar})
BAROMETRIC PRESSURE (in Hg):	29.59	29.59	29.59
Calibrated by:	LoF		

Barometer ID: 200567181

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	DGM READINGS (FT^3) NET (V_m)	AMBIENT F°	DGM F° INITIAL	DGM F° FINAL	Avg DGM F° T_m	ELAPSED TIME (MIN) θ	DGM ΔH (in H_2O)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	(4) $\Delta H_@$
8	1	0.2300	23	929.100	937.472	8.372	69	70	71	71	28	0.30	8.248	8.288	1.005	1.900
12	2	0.3326	21	937.711	946.387	8.676	70	71	71	71	20	0.64	8.547	8.552	1.001	1.943
16	3	0.4379	21	972.140	989.873	17.733	71	73	74	74	31	1.20	17.412	17.437	1.001	2.102
19	4	0.5162	19	913.500	928.906	15.406	68	68	69	69	23	1.60	15.285	15.293	1.001	2.028
25	5	0.6846	17	962.902	971.830	8.928	71	72	73	73	10	2.95	8.821	8.793	0.997	2.137
31	6	0.8304	15	947.100	962.183	15.083	71	72	72	72	14	4.40	14.969	14.933	0.998	2.183
														AVG =	**1.000**	**2.049**

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:
The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

Individual Y's .02 from average?	**PASS**
Individual $\Delta H_@$ values 0.15 from average?	**PASS**
Average Y value +/-.02 of 1.000?	**PASS**

(1) $$V_m\,(std) = K_1\,V_m\,\frac{P_{bar} + (\Delta H/13.6)}{T_m}$$ = Net volume of gas sample passed through DGM, corrected to standard conditions

K_1 = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)

T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $$V_{cr}\,(std) = K'\,\sqrt{\frac{P_{bar}\,\theta}{T_{amb}}}$$ = Volume of gas sample passed through the critical orifice, corrected to standard conditions

T_{amb} = Absolute ambient temperature (°R - English, °K - Metric)

K' = Average K' factor from Critical Orifice Calibration

(3) $$Y = \frac{V_{cr}\,(std)}{V_m\,(std)}$$ = DGM calibration factor

(4) $$\Delta H_@ = \frac{\Delta H\ 0.0319\ T_m\ \theta^2}{P_{bar}\ Y^2\ V_m^2}$$

Next Calibration Due By:	**5/14/2022**

AO25-6 Point - 5-14-2021

CALIBRATION GAS CERTIFICATES

Airgas
an Air Liquide company

Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI80E15A0138	Reference Number:	122-402016392-1
Cylinder Number:	XC013544B	Cylinder Volume:	150.9 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22021	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Feb 01, 2021

Expiration Date: Feb 01, 2029

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.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	10.00 %	10.16 %	G1	+/- 0.6% NIST Traceable	02/01/2021
OXYGEN	10.00 %	10.14 %	G1	+/- 0.7% NIST Traceable	02/01/2021
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060638	CC414571	13.359 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	May 14, 2025
NTRM	10010616	K014963	9.967 % OXYGEN/NITROGEN	+/- 0.3%	Apr 19, 2022

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VA-5001 CO2 BF89GV17	Nondispersive Infrared (NDIR)	Jan 06, 2021
Horiba MPA510 O2 41499150042	Paramagnetic	Jan 07, 2021

Triad Data Available Upon Request

Signature on file

Approved for Release

Airgas.
an Air Liquide company

Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E03NI60E15A0286
Cylinder Number: CC275468
Laboratory: 124 - Durham (SAP) - NC
PGVP Number: B22021
Gas Code: CO2,O2,BALN

Reference Number: 122-402008217-1
Cylinder Volume: 159.6 CF
Cylinder Pressure: 2015 PSIG
Valve Outlet: 590
Certification Date: Jan 22, 2021

Expiration Date: Jan 22, 2029

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.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	20.00 %	20.27 %	G1	+/- 0.6% NIST Traceable	01/22/2021
OXYGEN	20.00 %	20.24 %	G1	+/- 0.9% NIST Traceable	01/22/2021
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061508	CC354696	19.87 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 11, 2024
NTRM	08010202	1D003076	23.20 % OXYGEN/NITROGEN	+/- 0.4%	Jun 01, 2024

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VA-5001 CO2 BF89GV17	Nondispersive Infrared (NDIR)	Jan 06, 2021
Horiba MPA510 O2 41499150042	Paramagnetic	Jan 07, 2021

Triad Data Available Upon Request

Signature on file

Approved for Release

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

Airgas.
an Air Liquide company

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E03NI80E15A0138
Cylinder Number: SG9168283BAL
Laboratory: 124 - Durham (SAP) - NC
PGVP Number: B22021
Gas Code: CO2,O2,BALN
Reference Number: 122-402016392-1
Cylinder Volume: 150.9 CF
Cylinder Pressure: 2015 PSIG
Valve Outlet: 590
Certification Date: Feb 01, 2021

Expiration Date: Feb 01, 2029

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.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	10.00 %	10.16 %	G1	+/- 0.6% NIST Traceable	02/01/2021
OXYGEN	10.00 %	10.12 %	G1	+/- 0.5% NIST Traceable	02/01/2021
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060638	CC414571	13.359 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	May 14, 2025
NTRM	10010616	K014963	9.967 % OXYGEN/NITROGEN	+/- 0.3%	Apr 19, 2022

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VA-5001 CO2 BF89GV17	Nondispersive Infrared (NDIR)	Jan 06, 2021
Horiba MPA510 O2 41499150042	Paramagnetic	Jan 07, 2021

Triad Data Available Upon Request

Signature on file
Approved for Release

Airgas.
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI60E15A0286	Reference Number:	122-401761927-1
Cylinder Number:	CC454190	Cylinder Volume:	159.6 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22020	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Mar 16, 2020

Expiration Date: Mar 16, 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 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	20.00 %	20.41 %	G1	+/- 0.7% NIST Traceable	03/16/2020
OXYGEN	20.00 %	19.46 %	G1	+/- 0.5% NIST Traceable	03/16/2020
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061508	CC354696	19.87 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 11, 2024
NTRM	08010202	1D003076	23.20 % OXYGEN/NITROGEN	+/- 0.4%	Jun 01, 2024

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA510 CO2 2L6YXWY0	Nondispersive Infrared (NDIR)	Mar 05, 2020
Horiba MPA510 O2 41499150042	Paramagnetic	Mar 05, 2020

Triad Data Available Upon Request

Signature on file
Approved for Release

Airgas.
an Air Liquide company

Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0016	Reference Number:	122-401319824-1
Cylinder Number:	CC234516	Cylinder Volume:	144.4 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22018	Valve Outlet:	660
Gas Code:	SO2,BALN	Certification Date:	Oct 15, 2018

Expiration Date: Oct 15, 2026

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.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
SULFUR DIOXIDE	250.0 PPM	242.3 PPM	G1	+/- 0.9% NIST Traceable	10/08/2018, 10/15/2018
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	15060654	CC450608	248.1 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.6%	Dec 17, 2020

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801333 SO2	FTIR	Sep 22, 2018

Triad Data Available Upon Request

Signature on file
Approved for Release

Airgas
an Air Liquide company

Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0259	Reference Number:	122-401777520-1
Cylinder Number:	EB0108003	Cylinder Volume:	144.4 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22020	Valve Outlet:	660
Gas Code:	SO2,BALN	Certification Date:	Apr 06, 2020

Expiration Date: Apr 06, 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 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
SULFUR DIOXIDE	450.0 PPM	457.9 PPM	G1	+/- 0.8% NIST Traceable	03/30/2020, 04/06/2020
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801549 SO2	FTIR	Apr 02, 2020

Triad Data Available Upon Request

Signature on file

Approved for Release

Airgas.
an Air Liquide company

Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0678	Reference Number:	122-402048722-1
Cylinder Number:	CC416806	Cylinder Volume:	144.3 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22021	Valve Outlet:	330
Gas Code:	H2S,BALN	Certification Date:	Mar 10, 2021

Expiration Date: Mar 10, 2024

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.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
HYDROGEN SULFIDE	7.000 PPM	7.257 PPM	G1	+/- 1.4% NIST Traceable	03/03/2021, 03/10/2021
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
GMIS	122401645168101	CC163645	10.10 PPM HYDROGEN SULFIDE/NITROGEN	+/- 0.80	Jan 23, 2023
RGM	12332	CC183693	10.07 PPM HYDROGEN SULFIDE/NITROGEN	+/- 0.8%	Dec 18, 2017

The SRM, PRM or RGM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Applied Analytics OMA-406 AA210266	Ultraviolet	Mar 03, 2021

Triad Data Available Upon Request

Signature on file

Approved for Release

PERMEATION DEVICE CERTIFICATES

DYNACAL® PERMEATION DEVICE CERTIFICATE

VICI METRONICS

26295 Twelve Trees, Poulsbo, WA 98370, USA | tel: (360) 697-9199 | toll free: (877) 377-1887 | web: vicimetronics.com

The permeation rate of the DYNACAL® PERMEATION DEVICE below is certified traceable to N.I.S.T standards.

Serial Number: T-51828

Certification Date: Jan 18, 2021 Certificate Expires: Jan 18, 2022
Chemical: Hydrogen Sulfide (7783-06-4)
Part Number: 147-543-0110-C50
Device Type: Dynacal Wafer Geometry: 40T3
Permeation Rate: 482.97 ng/min Temperature: 50 C
True Accuracy: +/- 1.53 % Max Allowed Accuracy: +/- 5.00 %
Certification Method: Gravimetric Order No: 132578
Customer: WESTON SOLUTIONS, INC.
Note: Empty weight 20.41 g.

Approved By:____________________

INDIVIDUAL DEVICE CERTIFICATION

The gravimetric method measures the weight loss per unit of time at the certification temperature. Traceability is thus established by the use of temperature and weight standards traceable to N.I.S.T. standards. Individual certification is accomplished by: (1) maintaining the device in a constant temperature chamber with purge flow of dry nitrogen, and (2) weighing periodically on a semi-microanalytical balance, accurate to the nearest 0.01 mg, until a steady weight loss per unit has been achieved. Temperature control and accuracy are better than 0.05° C referenced against temperature standards traceable to the National Institute of Standards and Technology. The semi-microanalytical balances are routinely serviced and calibrated by an independent service organization using N.I.S.T. traceable weight standards. Gravimetric permeation rate determination is continued until the standard error of the permeation rate meets the required accuracy at the 95% confidence level.

DYNACAL® PERMEATION DEVICE CERTIFICATE

VICI METRONICS

26295 Twelve Trees, Poulsbo, WA 98370, USA | tel: (360) 697-9199 | toll free: (877) 377-1887 | web: vicimetronics.com

The permeation rate of the DYNACAL® PERMEATION DEVICE below is certified traceable to N.I.S.T standards.

Serial Number: 33-53274

Certification Date: Jan 18, 2021
Certificate Expires: Jan 18, 2022
Chemical: Methyl Mercaptan 74-93-1
Part Number: 187-040-6000-C50
Device Type: Dynacal Tube
Length: 4.00
Permeation Rate: 716.41 ng/min
Temperature: 50 C
True Accuracy: +/- 1.50 %
Max Allowed Accuracy: +/- 2.00 %
Certification Method: Gravimetric
Order No: 132578
Customer: WESTON SOLUTIONS, INC.
Note: Empty weight 10.9 g.

Approved By: ______

INDIVIDUAL DEVICE CERTIFICATION

The gravimetric method measures the weight loss per unit of time at the certification temperature. Traceability is thus established by the use of temperature and weight standards traceable to N.I.S.T. standards. Individual certification is accomplished by: (1) maintaining the device in a constant temperature chamber with purge flow of dry nitrogen, and (2) weighing periodically on a semi-microanalytical balance, accurate to the nearest 0.01 mg, until a steady weight loss per unit has been achieved. Temperature control and accuracy are better than 0.05° C referenced against temperature standards traceable to the National Institute of Standards and Technology. The semi-microanalytical balances are routinely serviced and calibrated by an independent service organization using N.I.S.T. traceable weight standards. Gravimetric permeation rate determination is continued until the standard error of the permeation rate meets the required accuracy at the 95% confidence level.

DYNACAL® PERMEATION DEVICE CERTIFICATE

VICI METRONICS

26295 Twelve Trees, Poulsbo, WA 98370, USA | tel: (360) 697-9199 | toll free: (877) 377-1887 | web: vicimetronics.com

The permeation rate of the DYNACAL® PERMEATION DEVICE below is certified traceable to N.I.S.T standards.

Serial Number: 89-53332

Certification Date: Jan 26, 2021
Certificate Expires: Jan 26, 2022
Chemical: Dimethyl Sulfide 75-18-3
Part Number: 187-013-6200-89-C50
Device Type: Dynacal Tube
Length: 1.30
Permeation Rate: 1197.35 ng/min
Temperature: 50 C
True Accuracy: +/- 1.26 %
Max Allowed Accuracy: +/- 2.00 %
Certification Method: Gravimetric
Order No: 132578
Customer: WESTON SOLUTIONS, INC.
Note: Empty weight 15.0g

Approved By:______________________

INDIVIDUAL DEVICE CERTIFICATION

The gravimetric method measures the weight loss per unit of time at the certification temperature. Traceability is thus established by the use of temperature and weight standards traceable to N.I.S.T. standards. Individual certification is accomplished by: (1) maintaining the device in a constant temperature chamber with purge flow of dry nitrogen, and (2) weighing periodically on a semi-microanalytical balance, accurate to the nearest 0.01 mg, until a steady weight loss per unit has been achieved. Temperature control and accuracy are better than 0.05° C referenced against temperature standards traceable to the National Institute of Standards and Technology. The semi-microanalytical balances are routinely serviced and calibrated by an independent service organization using N.I.S.T. traceable weight standards. Gravimetric permeation rate determination is continued until the standard error of the permeation rate meets the required accuracy at the 95% confidence level.

DYNACAL® PERMEATION DEVICE CERTIFICATE

VICI METRONICS

26295 Twelve Trees, Poulsbo, WA 98370, USA | tel: (360) 697-9199 | toll free: (877) 377-1887 | web: vicimetronics.com

The permeation rate of the DYNACAL® PERMEATION DEVICE below is certified traceable to N.I.S.T standards.

Serial Number: 89-53266

Certification Date: Jan 18, 2021
Certificate Expires: Jan 18, 2022
Chemical: Dimethyl Disulfide 624-92-0
Part Number: 107-200-6301-C50S
Device Type: Dynacal Tube
Length: 20.00
Permeation Rate: 917.53 ng/min
Temperature: 50 C
True Accuracy: +/- 1.85 %
Max Allowed Accuracy: +/- 2.00 %
Certification Method: Gravimetric
Order No: 132578
Customer: WESTON SOLUTIONS, INC.
Note: Empty weight 15.5 g.

Approved By: K. Mies

INDIVIDUAL DEVICE CERTIFICATION

The gravimetric method measures the weight loss per unit of time at the certification temperature. Traceability is thus established by the use of temperature and weight standards traceable to N.I.S.T. standards. Individual certification is accomplished by: (1) maintaining the device in a constant temperature chamber with purge flow of dry nitrogen, and (2) weighing periodically on a semi-microanalytical balance, accurate to the nearest 0.01 mg, until a steady weight loss per unit has been achieved. Temperature control and accuracy are better than 0.05° C referenced against temperature standards traceable to the National Institute of Standards and Technology. The semi-microanalytical balances are routinely serviced and calibrated by an independent service organization using N.I.S.T. traceable weight standards. Gravimetric permeation rate determination is continued until the standard error of the permeation rate meets the required accuracy at the 95% confidence level.

DYNACAL® PERMEATION DEVICE CERTIFICATE

VICI METRONICS

26295 Twelve Trees, Poulsbo, WA 98370, USA | tel: (360) 697-9199 | toll free: (877) 377-1887 | web: vicimetronics.com

The permeation rate of the DYNACAL® PERMEATION DEVICE below is certified traceable to N.I.S.T standards.

Serial Number: T-51831

Certification Date: Jan 18, 2021
Certificate Expires: Jan 18, 2022
Chemical: Hydrogen Sulfide (7783-06-4)
Part Number: 147-543-0110-C50
Device Type: Dynacal Wafer
Geometry: 40T3
Permeation Rate: 642.30 ng/min
Temperature: 50 C
True Accuracy: +/- 4.23 %
Max Allowed Accuracy: +/- 5.00 %
Certification Method: Gravimetric
Order No: 132575
Customer: WESTON SOLUTIONS, INC.

Note: Empty weight 20.32 g. chemical life for continuous use expires on 12/16/2021.

Approved By:

INDIVIDUAL DEVICE CERTIFICATION

The gravimetric method measures the weight loss per unit of time at the certification temperature. Traceability is thus established by the use of temperature and weight standards traceable to N.I.S.T. standards. Individual certification is accomplished by: (1) maintaining the device in a consta temperature chamber with purge flow of dry nitrogen, and (2) weighing periodically on a semi-microanalytical balance, accurate to the nearest 0.0 mg, until a steady weight loss per unit has been achieved. Temperature control and accuracy are better than 0.05° C referenced against temperatu standards traceable to the National Institute of Standards and Technology. The semi-microanalytical balances are routinely serviced and calibrated an independent service organization using N.I.S.T. traceable weight standards. Gravimetric permeation rate determination is continued until the standard error of the permeation rate meets the required accuracy at the 95% confidence level.

DYNACAL® PERMEATION DEVICE CERTIFICATE

VICI METRONICS

26295 Twelve Trees, Poulsbo, WA 98370, USA | tel: (360) 697-9199 | toll free: (877) 377-1887 | web: vicimetronics.com

The permeation rate of the DYNACAL® PERMEATION DEVICE below is certified traceable to N.I.S.T standards.

Serial Number: 33-50536

Certification Date: Jan 18, 2021
Certificate Expires: Jan 18, 2022
Chemical: Methyl Mercaptan 74-93-1
Part Number: 187-040-6000-C50
Device Type: Dynacal Tube
Length: 4.00
Permeation Rate: 900.58 ng/min
Temperature: 50 C
True Accuracy: +/- 1.93 %
Max Allowed Accuracy: +/- 2.00 %
Certification Method: Gravimetric
Order No: 132575
Customer: WESTON SOLUTIONS, INC.
Note: Empty weight 10.9 g.

Approved By:

INDIVIDUAL DEVICE CERTIFICATION

The gravimetric method measures the weight loss per unit of time at the certification temperature. Traceability is thus established by the use of temperature and weight standards traceable to N.I.S.T. standards. Individual certification is accomplished by: (1) maintaining the device in a consta temperature chamber with purge flow of dry nitrogen, and (2) weighing periodically on a semi-microanalytical balance, accurate to the nearest 0.01 mg, until a steady weight loss per unit has been achieved. Temperature control and accuracy are better than 0.05° C referenced against temperatur standards traceable to the National Institute of Standards and Technology. The semi-microanalytical balances are routinely serviced and calibrated an independent service organization using N.I.S.T. traceable weight standards. Gravimetric permeation rate determination is continued until the standard error of the permeation rate meets the required accuracy at the 95% confidence level.

DYNACAL® PERMEATION DEVICE CERTIFICATE

VICI METRONICS

26295 Twelve Trees, Poulsbo, WA 98370, USA | tel: (360) 697-9199 | toll free: (877) 377-1887 | web: vicimetronics.com

The permeation rate of the DYNACAL® PERMEATION DEVICE below is certified traceable to N.I.S.T standards.

Serial Number: 89-50725

Certification Date: Jan 18, 2021
Certificate Expires: Jan 18, 2022
Chemical: Dimethyl Sulfide 75-18-3
Part Number: 187-013-6200-89-C50
Device Type: Dynacal Tube
Length: 1.30
Permeation Rate: 758.14 ng/min
Temperature: 50 C
True Accuracy: +/- 1.42 %
Max Allowed Accuracy: +/- 2.00 %
Certification Method: Gravimetric
Order No: 132575
Customer: WESTON SOLUTIONS, INC.
Note: Empty weight 15.0 g.

Approved By:

INDIVIDUAL DEVICE CERTIFICATION

The gravimetric method measures the weight loss per unit of time at the certification temperature. Traceability is thus established by the use of temperature and weight standards traceable to N.I.S.T. standards. Individual certification is accomplished by: (1) maintaining the device in a constan temperature chamber with purge flow of dry nitrogen, and (2) weighing periodically on a semi-microanalytical balance, accurate to the nearest 0.01 mg, until a steady weight loss per unit has been achieved. Temperature control and accuracy are better than 0.05° C referenced against temperatur standards traceable to the National Institute of Standards and Technology. The semi-microanalytical balances are routinely serviced and calibrated b an independent service organization using N.I.S.T. traceable weight standards. Gravimetric permeation rate determination is continued until the standard error of the permeation rate meets the required accuracy at the 95% confidence level.

DYNACAL® PERMEATION DEVICE CERTIFICATE

VICI METRONICS

26295 Twelve Trees, Poulsbo, WA 98370, USA | tel: (360) 697-9199 | toll free: (877) 377-1887 | web: vicimetronics.com

The permeation rate of the DYNACAL® PERMEATION DEVICE below is certified traceable to N.I.S.T standards.

Serial Number: 89-53405

Certification Date: Jan 18, 2021
Certificate Expires: Jan 18, 2022
Chemical: Dimethyl Disulfide 624-92-0
Part Number: PD-6301-C50
Device Type: Dynacal Tube
Length: 20.00
Permeation Rate: 895.19 ng/min
Temperature: 50 C
True Accuracy: +/- 1.44 %
Max Allowed Accuracy: +/- 2.00 %
Certification Method: Gravimetric
Order No: 132575
Customer: WESTON SOLUTIONS, INC.
Note: Empty weight 15.5 g.

Approved By:

INDIVIDUAL DEVICE CERTIFICATION

The gravimetric method measures the weight loss per unit of time at the certification temperature. Traceability is thus established by the use of temperature and weight standards traceable to N.I.S.T. standards. Individual certification is accomplished by: (1) maintaining the device in a consta temperature chamber with purge flow of dry nitrogen, and (2) weighing periodically on a semi-microanalytical balance, accurate to the nearest 0.0 mg, until a steady weight loss per unit has been achieved. Temperature control and accuracy are better than 0.05° C referenced against temperatu standards traceable to the National Institute of Standards and Technology. The semi-microanalytical balances are routinely serviced and calibrated an independent service organization using N.I.S.T. traceable weight standards. Gravimetric permeation rate determination is continued until the standard error of the permeation rate meets the required accuracy at the 95% confidence level.

CYCLONIC FLOW CHECKS

PULP DRYER

Determination of Stack Gas Velocity - Method 2

Client	New Indy	Source	Pulp Dryer	Pitot Coeff (C_p)	0.84
Location/Plant	Catawba, SC	W.O. Number	15730.001.008	Stack Area (A_s), ft^2	19.63
Operator	ATR	Date	6/26/21	Pitot/Thermo ID	P560 / A010

Run Number	Prelim cyclonic		
Time	11:55		
Barometric Press (P_{bar}), in Hg*			
Static Press (P_g), in H_20			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
0	AR ~~5~~0	A	1						
.02	5		2						
.02	5		3						
.02	5		4						
.03	5		5						
.05	10		6						
.08	20		7						
.08	20		8						
0	0	B	1						
0	0		2						
.03	3		3						
.03	3		4						
.04	5		5						
.05	10		6						
.07	15		7						
.06	15		8						
Avg Angle	4.83	Avg Δp & Temp							

Avg √Δp			
Average gas stream velocity, ft/sec.			
Vol. flow rate at actual conditions, acf/min			
Vol. flow rate at standard conditions, dscf/min			

M_d = 0.32 x %O_2 + 0.44 x %CO_2 + 0.28 x (100% - (%O_2 + %CO_2))
M_s = Md x (1 - B_{ws} / 100) + 18 x B_{ws} / 100
$T_{s(abs)}$ = T_s + 460
P_s = P_{bar} + P_g / 13.6

V_s = 85.49 x C_p x $\sqrt{\Delta p_{avg}}$ x $\sqrt{(T_{s(abs)} / (P_s \times M_s))}$
Q_{act} = 60 x V_s x A_s
Q_{sd} = Q_{act} x 17.64 x (1 - B_{ws} / 100) x P_s / $T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments ______________________

WESTON SOLUTIONS
Integrated Air Services

NO. 3 PAPER MACHINE

Determination of Stack Gas Velocity - Method 2

Client: New Indy
Source: No. 1 Hood Exhaust
Pitot Coeff (C_p): 0.84
Location/Plant: Catawba, SC
W.O. Number: 15730.001.008
Stack Area (A_s), ft^2: 13.64
Operator: VD/LF
Date: 6/15/21
Pitot/Thermo ID: P147/M-1

Run Number	Prelim		
Time	1221		
Barometric Press (P_{bar}), in Hg*			
Static Press (P_g), in H_20			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.70	17	A	1						
.50	14		2						
.60	10		3						
.26	7		4						
.66	15		5						
.58	22		6						
.26	20		7						
.18	37		8						
.80	23	B	1						
.78	21		2						
.50	16		3						
.18	5		4						
.44	15		5						
.38	11		6						
.10	5		7						
.06	5		8						
Avg Angle	15.2	Avg Δp & Temp							

Avg √Δp			
Average gas stream velocity, ft/sec.			
Vol. flow rate at actual conditions, acf/min			
Vol. flow rate at standard conditions, dscf/min			

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$
$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$
$T_{s(abs)} = T_s + 460$
$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_p \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$
$Q_{act} = 60 \times V_s \times A_s$
$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

WESTON SOLUTIONS
Integrated Air Services

Determination of Stack Gas Velocity - Method 2

Client: New Indy
Source: No. 2 Hood Exhaust
Pitot Coeff (C_p): 0.84
Location/Plant: Catawba, SC
W.O. Number: 15730.001.008
Stack Area (A_s), ft^2: 17.03
Operator: VD/LF
Date: 6/15/21
Pitot/Thermo ID: P147/M-1

Run Number	Prelim		
Time	1157		
Barometric Press (P_{bar}), in Hg*			
Static Press (P_g), in H_20			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.72	13	A	1						
.78	13		2						
.92	13		3						
.96	16		4						
.40	10		5						
.92	25		6						
.46	17		7						
.60	20		8						
1.1	25	B	1						
1.1	22		2						
1.1	15		3						
.57	8		4						
.62	10		5						
.24	10		6						
.12	5		7						
.04	2		8						
Avg Angle	14	Avg Δp & Temp							
		Avg √Δp							
		Average gas stream velocity, ft/sec.							
		Vol. flow rate at actual conditions, acf/min							
		Vol. flow rate at standard conditions, dscf/min							

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$
$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$
$T_{s(abs)} = T_s + 460$
$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_p \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$
$Q_{act} = 60 \times V_s \times A_s$
$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments:

WESTON SOLUTIONS
Integrated Air Services

Determination of Stack Gas Velocity - Method 2

Client: New Indy
Location/Plant: Catawba, SC
Operator: VD/LF
Source: No. 3 Hood Exhaust
W.O. Number: 15730.001.008
Date: 6/15/21
Pitot Coeff (C_p): 0.84
Stack Area (A_s), ft^2: 17.03
Pitot/Thermo ID: P147/M-1

Run Number	Prelim		
Time	1105		
Barometric Press (P_{bar}), in Hg*			
Static Press (P_g), in H_2O			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.64	10	A	1						
.62	8		2						
.60	8		3						
.72	12		4						
.32	11		5						
.96	26		6						
.98	26		7						
.70	28		8						
.76	12	B	1						
.66	10		2						
.56	7		3						
.40	5		4						
.96	9		5						
1.1	~~22~~ 24	6/15/21	6						
.86	24		7						
.59	25		8						
Avg Angle	15.3		Avg Δp & Temp						

Avg √Δp			
Average gas stream velocity, ft/sec.			
Vol. flow rate at actual conditions, acf/min			
Vol. flow rate at standard conditions, dscf/min			

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$

$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$

$T_{s(abs)} = T_s + 460$

$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_p \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$

$Q_{act} = 60 \times V_s \times A_s$

$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

WESTON SOLUTIONS
Integrated Air Services

Determination of Stack Gas Velocity - Method 2

Client: New Indy
Source: No. 4 Hood Exhaust
Pitot Coeff (C_p): 0.84
Location/Plant: Catawba, SC
W.O. Number: 15730.001.008
Stack Area (A_s), ft^2: 17.18
Operator: VD/LF
Date: 6/15/21
Pitot/Thermo ID: P147/M-1

Run Number	Prelim		
Time	1041		
Barometric Press (P_{bar}), in Hg*			
Static Press (P_g), in H_20			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.38	15	A	1						
.32	17		2						
.20	15		3						
.08	7		4						
.22	12		5						
.28	17		6						
.16	13		7						
.12	14		8						
.60	27	B	1						
.56	25		2						
.40	20		3						
.20	3		4						
.40	16		5						
.22	13		6						
.02	8		7						
.02	8		8						
Avg Angle	14.4	Avg Δp & Temp							

Avg √Δp			
Average gas stream velocity, ft/sec.			
Vol. flow rate at actual conditions, acf/min			
Vol. flow rate at standard conditions, dscf/min			

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$
$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$
$T_{s(abs)} = T_s + 460$
$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_p \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$
$Q_{act} = 60 \times V_s \times A_s$
$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments:

WESTON SOLUTIONS®
Integrated Air Services

Determination of Stack Gas Velocity - Method 2

Client New Indy
Source No. 6 Hood Exhaust
Pitot Coeff (C_p) 0.84
Location/Plant Catawba, SC
W.O. Number 15730.001.008
Stack Area (A_s), ft^2 14.75
Operator VD / LF
Date 6/15/21
Pitot/Thermo ID P147 / M-1

Run Number	Prelim		
Time	1014		
Barometric Press (P_{bar}), in Hg*			
Static Press (P_g), in H_2O			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding $\Delta p = 0$	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
1.2	34	A	1						
1.8	34		2						
1.2	28		3						
.30	10		4						
.66	9		5						
.50	10		6						
.10	8		7						
.10	8		8						
1.1	21	B	1						
1.1	18		2						
1.0	18		3						
.80	10		4						
.74	10		5						
.46	15		6						
.14	8		7						
.12	8		8						
Avg Angle	15.6	Avg Δp & Temp							
		Avg $\sqrt{\Delta p}$							
		Average gas stream velocity, ft/sec.							
		Vol. flow rate at actual conditions, acf/min							
		Vol. flow rate at standard conditions, dscf/min							

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$
$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$
$T_{s(abs)} = T_s + 460$
$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_p \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$
$Q_{act} = 60 \times V_s \times A_s$
$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

Integrated Air Services

Determination of Stack Gas Velocity - Method 2

Client: New Indy
Source: No. 7 Hood Exhaust
Pitot Coeff (C_p): 0.84
Location/Plant: Catawba, SC
W.O. Number: 15730.001.008
Stack Area (A_s), ft²: 23.76
Operator: VD/LF
Date: 6/15/21
Pitot/Thermo ID: P147/M-1

Run Number	Prelim		
Time	1001		
Barometric Press (P_{bar}), in Hg*			
Static Press (P_g), in H_2O			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.90	15	A	1						
.88	14		2						
.78	12		3						
.64	12		4						
.50	10		5						
.50	13		6						
.12	10		7						
0	0		8						
.68	14	B	1						
1.0	18		2						
.92	18		3						
.68	10		4						
.44	10		5						
.22	8		6						
.14	6		7						
0	0		8						
Avg Angle	10.6	Avg Δp & Temp							

Avg √Δp			
Average gas stream velocity, ft/sec.			
Vol. flow rate at actual conditions, acf/min			
Vol. flow rate at standard conditions, dscf/min			

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$
$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$
$T_{s(abs)} = T_s + 460$
$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_p \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$
$Q_{act} = 60 \times V_s \times A_s$
$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

WESTON SOLUTIONS®
Integrated Air Services

Determination of Stack Gas Velocity - Method 2

Client New Indy
Location/Plant Catawba, SC
Operator VD/LF
Source No. 8 Hood Exhaust
W.O. Number 15730.001.008
Date 6/15/21
Pitot Coeff (C_p) 0.84
Stack Area (A_s), ft^2 23.76
Pitot/Thermo ID P147/M-1

Run Number	Prelim		
Time	945		
Barometric Press (P_{bar}), in Hg*			
Static Press (P_g), in H_2O			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
1.1	15	A	1						
1.1	15		2						
1.1	15		3						
.88	14		4						
.68	8		5						
.50	9		6						
.16	10		7						
.14	10		8						
.86	13	B	1						
1.1	18		2						
.96	20		3						
.48	11		4						
.30	7		5						
.24	7		6						
.16	3		7						
.10	5		8						
Avg Angle	11.3	Avg Δp & Temp							

Avg √Δp			
Average gas stream velocity, ft/sec.			
Vol. flow rate at actual conditions, acf/min			
Vol. flow rate at standard conditions, dscf/min			

M_d = 0.32 x %O_2 + 0.44 x %CO_2 + 0.28 x (100% - (%O_2 + %CO_2))
M_s = Md x (1 - B_{ws} / 100) + 18 x B_{ws} / 100
$T_{s(abs)}$ = T_s + 460
P_s = P_{bar} + P_g / 13.6

V_s = 85.49 x C_p x $\sqrt{\Delta p_{avg}}$ x $\sqrt{(T_{s(abs)} / (P_s \times M_s))}$
Q_{act} = 60 x V_s x A_s
Q_{sd} = Q_{act} x 17.64 x (1 - B_{ws} / 100) x P_s / $T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

Determination of Stack Gas Velocity - Method 2

Client New Indy
Source o. 1 Hood Exhaust
Pitot Coeff (C_p) 0.84
Location/Plant Catawba, SC
W.O. Number 15730.001.008
Stack Area (A_s), ft^2 13.64
Operator BEA/BE
Date 6/25/21
Pitot/Thermo ID P77

Run Number	Prelim		
Time	7:30-7:45		
Barometric Press (P_{bar}), in Hg*	29.68		
Static Press (P_g), in H_2O	-.68		
Source Moisture (B_{WS}), %	~20		
O_2, %	20.9		
CO_2, %	8		

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.40	11	A	1		173				
.26	13		2		173				
.19	6		3		174				
.14	5		4		173				
.07	15		5		174				
07	4		6		174				
02	4		7		173				
.01	2		8		169				
.70	18	B	1		171				
.58	14		2		174				
.41	14		3		174				
.15	11		4		174				
.03	16		5		174				
.03	19		6		174				
.01	6		7		173				
.03	2		8		168				
Avg Angle			Avg Δp & Temp						
			Avg √Δp						
			Average gas stream velocity, ft/sec.						
			Vol. flow rate at actual conditions, acf/min						
			Vol. flow rate at standard conditions, dscf/min						

M_d = 0.32 x %O_2 + 0.44 x %CO_2 + 0.28 x (100% - (%O_2 + %CO_2))
M_s = Md x (1 - B_{ws} / 100) + 18 x B_{ws} / 100
$T_{s(abs)}$ = T_s + 460
P_s = P_{bar} + P_g / 13.6

V_s = 85.49 x C_p x $\sqrt{\Delta p_{avg}}$ x $\sqrt{(T_{s(abs)} / (P_s \times M_s))}$
Q_{act} = 60 x V_s x A_s
Q_{sd} = Q_{act} x 17.64 x (1 - B_{ws} / 100) x P_s / $T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

WESTON SOLUTIONS®
Integrated Air Services

Determination of Stack Gas Velocity - Method 2

Client: New Indy
Location/Plant: Catawba, SC
Operator: BEA/BE
Source o. ~~1~~ B2 Hood Exhaust
W.O. Number: 15730.001.008
Date: 6/24/21
Pitot Coeff (C_p): 0.84
Stack Area (A_s), ft^2: 17.03
Pitot/Thermo ID: 777

Run Number	Prelim		
Time	18:30-18:50		
Barometric Press (P_{bar}), in Hg*	29.58		
Static Press (P_g), in H_2O			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.55	6	A	1		186				
.60	8		2		186				
.35	3		3		185				
.57	8		4		180				
.30	4		5		180				
.85	16		6		176				
.86	26		7		173				
.77	26		8		180				
.74	14	B	1		180				
.52	8		2		181				
.56	8		3		181				
.28	4		4		183				
.28	4		5		183				
.83	20		6		184				
.92	24		7		182				
.90	28		8		180				
Avg Angle									

Avg Δp & Temp						
Avg √Δp						
Average gas stream velocity, ft/sec.						
Vol. flow rate at actual conditions, acf/min						
Vol. flow rate at standard conditions, dscf/min						

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$
$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$
$T_{s(abs)} = T_s + 460$
$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_p \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$
$Q_{act} = 60 \times V_s \times A_s$
$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

WESTON SOLUTIONS
Integrated Air Services

Determination of Stack Gas Velocity - Method 2

Client	New Indy	Source	o. 3 Hood Exhaust ②	Pitot Coeff (C_p)	0.84
Location/Plant	Catawba, SC	W.O. Number	15730.001.008	Stack Area (A_s), ft^2	
Operator	BEA/BE	Date	6/25/21 24	Pitot/T ermo ID	P77

Run Number	Prelim		
Time	7:45-7:55		
Barometric Press (P_{bar}), in Hg*	29.68		
Static Press (P_g), in H_2O			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
1.0	28	A	1		190				
1.3	30		2		191				
.99	25		3		191				
.30	12		4		191				
.53	14		5		192				
.47	8		6		193				
.09	7		7		190				
.06	5		8		191				
1.1	20	B	1		188				
.56	15		2		187				
.69	8		3		190				
.53	13		4		191				
.50	14		5		192				
.12	6		6		191				
.18	7		7		190				
.10	5		8		190				
Avg Angle		Avg Δp & Temp							

Avg √Δp			
Average gas stream velocity, ft/sec.			
Vol. flow rate at actual conditions, acf/min			
Vol. flow rate at standard conditions, dscf/min			

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$

$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$

$T_{s(abs)} = T_s + 460$

$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_p \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$

$Q_{act} = 60 \times V_s \times A_s$

$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:

M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

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Integrated Air Services

Determination of Stack Gas Velocity - Method 2

Client: New Indy
Location/Plant: Catawba, SC
Operator: BEA/BE
Source: o. 4 Hood Exhaust
W.O. Number: 15730.001.008
Date: 6/25/21
Pitot Coeff (C_p): 0.84
Stack Area (A_s), ft^2: 17.18
Pitot/Thermo ID: P77

Run Number	Prelim		
Time	11:05-11:20		
Barometric Press (P_{bar}), in Hg*	29.68		
Static Press (P_g), in H_2O	-.49		
Source Moisture (B_{WS}), %	~20		
O_2, %	20.9		
CO_2, %	0		

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.32	14	A	1		192				
.33	16		2		193				
.19	13		3		192				
.08	6		4		192				
.23	12		5		193				
.29	17		6		192				
.12	9		7		191				
.07	4		8		190				
.51	23	B	1		190				
.46	20		2		192				
.47	22		3		193				
.16	11		4		193				
.23	12		5		194				
.20	10		6		192				
.02	6		7		191				
.08	10		8		189				

Avg Angle:

Avg Δp & Temp			
Avg √Δp			
Average gas stream velocity, ft/sec.			
Vol. flow rate at actual conditions, acf/min			
Vol. flow rate at standard conditions, dscf/min			

M_d = 0.32 x %O_2 + 0.44 x %CO_2 + 0.28 x (100% - (%O_2 + %CO_2))
M_s = Md x (1 - B_{ws} / 100) + 18 x B_{ws} / 100
$T_{s(abs)}$ = T_s + 460
P_s = P_{bar} + P_g / 13.6

V_s = 85.49 x C_p x √Δp_{avg} x √($T_{s(abs)}$ / (P_s x M_s))
Q_{act} = 60 x V_s x A_s
Q_{sd} = Q_{act} x 17.64 x (1 - B_{ws} / 100) x P_s / $T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments:

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Determination of Stack Gas Velocity - Method 2

Client: New Indy
Location/Plant: Catawba, SC
Operator: BA
Source: #6 PM vent
W.O. Number: 15730.001.008
Date: 6/25/2021
Pitot Coeff (C_p): 0.84
Stack Area (A_s), ft^2: 14.73
Pitot/Thermo ID: P77

Run Number	Check		
Time	1930		
Barometric Press (P_{bar}), in Hg*	29.68		
Static Press (P_g), in $H_2$0	-.75		
Source Moisture (B_{WS}), %	~15		
O_2, %	20.8		
CO_2, %	0		

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
1.0	28	A	1						
1.5	32		2						
1.1	29		3						
.38	12		4						
.70	13		5						
.43	8		6						
.10	8		7						
.06	5		8						
1.2	30	B	1						
1.0	18		2						
1.0	16		3						
.73	12		4						
.73	10		5						
.70	8		6						
.42	4		7						
.12	6		8						

Avg Angle: 14.9

Avg Δp & Temp						
Avg √Δp						
Average gas stream velocity, ft/sec.						
Vol. flow rate at actual conditions, acf/min						
Vol. flow rate at standard conditions, dscf/min						

M_d = 0.32 x %O_2 + 0.44 x %CO_2 + 0.28 x (100% - (%O_2 + %CO_2))
M_s = Md x (1 - B_{ws} / 100) + 18 x B_{ws} / 100
$T_{s(abs)}$ = T_s + 460
P_s = P_{bar} + P_g / 13.6

V_s = 85.49 x C_p x $\sqrt{\Delta p_{avg}}$ x $\sqrt{(T_{s(abs)} / (P_s \times M_s))}$
Q_{act} = 60 x V_s x A_s
Q_{sd} = Q_{act} x 17.64 x (1 - B_{ws} / 100) x P_s / $T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

Integrated Air Services

Determination of Stack Gas Velocity - Methc d 2

Client New Indy
Source o. 7 Hood Exhaust
Pitot Coeff (C_p) 0.84
Location/Plant Catawba, SC
W.O. Number 15730.001.008
Stack Area (A_s), ft^2 23.76
Operator ~~BCA~~/BE
Date 6/24/21
Pitot/Thermo ID P77

Run Number	Prelim		
Time	8:05 - 8:25		
Barometric Press (P_{bar}), in Hg*	29.68		
Static Press (P_g), in H_20	-.30		
Source Moisture (B_{WS}), %	~20		
O_2, %	20.9		
CO_2, %	0		

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.02	11	A	1		188				
.05	13		2		189				
.02	10		3		186				
.07	4		4		188				
.31	8		5		187				
.16	7		6		188				
0	0		7		189				
.01	2		8		189				
.05	14	B	1		186				
.03	7		2		184				
.02	3		3		185				
.06	5		4		186				
.25	18		5		184				
.01	2		6		182				
0	0		7		181				
0	0		8		181				
Avg Angle			Avg Δp & Temp						

Avg √Δp			
Average gas stream velocity, ft/sec.			
Vol. flow rate at actual conditions, acf/min			
Vol. flow rate at standard conditions, dscf/min			

M_d = 0.32 x %O_2 + 0.44 x %CO_2 + 0.28 x (100% - (%O_2 + %CO_2))
M_s = Md x (1 - B_{ws} / 100) + 18 x B_{ws} / 100
$T_{s(abs)}$ = T_s + 460
P_s = P_{bar} + P_g / 13.6

V_s = 85.49 x C_p x $\sqrt{\Delta p_{avg}}$ x $\sqrt{(T_{s(abs)} / (P_s \times M_s))}$
Q_{act} = 60 x V_s x A_s
Q_{sd} = Q_{act} x 17.64 x (1 - B_{ws} / 100) x P_s / $T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

WESTON SOLUTIONS®
Integrated Air Services

Determination of Stack Gas Velocity - Method 2

Client New Indy
Source o. 8 Hood Exhaust
Pitot Coeff (C_p) 0.84
Location/Plant Catawba, SC
W.O. Number 15730.001.008
Stack Area (A_s), ft^2 23.76
Operator BEA/BE
Date 6/26/21
Pitot/Thermo ID P77

Run Number	Prelim		
Time	16:45 - 16:55		
Barometric Press (P_{bar}), in Hg*	29.66		
Static Press (P_g), in H_20	-.71		
Source Moisture (B_{WS}), %	~20		
O_2, %	20.5		
CO_2, %	0		

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
-.07	15	A	1		186				
-.06	13		2		181				
-.06	17		3		180				
-.04	14		4		186				
.08	3		5		182				
.04	4		6		180				
.03	4		7		181				
-.01	2		8		181				
-.09	18	B	1		186				
-.07	16		2		180				
-.06	14		3		180				
-.05	16		4		184				
.14	6		5		184				
.09	10		6		182				
.05	9		7		181				
.04	6		8		180				
Avg Angle		Avg Δp & Temp							
		Avg √Δp							
		Average gas stream velocity, ft/sec.							
		Vol. flow rate at actual conditions, acf/min							
		Vol. flow rate at standard conditions, dscf/min							

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$
$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$
$T_{s(abs)} = T_s + 460$
$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_D \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$
$Q_{act} = 60 \times V_s \times A_s$
$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

Integrated Air Services

NO. 2 AND 3 SMELT DISSOLVING TANK VENTS

Determination of Stack Gas Velocity - Method 2

Client New Indy
Location/Plant Catawba, SC
Operator ATR / CL
Source SDTV
W.O. Number 15730.001.008
Date ATR
Pitot Coeff (C_p) 0.84
Stack Area (A_s), ft^2 27.49
Pitot/Thermo ID P320 / A025

Run Number	Prelim cyclonic		
Time	10:10		
Barometric Press (P_{bar}), in Hg*	29.40		
Static Press (P_g), in H_2O			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.04	5	A	1						
.04	5		2						
.03	4		3						
.0	3		4						
.0	2		5						
.05	6		6						
.05	6		7						
.05	7		8						
.06	6	B	1						
.05	6		2						
.04	5		3						
.03	4		4						
.03	4		5						
.05	5		6						
.06	7		7						
.06	8		8						
Avg Angle	5.18	Avg Δp & Temp							
		Avg √Δp							
		Average gas stream velocity, ft/sec.							
		Vol. flow rate at actual conditions, acf/min							
		Vol. flow rate at standard conditions, dscf/min							

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$
$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$
$T_{s(abs)} = T_s + 460$
$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_p \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$
$Q_{act} = 60 \times V_s \times A_s$
$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

NO. 1 AND 2 COMBINATION BOILERS

Determination of Stack Gas Velocity - Method 2

Client: New Indy
Source: No. 1 Combination Boiler
Pitot Coeff (C_p): 0.84
Location/Plant: Catawba, SC
W.O. Number: 15730.001.008
Stack Area (A_s), ft^2: 78.54
Operator: ATR
Date: 6/23/21
Pitot/Thermo ID: P172 / A010

Run Number	Prelim cyclonic		
Time	9:36		
Barometric Press (P_{bar}), in Hg*	29.45		
Static Press (P_g), in H_20			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.08	15	A	1						
.08	12		2						
.06	10		3						
.09	14		4						
.09	10	B	1						
.08	13		2						
.08	13		3						
.09	12		4						
.07	10	C	1						
.08	12		2						
.06	10		3						
.07	10		4						
.09	13	D	1						
.08	12		2						
.67	12		3						
.08	13		4						
Avg Angle	11.9	Avg Δp & Temp							

Avg √Δp			
Average gas stream velocity, ft/sec.			
Vol. flow rate at actual conditions, acf/min			
Vol. flow rate at standard conditions, dscf/min			

M_d = 0.32 x $\%O_2$ + 0.44 x $\%CO_2$ + 0.28 x (100% - ($\%O_2$ + $\%CO_2$))
M_s = Md x (1 - B_{ws} / 100) + 18 x B_{ws} / 100
$T_{s(abs)}$ = T_s + 460
P_s = P_{bar} + P_g / 13.6

V_s = 85.49 x C_p x $\sqrt{\Delta p_{avg}}$ x $\sqrt{(T_{s(abs)} / (P_s \times M_s))}$
Q_{act} = 60 x V_s x A_s
Q_{sd} = Q_{act} x 17.64 x (1 - B_{ws} / 100) x P_s / $T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

WESTON SOLUTIONS
Integrated Air Services

Determination of Stack Gas Velocity - Method 2

Client: New Indy
Source: No. 2 Combination Boiler
Pitot Coeff (C_p): 0.84
Location/Plant: Catawba, SC
W.O. Number: 15730.001.008
Stack Area (A_s), ft^2: 78.54
Operator: ATR
Date: 6/24/21
Pitot/Thermo ID: P172/A010

Run Number	Prelim cyclonic		
Time	11:58		
Barometric Press (P_{bar}), in Hg*	29.65		
Static Press (P_g), in H_2O			
Source Moisture (B_{WS}), %			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? [✓ Y] / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Δp at 0°	Angle yielding Δp = 0	Port	Point	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F	Δp, in H_2O	Source Temperature (T_s), °F
.07	9	A	1						
.07	10		2						
.08	10		3						
.07	12		4						
.09	15	B	1						
.09	12		2						
.08	12		3						
.08	10		4						
.08	10	C	1						
.07	10		2						
.07	12		3						
.08	12		4						
.06	10	D	1						
.08	13		2						
.08	15		3						
.07	13		4						
Avg Angle	11.56	Avg Δp & Temp							

Avg √Δp			
Average gas stream velocity, ft/sec.			
Vol. flow rate at actual conditions, acf/min			
Vol. flow rate at standard conditions, dscf/min			

$M_d = 0.32 \times \%O_2 + 0.44 \times \%CO_2 + 0.28 \times (100\% - (\%O_2 + \%CO_2))$
$M_s = Md \times (1 - B_{ws} / 100) + 18 \times B_{ws} / 100$
$T_{s(abs)} = T_s + 460$
$P_s = P_{bar} + P_g / 13.6$

$V_s = 85.49 \times C_p \times \sqrt{\Delta p_{avg}} \times \sqrt{(T_{s(abs)} / (P_s \times M_s))}$
$Q_{act} = 60 \times V_s \times A_s$
$Q_{sd} = Q_{act} \times 17.64 \times (1 - B_{ws} / 100) \times P_s / T_{s(abs)}$

where:
M_d = Dry molecular weight source gas, lb/lb-mole.
M_s = Wet molecular weight source gas, lb/lb-mole.
$T_{s(abs)}$ = Source Temperature, absolute(°R)
P_s = Absolute stack static pressure, inches Hg.
V_s = Average gas stream velocity, ft/sec.
Q_{act} = Volumetric flow rate of wet stack gas at actual, wacf/min
Q_{sd} = Volumetric flow rate of dry stack gas at standard conditions,

*Barometric Pressure is at port elevation

Comments

WESTON SOLUTIONS®
Integrated Air Services

STRATIFICATION AND RESPONSE TIME CHECKS

NO. 1 COMBINATION BOILER

WO# 15730.001.008
Source: No. 1 Combination Boiler ✓
Operating load: Normal

Client: New Indy ✓
Location: Catawba, SC
Date: 6/23/2021

Source

Port	Point	O2	% difference from Mean	Absolute difference	CO2	% difference from Mean	Absolute difference	SO2	% difference from Mean	Absolute difference
D	1	12.55 ✓	3.8%	0.454	7.10 ✓	6.0%	0.454	264.5 ✓	2.8%	7.250
	2	12.50 ✓	3.3%	0.404	7.25 ✓	4.0%	0.304	284.0 ✓	10.4%	26.750
	3	12.25 ✓	1.3%	0.154	7.40 ✓	2.0%	0.154	281.5 ✓	9.4%	24.250
	4	12.45 ✓	2.9%	0.354	7.20 ✓	4.7%	0.354	276.5 ✓	7.5%	19.250
	5	12.10 ✓	0.0%	0.004	7.50 ✓	0.7%	0.054	263.5 ✓	2.4%	6.250
	6	12.00 ✓	0.8%	0.096	7.60 ✓	0.6%	0.046	243.0 ✓	5.5%	14.250
C	1	12.10 ✓	0.0%	0.004	7.45 ✓	1.4%	0.104	259.5 ✓	0.9%	2.250
	2	12.05 ✓	0.4%	0.046	7.65 ✓	1.3%	0.096	261.0 ✓	1.5%	3.750
	3	11.55 ✓	4.5%	0.546	8.20 ✓	8.5%	0.646	252.5 ✓	1.8%	4.750
	4	11.65 ✓	3.7%	0.446	7.95 ✓	5.2%	0.396	231.5 ✓	10.0%	25.750
	5	11.95 ✓	1.2%	0.146	7.70 ✓	1.9%	0.146	226.0 ✓	12.1%	31.250
	6	12.00	0.8%	0.096	7.65 ✓	1.3%	0.096	243.5 ✓	5.3%	13.750
Mean:		12.10			7.55			257.25		

Compliance Testing	
Results	Not Stratified per O2
Sampling Approach	Sampled at single point which most closely represented the mean

EPA Part 60 Testing	
Results	Not Stratified per O2
Sampling Approach	Sampled at 0.4m, 1.0m and 2.0m from stack wall or sampled at 16.7%, 50%, and 83.3% of duct diameter

EPA Part 75 Testing	
Results	Not Stratified per O2
Sampling Approach	Sampled at single point located no less than 1m from the stack wall and located on the same line as the traverse test

Per EPA Method 7E, a 12 point traverse was conducted to measure for stratification of the flue gas. According to Method 7E, the gas stream can stratified, minimally stratified, or not stratified. If at each point any pollutant or diluent is determined to be less than 5% or 0.5 ppm different than the mean concentration, the source is not stratified. If at each point any pollutant or diluent is determined to be greater than 5% but less than 10% or greater than 0.5 ppm but less than 1.0 ppm different than the mean concentration, the source is minimally stratified. If at any point the pollutants and diluents are greater than 10% or 1.0 ppm different than the mean concentration, the source is stratified.

Per EPA Part 60, a 12 point traverse was conducted to measure for stratification of the flue gas. If at each point any pollutant or diluent is determined to be less than 10% different than the mean concentration, the source is not stratified. If at any point the pollutants or dilluents are greater than 10% different than the mean concentration, the source is stratified.

Per EPA Part 75, a 12 point traverse was conducted to measure for stratification of the flue gas. If at each point any pollutant or diluent is determined to be less than 5% different than the mean concentration, the source is not stratified. If at any point the pollutants are determined to be less than 3.0 ppm less than 3.0 ppm or the diluents determined to be less than 0.3% different than the mean concentration, the source is not stratified. If at any point the pollutants or diluents are greater than 5%, the pollutants are greater than 3.0 ppm, or the diluents are greater than 0.3% different than the mean concentration the source is stratified.

AM✓

RUN DATA

Number 0

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
Stratification Check						
Response time - 4 minutes, timed during 1st bias						
Points Selected by Table 1-2 of EPA Method 1						
Port D Point 1 (O2 higher due to interference from open port)						
08:53	4339	13.0	2768	6.8	2406	241
08:54	4279	12.9	2789	6.9	2303	230
08:55	4339	13.0	2836	7.0	2224	223
08:56	4186	12.6	2840	7.0	2077	208
08:57	4317	13.0	2896	7.2	2030	203
08:58	4391	13.2	2798	6.9	2221	222
08:59	4518	13.6	2700	6.7	2311	231
09:00	4563	13.7	2543	6.3	2383	238
Point 2						
09:01	4490	13.5	2549	6.3	2367	237
09:02	4449	13.4	2583	6.4	2376	238
09:03	4246	12.8	2676	6.6	2389	239
09:04	4262	12.8	2848	7.0	2338	234
09:05	4234	12.7	2846	7.0	2288	229
09:06	4192	12.6	2870	7.1	2708	271
09:07	4163	12.5	2907	7.2	2808	281
09:08	4169	12.5	2949	7.3	2873	287
Point 3						
09:09	4239	12.7	2917	7.2	2776	278
09:10	4239	12.7	2866	7.1	2526	253
09:11	4099	12.3	2877	7.1	2470	247
09:12	4083	12.3	3024	7.5	2360	236
09:13	4169	12.5	3019	7.5	2334	234
09:14	4154	12.5	2930	7.2	2763	276
09:15	4071	12.2	2961	7.3	2847	285
09:16	4084	12.3	3043	7.5	2778	278
Point 4						
09:17	4145	12.5	3027	7.5	2632	263
09:18	4171	12.5	2961	7.3	2537	254
09:19	4209	12.6	2922	7.2	2590	259
09:20	4198	12.6	2880	7.1	2538	254
09:21	4139	12.4	2891	7.2	2560	256
09:22	4172	12.5	2934	7.3	2801	280
09:23	4163	12.5	2900	7.2	2873	287
09:24	4133	12.4	2906	7.2	2657	266
Point 5						
09:25	4175	12.5	2919	7.2	2406	241

RUN DATA

Number 0

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %	SO_2 mv	SO_2 ppm
09:26	4232	12.7	2872	7.1	2308	231
09:27	4241	12.7	2826	7.0	2273	227
09:28	4169	12.5	2822	7.0	2447	245
09:29	4091	12.3	2897	7.2	2770	277
09:30	4011	12.1	2969	7.3	2819	282
09:31	4029	12.1	3033	7.5	2821	282
09:32	4013	12.1	3034	7.5	2453	245
Port stuffer fell out						
09:33	5096	15.3	2841	7.0	1574	158
09:34	5110	15.3	2003	4.9	1594	160
09:35	4584	13.8	1940	4.8	2221	222
Point 6						
09:36	3905	11.7	2614	6.5	2642	264
09:37	3914	11.8	3145	7.8	3031	303
09:38	3956	11.9	3132	7.8	2875	288
09:39	3989	12.0	3101	7.7	2929	293
09:40	3980	12.0	3068	7.6	2649	265
09:41	4021	12.1	3087	7.6	2464	247
09:42	4013	12.1	3057	7.6	2374	238
09:43	3957	11.9	3061	7.6	2474	248
Interference from open port						
09:44	4003	12.0	3129	7.7	2424	243
09:45	4594	13.8	2963	7.3	2253	225
09:46	4365	13.1	2490	6.2	2512	251
Point 1						
09:47	4028	12.1	2787	6.9	2643	264
09:48	4021	12.1	3046	7.5	2444	245
09:49	4131	12.4	3041	7.5	2438	244
09:50	4160	12.5	2942	7.3	2344	235
09:51	4158	12.5	2894	7.2	2593	259
09:52	4204	12.6	2890	7.1	2577	258
09:53	4191	12.6	2852	7.1	2665	267
09:54	4170	12.5	2864	7.1	2615	262
Port Change						
09:55	4202	12.6	2878	7.1	2634	264
09:56	4125	12.4	2869	7.1	2415	242
09:57	4086	12.3	2946	7.3	2459	246
09:58	5619	16.9	2802	6.9	902	91
09:59	6924	20.8	294	0.7	122	13
10:00	6928	20.8	6	0.0	59	6
10:01	6932	20.8	6	0.0	40	4

RUN DATA

Number 0

Client: New Indy
Location: Catawba, SC
Source: No. 1 Combination Boiler
Calibration **1**
Project Number: 15730.001.008
Operator: VD
Date: 23 Jun 2021

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %	SO_2 mv	SO_2 ppm
10:02	6934	20.8	6	0.0	30	3
10:03	6937	20.8	6	0.0	23	3
10:04	6941	20.8	6	0.0	16	2
10:05	6940	20.8	6	0.0	12	2
10:06	5040	15.1	388	0.9	1610	161
Port C Point 1						
10:07	3989	12.0	2906	7.2	2393	239
10:08	4005	12.0	3070	7.6	2375	238
10:09	4016	12.1	3076	7.6	2668	267
10:10	4046	12.2	3053	7.6	2778	278
10:11	4028	12.1	3027	7.5	2772	277
10:12	4084	12.3	3027	7.5	2651	265
10:13	4050	12.2	2991	7.4	2596	260
10:14	3999	12.0	3032	7.5	2590	259
Point 2						
10:15	4016	12.1	3070	7.6	2528	253
10:16	3911	11.8	3083	7.6	2523	252
10:17	3855	11.6	3188	7.9	2826	283
10:18	3872	11.6	3255	8.1	2823	282
10:19	3884	11.7	3244	8.0	2803	280
10:20	4008	12.0	3218	8.0	2575	258
10:21	4003	12.0	3094	7.7	2638	264
10:22	4036	12.1	3083	7.6	2575	258
Point 3						
10:23	4043	12.1	3061	7.6	2489	249
10:24	4020	12.1	3046	7.5	2518	252
10:25	3931	11.8	3087	7.6	2785	279
10:26	3849	11.6	3188	7.9	2818	282
10:27	3789	11.4	3283	8.1	2757	276
10:28	3759	11.3	3351	8.3	2443	244
10:29	3839	11.5	3365	8.3	2509	251
10:30	3866	11.6	3290	8.1	2534	254
Point 4						
10:31	3886	11.7	3251	8.0	2680	268
10:32	3900	11.7	3236	8.0	2566	257
10:33	3884	11.7	3233	8.0	2871	287
10:34	3917	11.8	3228	8.0	2764	277
10:35	3995	12.0	3174	7.9	2260	226
10:36	3983	12.0	3095	7.7	1976	198
10:37	3842	11.5	3150	7.8	2298	230
10:38	3913	11.8	3272	8.1	2328	233

RUN DATA

Number 0

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 1 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **23 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %	SO_2 mv	SO_2 ppm
			Point 5			
10:39	4002	12.0	3182	7.9	2024	203
10:40	4039	12.1	3096	7.7	1908	191
10:41	4118	12.4	3033	7.5	2372	237
10:42	4042	12.1	2973	7.4	2540	254
10:43	3981	12.0	3040	7.5	2288	229
10:44	3976	11.9	3113	7.7	2001	200
10:45	3996	12.0	3123	7.7	2186	219
10:46	3966	11.9	3104	7.7	2330	233
			Point 6			
10:47	3995	12.0	3128	7.7	2014	202
10:48	4059	12.2	3089	7.6	2056	206
10:49	4040	12.1	3046	7.5	2233	223
10:50	4029	12.1	3039	7.5	2260	226
10:51	3949	11.9	3065	7.6	2304	231
10:52	4019	12.1	3118	7.7	2156	216
10:53	4007	12.0	3067	7.6	2390	239
10:54	4010	12.0	3091	7.7	2483	248
Avgs	**4288**	**12.9**	**2787**	**6.9**	**2323**	**232**

Sample and Velocity Traverse Point Data Sheet - Method 1

Client New Indy
Loaction/Plant Catawba, SC
Source No. 1 Combination Boiler

Operator VD
Date 21-Jun-21
W.O. Number 15730.001.008

Duct Type ☑ Circular ☐ Rectangular Duct
Traverse Type ☐ Particulate Traverse ☐ Velocity Traverse
Indicate appropriate type

Distance from far wall to outside of port (in.) = C	127.5
Port Depth (in.) = D	7.5
Depth of Duct, diameter (in.) = C-D	120
Area of Duct (ft^2)	78.54
Total Traverse Points	12
Total Traverse Points per Port	6

Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

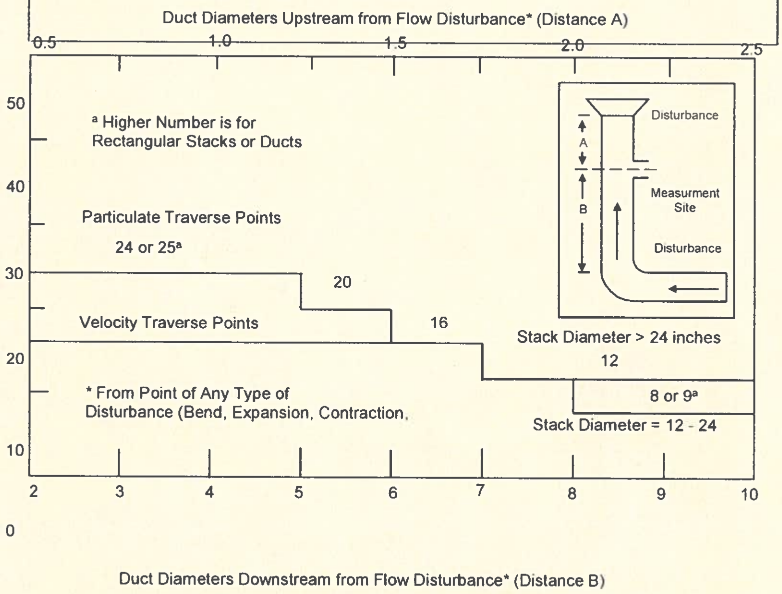
Flow Disturbances	
Upstream - A (ft)	45.0
Downstream - B (ft)	32.0
Upstream - A (duct diameters)	4.50
Downstream - B (duct diameters)	3.20

Diagram of Stack

Stratification
check

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	4.4	5 1/2	13
2	14.6	17 1/2	25
3	29.6	35 1/2	43
4	70.4	84 1/2	92
5	85.4	102 1/2	110
6	95.6	114 1/2	122
7			
8			
9			
10			
11			
12			



Equivalent Diameter = (2*L*W)/(L+W)

Traverse Point Location Percent of Stack -Circular

Traverse Location Point	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Location Point	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Port Diam. (in) = ____
Number of Ports = ____

Tape Measure I.D. # ____

Method 1.xls

NO. 2 COMBINATION BOILER

Client New Indy
Location Catawba, SC
Date 6/24/2021

WO# 15730.001.008
Source No. 2 Combination Boiler

Source

Port	Point	O2	% difference from Mean	Absolute difference	CO2	% difference from Mean	Absolute difference	SO2	% difference from Mean	Absolute difference
B	1	12.30	1.1%	0.142	7.45	4.0%	0.288	324.5	0.9%	2.875
	2	12.80	2.9%	0.358	6.95	3.0%	0.213	308.0	4.2%	13.625
	3	12.45	0.1%	0.008	7.20	0.5%	0.037	323.5	0.6%	1.875
	4	11.80	5.2%	0.642	6.85	4.4%	0.313	335.0	4.2%	13.375
	5	12.70	2.1%	0.258	7.20	0.5%	0.037	313.5	2.5%	8.125
	6	12.10	2.7%	0.342	7.50	4.7%	0.337	303.5	5.6%	18.125
C	1	12.95	4.1%	0.508	7.15	0.2%	0.013	343.5	6.8%	21.875
	2	12.15	2.3%	0.292	7.15	0.2%	0.013	319.5	0.7%	2.125
	3	12.75	2.5%	0.308	6.80	5.1%	0.363	331.5	3.1%	9.875
	4	12.65	1.7%	0.208	6.90	3.7%	0.263	333.0	3.5%	11.375
	5	12.45	0.1%	0.008	7.20	0.5%	0.037	318.5	1.0%	3.125
	6	12.20	1.9%	0.242	7.60	6.1%	0.437	305.5	5.0%	16.125
Mean:		12.44			7.16			321.63		

Compliance Testing

Results	Minimally Stratified per O2
Sampling Approach	Sampled at three points in line with the highest concentration at 16.7%,50%, and 83.3% or sampled at three points of 0.4m, 1.0m, and

EPA Part 60 Testing

Results	Not Stratified per O2
Sampling Approach	Sampled at 0.4m, 1.0m and 2.0m from stack wall or sampled at 16.7%, 50%, and 83.3% of duct diameter

EPA Part 75 Testing

Results	Stratified
Sampling Approach	Sampled at single point located no less than 1m from the stack wall and located on the same line as the traverse test

Per EPA Method 7E, a 12 point traverse was conducted to measure for stratification of the flue gas. According to Method 7E, the gas stream can stratified, minimally stratified, or not stratified. If at each point any pollutant or diluent is determined to be less than 5% or 0.5 ppm different than the mean concentration, the source is not stratified. If at each point any pollutant or diluent is determined to be greater than 5% but less than 10% or greater than 0.5 ppm but less than 1.0 ppm different than the mean concentration, the source is minimally stratified. If at any point the pollutants and diluents are greater than 10% or 1.0 ppm different than the mean concentration, the source is stratified.

Per EPA Part 60, a 12 point traverse was conducted to measure for stratification of the flue gas. If at each point any pollutant or diluent is determined to be less than 10% different than the mean concentration, the source is not stratified. If at any point the pollutants or dilluents are greater than 10% different than the mean concentration, the source is stratified.

Per EPA Part 75, a 12 point traverse was conducted to measure for stratification of the flue gas. If at each point any pollutant or diluent is determined to be less than 5% different than the mean concentration, the source is not stratified. If at any point the pollutants are determined to be less than 3.0 ppm less than 3.0 ppm or the diluents determined to be less than 0.3% different than the mean concentration, the source is not stratified. If at any point the pollutants or diluents are greater than 5%, the pollutants are greater than 3.0 ppm, or the diluents are greater than 0.3% different than the mean concentration the source is stratified.

RUN DATA

Number 0

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
Stratification Check Response Time - 4 minutes, timed during 1st bias Points selected by Table 1-2 of EPA Method 1 Port B Point 1						
12:03	4121	12.4	2975	7.4	3136	312
12:04	4225	12.7	2954	7.4	3085	307
12:05	4466	13.4	2797	7.0	3128	312
12:06	4312	13.0	2586	6.4	3283	327
12:07	4211	12.7	2755	6.9	3351	334
12:08	4103	12.4	2875	7.2	3396	338
12:09	4088	12.3	2971	7.4	3304	329
12:10	4101	12.3	3009	7.5	3211	320
Point 2						
12:11	4161	12.5	2981	7.4	3140	313
12:12	4185	12.6	2926	7.3	3082	307
12:13	4165	12.5	2917	7.3	3062	305
12:14	4166	12.5	2956	7.4	3041	303
12:15	4243	12.8	2927	7.3	3063	305
12:16	4316	13.0	2839	7.1	3105	309
12:17	4280	12.9	2776	6.9	3137	312
12:18	4224	12.7	2808	7.0	3055	304
Point 3						
12:19	4216	12.7	2866	7.1	3021	301
12:20	4261	12.8	2847	7.1	3103	309
12:21	4249	12.8	2837	7.1	3168	316
12:22	4326	13.0	2802	7.0	3206	319
12:23	4288	12.9	2754	6.8	3258	325
12:24	4258	12.8	2778	6.9	3205	319
12:25	4165	12.5	2843	7.1	3194	318
12:26	4129	12.4	2916	7.3	3301	329
Point 4						
12:27	4093	12.3	2960	7.4	3393	338
12:28	3796	11.4	3026	7.5	4221	421
12:29	3709	11.2	3320	8.3	4324	431
12:30	4274	12.9	3287	8.2	3850	384
12:31	4415	13.3	2769	6.9	3805	379
12:32	4279	12.9	2721	6.8	3499	349
12:33	4450	13.4	2833	7.0	3372	336
12:34	4482	13.5	2676	6.7	3354	334
Point 5						
12:35	4397	13.2	2636	6.6	3369	336

RUN DATA

Number 0

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 2 Combination Boiler** Calibration **1**	Date:	**24 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
12:36	4326	13.0	2722	6.8	3299	329
12:37	4298	12.9	2761	6.9	3269	326
12:38	4270	12.9	2778	6.9	3235	322
12:39	4218	12.7	2839	7.1	3201	319
12:40	4188	12.6	2884	7.2	3198	319
12:41	4197	12.6	2908	7.2	3187	317
12:42	4248	12.8	2908	7.2	3111	310
Point 6						
12:43	4304	13.0	2847	7.1	3137	312
12:44	4299	12.9	2793	6.9	3109	310
12:45	4368	13.1	2775	6.9	3196	318
12:46	4421	13.3	2705	6.7	3305	329
12:47	4431	13.3	2655	6.6	3253	324
12:48	4440	13.4	2638	6.6	3179	317
12:49	4460	13.4	2634	6.5	3132	312
12:50	4537	13.7	2590	6.4	3167	315
Port Change						
12:51	4637	14.0	2500	6.2	2698	269
12:52	6832	20.5	1490	3.7	269	27
12:53	6942	20.9	15	0.0	85	8
12:54	5605	16.9	118	0.2	2307	230
12:55	4420	13.3	2357	5.9	3325	331
Port C Port 1						
12:56	4332	13.0	2660	6.6	3321	331
12:57	4421	13.3	2721	6.8	3382	337
12:58	4342	13.1	2624	6.5	3466	345
12:59	4070	12.3	2747	6.8	3665	365
13:00	3992	12.0	3025	7.5	3853	384
13:01	4129	12.4	3074	7.7	3750	374
13:02	4237	12.8	2932	7.3	3483	347
13:03	4362	13.1	2823	7.0	3412	340
Point 2						
13:04	4480	13.5	2671	6.6	3330	332
13:05	4458	13.4	2583	6.4	3339	333
13:06	4571	13.8	2576	6.4	3321	331
13:07	4618	13.9	2452	6.1	3372	336
13:08	4541	13.7	2420	6.0	3429	342
13:09	4538	13.7	2489	6.2	3312	330
13:10	4551	13.7	2505	6.2	3301	329
13:11	4619	13.9	2479	6.2	3308	330

RUN DATA

Number 0

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**
Calibration **1**
Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
Point 3						
13:12	4531	13.6	2393	5.9	3470	346
13:13	4458	13.4	2436	6.1	3491	348
13:14	4280	12.9	2494	6.2	3423	341
13:15	4171	12.6	2694	6.7	3260	325
13:16	4253	12.8	2780	6.9	3269	326
13:17	4204	12.7	2720	6.8	3259	325
13:18	4213	12.7	2753	6.8	3297	328
13:19	4264	12.8	2746	6.8	3362	335
Point 4						
13:20	4201	12.6	2704	6.7	3341	333
13:21	4339	13.1	2742	6.8	3271	326
13:22	4315	13.0	2621	6.5	3271	326
13:23	4297	12.9	2618	6.5	3356	334
13:24	4158	12.5	2682	6.7	3460	345
13:25	4197	12.6	2810	7.0	3434	342
13:26	4191	12.6	2783	6.9	3403	339
13:27	4208	12.7	2755	6.9	3281	327
Point 5 (process changed)						
13:28	4138	12.5	2779	6.9	3255	324
13:29	4113	12.4	2851	7.1	3302	329
13:30	4068	12.2	2911	7.2	3294	328
13:31	4040	12.2	2904	7.2	3313	330
13:32	3939	11.9	2999	7.5	3304	329
13:33	3950	11.9	3074	7.7	3333	332
13:34	3810	11.5	3103	7.7	3408	339
13:35	3647	11.0	3250	8.1	3867	385
Point 6						
13:36	3452	10.4	3420	8.5	4106	409
13:37	3594	10.8	3572	8.9	3836	382
13:38	3761	11.3	3451	8.6	3698	368
13:39	3858	11.6	3268	8.1	3529	352
13:40	3944	11.9	3169	7.9	3491	348
13:41	3868	11.6	3110	7.7	3259	325
13:42	3941	11.9	3185	7.9	3215	320
13:43	4060	12.2	3067	7.6	3149	314
Point 5						
13:44	3997	12.0	2970	7.4	3147	313
13:45	3992	12.0	3025	7.5	3193	318
13:46	4066	12.2	3030	7.5	3154	314
13:47	4065	12.2	2962	7.4	3153	314

RUN DATA

Number 0

Client:	**New Indy**	Project Number:	**15730.001.008**
Location:	**Catawba, SC**	Operator:	**VD**
Source:	**No. 2 Combination Boiler** Calibration **1**	Date:	**24 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
13:48	4063	12.2	2932	7.3	3203	319
13:49	4068	12.2	2976	7.4	3148	314
13:50	4157	12.5	2933	7.3	3193	318
13:51	4119	12.4	2860	7.1	3201	319
Avgs	**4274**	**12.9**	**2772**	**6.9**	**3260**	**325**

RUN DATA

Number 0

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	O_2 mv	O_2 %	CO_2 mv	CO_2 %	SO_2 mv	SO_2 ppm
Stratification Check cont.						
Port C Point 2						
13:56	4148	12.5	2790	6.9	3180	317
13:57	4210	12.7	2786	6.9	3180	317
13:58	4147	12.5	2761	6.9	3257	324
13:59	4216	12.7	2784	6.9	3290	328
14:00	4131	12.4	2758	6.9	3193	318
14:01	4139	12.5	2836	7.1	3102	309
14:02	4081	12.3	2848	7.1	3235	322
14:03	3994	12.0	2911	7.2	3181	317
Point 6						
14:04	4001	12.0	3014	7.5	3223	321
14:05	4121	12.4	2969	7.4	3164	315
14:06	4107	12.4	2855	7.1	3117	310
14:07	4033	12.1	2879	7.2	3157	314
14:08	3993	12.0	2972	7.4	3124	311
14:09	3990	12.0	2994	7.5	3132	312
14:10	3818	11.5	3036	7.6	3217	320
14:11	3864	11.6	3224	8.0	3181	317
14:12	4036	12.2	3125	7.8	3108	310
14:13	4037	12.2	2961	7.4	3020	301
Port Change						
14:14	3982	12.0	2976	7.4	3069	306
14:15	4051	12.2	3044	7.6	2597	259
14:16	6805	20.5	1871	4.6	308	30
14:17	6926	20.8	22	0.0	91	9
14:18	5009	15.1	367	0.9	2413	240
Port B Point 6						
14:19	3986	12.0	2860	7.1	3212	320
14:20	3971	12.0	3018	7.5	3032	302
14:21	3904	11.8	3065	7.6	2897	289
14:22	3947	11.9	3128	7.8	2928	292
14:23	4006	12.1	3071	7.6	2951	294
14:24	4007	12.1	3015	7.5	2973	296
14:25	4009	12.1	3019	7.5	3041	303
14:26	4010	12.1	3014	7.5	3055	304
Point 4						
14:27	4012	12.1	3009	7.5	2995	298
14:28	3996	12.0	3007	7.5	2988	298
14:29	3899	11.7	3051	7.6	3126	311
14:30	3877	11.7	3146	7.8	3154	314

RUN DATA

Number 0

Client: **New Indy**
Location: **Catawba, SC**
Source: **No. 2 Combination Boiler**

Calibration **1**

Project Number: **15730.001.008**
Operator: **VD**
Date: **24 Jun 2021**

Time	O_2		CO_2		SO_2	
	mv	%	mv	%	mv	ppm
14:31	3916	11.8	3167	7.9	3081	307
14:32	3940	11.9	3110	7.7	2924	291
14:33	3899	11.7	3097	7.7	2878	287
Avgs	**4190**	**12.6**	**2804**	**7.0**	**2915**	**290**

Sample and Velocity Traverse Point Data Sheet - Method 1

Client: New Indy
Loaction/Plant: Catawba, SC
Source: No. 2 Combination Boiler

Operator: VD
Date: 21-Jun-21
W.O. Number: 15730.001.008

Duct Type ☑ Circular ☐ Rectangular Duct

Traverse Type ☐ Particulate Traverse ☐ Velocity Traverse

Indicate appropriate type

Distance from far wall to outside of port (in.) = C	129.0
Port Depth (in.) = D	9.0
Depth of Duct, diameter (in.) = C-D	120
Area of Duct (ft^2)	78.54
Total Traverse Points	12
Total Traverse Points per Port	6

Flow Disturbances	
Upstream - A (ft)	45.0
Downstream - B (ft)	32.0
Upstream - A (duct diameters)	4.50
Downstream - B (duct diameters)	3.20

Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

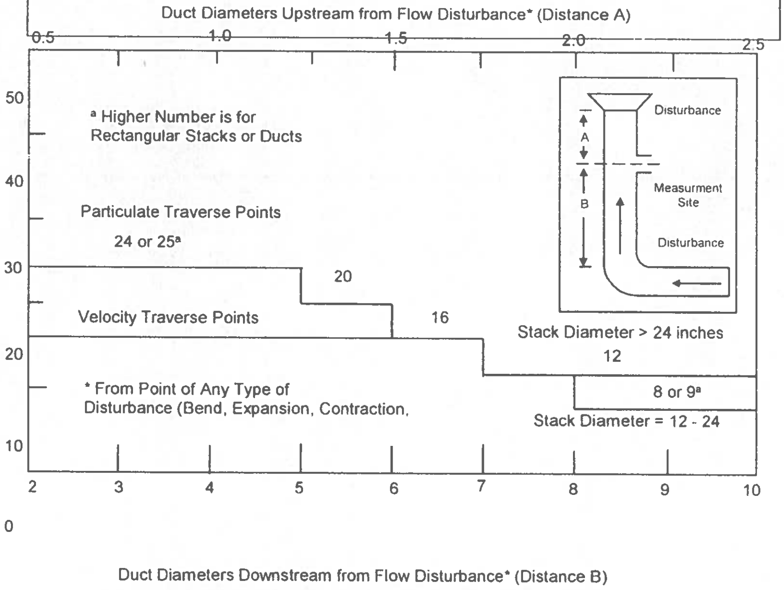
Diagram of Stack

stratification check

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	4.4	5 1/2	14 1/2
2	14.6	17 1/2	26 1/2
3	29.6	35 1/2	44 1/2
4	70.4	84 1/2	93 1/2
5	85.4	102 1/2	111 1/2
6	95.6	114 1/2	123 1/2
7			
8			
9			
10			
11			
12			

Equivalent Diameter = (2*L*W)/(L+W)



Traverse Point Location Percent of Stack -Circular

Traverse Point Location	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Point Location	Number of Traverse Points: 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Port Diam. (in) = ________
Number of Ports = ________

Tape Measure I.D. # ________

Method 1.xls

INTERFERENCE CHECKS

Method 7E-Interfernce Response

Applies to Models: 600 Series NDIR/PMD, 100/200/300 Series NDIR/PMD, ZRE w/PMD
Date of Test: 1/26/2011
Analyzer Type: PMD
Model: 602-P
Serial Numer: U09018-M
Calibration Span: 20.7% O2, balance N2

Test Gas	Interfernt Concentration	Zero Response	Span Response	Interferent Response
SO2	513 ppm	0.000%	0.020%	0.020%
H2O	0.82%	0.015%	0.020%	0.020%
N2O	10.00 ppm	0.000%	0.000%	0.000%
NO	94.9 ppm	0.000%	0.000%	0.000%
NO2	99.8 ppm	0.000%	0.000%	0.000%
CO	900 ppm	0.000%	0.000%	0.000%
CH4	90.9 ppm	0.000%	0.000%	0.000%
HCl	27.99ppm	0.000%	0.000%	0.000%
Sum of Responses				0.004%
% of Calibration Span				0.019%

Method 7E-Interfernce Response

Applies to Models: 600 Series NDIR, 100/200/300 Series NDIR, ZRE
Date of Test: 1/26/2011
Analyzer Type: NDIR
Model: 602-P
Serial Numer: U09018-M
Calibration Span: 20.2% CO2/Balance N2

Test Gas	Interfernt Concentration	Zero Response	Span Response	Interferent Response
SO2	102.6 ppm	0.000%	0.000%	0.000%
H2O	0.82%	0.055%	0.055%	0.055%
N2O	10.00 ppm	0.005%	0.010%	0.010%
NO	94.9 ppm	0.005%	0.025%	0.025%
NO2	99.8 ppm	0.010%	0.010%	0.010%
CO	100.0 ppm	0.010%	0.010%	0.010%
CH4	101.0 ppm	0.010%	0.010%	0.010%
HCl	27.99ppm	0.010%	0.010%	0.010%
Sum of Responses				0.013%
% of Calibration Span				0.064%

TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company
9480 Carroll Park Drive
San Diego, CA 92121-5201

August 4, 2014

To Whom It May Concern:

Teledyne Advanced Pollution Instrumentation has introduced new instrument models to replace our existing E Series gas analyzers. The new instruments are collectively referred to as our T Series models.

The fundamental design and all critical wetted, electronic, electrical and analytical components of the T Series instruments are identical to the E Series, including: UV sources, photo detectors, power supplies, pressure and flow transducers, pneumatic connectors and valves as well as external signal I/O connectors for serial data (RS-232/485 and Ethernet), analog concentration and status signals, and control inputs.

The design of all analytical algorithms, signal processing and control software algorithms are identical as well, including A/D measurements, digital signal filtering, concentration calculations, calibration factors and algorithms, temperature and pressure compensation, temperature control loops.

The primary differences between the models E Series and T Series instrument designs are provided below:

1. The 2 line by 40 character vacuum fluorescent display module is replaced by a 7" color LCD display with a touch screen interface. The current human user interface is emulated on the color, graphical display. The touch screen is used to emulate the existing 8 button context sensitive keyboard.
2. The software platform has been upgraded to support the graphical display and touchscreen. Software routines have been added to support the new analog input option, and a native Ethernet port on the CPU.
3. An upgraded CPU board that includes hardware to drive the LCD display and is backwards compatible with the current E-series CPU is used for the T-series analyzers.
4. A new front panel assembly has been designed to house the new display, and a new 9-pin connector will be added to the rear panel to support the new analog input option.
5. The new analog input option is designed to permit users to display and log, using the analyzer's internal data logger, signals from meteorological and other miscellaneous external sensors. None of the external signals are used in the calculations that yield calibrated concentration.

Internal production testing of the T Series analyzers that have been manufactured to date has shown that they meet the same analytical specifications as the equivalent E Series analyzers, including noise, linearity, drift, and response time.

We feel that, due to the nature of the changes described above and the testing performed to date, the modifications will not affect the performance characteristics of the analyzer.

Best Regards,

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Method 7E Results for TAPI High Level Gas Analyzers

		Instrument Type									
Potential Interferent Gas	Potential Interferent Gas Concentration	M100EH	M200EM	M200EH	M200EH CO2 Sensor	M201E	M300E	M300EM	M320E	M803E O2 Sensor	M803E CO2 Sensor
SO2	20 ppmv		0.012	-0.167	-0.014	0.001	-0.058	-0.092	-0.106	-0.061	-0.015
NO	15 ppmv	0.162			0.002		-0.015	-0.054	-0.035	-0.051	-0.015
NO2	15 ppmv	0.053			-0.026		-0.059	-0.007	0.041	-0.051	-0.027
N2O	10 ppmv	-0.198	-0.033	-0.166	-0.036	0.040	0.113	-0.009		-0.041	-0.034
CO	50 ppmv	-0.084	0.022	-0.211	0.000	-0.005			-2.518	-0.164	-0.034
CH4	50 ppmv	-0.051	-0.042	-0.461	-0.043	0.037	-0.025	-0.030	-0.068	0.000	-0.015
H2	50 ppmv	-0.230	-0.035	-0.253	-0.038	0.030	-0.061	-0.128	0.000	-0.010	-0.008
CO2	15%	0.361	-2.397	-0.808		-1.076	0.470	0.313	7.843	-0.026	
NH3	10 ppmv	0.000	0.000		0.000		0.000	0.000	0.000	0.000	0.000
HCl	10 ppmv	0.047	0.168	-0.133	-0.032	0.078	-0.002	-0.087	0.073	-0.043	-0.027
H2O	1%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Absolute Sum of Responses		1.186	2.710	2.198	0.191	1.268	0.803	0.720	10.685	0.447	0.175
Calibration Span		90 ppm	90 ppm	90 ppm	15 %	18 ppm	90 ppm	90 ppm	90 ppm	20.95 %	15 %
Percent of Calibration Span		1.318	3.011	2.442	1.273	7.046	0.892	0.800	11.872	2.134	1.163

TABLE 7E-3—EXAMPLE INTERFERENCE CHECK GAS CONCENTRATIONS

Potential interferent gas[1]	Concentrations[2] sample conditioning type	
	Hot wet	Dried
CO_2	5 and 15%	5 and 15%
H_2O	25%	1%
NO	15 ppmv	15 ppmv
NO_2	15 ppmv	15 ppmv
N_2O	10 ppmv	10 ppmv
CO	50 ppmv	50 ppmv
NH_3	10 ppmv	10 ppmv
CH_4	50 ppmv	50 ppmv
SO_2	20 ppmv	20 ppmv
H_2	50 ppmv	50 ppmv
HCl	10 ppmv	10 ppmv

(1) Any applicable gas may be eliminated or tested at a reduced level if the manufacturer has provided reliable means for limiting or scrubbing that gas to a specified level.
(2) As practicable, gas concentrations should be the highest expected at test sites.

TABLE 7E-4—INTERFERENCE RESPONSE

Date of Test: ____________

Analyzer Type: ____________
Model No.: ____________
Serial No: ____________
Calibration Span: ____________

Test gas type	Concentration (ppm)	Analyzer response
	Sum of Responses	
	% of Calibration Span	

PROJECT TEAM QUALIFICATIONS

Weston Solutions, Inc. Integrated Air Services Employee Qualifications

Name	Title/Position	Education/Training	QSTI	Years of Experience	
				Total	Emission Testing
Alldredge, Bryan	Emissions Testing Specialist	AAS - Electronic Engineering Tehcnology Snead State Community College (1998)	QSTI 1 & 3	7	7
Bryant, Ashley	Report Coordinator	BS - English Ed. - Jacksonville State University (2011) MA - English - Jacksonville State University (2012)	QSTI 1	9	9
Ennis, Brock	Emissions Testing Specialist	BA - Urban Environmental Studies Birmingham-Southern College (2021)		1	1
Dubay, Van	Emissions Testing Specialist	BS - Horticulture Auburn University (2007)	QSTI 1, 3, & 4	6	6
Hammonds, Natalie	Quality Manager	BS - Environmental Science Auburn University (1998)	QSTI 1	23	18
Hartsky, Chris	Emission Testing Specialist	BA - Environmental Studies Washington College (2016)		10	5
Lestochi, Cory	Emissions Testing Specialist	BS - Biochemistry & Molecular Biology Penn State University (2019)	QSTI 1	1	1
Roberts, Wayne	Operations Manager	BS - Env. Science AU (1992)		28	27
Robinson, Tyler	Emissions Testing Specialist	BA - IDSC - Natural Resource Ecology, Sustainability - AU (2017)	QSTI 1	4	4
Simpkins, Templeton	Project Manager	BS - Zoology Auburn University (1997)	QSTI 1 & 3	20	20

APPENDIX I
PROCESS OPERATING/PRODUCTION DATA

PULP DRYER

Pulp Dryer Vent Testing

Pulp Dryer Vent - 6/26/21

Run #	Start Time	Speed (FPM)	Steam Usage (10^3 lbs/hr)	TRS Emissions (lbs/hr)
1	1230	105	68106	0.21
2	1347	105	67090	0.18
3	1506	105	67567	0.17
Average:		105	67588	0.19

NO. 3 PAPER MACHINE VENTS

Paper Machine Dryer Vent Testing

#3 Dryer Vent - 6/24/21

Run #	Start Time	Reel Speed (FPM)	Steam Usage (10^3 lbs/hr)	TRS Emissions (lbs/hr)
1	937	2459	266	0.23
2	1042	2459	279	0.19
3	1145	2459	293	0.21
Average:		2459	279	0.21

#2 Dryer Vent - 6/24/21

Run #	Start Time	Reel Speed (FPM)	Steam Usage (10^3 lbs/hr)	TRS Emissions (lbs/hr)
1	1310	2459	297	0.19
2	1416	2459	310	0.17
3	1522	2461	296	0.16
Average:		2460	301	0.18

#1 Dryer Vent - 6/25/21

Run #	Start Time	Reel Speed (FPM)	Steam Usage (10^3 lbs/hr)	TRS Emissions (lbs/hr)
1	755	2651	294	0.08
2	900	2651	306	0.09
3	1005	2651	315	0.10
Average:		2651	305	0.09

#4 Dryer Vent - 6/25/21

Run #	Start Time	Reel Speed (FPM)	Steam Usage (10^3 lbs/hr)	TRS Emissions (lbs/hr)
1	1135	2651	331	0.10
2	1240	2628	328	0.10
3	1345	2615	328	0.11
Average:		2631	329	0.10

NO. 2 AND 3 SMELT DISSOLVING TANK VENTS

#6 Dryer Vent - 6/25/21

Run #	Start Time	Reel Speed (FPM)	Steam Usage (10^3 lbs/hr)	TRS Emissions (lbs/hr)
1	1555	2583	319	0.13
2	1715	2574	314	0.13
3	1820	2584	309	0.13
Average:		2580	314	0.13

#7 Dryer Vent - 6/26/21

Run #	Start Time	Reel Speed (FPM)	Steam Usage (10^3 lbs/hr)	TRS Emissions (lbs/hr)
1	945	2550	306	0.14
2	1050	2593	313	0.15
3	1155	2641	326	0.18
Average:		2595	315	0.16

#8 Dryer Vent - 6/26/21

Run #	Start Time	Reel Speed (FPM)	Steam Usage (10^3 lbs/hr)	TRS Emissions (lbs/hr)
1	1315	2652	328	0.20
2	1420	2664	338	0.18
3	1524	2691	322	0.19
Average:		2669	329	0.19

Smelt Dissolving Tank Vent Testing

Smelt Dissolving Tank Vent - 6/27/21

		SMELT DISSOLVING TANK VENT				RB #2			RB #3				
Run #	Start Time	Scrubber Pump Discharge Pressure (PSIG)	Weak Wash Spray Flow (gpm)	Weak Wash Flow (gpm)	Differential Pressure (" Water)	Liquor Firing Rate (gpm)	Solids %	Lbs/Hr BLS	Liquor Firing Rate (gpm)	Solids %	Lbs/Hr BLS	Tons LBS/hr	TRS Emissions (lbs/hr)
1	1100	55.9	93.3	91.6	4.8	201.7	70.3	92950	314.8	69.0	142388	117.7	1.02
2	1222	55.9	93.7	90.2	4.8	205.8	70.4	94974	315.5	69.0	142704	118.8	1.28
3	1344	55.9	93.7	90.6	4.7	199.1	70.4	91882	315.5	69.1	142911	117.4	1.10
Average:		55.9	93.6	90.8	4.8	202.2	70.4	93269	315.3	69.0	142668	118.0	1.13

NO. 1 COMBINATION BOILER

Combination Boiler #1

Condition 1: With NCGs, with SOGs
23-Jun-21

Run #	Start Time	Steam Rate (10^3 lbs/hr)	Bark Rate (Tons/Hr)	Gas Flow (10^3 SCF/Hr)	TDF (TPH)	NCG Scrubber Flow (GPM)	NCG Scrubber pH (SU)	Stripper Foul Condensate Flow (GPM)	Hard Pipe Foul Condensate Flow (GPM)	LVHC Flow to Boilers (SCFM)	SOG Flow to Boilers (SCFM)	HVLC Flow to Boilers (SCFM)	Pulp Production (ODT/Hr)	SO_2 Emissions (lbs/hr)	SO_2 Emissions (lbs/ODT Pulp)	TRS Emissions (lbs/hr)
1	1158	208	25.1	80.8	1.37	40	10.9	458	146	1585	621	11575	49.7	262.7	5.29	0.56
2	1400	225	29.3	68.8	1.37	40	10.9	491	152	1595	1219	11048	54.0	362.5	6.71	0.49
3	1541	207	24.8	81.2	1.37	40	10.9	491	45	1578	1136	11009	64.0	457.4	7.15	0.50
Average:		213	26.4	76.9	1.37	40	10.9	480	114	1586	992	11211	55.9	360.9	6.46	0.52

Condition 2: With NCGs, without SOGs
23-Jun-21

Run #	Start Time	Steam Rate (10^3 lbs/hr)	Bark Rate (Tons/Hr)	Gas Flow (10^3 SCF/Hr)	TDF (TPH)	NCG Scrubber Flow (GPM)	NCG Scrubber pH (SU)	Stripper Foul Condensate Flow (GPM)	Hard Pipe Foul Condensate Flow (GPM)	LVHC Flow to Boilers (SCFM)	SOG Flow to Boilers (SCFM)	HVLC Flow to Boilers (SCFM)	Pulp Production (ODT/Hr)	SO_2 Emissions (lbs/hr)	SO_2 Emissions (lbs/ODT Pulp)	TRS Emissions (lbs/hr)
1	1824	230	26.3	94.9	1.37	40	10.9	489	123	1587	[redacted]	10515	74.1	404.4	5.46	0.43
2	2019	216	23.7	97.5	1.37	40	10.9	491	184	1593	[redacted]	10377	74.7	452.9	6.06	0.42
3	2202	220	25.2	92.4	1.37	40	10.9	490	152	1570	[redacted]	10573	79.2	450.8	5.69	0.46
Average:		222	25.1	94.9	1.37	40	10.9	490	153	1583	[redacted]	10488	76.0	436.1	5.74	0.44

NO. 2 COMBINATION BOILER

Combination Boiler #2

Condition 1: With NCGs, with SOGs
24-Jun-21

Run #	Start Time	Steam Rate (10^3 lbs/hr)	Bark Rate (Tons/Hr)	Gas Flow (10^3 SCF/Hr)	TDF (TPH)	NCG Scrubber Flow (GPM)	NCG Scrubber pH (SU)	Stripper Foul Condensate Flow (GPM)	Hard Pipe Foul Condensate Flow (GPM)	LVHC Flow to Boilers (SCFM)	SOG Flow to Boilers (SCFM)	HVLC Flow to Boilers (SCFM)	Pulp Production (ODT/Hr)	SO_2 Emissions (lbs/hr)	SO_2 Emissions (lbs/ODT Pulp)	TRS Emissions (lbs/hr)
1	1445	219	39.0	125.3	1.37	40	10.9	491	190	1572	1231	10253	87.8	508.7	5.79	0.77
2	1630	224	31.1	146.4	1.37	40	10.9	490	186	1576	1231	10277	88.6	507.2	5.72	0.63
3	1806	241	33.6	146.4	1.37	40	10.9	490	190	1580	1231	10300	88.6	496.1	5.60	0.63
Average:		228	34.6	139.4	1.37	40	10.9	490	189	1576	1231	10277	88.3	504.0	5.71	0.68

Condition 2: With NCGs, without SOGs
25-Jun-21

Run #	Start Time	Steam Rate (10^3 lbs/hr)	Bark Rate (Tons/Hr)	Gas Flow (10^3 SCF/Hr)	TDF (TPH)	NCG Scrubber Flow (GPM)	NCG Scrubber pH (SU)	Stripper Foul Condensate Flow (GPM)	Hard Pipe Foul Condensate Flow (GPM)	LVHC Flow to Boilers (SCFM)	SOG Flow to Boilers (SCFM)	HVLC Flow to Boilers (SCFM)	Pulp Production (ODT/Hr)	SO_2 Emissions (lbs/hr)	SO_2 Emissions (lbs/ODT Pulp)	TRS Emissions (lbs/hr)
1	1000	234	35.7	132.7	1.37	40	10.9	482	155	1579	[redacted]	10475	87.2	383.2	4.39	0.86
2	1135	225	30.8	147.8	1.37	40	10.9	479	252	1573	[redacted]	10425	84.3	380.0	4.51	0.82
3	1315	245	30.6	141.7	1.37	40	10.9	482	97	1571	[redacted]	10500	84.2	366.2	4.35	0.63
Average:		235	32.4	140.7	1.37	40	10.9	481	168	1574	[redacted]	10467	85.2	376.4	4.42	0.77

END
OF
DOCUMENT