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Hydrogen Cyanide, Hydrogen Fluoride and Diatomic Chlorine from a Portland Cement Plant; Line 1and Line 2

Holcim (US) Inc.
Midlothian, TX

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TEST DATES: November 15-17, 2023

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1. INTRODUCTION

The United States Environmental Protection Agency (US EPA) has directed the portland cement industry (SIC 3241) to conduct emissions testing as part of the US EPA Risk and Technology Review (RTR). This document provides the emission test results and supporting quality assurance/quality control (QA/QC) measures used to produce standardized data having known precision and accuracy. Collection of accurate, representative, and standardized data for facilities with low emissions is necessary especially in view of MACT standard setting procedures.

The Holcim (US) Inc. facility located in Ellis County, Texas has been included in this request. Holcim operates two in-line kiln/raw mill systems at the facility in Midlothian, Texas. Emissions from the kiln, alkali bypass, clinker cooler and coal mills for each kiln line are ducted to a common stack.

The processes tested at the Midlothian facility are two preheater/precalciner pyro-processing systems, each with an inline raw mill, producing portland cement, referred to as Line 1 and Line 2. Line 1 incorporates a Fuller Flash Furnace inline calciner, and Line 2 is equipped with a KHD inline calciner in their respective process. Clinker production is permitted at 1.3 Million tons-per-year, each.

The kilns are fueled by a variety of fuels including, but not limited to, coal, pet coke, natural gas, tire-derived fuel (TDF), wood waste, non-hazardous waste solids, fuel oil, non-hazardous waste liquids and oil filter fluff.

The air pollution control equipment for Line 1 consists of three control devices. A dry sorbent injection system utilizing lime is used to control acid gas emissions. Combined emissions from the clinker cooler and the kiln/raw mill and alkali bypass directed through respective fabric filters for particulate removal. The kiln/raw mill exiting the fabric filter is sent to a selective catalytic reduction (SCR) system for reducing organic emissions. Exhaust from the SCR and the alkali bypass are combined and sent to scrubber for final particulate removal and acid gas control before exhausting through the Line 1 Main Stack.

The air pollution control equipment for Line 2 consists of three control devices. A dry sorbent injection system utilizing lime is used to control acid gas emissions. Combined emissions from the clinker cooler and the kiln/raw mill and alkali bypass directed through respective fabric filters for particulate removal. The kiln/raw mill exiting the fabric filter is sent to a regenerative thermal oxidizer (RTO) system for reducing organic emissions. Exhaust from the RTO and the alkali bypass are are combined and sent to scrubber for final particulate removal and acid gas control before exhausting through the Line 2 Main Stack. A more detailed description of the processes is provided in Section 2 of the RTR Sampling and Analytical Protocol reproduced in Appendix

The Holcim (US) Inc. retained DEECO Inc. (DEECO) to conduct emission tests for for hydrogen cyanide (HCN), hydrogen fluoride (HF), and diatomic chlorine (Cl_2). All sampling runs were be one hour long. Concurrent measurements to determine volumetric flow rate were made.

A summary of the test results is shown in Table 1.1.

TABLE 1.1 SUMMARY OF HYDROGEN CYANIDE, HYDROGEN FLUORIDE, AND DIATOMIC CHLORINE EMISSIONS; HOLCIM (US) INC., MIDLOTHIAN, TX FACILITY; LINE 1 AND LINE 2; NOVEMBER 15-17, 2023

Test Parameters	Main Stack Raw Mill On	Main Stack Raw Mill Off
Line 1 Main Stack; November 15, 2023		
Hydrogen Cyanide (FTIR) parts-per-million, dry basis corrected to 7% O_2 pounds-per-hour pounds-per-ton of clinker	 57.7 34.2 0.237	 53.2 36.4 0.252
Hydrogen Fluoride (FTIR) parts-per-million, dry basis corrected to 7% O_2 pounds-per-hour pounds-per-ton of clinker	 Invalidated See Section 2 for discussion	 <0.08 <0.04 <0.0003
Hydrogen Fluoride (Method 26A) parts-per-million, dry basis corrected to 7% O_2 pounds-per-hour pounds-per-ton of clinker	 <0.29 <0.13 <0.0009	 <0.25 <0.13 <0.0009
Diatomic Chlorine (Method 26A) parts-per-million, dry basis corrected to 7% O_2 pounds-per-hour pounds-per-ton of clinker	 <0.19 <0.29 <0.0020	 <0.45 <0.82 <0.0059
Line 2 Main Stack; November 16 and 17, 2023		
Hydrogen Cyanide (FTIR) parts-per-million, dry basis corrected to 7% O_2 pounds-per-hour pounds-per-ton of clinker	 52.7 39.5 0.290	 51.5 33.1 0.243
Hydrogen Fluoride (FTIR) parts-per-million, dry basis corrected to 7% O_2 pounds-per-hour pounds-per-ton of clinker	 <0.08 <0.043 <0.0003	 <0.07[1] <0.03[1] <0.0002[1]
Hydrogen Fluoride (Method 26A) parts-per-million, dry basis corrected to 7% O_2 pounds-per-hour pounds-per-ton of clinker	 <0.28 <0.16 <0.0012	 <0.35 <0.17 <0.0012
Diatomic Chlorine (Method 26A) parts-per-million, dry basis corrected to 7% O_2 pounds-per-hour pounds-per-ton of clinker	 0.38 0.76 0.0055	 0.77 1.31 0.0096

[1]The FTIR hydrogen fluoride results for Run 1 are considered to be invalid due to sample line off gassing and are not included in the average. See Section 2 for discussion.

The sampling and analytical procedures followed are summarized in Table 1.2 and discussed in detail in Section 3.

Testing was performed on the Line 1 main stack under two conditions, Raw Mill On and Raw Mill Off. Testing on Line 1 was conducted on November 15, 2023. Testing was performed on the Line 2 main stack under two conditions, Raw Mill On and Raw Mill Off. Testing on Line 2 was conducted on November 16 and 17, 2023.

Sampling was conducted by personnel from DEECO, Inc. of Raleigh, North Carolina. All questions regarding sampling and analytical data should be directed to Dr. Scott Steinsberger of DEECO at (800) 733-3261. The field sampling was completed by Lee Harris, Gage Mayer, Michael Powell, and Scott Steinsberger of DEECO.

The remainder of this document summarizes the results, procedures and quality control measures followed for this program. Section 2 contains tabulated air emission results for each parameter of interest. Section 3 summarizes the air emission sampling and analytical procedures performed by DEECO, with a brief description and/or reference to the applicable methodologies. Section 4 discusses the basic quality control elements in place for this program to assure the collection of representative, accurate air emission data.

The appendices provided in this document contain all of the necessary information to verify the reported results. Included as Appendices are: Appendix A - Emission Summary Tables; Appendix B - Field Data and CEM/FTIR Data; Appendix C - Ion Chromatography Analytical Report Data; Appendix D - Plant Process Data; Appendix E - Calibration Documents; Appendix F - Test Participants; Appendix G - RTR Sampling and Analytical Protocol

TABLE 1.2 SUMMARY OF SAMPLING AND ANALYTICAL PROTOCOLS FOR HOLCIM (US) INC, MIDLOTHIAN, TEXAS FACILITY

Location and Frequency	Test Parameter	Sampling Method	Sampling Procedure	Analysis Method	Analysis Procedure
Line 1 and Line 2 Kiln Main Stacks	Volumetric Flow Rate and cyclonic check	EPA Methods 1 and 2	Velocity and temperature traverses	EPA Methods 1 and 2	Manometer for differential pressure and thermocouple for temperature
	Oxygen and Carbon Dioxide and Stratification Check	EPA Method 3A	Continuous; extractive sample	EPA Method 3A	Paramagnetic for O_2 and NDIR for CO_2
	Moisture	EPA Method 4	Condensation	EPA Method 4	Gravimetric
	Hydrogen Fluoride and Diatomic Chlorine (Cl_2)	EPA Method 26A	Isokinetic integrated sample	EPA Method 26A	Ion chromatography
	Hydrogen Fluoride and Hydrogen Cyanide	EPA Method 320	Continuous; extractive sample	EPA Method 320	Fourier Transform Infrared (FTIR) Spectroscopy

2. SUMMARY OF RESULTS

Emissions sampling was conducted at the Holcim facility located in Midlothian, TX Sampling was conducted for stack gas flow rate (EPA Methods 1 and 2), stack gas oxygen and carbon dioxide (EPA Method 3A), stack gas moisture (EPA Method 4), stack gas hydrogen fluoride and diatomic chlorine (EPA Method 26A) and stack gas hydrogen cyanide and hydrogen fluoride (EPA Method 320).

Testing was conducted on the Line 1 main stack under two conditions; Raw Mill On and Raw Mill Off and the results are summarized in Tables 2.1 and 2.2, respectively.

During the Raw Mill On test runs on Line 1, the hydrogen fluoride FTIR concentration started at 0.3 parts-per-million and five hours later was below detection. Method 26A samples from the Line 1 Raw Mill On test runs were all non-detect for hydrogen fluoride. The hydrogen fluoride FTIR results for the Raw Mill On test runs on Line 1 are provided in Appendix B but not included in the Tables 1.1 and 2.1. **Based on this evidence, the hydrogen fluoride results from the FTIR is considered to be invalid for the Line 1 Raw Mill On condition.**

Testing was conducted on the Line 2 main stack under two conditions; Raw Mill Off and Raw Mill On and the results are summarized in Tables 2.3 and 2.4, respectively.

Similar to Line 1, during the Raw Mill Off test on Line 2, the hydrogen fluoride concentration FTIR started at 0.6 parts-per-million and dropped to below detection before the end of the Run 1. Method 26A samples from the Line 2 Raw Mill Off test runs were all non-detect for hydrogen fluoride. The hydrogen fluoride FTIR results from the Raw Mill Off Run 1 are provided in Appendix B. **Based on this evidence, the hydrogen fluoride FTIR results from the Raw Mill Off Run 1 considered to be invalid and are not included in the averages in Tables 1.1 and 2.3.**

TABLE 2.1 HOLCIM (US) INC., MIDLOTHIAN, TX FACILITY; LINE 1 KILN MAIN STACK HYDROGEN CYANIDE, HYDROGEN FLUORIDE, AND DIATOMIC CHLORINE EMISSIONS; RAW MILL ON; NOVEMBER 15, 2023

Test Parameter	Main Stack Raw Mill On Run 1	Main Stack Raw Mill On Run 2	Main Stack Raw Mill On Run 3	Main Stack Raw Mill On Average
Time	09:00-10:09	10:32-11:41	12:02-13:11	November 15, 2023
Flow Rate (dscfm)	349,250	349,600	351,900	350,300
Oxygen	15.2%	15.2%	15.5%	15.3%
Carbon Dioxide	9.0%	9.0%	9.0%	9.0%
Moisture	17.1%	17.2%	17.0%	17.1%
Hydrogen Cyanide (FTIR)				
ppm_{dry} at 7% O_2	56.6	56.4	60.1	57.7
pounds-per-hour	34.1	34.0	34.6	34.2
pounds-per-ton of clinker	0.236	0.236	0.239	0.237
Hydrogen Fluoride (Method 26A)				
ppm_{dry} at 7% O_2	<0.26	<0.30	<0.32	<0.29
pounds-per-hour	<0.115	<0.136	<0.134	<0.128
pounds-per-ton of clinker	<0.0008	<0.0009	<0.0009	<0.0009
Diatomic Chlorine (Method 26A)				
ppm_{dry} at 7% O_2	<0.11	<0.26	<0.20	<0.19
pounds-per-hour	<0.17	<0.41	<0.30	<0.29
pounds-per-ton of clinker	<0.0012	<0.0029	<0.0021	<0.0020

TABLE 2.2 HOLCIM (US) INC., MIDLOTHIAN, TX FACILITY; LINE 1 KILN MAIN STACK HYDROGEN CYANIDE, HYDROGEN FLUORIDE, AND DIATOMIC CHLORINE EMISSIONS; RAW MILL OFF; NOVEMBER 15, 2023

Test Parameter	Main Stack Raw Mill Off Run 1	Main Stack Raw Mill Off Run 2	Main Stack Raw Mill Off Run 3	Main Stack Raw Mill Off Average
Time	14:32-15:41	15:56-17:05	17:19-18:28	November 15, 2023
Flow Rate (dscfm)	338,000	329,650	313,950	327,200
Oxygen	14.1%	14.0%	13.6%	13.9%
Carbon Dioxide	10.7%	10.8%	11.4%	11.0%
Moisture	18.4%	17.8%	18.8%	18.3%
Hydrogen Cyanide (FTIR)				
ppm_{dry} at 7% O_2	58.3	52.6	48.8	53.2
pounds-per-hour	39.2	36.2	33.8	36.4
pounds-per-ton of clinker	0.271	0.251	0.234	0.252
Hydrogen Fluoride (FTIR)				
ppm_{dry} at 7% O_2	<0.08	<0.08	<0.08	<0.08
pounds-per-hour	<0.04	<0.04	<0.04	<0.04
pounds-per-ton of clinker	<0.0003	<0.0003	<0.0003	0.0003
Hydrogen Fluoride (Method 26A)				
ppm_{dry} at 7% O_2	<0.25	<0.26	<0.23	<0.25
pounds-per-hour	<0.13	<0.14	<0.12	<0.13
pounds-per-ton of clinker	<0.0009	<0.0009	<0.0008	<0.0009
Diatomic Chlorine (Method 26A)				
ppm_{dry} at 7% O_2	0.72	0.40	<0.30	<0.45
pounds-per-hour	1.31	0.72	0.55	<0.82
pounds-per-ton of clinker	0.0091	0.0050	<0.0038	<0.059

TABLE 2.3 HOLCIM (US) INC., MIDLOTHIAN, TX FACILITY; LINE 2 KILN MAIN STACK HYDROGEN CYANIDE, HYDROGEN FLUORIDE, AND DIATOMIC CHLORINE EMISSIONS; RAW MILL OFF; NOVEMBER 16, 2023

Test Parameter	Main Stack Raw Mill Off Run 1	Main Stack Raw Mill Off Run 2	Main Stack Raw Mill Off Run 3	Main Stack Raw Mill Off Average
Time	14:20-15:57	16:19-17:25	17:41-18:47	November 16, 2023
Flow Rate (dscfm)	268,350	265,400	266,100	266,600
Oxygen	13.0%	12.9%	12.9%	12.9%
Carbon Dioxide	12.7%	13.2%	13.3%	13.1%
Moisture	18.5%	20.6%	20.0%	19.7%
Hydrogen Cyanide (FTIR)				
ppm_{dry} at 7% O_2	49.2	52.5	52.8	51.5
pounds-per-hour	31.6	33.7	34.0	33.1
pounds-per-ton of clinker	0.231	0.247	0.250	0.243
Hydrogen Fluoride (FTIR)				
ppm_{dry} at 7% O_2	0.32[1]	<0.07	<0.07	<0.07
pounds-per-hour	0.15[1]	<0.03	<0.03	<0.03
pounds-per-ton of clinker	0.0011[1]	<0.0002	<0.0002	<0.0002
Hydrogen Fluoride (Method 26A)				
ppm_{dry} at 7% O_2	<0.41	<0.33	<0.31	<0.35
pounds-per-hour	<0.20	<0.15	<0.15	<0.17
pounds-per-ton of clinker	<0.0014	<0.0011	<0.0011	<0.0012
Diatomic Chlorine (Method 26A)				
ppm_{dry} at 7% O_2	0.69	0.78	0.85	0.77
pounds-per-hour	1.17	1.32	1.44	1.31
pounds-per-ton of clinker	0.0086	0.0097	0.0106	0.0096

[1]The FTIR hydrogen fluoride results for Run 1 are considered to be invalid due to sample line off gassing and are not included in the average

TABLE 2.4 HOLCIM (US) INC., MIDLOTHIAN, TX FACILITY; LINE 1 KILN MAIN STACK HYDROGEN CYANIDE, HYDROGEN FLUORIDE, AND DIATOMIC CHLORINE EMISSIONS; RAW MILL ON; NOVEMBER 17, 2023

Test Parameter	Main Stack Raw Mill On Run 1	Main Stack Raw Mill On Run 2	Main Stack Raw Mill On Run 3	Main Stack Raw Mill On Average
Time	08:06-09:12	09:30-10:36	10:58-12:04	November 17, 2023
Flow Rate (dscfm)	355,200	356,750	353,550	355,200
Oxygen	14.0%	13.9%	13.9%	13.9%
Carbon Dioxide	11.3%	11.4%	11.5%	11.4%
Moisture	18.2%	19.5%	18.9%	18.9%
Hydrogen Cyanide (FTIR)				
ppm_{dry} at 7% O_2	53.5	52.3	52.4	52.7
pounds-per-hour	39.7	39.5	39.3	39.5
pounds-per-ton of clinker	0.291	0.290	0.288	0.290
Hydrogen Fluoride (FTIR)				
ppm_{dry} at 7% O_2	<0.08	<0.08	<0.08	<0.08
pounds-per-hour	<0.043	<0.043	<0.044	<0.043
pounds-per-ton of clinker	<0.0003	<0.0003	<0.0003	<0.0003
Hydrogen Fluoride (Method 26A)				
ppm_{dry} at 7% O_2	<0.31	<0.26	<0.28	<0.28
pounds-per-hour	<0.17	<0.15	<0.15	<0.16
pounds-per-ton of clinker	<0.0013	<0.0011	<0.0011	<0.0012
Diatomic Chlorine (Method 26A)				
ppm_{dry} at 7% O_2	0.33	0.43	0.39	0.38
pounds-per-hour	0.64	0.86	0.77	0.76
pounds-per-ton of clinker	0.0047	0.0063	0.0056	0.0055

3. SAMPLING AND ANALYTICAL PROCEDURES

Table 1.2 presents a summary of the overall sampling and analytical protocols used for the test program for the Line 1 and Line 2 main stacks at Holcim's Midlothian, TX facility. All sampling and analytical methods employed for this test program were performed in accordance with the procedures outlined in the Reference Test Methods contained in the Code of Federal Regulations, Title 40, Part 60, Appendix A (40 CFR 60, Appendix A) and 40 CFR 63, Appendix A.

3.1 Sampling Point Determination - EPA Method 1

The Line 1 Main stack is a vertically-oriented circular stack with an inside diameter of 161.5" inside diameter. The stack gas sampling ports are located approximately 101' 7" (approximately 7.55 duct diameters) above the ID fan breaching and approximately 38' 6" (approximately 2.86 duct diameters) from the stack outlet.

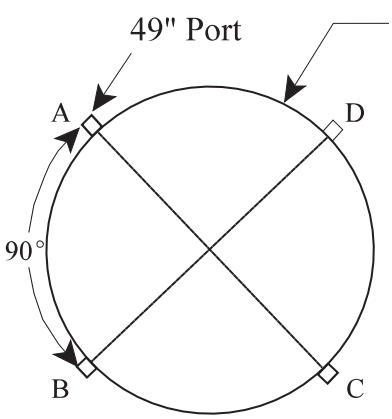
The Line 2 Main stack is a vertically-oriented circular stack with an inside diameter of 164.063" inside diameter. The stack gas sampling ports are located approximately 102' 9" (approximately 7.52 duct diameters) above the ID fan breaching and approximately 83' 6" (approximately 6.11 duct diameters) from the stack outlet.

Both sampling locations met the minimum specifications for selection of a measurement site as outlined in EPA Method 1. Cyclonic flow checks, as described in EPA Method 1 Section 2.4, using the Type-S pitot null procedure and angle measurements at the stack test location were conducted.

A twelve (12) point sampling traverse were made using 3 points in each of 4 sampling ports at the Line 1 Main stack and Line 2 Main stack. Each traverse was made at each sampling location using a type-S pitot tube in accordance with EPA Methods 2 procedures. Gas temperatures were measured using calibrated Type K thermocouples and digital readout devices. All measurements were performed in accordance with the procedures in EPA Methods 2, and 26A.

Schematics of the Line 1 Main stack and Line 2 Main stack are provided in Figures 3-1 and 3-2, respectively.

6-pt Traverse Points
2 Axes
6 points/axis
4 ports
3 points/port
12 total points



Section K-K

Traverse Distance from Outside Sample Port
56⅛ in.
72⅝ in.
96¾ in.
162¾ in.
186⅞ in.
203⅜ in.

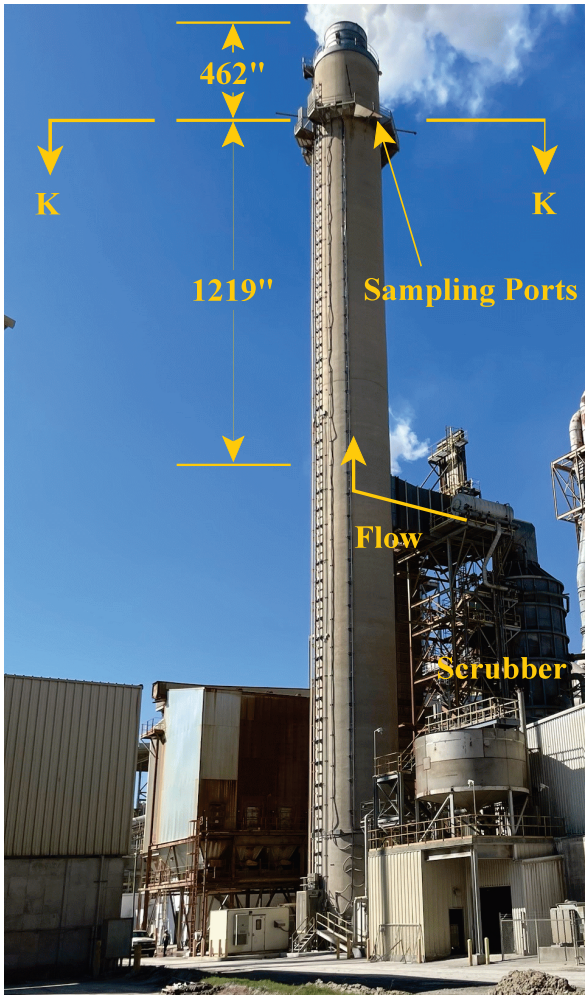
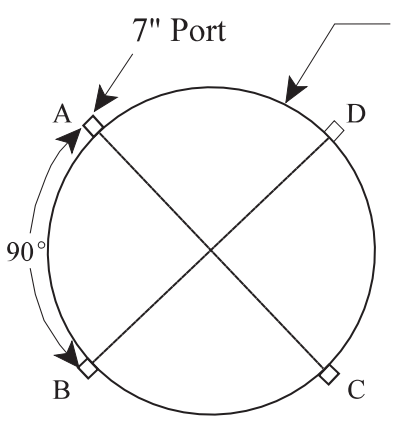


Figure 3.1 Schematic of the Line 1 Stack Sampling Location

6-pt Traverse Points
2 Axes
6 points/axis
4 ports
3 points/port
12 total points



Section K-K

Traverse Distance from Outside Sample Port
14¼ in.
31 in.
55½ in.
122½ in.
147⅛ in.
163⅞ in.

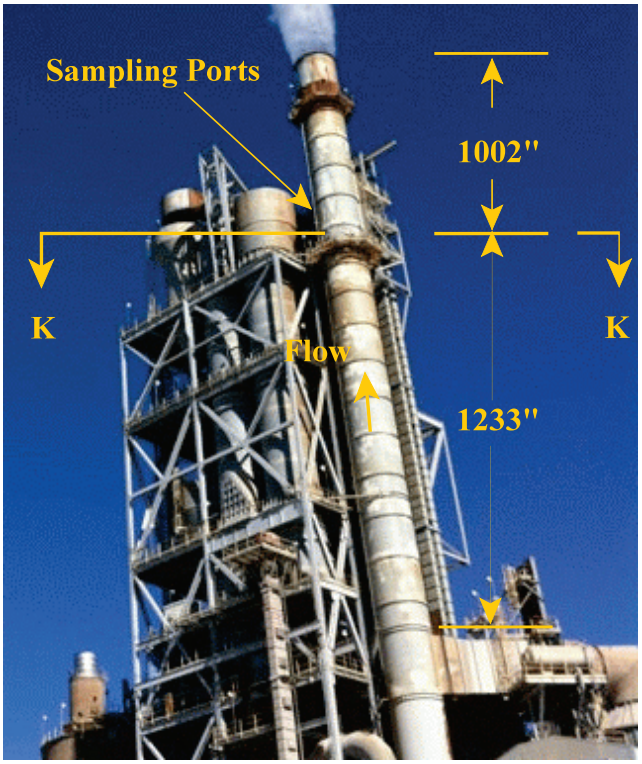


Figure 3.2 Schematic of the Line 2 Stack Sampling Location

The number and location of the sampling or traverse points were determined according to the procedures outlined in EPA Method 1. All points were at least 1.0 inches from the stack wall, per Method 1.

3.2 Flue Gas Velocity and Volumetric Flow Rate - EPA Method 2

The flue gas velocity and volumetric flow rate were determined according to the procedures outlined in EPA Method 2. Velocity measurements were using type S pitot tubes conforming to the calibration specifications outlined in EPA Method 2, Section 10.1. Each Type-S pitot tube, calibrated according to these standards, had an assigned coefficient. Differential pressures were measured with fluid manometers. Effluent gas temperatures were measured with chromel-alumel thermocouples equipped with digital readouts.

3.3 Outlet Flue Gas Composition - EPA Method 3A

Outlet flue gas analysis for oxygen (O_2) and carbon dioxide (CO_2) concentrations, and the calculation of percent excess air and flue gas dry molecular weight was performed in accordance with EPA Method 3A.

To evaluate the sampling location and points for FTIR and O_2 sampling, a three-point O_2 concentration stratification test on a line passing through the centroidal area at (for stacks is greater than 2.4 meters) at 0.4, 1.2 and 2.0 meters from the stack or duct wall. The procedures in Section 8.1.2 of Method 7E were followed, using oxygen as allowed by fourth sentence in Section 8.1.2. The plant O_2 CEMS was used as a control. A criteria of <5% variation from combined mean for each point was used as indication of non-stratification to allow single point sampling at the point closest to the mean.

Per EPA Method 3A for determining molecular weight, continuous extractive sampling was obtained using the same Method 320 sampling system described in Section 3.6.

A portion of the hot , wet gas sample was sent through a condensing system to remove the stack moisture. A portion of the moisture-free gas sample was sent to an O_2/CO_2 analyzer.

Calibration procedures were be performed in accordance with EPA methodology. Analyzers were calibrated before and after each test and a calibration check between each test run.

The pretest calibrations consisted of the following steps:

- Internal (direct) calibration of each analyzer to adjust calibration and check linearity.
- External (through the entire sampling system) calibration to check the system bias on zero and span gases.

The post test calibration consisted of an external system bias calibration check.

The analyzer calibrated using a certified zero and span (mid or high range) gas. Zero and span gases were directed to each analyzer through the appropriate plumbing, the calibration gas flow rates were adjusted to the correct flow rate and the analyzer was adjusted with the appropriate span pot.

After the analyzer was properly adjusted the linearity was checked using a low and high range calibration gas. The maximum allowable limit for linearity is 2% of the analyzer range and all analyzers were shown to be linear within these limits before proceding..

The external calibration bias check were performed by placing the CEM system in sampling mode and injecting a zero and span gas into the sample line at the probe exit. This check showed if there is any sampling system related bias, and also checks the integrity of the sample line.

3.3.1 Calibration Gases

DEECO useed EPA Protocol and/or ±2% NIST Traceable gases for calibration as required by the various reference methods employed in this test program. Calibration gases were selected from previous experience with similar sources and/or from information obtained from the facility engineer prior to sampling. In some cases if the gases that are selected are out of the optimum range of operation then no significant impact of data quality is expected due to the linear nature of the analyzers that were used.

Specific HCN gases were manufactured for this test program in the range of 50-100 ppm to provide spikes in the 5-10 ppm range, or lower; with an SF_6 or appropriate tracer used to calculate the exact spike gas dilution ratio of 10% or less

No audit gases from a federal or a state agency were provided.

3.3.2 Sampling Procedures

At the completion of the pretest calibration routine, the CEM system was ready for operation. No further adjustments of sample flow rates, analyzer zero or span adjustments, or other critical CEM operating parameters were made until testing and post test calibration were complete.

Each sampling run was one hour. At the completion for each test run, calibration gases were used to check between test runs. A zero and the upscale calibration gas closest to the actual emission concentrations were used for the pretest and post test calibrations.

3.4 Flue Gas Moisture Content - EPA Method 4

The flue gas moisture content was determined in conjunction with the EPA Method 26A trains according to the sampling and analytical procedures outlined in EPA Method 4. (**NOTE:** In order to maintain isokinetic sampling, the sampling rate used may have been required to temporarily exceed the EPA Method 4-specified maximum sampling rate of 0.75 CFM, based on observed stack gas pitot readings.) The impingers were connected in series and contained reagents as described below. The impingers were contained in an ice bath in order to assure condensation of the moisture in the flue gas stream. Any moisture that is not condensed in the impingers was captured in the silica gel, therefore all moisture was weighed and entered into moisture content calculations.

3.5 Hydrogen Fluoride and Diatomic Chlorine - EPA Method 26A

Sampling and analytical procedures were those outlined in EPA Method 26A to determine primarily diatomic chlorine (Cl_2) emissions and hydrogen fluoride (HF) emissions at main stack

outlet sampling locations. Duplicate simultaneous trains (a.k.a "paired trains") for each test run were used to determine precision.

Sample was collected through a heated glass probe, followed by a heated Teflon filter, where stack gas HF and Cl_2 were collected in a series of chilled impingers. The sampling train impingers contained 100 ml of 0.1N sulfuric acid in the first and second, an empty third impinger, 100 ml of 0.1N NaOH in the fourth and fifth and 200 grams of silica gel in the last impinger

Sampling was conducted isokinetically (±10%) with readings of flue gas parameters recorded at traverse points selected according to EPA Method 1. Leak-checks on the Method 26A sampling train were performed before and after each sampling run and optionally for any port change. The sampling train leak-checks and leakage rate (where applicable) were documented on the field test data sheet for each respective run. All leak checks were acceptable.

The glass button hook nozzle and probe liner was constructed of borosilicate glass. The filter holder was constructed of borosilicate glass with a Teflon frit filter support and a sealing gasket. A PTFE-bonded glass fiber filter was used. The probe and filter housing were heated to above 248°F and not exceed an upper boundary of 273°F. Probe liners and filter holders were cleaned thoroughly prior to testing.

The Method 26A trains was operated isokinetically for a minimum of 60 minutes and collected a minimum of 1 dry, standard cubic meter (DSCM). Pretest preparations, preliminary determinations, and leak check procedures were those outlined in EPA Method 5.

After completion of sampling the train was leak checked and transferred to the sample recovery trailer. All leak checks were acceptable. The impingers were weighed to determine moisture gain in accordance with EPA Method 4.

Sample recovery involved quantitative recovery of the sulfuric acid impinger contents and the NaOH impinger contents into separate tare-weighed, precleaned polyethylene sample containers.

The nozzle, probe, filter and filter housing were not recovered.

The contents of sulfuric acid impingers, including the contents if any of the empty (2^{nd} knockout or third) impinger were quantitatively transferred to the tare-weighed, precleaned polyethylene sample container, followed by three rinses with deionized (DI) water of the impingers and all connecting glassware (including the connecting glassware to the first impinger) placed in the same H_2SO_4 container. The container was labeled and weighed to determine the final sample volume.

The contents NaOH impingers were quantitatively transferred to a second tare-weighed, precleaned polyethylene sample container, followed by three rinses with DI water of the impingers and all connecting glassware placed in the same NaOH container. The container was labeled and weighed to determine the final sample volume.

Sample recovery from each train included:

1. Container No. 1 - Contents of H_2SO_4 impingers and knockout impinger and, and DI rinse of impingers and connecting glassware; and

2. Container No. 2 - Contents NaOH impingers, and DI rinse of impingers and connecting glassware.

Additional quality control consisted of collecting and analyzing a field blank train for every three test runs. The blank train was assembled from a used train, leak checked and sat for a period equal to the sampling time (i.e, 1-hr). The blank train data was to be used to determine the method detection limit for the test program target analytes (ie. The lowest number that could be detected), and compared to stack emissions.

Reagent blanks of 0.1 N H_2SO_4, 0.1N NaOH, and DI water were collected and archived for later analysis should there be any issues with the field blank train samples

The H_2SO_4 impinger solutions were analyzed using ion chromatography techniques for fluoride ions (F^-) (EPA SW-9057). Duplicate analyses performed on the samples and field blanks. Precision was demonstrated by duplicate injection of each sample, the results of each individual analysis being within 5% of their mean to be acceptable.

The NaOH impinger solutions was treated with sodium thiosulfate to ensure complete conversion of hypochlorous acid (HClO) to chloride ions (Cl^-). The resulting solution was analyzed using ion chromatography techniques for chloride ions (EPA SW-9057). Duplicate analyses was performed on the samples and field blanks. Precision was demonstrated by duplicate injection of each sample, the results of each individual analysis being within 5% of their mean to be acceptable

All EPA Method 26A HF/Cl_2 samples were analyzed by Element One of Wilmington NC. Refer to Section 1, Figure 1.1 of the RTR Sampling and Analytical Protocol for contact information.

For this test program, the relative deviation (RD) was to be calculated as described in EPA Method 30B between the Cl_2 concentrations measured with the paired trains. A criteria of a less than 10% relative deviation or 0.2 ppm absolute difference was required.

The absolute differences between the Cl_2 concentrations measured with the paired trains is summarized in Table 3.1. For each paired run, Cl_2 concentrations met the 0.2 ppm absolute difference criteria.

TABLE 3.1 PAIRED METHOD 26A SAMPLING TRAIN DIATOMIC CHLORINE CONCENTRATION COMPARISON RESULTS FOR THE LINE 1 AND LIINE 2 KILN MAIN STACKS; NOVEMBER 15-17, 2023

Run	Time	Train A Diatomic Chlorine Concentration (ppm,dry)	Train B Diatomic Chlorine Concentration (ppm,dry)	Absolute Difference (ppm,dry)
November 15, 2023; Line 1 Main Stack Raw Mill On				
Run 1	09:00-10:09	<0.04	<0.05	0.01
Run 2	10:32-11:41	0.14	<0.08	0.06
Run 3	12:02-13:11	<0.07	<0.08	0.01
November 15, 2023; Line 1 Main Stack Raw Mill Off				
Run 1	14:32-15:41	0.33	0.37	0.04
Run 2	15:56-17:05	0.13	0.26	0.13
Run 3	17:19-18:28	0.25	<0.07	0.18
November 16, 2023; Line 1 Main Stack Raw Mill Off				
Run 1	14:20-15:57	0.35	0.43	0.08
Run 2	16:19-17:25	0.52	0.39	0.13
Run 3	17:41-18:47	0.49	0.50	0.01
November 17, 2023; Line 1 Main Stack Raw Mill Off				
Run 1	08:06-09:12	0.17	0.15	0.02
Run 2	09:30-10:36	0.23	0.22	0.01
Run 3	10:58-12:04	0.19	0.21	0.02

3.6 Hydrogen Cyanide and Hydrogen Fluoride - EPA Method 320

EPA Method 320 was performed to determine emissions of concentrations of HCN and HF. Three, 1-hour sampling runs were conducted under each representative process and control system operating conditions.

The gas sample was extracted from the stack through a glass-lined probe and filter heated to 375° F. For external calibration checks and analyte spikes, the gases were introduced in front of the heated filter. Any excess calibration gas was diverted through the sample probes into the source. Outflow of gas from the heated filter enclosure was transported through a Teflon sample line heated to 375° F. For these sources approximately 300' of sample line was required. The heated sample line was connected directly to the FTIR sample cell. Using heat-traced Teflon tubing the exit of the FTIR cell was connected to a sample pump with a heated stainless steel pump head. The pump discharge was directed to a proprietary chiller-type gas conditioner to remove moisture prior to delivery sample gas to the O_2/CO_2 monitor.

The distribution of the gas sample to the monitors was accomplished using a panel equipped with valves and rotometers. The gas sample was then divided and directed to the O_2/CO_2 analyzer.

FTIR sample cell was maintained at 191°C and connected to a MKS Instruments Multigas 2030 Fourier Transform Infrared Spectrometer and Detector.

The FTIR spectrometer measured vapor phase organic or inorganic compounds which absorb energy in the mid-infrared spectral region, about 400 to 4000 cm^{-1} (25 to 2.5 μm). Continuous measurement were made by matching sample absorbance bands with bands in reference spectra, and comparing sample band intensities with reference band intensities.

The principle limitation to FTIR spectroscopy are the presence of interfering compounds that also absorb energy in the mid-infrared spectral region. In a cement kiln stack gas matrix, water vapor (H_2O) and carbon dioxide (CO_2) are the primary interferents that must be incorporated into the identification and quantitation method.

The FTIR software performs the computation for a single compound by subtracting all the other compounds (interferants and target) from the absorbance spectra and quantifies the single compound based on the remain absorbance. The FTIR software provides a Standard Error Calculation (SEC) value that is an indication of how well the identification and quantitation has been performed. A high SEC indicates that other interferants have not been accounted for in the analysis method, and a low SEC is indicative of greater confidence measurement.

The instrument is operated with a resolution of 0.5 cm^{-1} with 4x zero filling. Beer-Norton Medium apodization is used with amplitude phase correction.

For this RTR test program, following specific QA/QC activities for EPA Method 320 were performed and are summarized in Table 3.2

3.6.1 Laboratory QA/QC Activities Before Field Test Program

Before field testing occurs, the following QA/QC activities were conducted;

1) Seven consecutive samples of dry nitrogen through the sampling system was acquired and used to calculate the standard deviation for each of the test program target analytes multiplied by a factor of 3. These data were considered representative of detection limits (DL) for this test program and were below the 0.5 ppm required DL for both HCN and HF;

2) From these seven dry nitrogen samples, the results for the Signal-to-Noise Ratio (SNR) @ 2500 cm^{-1} was >2500, at 64 scans and the results for single beam intensity @ 2500 cm^{-1} was >0.9; and

3) The HCN calibration gases was analyzed directly and the FTIR responses agreed with tag value within 5%

3.6.2 QA/QCActivities During Field Test Program

During the field test program, following QA/QC activities were be performed and criterium met;

1) On each test day prior to any testing, an instrument background was collected using dry nitrogen directed to the gas cell. The background was collected with at least 128 scans;

2) The probe, filter, sample line and all sample system components in contact with effluent were be maintained at or above 375ºF or 191ºC (consistent with FTIR calibration temperature) to avoid any possible "cold spots;"

3) A system zero with all sampling system components at operating temperature was performed by injecting nitrogen at the sample probe and through sample filter and entire measurement system. After zero equilibration was achieved, all measurement components were quantified for at least 128 scans;

4) The sample probe was position at effluent measurement point and sampling was continue until equilibration of the measurement system has been achieved. At this point, the effluent concentrations was quantified with two consecutive 64-scan samples as the initial native concentration for the dynamic spike;

5) Analyte spiking was conducted for HCN before the first test run, and after each successive test run for a minimum of 4 spikes per test condition. These results were used to determine accuracy and are summarized in Table 3.3;

6) The spike gas injections was maintained at 10% or less of total sample volume. The spike gas concentration and flow rate was be selected to approximately double the native effluent concentration. Spike recovery results were within ±20% of the expected value. An SF_6 tracer was used to calculate the exact spike gas dilution ratio of 10% or less;

TABLE 3.2 FTIR PRETEST AND FIELD TEST QA/QC SUMMARY

Spectrum	HCN	SF6	HF	SNR 2500	sBeam @2500
Seven consecutive samples of dry nitrogen for detection limit					
SPC__000837.LAB	-0.051		-0.002	6223.51	1.42
SPC__000838.LAB	-0.032		-0.000	5809.30	1.42
SPC__000839.LAB	0.046		-0.017	3759.60	1.42
SPC__000840.LAB	-0.011		0.016	4373.66	1.42
SPC__000841.LAB	0.080		0.002	5347.95	1.42
SPC__000842.LAB	0.059		-0.012	5012.46	1.42
SPC__000843.LAB	-0.029		-0.006	4706.13	1.42
Standard Deviation X 3	**0.156**		**0.032**		
Averages				**5033.23**	**1.42**
HCN Standard (CC768233; 199.1 ppm HCN/10.0 ppm SF6)					
SPC__000863.LAB	198.2	9.6			
SPC__000864.LAB	198.4	9.6			
SPC__000865.LAB	198.7	9.6			
SPC__000866.LAB	197.5	9.6			
Averages	198.2	9.6			
HCN Standard (CC768222; 49.9 ppm HCN/5.0 ppm SF6)					
SPC__000873.LAB	49.83	4.86			
SPC__000874.LAB	49.91	4.86			
SPC__000875.LAB	49.85	4.85			
SPC__000876.LAB	49.90	4.86			
Averages	49.87	4.86			
Residuals for Post HCN analyte spike native scans					
SPC_001501.LAB					
Concentration	22.3		0.21		
MDC3	0.52		0.19		
MDC3%	2.3%		NA		
SPC_001502LAB					
Concentration	21.1		0.23		
MDC3	0.45		0.17		
MDC3%	2.1%		NA		
Final SNR @ 2500 cm^{-1} and single beam intensity @ 2500 cm^{-1}					
SPC__002711.LAB				3548.4	1.16

7) After the dynamic spike, nitrogen was sent through the sampling system until all traces of spike gas removed and lines proven below DL for target analytes;

8) The nitrogen purge was discontinued and the sampling system was allowed to equilibrate with stack gas before starting a test run. The first two consecutive 64-scan samples of a sample run was used for the final native concentration. Residual results for HCN and HF were verified to be less than 0.2-0.3 ppm for data acceptance, or less than 5% of the measured value, whichever was least restrictive.

9) The final SNR @ 2500 cm^{-1}, at 64 scans, and the results for single beam intensity @ 2500 cm^{-1} were verified to met the >2500 and >0.9 criterium; respectively.

TABLE 3.3 ETHYLENE CALIBRATION TRANSFER STANDARD (CTS) AND HYDROGEN CYANIDE ANALYTE SPIKING TEST RESULTS FOR THE LINE 1 AND LINE 2 KILN MAIN STACKS; NOVEMBER 15-17, 2023

Run	Time	Average Native Hydrogen Cyanide Concentration (ppm,wet)	Spike plus Average Hydrogen Cyanide Native Concentration (ppm,wet)	Hydrogen Cyanide Spike Recovery	CTS Error
November 15, 2023; Line 1 Main Stack Raw Mill On					
Pre Run 1	08:47-08:59	22.15	34.39	83.8%	-2.1%
Post Run 1	10:16-10:34	19.88	32.39	84.7%	
Post Run 2	11:42-11:56	19.01	29.89	81.4%	
Post Run 3	13:16-13:56	19.88	31.61	80.3%	-1.8%
November 15, 2023; Line 1 Main Stack Raw Mill Off					
Pre Run 1	14:15-14:37	22.60	34.97	82.4%	-2.2%
Post Run 1	15:42-16:08	21.64	34.21	83.3%	
Post Run 2	17:07-17:36	20.30	32.14	80.4%	
Post Run 3	18:30-18:54	21.44	34.11	83.3%	-1.9%
November 16, 2023; Line 1 Main Stack Raw Mill Off					
Pre Run 1	13:46-14:07	19.80	34.73	92.8%	-2.3%
Post Run 1	15:57-16:14	23.52	35.54	82.4%	
Post Run 2	17:32-17:48	23.51	37.85	90.1%	
Post Run 3	18:48-19:09	23.90	37.06	85.2%	-2.3%
November 17, 2023; Line 1 Main Stack Raw Mill Off					
Pre Run 1	07:50-08:11	21.23	33.57	84.7%	-2.5%
Post Run 1	09:13-09:27	21.24	34.52	83.3%	
Post Run 2	10:42-10:57	21.11	33.10	86.1%	
Post Run 3	12:06-12:31	20.57	33.10	87.2%	-2.2%

4. QA/QC PROCEDURES AND RESULTS

The objective of a quality assurance/quality control (QA/QC) program is to assure that the precision and accuracy of all environmental data generated by DEECO for clients are commensurate with data quality objectives (DQO's). DQO's are based on a common understanding of the intended end use(s) of the data, the measurement process, and the availability of resources. Once DQO's are established, formally or informally, QC protocol can be defined for the measurements.

In this project, the final data user is Holcim. The data quality objectives in this project are to generate scientifically sound data to be used for compliance purposes.

4.1 Sampling Equipment

All of the sampling equipment used was calibrated according to the procedures outlined in the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, EPA-600/4-77-027b.

4.1.1 Manual Sampling Equipment Calibrations

For sampling Methods 1, 2, and 4 the procedures and equipment used to measure stack gas velocity and temperature measurements and the metering system used to maintain constant rate sampling conditions and to determine the sample gas volume were subjected to pretest and posttest calibrations and/or inspections as required by the appropriate EPA methods.

Barometer - Barometric pressure values were obtained from a calibrated barometer, verified by phone call to a local airport, and corrected for elevation to sample port level (0.01 inches Hg per 10 ft. elevation).

Pitot Tubes - Each pitot tube used in sampling meets the design specifications for type-S pitot tubes in EPA Method 2. Therefore, a maximum value baseline coefficient (C_p) of 0.84 is assigned to each pitot tube. Calibration by the manufacturer for pitot face-opening alignment included measuring the external tubing diameter (dimension D_t), the base-to-opening plane distance (dimensions P_a and P_b), and the face opening misalignment angles, with all terms as described in EPA Method 2. Pitot tubes were visually inspected for structural integrity at the completion of each test. Inspection sheets for pitot tubes are included in Appendix E.

Calibration Meter and Metering System - The secondary reference meter equipment arrangement for calibration is shown in Figure 5.7 of EPA Method 5. The prescribed procedures were followed. A wet test meter with a 1 ft^3/rev capacity and $\pm$ 1 percent accuracy is used as the primary calibrant. The dry gas meter's pump is run for a minimum of 5 minutes at a flow rate of 0.35 cfm to condition the interior surface of the wet test meter. Leak checks are performed and if satisfactory, triplicate runs at each of no less than five different flow rates are done. A calibration curve is prepared and the meter is recalibrated after 200 hours of operation or annually, whichever comes first.

The calibration set-up for the dry gas metering system using the secondary reference meter in lieu of the wet test meter is given in Figure 5.5 of EPA Method 5. A leak check of the metering system before calibration was performed as shown in Figure 5.4 of EPA Method 5. The metering systems's pump is operated for 5 minutes at an orifice manometer setting of 0.5 inches H_20 to heat up the pump and system to stabilize the meter inlet and outlet temperatures. Values for the orifice setting (delta H), wet test meter volume (V_w), corresponding dry test meter volume (V_d), dry test meter inlet and outlet gas temperatures (t_{di} and t_{dn}), and time are recorded for the initial calibration. Then the ratio of the wet test meter to the dry test meter (gamma) and the orifice pressure differential that equates to 0.75 cfm at standard conditions (delta H@) are calculated.

A post-test meter calibration was made on the dry gas meter used during the test to check its accuracy against the pre-test calibration. This post-test calibration check was made using the average orifice setting obtained during each test run and setting the vacuum at the maximum value obtained during each test run. These test runs were made against DEECO's secondary reference dry gas meter which was calibrated against a wet test meter. The calibration data sheets for the dry gas meters are included in Appendix E.

Thermocouples and Digital Indicators - Thermocouples were calibrated by comparing them against an ASTM-3F mercury-in-glass thermometer at approximately 32°F (ice water), ambient temperature, and at approximately 220°F. Each thermocouple was calibrated against temperature ranges to which it is typically exposed during test conditions, and they agreed within 1.5 percent (expressed in °R) of the reference thermometer throughout the entire calibration range. Also, thermocouples were checked at ambient temperature at the test site to verify calibration. The calibration data sheets for the thermocouples are included in Appendix E.

Pretest and Posttest Leak Checks of Sampling Trains - Each Method 4 sampling train was subjected to pretest leak checks and posttest leak checks. For all sampling runs the posttest leak checks were acceptable (less than 4% of the sampling rate at the highest vacuum recorded during the test run).

4.2 Analytical QA/QC Results

Analytical measurements of precision and accuracy were made on stack gas samples, and are summarized in a separate report.

Appendix A

Emission Summary Tables

Company: Holcim; Midlothian TX
Source: Line 1 Main Stack; Raw Mill On
Job ID: 23-3313
Train Type: EPA Method 26A

	1A 11/15/23 900-1009	1B 11/15/23 900-1009	2A 11/15/23 1032-1141	2B 11/15/23 1032-1141	3A 11/15/23 1202-1311	3B 11/15/23 1202-1311	Average
Initial Meter Volume, ft^3	751.876	261.182	802.531	317.364	921.590	372.800	
Final Meter Volume, ft^3	802.152	317.211	854.001	372.771	970.828	428.837	
Intra-Port Volume and/or Leak Check Correction, ft^3	0.000	0.000	0.000	0.000	0.000	0.000	
Total Sample Volume, cf	**50.276**	**56.029**	**51.470**	**55.407**	**49.238**	**56.037**	**53.076**
DGM Calibration Factor	1.014	0.975	1.014	0.975	1.014	0.975	0.995
Average DGM Temp, F	62.6	61.8	53.1	80.2	52.4	82.0	65.4
Average DGM delta H, "H2O	2.29	2.44	2.41	2.38	2.41	2.44	2.40
Barometric Pressure, "Hg	29.00	29.00	29.00	29.00	29.00	29.00	29.00
Corrected Sample Vol, dscf	**50.181**	**53.875**	**52.340**	**51.455**	**50.139**	**51.875**	**51.644**
Corrected Sample Vol, dscm	**1.421**	**1.526**	**1.482**	**1.457**	**1.420**	**1.469**	**1.463**
Sample Volume (at Stack Conditions), acf	**70.497**	**76.056**	**73.191**	**72.958**	**69.969**	**73.427**	**72.683**
Sample Volume (at Stack Conditions), acm	**1.996**	**2.154**	**2.073**	**2.066**	**1.981**	**2.079**	**2.058**
Oxygen, %	15.2	15.2	15.2	15.2	15.5	15.5	15.3
Carbon Dioxide, %	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Nitrogen, %	75.8	75.8	75.8	75.8	75.5	75.5	75.7
Stack Gas Excess Air, %	315.9	315.9	315.9	315.9	349.7	349.7	327.2
Total Moisture Catch Weight, grams	219.2	235.7	223.4	233.0	210.9	233.8	225.9
Stack Gas Moisture, %	**17.1**	**17.1**	**16.8**	**17.6**	**16.6**	**17.5**	**17.1**
Stack Gas Dry Molecular Weight, lb/lbmole	30.05	30.05	30.05	30.05	30.06	30.06	30.05
Stack Gas Wet Molecular Weight, lb/lbmole	27.99	27.99	28.02	27.93	28.06	27.95	27.99
Average Stack Temp, F	135.4	138.3	134.8	137.3	135.0	137.0	136.3
Stack Static (Gauge) Pressure, "H2O	-0.35	-0.35	-0.35	-0.35	-0.35	-0.35	-0.35
Stack Gas Actual Pressure, "Hg	28.97	28.97	28.97	28.97	28.97	28.97	28.97
Average Sqrt delta P *	0.919	0.962	0.941	0.943	0.943	0.951	0.943
Pitot Tube Coefficient	0.82	0.85	0.82	0.85	0.82	0.85	0.84
Stack Gas Velocity, ft/second	**55.20**	**60.05**	**56.47**	**58.88**	**56.56**	**59.34**	**57.75**
Nozzle Inside Diameter, inches	0.250	0.250	0.250	0.250	0.250	0.250	
Total Sample Time, min	60	60	60	60	60	60	60
Isokinetic Rate, %	**104.1**	**103.3**	**105.7**	**101.0**	**100.9**	**100.9**	**102.7**
Stack Dimensions	161.5 in. ID	161.5 in. ID	161.5 in. ID	161.5 in. ID	161.5 in. ID	161.5 in. ID	
Stack Area, sq ft	142.26	142.26	142.26	142.26	142.26	142.26	142.26
Actual Stack Gas Flow Rate, acfm	**471,200**	**512,600**	**482,000**	**502,600**	**482,800**	**506,500**	**493,000**
Actual Stack Gas Flow Rate, acmm	13,343	14,515	13,649	14,232	13,671	14,343	13,959
Stack Gas Flow Rate, dscfm	**335,400**	**363,100**	**344,700**	**354,500**	**346,000**	**357,800**	**350,300**
Stack Gas Flow Rate, dscmm	9,498	10,282	9,761	10,038	9,798	10,132	9,918
ASTM 7459-08; Max Sampling Deviation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
ASTM 7459-08; Stack Flow Deviation	3.1%	11.8%	5.9%	7.6%	6.0%	7.2%	
ALT-009 Post Test Calibration	pass	pass	pass	pass	pass	pass	

Company: Holcim; Midlothian TX
Source: Line 1 Main Stack; Raw Mill On
Job ID: 23-3313
Train Type: EPA Method 26A

NOTE: Average INCLUDES Non-detect runs' results

"ND()" denotes values below detection limits

		1A 11/15/23 900-1009	1B 11/15/23 900-1009	2A 11/15/23 1032-1141	2B 11/15/23 1032-1141	3A 11/15/23 1202-1311	3B 11/15/23 1202-1311	Average
Hydrogen Fluoride	Catch Wt, mg	ND(0.126)	ND(0.132)	ND(0.155)	ND(0.149)	ND(0.139)	ND(0.155)	ND(0.143)
	Conc., mg/dscm	ND(0.089)	ND(0.087)	ND(0.105)	ND(0.102)	ND(0.098)	ND(0.106)	ND(0.098)
	Conc., mg/dscm @ 7% O2	ND(0.216)	ND(0.211)	ND(0.255)	ND(0.249)	ND(0.252)	ND(0.272)	ND(0.243)
	Conc., mg/dscm @ 12% CO2	ND(0.118)	ND(0.115)	ND(0.139)	ND(0.136)	ND(0.131)	ND(0.141)	ND(0.130)
	Conc., ppmvd	ND(0.107)	ND(0.104)	ND(0.126)	ND(0.123)	ND(0.118)	ND(0.127)	ND(0.117)
	Conc., ppmvd @ 7% O2	ND(0.260)	ND(0.254)	ND(0.307)	ND(0.300)	ND(0.303)	ND(0.327)	ND(0.292)
	Conc., ppmvd @ 12% CO2	ND(0.142)	ND(0.139)	ND(0.168)	ND(0.164)	ND(0.157)	ND(0.169)	ND(0.156)
	Emission Rate, lb/hr	ND(0.111)	ND(0.118)	ND(0.135)	ND(0.136)	ND(0.127)	ND(0.141)	ND(0.128)
	Clinker Rates (mtph and lbs/ton)	130.96	ND(0.0008)	130.96	ND(0.0009)	130.96	ND(0.0009)	ND(0.0009)
Chlorine	Catch Wt, mg	ND(0.176)	ND(0.203)	0.582	ND(0.348)	ND(0.300)	ND(0.350)	< 0.327
	Conc., mg/dscm	ND(0.124)	ND(0.133)	0.393	ND(0.239)	ND(0.211)	ND(0.238)	< 0.223
	Conc., mg/dscm @ 7% O2	ND(0.302)	ND(0.324)	0.958	ND(0.582)	ND(0.544)	ND(0.613)	< 0.554
	Conc., mg/dscm @ 12% CO2	ND(0.165)	ND(0.177)	0.524	ND(0.318)	ND(0.282)	ND(0.318)	< 0.297
	Conc., ppmvd	ND(0.042)	ND(0.045)	0.133	ND(0.081)	ND(0.072)	ND(0.081)	< 0.076
	Absolute Difference, ppmvd (<0.2 required)		0.00		0.05		0.01	
	Conc., ppmvd @ 7% O2	ND(0.102)	ND(0.110)	0.325	ND(0.198)	ND(0.184)	ND(0.208)	< 0.188
	Conc., ppmvd @ 12% CO2	ND(0.056)	ND(0.060)	0.178	ND(0.108)	ND(0.096)	ND(0.108)	< 0.101
	Emission Rate, lb/hr	ND(0.156)	ND(0.181)	0.507	ND(0.317)	ND(0.274)	ND(0.319)	< 0.292
	Clinker Rates (mtph and lbs/ton)	130.96	ND(0.0012)	130.96	ND(0.0029)	130.96	ND(0.0021)	< 0.0020

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill On
Run 1

Spectrum	Date	Time	HCN PCA 191c R1 191c	HF ppm (10) 191C	SF6 (10) 191C	Ethylene (100,3000) 191C	H2O% (40) 191C	CO2% (40) 191C
SPC__001503.LAB	11/15/23	09:00:21.475	21.016	0.295	-0.004	6.095	16.866	7.147
SPC__001504.LAB	11/15/23	09:01:25.608	20.808	0.287	-0.003	6.082	16.601	7.101
SPC__001505.LAB	11/15/23	09:02:29.285	20.625	0.288	-0.004	6.000	16.869	7.025
SPC__001506.LAB	11/15/23	09:03:33.148	20.769	0.249	-0.004	6.056	16.953	6.997
SPC__001507.LAB	11/15/23	09:04:37.437	20.449	0.308	-0.004	6.057	17.345	7.005
SPC__001508.LAB	11/15/23	09:05:40.993	20.453	0.261	-0.006	5.986	17.268	6.941
SPC__001509.LAB	11/15/23	09:06:44.946	20.223	0.273	-0.005	5.912	17.195	7.015
SPC__001510.LAB	11/15/23	09:07:48.766	20.171	0.265	-0.006	5.837	17.349	6.987
SPC__001511.LAB	11/15/23	09:08:52.707	20.291	0.292	-0.004	5.879	17.233	6.991
SPC__001512.LAB	11/15/23	09:09:56.582	20.112	0.295	-0.004	5.890	17.187	7.018
SPC__001513.LAB	11/15/23	09:11:00.870	19.922	0.299	-0.004	5.827	17.745	6.902
SPC__001514.LAB	11/15/23	09:12:04.389	19.901	0.287	-0.004	5.905	17.205	7.118
SPC__001515.LAB	11/15/23	09:13:08.301	19.777	0.282	-0.006	5.892	17.608	7.216
SPC__001516.LAB	11/15/23	09:14:12.590	19.922	0.258	-0.005	6.059	17.159	7.137
SPC__001517.LAB	11/15/23	09:15:16.105	19.677	0.315	-0.008	5.995	17.816	6.948
SPC__001518.LAB	11/15/23	09:16:20.016	19.877	0.259	-0.006	5.932	17.437	6.973
SPC__001519.LAB	11/15/23	09:17:23.914	19.573	0.285	-0.005	5.948	17.711	7.013
SPC__001520.LAB	11/15/23	09:18:27.820	19.134	0.277	-0.006	5.846	18.603	6.794
SPC__001521.LAB	11/15/23	09:19:31.729	19.081	0.315	-0.005	5.833	18.050	6.858
SPC__001522.LAB	11/15/23	09:20:35.745	19.311	0.304	-0.005	5.867	17.885	6.880
SPC__001523.LAB	11/15/23	09:21:39.951	19.036	0.283	-0.006	5.832	17.770	6.918
SPC__001524.LAB	11/15/23	09:22:43.528	18.932	0.269	-0.004	5.795	17.847	6.858
SPC__001525.LAB	11/15/23	09:23:47.343	18.864	0.306	-0.004	5.693	18.021	6.856
SPC__001526.LAB	11/15/23	09:24:51.247	18.911	0.264	-0.007	5.775	17.622	6.907
SPC__001527.LAB	11/15/23	09:25:55.540	18.892	0.278	-0.005	5.742	18.053	6.857
SPC__001528.LAB	11/15/23	09:26:59.055	18.957	0.256	-0.004	5.746	17.999	6.977
SPC__001529.LAB	11/15/23	09:28:02.960	18.603	0.261	-0.005	5.664	18.067	6.973
SPC__001530.LAB	11/15/23	09:29:06.868	18.674	0.259	-0.002	5.653	18.071	7.111
SPC__001531.LAB	11/15/23	09:30:11.038	18.727	0.266	-0.005	5.804	18.086	7.103
SPC__001532.LAB	11/15/23	09:31:14.710	18.562	0.267	-0.005	5.743	18.004	6.966
SPC__001533.LAB	11/15/23	09:32:18.629	18.540	0.258	-0.003	5.806	17.787	6.978
SPC__001534.LAB	11/15/23	09:33:22.535	18.587	0.268	-0.005	5.721	18.139	6.851
SPC__001535.LAB	11/15/23	09:34:26.764	18.417	0.249	-0.007	5.696	17.948	6.966
SPC__001536.LAB	11/15/23	09:35:30.300	18.509	0.281	-0.004	5.754	17.946	6.930
SPC__001537.LAB	11/15/23	09:36:34.201	18.561	0.277	-0.005	5.711	17.801	6.915
SPC__001538.LAB	11/15/23	09:37:38.227	18.431	0.316	-0.004	5.817	18.039	6.927
SPC__001539.LAB	11/15/23	09:38:42.071	18.270	0.353	-0.004	5.810	18.216	6.772
SPC__001540.LAB	11/15/23	09:39:46.064	18.570	0.302	-0.005	5.814	18.151	6.814
SPC__001541.LAB	11/15/23	09:40:49.816	18.781	0.282	-0.006	5.579	18.183	6.697
SPC__001542.LAB	11/15/23	09:41:54.084	18.730	0.281	-0.005	5.562	18.269	6.722
SPC__001543.LAB	11/15/23	09:42:57.624	18.904	0.282	-0.006	5.668	18.013	6.770
SPC__001544.LAB	11/15/23	09:44:01.625	18.922	0.264	-0.004	5.548	17.934	6.825
SPC__001545.LAB	11/15/23	09:45:05.437	18.949	0.237	-0.007	5.656	17.661	7.072
SPC__001546.LAB	11/15/23	09:46:09.387	19.176	0.233	-0.004	5.609	17.904	6.991
SPC__001547.LAB	11/15/23	09:47:13.343	19.013	0.220	-0.003	5.734	18.075	6.902
SPC__001548.LAB	11/15/23	09:48:17.205	19.157	0.260	-0.003	5.678	17.981	6.762
SPC__001549.LAB	11/15/23	09:49:21.047	19.108	0.235	-0.006	5.602	17.762	6.781
SPC__001550.LAB	11/15/23	09:50:24.952	19.300	0.222	-0.008	5.671	17.806	6.781
SPC__001551.LAB	11/15/23	09:51:28.970	18.921	0.211	-0.005	5.558	18.089	6.832
SPC__001552.LAB	11/15/23	09:52:32.801	18.869	0.215	-0.005	5.694	17.939	7.042
SPC__001553.LAB	11/15/23	09:53:36.696	19.027	0.201	-0.005	5.677	17.795	6.954
SPC__001554.LAB	11/15/23	09:54:40.603	19.006	0.197	-0.005	5.662	17.730	6.908
SPC__001555.LAB	11/15/23	09:55:44.465	19.119	0.190	-0.005	5.681	17.904	6.861
SPC__001556.LAB	11/15/23	09:56:48.368	18.892	0.201	-0.004	5.713	18.224	6.861
SPC__001557.LAB	11/15/23	09:57:52.272	18.953	0.196	-0.005	5.747	18.157	6.897
SPC__001558.LAB	11/15/23	09:58:56.172	19.131	0.185	-0.005	5.681	17.980	6.871
SPC__001559.LAB	11/15/23	10:00:00.074	18.712	0.190	-0.004	5.764	17.880	7.056
SPC__001560.LAB	11/15/23	10:01:03.980	18.931	0.190	-0.006	5.768	17.784	7.171
SPC__001561.LAB	11/15/23	10:02:07.968	18.700	0.189	-0.004	5.809	18.041	7.008
SPC__001562.LAB	11/15/23	10:03:11.877	18.784	0.185	-0.005	5.821	17.882	6.955
SPC__001563.LAB	11/15/23	10:04:15.737	19.061	0.211	-0.006	5.770	17.703	6.922
SPC__001564.LAB	11/15/23	10:05:19.637	19.147	0.263	-0.002	5.892	17.860	6.935
SPC__001565.LAB	11/15/23	10:06:23.539	19.221	0.249	-0.005	5.812	18.094	6.848
SPC__001566.LAB	11/15/23	10:07:27.399	18.983	0.208	-0.007	5.695	17.989	6.886
SPC__001567.LAB	11/15/23	10:08:31.579	19.165	0.199	-0.004	5.758	17.718	6.871
SPC__001568.LAB	11/15/23	10:09:35.199	19.504	0.190	-0.005	5.789	17.540	6.980
Mill On Run 1 Averages		**(actual)**	**19.232**	**0.256**	**-0.005**	**5.789**	**17.781**	**6.938**
Oxygen	**15.2%**	**(ppm,dry @7% O2)**	**56.573**	**0.753**				
DSCFM	**349,250**	**(lbs/hr)**	**34.094**	**0.336**		**M26A Average Moisture**	**17.1**	
metric tons/hr	**130.96**	**(lbs/ton clinker)**	**0.236**	**0.002**				

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill On
Run 2

Spectrum	Date	Time	HCN PCA 191c R1 191c	HF ppm (10) 19	SF6 (10) 191C	Ethylene (100,3000) 191C	H2O% (40) 191C	CO2% (40) 191C
SPC__001589.LAB	11/15/23	10:32:31.133	20.280	0.092	-0.007	5.967	14.675	7.536
SPC__001590.LAB	11/15/23	10:33:35.046	20.108	0.074	-0.007	5.985	15.492	7.428
SPC__001591.LAB	11/15/23	10:34:39.019	20.112	0.088	-0.004	5.828	15.948	7.135
SPC__001592.LAB	11/15/23	10:35:42.803	19.453	0.123	-0.006	5.891	17.156	7.045
SPC__001593.LAB	11/15/23	10:36:46.766	19.477	0.115	-0.007	5.801	17.525	6.939
SPC__001594.LAB	11/15/23	10:37:50.605	19.279	0.118	-0.006	5.787	17.744	6.896
SPC__001595.LAB	11/15/23	10:38:54.842	19.421	0.118	-0.005	5.685	17.809	6.849
SPC__001596.LAB	11/15/23	10:39:58.409	19.444	0.112	-0.004	5.758	17.499	6.964
SPC__001597.LAB	11/15/23	10:41:02.352	19.468	0.128	-0.003	5.790	17.663	6.895
SPC__001598.LAB	11/15/23	10:42:06.264	19.665	0.102	-0.006	5.682	17.613	6.862
SPC__001599.LAB	11/15/23	10:43:10.152	19.687	0.115	-0.004	5.750	17.181	6.947
SPC__001600.LAB	11/15/23	10:44:14.349	19.554	0.109	-0.004	5.678	17.428	6.859
SPC__001601.LAB	11/15/23	10:45:17.907	19.561	0.108	-0.004	5.682	17.226	7.005
SPC__001602.LAB	11/15/23	10:46:21.853	19.710	0.098	-0.005	5.691	17.227	6.978
SPC__001603.LAB	11/15/23	10:47:25.752	19.542	0.097	-0.003	5.614	17.274	6.888
SPC__001604.LAB	11/15/23	10:48:29.655	19.512	0.113	-0.004	5.609	17.214	7.108
SPC__001605.LAB	11/15/23	10:49:33.514	19.660	0.089	-0.004	5.720	17.723	7.140
SPC__001606.LAB	11/15/23	10:50:37.522	19.380	0.112	-0.007	5.814	18.012	7.018
SPC__001607.LAB	11/15/23	10:51:41.405	19.518	0.107	-0.002	5.663	17.621	6.838
SPC__001608.LAB	11/15/23	10:52:45.581	19.291	0.108	-0.005	5.655	17.983	6.824
SPC__001609.LAB	11/15/23	10:53:49.159	19.095	0.128	-0.006	5.665	18.401	6.773
SPC__001610.LAB	11/15/23	10:54:53.048	19.509	0.101	-0.003	5.640	17.335	6.808
SPC__001611.LAB	11/15/23	10:55:57.317	19.346	0.103	-0.006	5.728	17.343	6.877
SPC__001612.LAB	11/15/23	10:57:00.814	19.472	0.082	-0.006	5.600	17.498	6.771
SPC__001613.LAB	11/15/23	10:58:04.716	19.384	0.083	-0.005	5.596	17.443	6.824
SPC__001614.LAB	11/15/23	10:59:08.617	19.666	0.094	-0.006	5.596	17.562	6.820
SPC__001615.LAB	11/15/23	11:00:12.565	19.096	0.114	-0.006	5.551	18.311	6.784
SPC__001616.LAB	11/15/23	11:01:16.411	19.125	0.089	-0.004	5.600	17.781	6.827
SPC__001617.LAB	11/15/23	11:02:20.320	19.189	0.083	-0.004	5.594	17.416	6.891
SPC__001618.LAB	11/15/23	11:03:24.216	19.065	0.094	-0.004	5.654	17.801	6.935
SPC__001619.LAB	11/15/23	11:04:28.209	19.130	0.101	-0.007	5.611	17.592	7.102
SPC__001620.LAB	11/15/23	11:05:32.025	19.007	0.098	-0.006	5.804	17.549	7.238
SPC__001621.LAB	11/15/23	11:06:35.951	18.947	0.090	-0.006	5.855	17.635	7.083
SPC__001622.LAB	11/15/23	11:07:39.911	19.026	0.095	-0.005	5.785	17.459	6.946
SPC__001623.LAB	11/15/23	11:08:43.722	18.603	0.099	-0.005	5.749	18.586	6.806
SPC__001624.LAB	11/15/23	11:09:47.902	19.045	0.082	-0.004	5.719	17.355	6.846
SPC__001625.LAB	11/15/23	11:10:51.901	18.927	0.094	-0.005	5.693	17.596	6.859
SPC__001626.LAB	11/15/23	11:11:55.811	19.186	0.086	-0.006	5.713	17.340	6.914
SPC__001627.LAB	11/15/23	11:12:59.374	19.051	0.083	-0.007	5.674	17.587	6.901
SPC__001628.LAB	11/15/23	11:14:03.259	19.034	0.083	-0.004	5.689	17.689	6.844
SPC__001629.LAB	11/15/23	11:15:07.165	19.174	0.082	-0.005	5.643	17.335	6.889
SPC__001630.LAB	11/15/23	11:16:11.094	18.905	0.099	-0.004	5.710	17.769	6.898
SPC__001631.LAB	11/15/23	11:17:14.922	19.088	0.101	-0.006	5.657	18.094	6.823
SPC__001632.LAB	11/15/23	11:18:18.825	19.009	0.081	-0.006	5.691	17.864	6.872
SPC__001633.LAB	11/15/23	11:19:22.787	18.650	0.088	-0.003	5.641	18.757	6.705
SPC__001634.LAB	11/15/23	11:20:26.623	18.724	0.053	-0.008	5.640	17.981	7.087
SPC__001635.LAB	11/15/23	11:21:30.525	18.747	0.086	-0.005	5.687	18.019	7.153
SPC__001636.LAB	11/15/23	11:22:34.421	18.441	0.096	-0.005	5.602	18.546	6.886
SPC__001637.LAB	11/15/23	11:23:38.321	18.442	0.069	-0.006	5.635	18.443	6.842
SPC__001638.LAB	11/15/23	11:24:42.224	18.615	0.095	-0.004	5.507	17.950	6.770
SPC__001639.LAB	11/15/23	11:25:46.501	18.389	0.101	-0.006	5.619	18.531	6.799
SPC__001640.LAB	11/15/23	11:26:50.050	18.652	0.073	-0.005	5.644	17.604	6.810
SPC__001641.LAB	11/15/23	11:27:54.010	18.650	0.083	-0.006	5.628	17.712	6.835
SPC__001642.LAB	11/15/23	11:28:57.813	18.546	0.088	-0.006	5.743	17.969	6.903
SPC__001643.LAB	11/15/23	11:30:02.099	18.929	0.087	-0.004	5.760	17.627	6.881
SPC__001644.LAB	11/15/23	11:31:05.993	18.995	0.094	-0.005	5.858	17.474	6.950
SPC__001645.LAB	11/15/23	11:32:09.508	19.258	0.089	-0.005	5.834	17.184	6.920
SPC__001646.LAB	11/15/23	11:33:13.505	19.204	0.079	-0.008	5.933	17.346	6.979
SPC__001647.LAB	11/15/23	11:34:17.609	18.880	0.103	-0.006	5.846	18.327	6.805
SPC__001648.LAB	11/15/23	11:35:21.209	18.900	0.096	-0.005	5.822	18.014	6.821
SPC__001649.LAB	11/15/23	11:36:25.139	18.852	0.092	-0.006	5.891	17.746	7.131
SPC__001650.LAB	11/15/23	11:37:29.054	18.785	0.108	-0.005	5.847	18.001	7.102
SPC__001651.LAB	11/15/23	11:38:32.907	18.954	0.091	-0.006	5.957	17.842	7.157
SPC__001652.LAB	11/15/23	11:39:36.810	18.624	0.099	-0.004	5.856	18.362	6.898
SPC__001653.LAB	11/15/23	11:40:40.813	18.879	0.114	-0.004	5.886	17.805	6.931
Mill On Run 2 Averages		**(actual)**	**19.159**	**0.096**	**-0.005**	**5.725**	**17.625**	**6.936**
Oxygen	**15.2%**	**(ppm,dry @7% O2)**	**56.426**	**0.284**				
DSCFM	**349,600**	**(lbs/hr)**	**34.039**	**0.127**		**M26A Average Moisture**	**17.2**	
metric tons/hr	**130.96**	**(lbs/ton clinker)**	**0.236**	**0.001**				

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill On
Run 3

Spectrum	Date	Time	HCN PCA 191c R1 191c	HF ppm (10) 191C	SF6 (10) 191C	Ethylene (100,3000) 191C	H2O% (40) 191C	CO2% (40) 191C
SPC__001672.LAB	11/15/23	12:02:55.133	19.107	0.079	-0.005	5.758	17.840	6.832
SPC__001673.LAB	11/15/23	12:03:59.071	18.788	0.096	-0.005	5.831	18.031	6.868
SPC__001674.LAB	11/15/23	12:05:02.927	19.155	0.075	-0.004	5.853	17.929	6.866
SPC__001675.LAB	11/15/23	12:06:07.136	18.582	0.119	-0.005	5.864	18.587	6.784
SPC__001676.LAB	11/15/23	12:07:10.692	19.064	0.099	-0.003	5.841	17.959	6.745
SPC__001677.LAB	11/15/23	12:08:14.616	18.763	0.082	-0.005	5.762	18.324	6.943
SPC__001678.LAB	11/15/23	12:09:18.523	18.869	0.089	-0.005	5.902	18.451	7.125
SPC__001679.LAB	11/15/23	12:10:22.419	19.032	0.047	-0.005	5.876	18.533	6.833
SPC__001680.LAB	11/15/23	12:11:26.395	19.196	0.100	-0.001	5.984	17.853	6.904
SPC__001681.LAB	11/15/23	12:12:30.270	19.064	0.087	-0.004	5.814	18.322	6.775
SPC__001682.LAB	11/15/23	12:13:34.161	19.133	0.107	-0.004	5.857	18.348	6.880
SPC__001683.LAB	11/15/23	12:14:38.395	19.176	0.087	-0.005	5.909	17.977	6.858
SPC__001684.LAB	11/15/23	12:15:41.967	19.351	0.093	-0.004	5.867	17.962	6.798
SPC__001685.LAB	11/15/23	12:16:46.122	19.186	0.090	-0.007	5.922	18.092	6.825
SPC__001686.LAB	11/15/23	12:17:50.020	19.530	0.080	-0.006	5.979	17.564	6.864
SPC__001687.LAB	11/15/23	12:18:53.919	19.340	0.093	-0.005	5.982	18.123	6.875
SPC__001688.LAB	11/15/23	12:19:57.515	19.589	0.085	-0.005	6.010	17.695	6.872
SPC__001689.LAB	11/15/23	12:21:01.499	19.689	0.085	-0.007	6.008	18.074	6.874
SPC__001690.LAB	11/15/23	12:22:05.364	19.748	0.099	-0.005	6.031	17.980	6.898
SPC__001691.LAB	11/15/23	12:23:09.170	19.814	0.082	-0.005	5.931	17.565	6.859
SPC__001692.LAB	11/15/23	12:24:13.063	19.325	0.096	-0.006	6.034	18.429	7.036
SPC__001693.LAB	11/15/23	12:25:17.017	19.514	0.076	-0.006	6.122	17.963	7.226
SPC__001694.LAB	11/15/23	12:26:20.908	19.174	0.115	-0.005	6.137	18.492	7.005
SPC__001695.LAB	11/15/23	12:27:25.134	19.445	0.092	-0.005	6.059	17.680	6.961
SPC__001696.LAB	11/15/23	12:28:29.031	19.126	0.101	-0.006	5.997	18.390	6.868
SPC__001697.LAB	11/15/23	12:29:32.650	19.173	0.088	-0.005	6.073	17.869	6.900
SPC__001698.LAB	11/15/23	12:30:36.453	18.847	0.083	-0.005	5.967	18.025	6.875
SPC__001699.LAB	11/15/23	12:31:40.417	19.126	0.074	-0.004	6.075	17.838	6.978
SPC__001700.LAB	11/15/23	12:32:44.255	18.940	0.095	-0.006	5.923	17.636	6.812
SPC__001701.LAB	11/15/23	12:33:48.151	18.921	0.055	-0.004	5.954	17.646	6.848
SPC__001702.LAB	11/15/23	12:34:52.048	19.074	0.086	-0.004	6.049	17.708	6.962
SPC__001703.LAB	11/15/23	12:35:55.953	19.229	0.084	-0.005	6.016	17.807	6.972
SPC__001704.LAB	11/15/23	12:36:59.846	18.883	0.064	-0.005	6.046	18.348	6.958
SPC__001705.LAB	11/15/23	12:38:03.743	19.373	0.097	-0.006	5.889	18.083	6.865
SPC__001706.LAB	11/15/23	12:39:07.709	19.281	0.099	-0.005	5.948	17.885	6.900
SPC__001707.LAB	11/15/23	12:40:11.539	19.211	0.086	-0.003	5.883	17.948	7.017
SPC__001708.LAB	11/15/23	12:41:15.797	19.104	0.102	-0.005	5.946	18.464	7.087
SPC__001709.LAB	11/15/23	12:42:19.344	19.173	0.088	-0.005	5.973	18.389	6.938
SPC__001710.LAB	11/15/23	12:43:23.236	19.504	0.088	-0.004	5.866	17.846	6.845
SPC__001711.LAB	11/15/23	12:44:27.135	19.319	0.087	-0.006	5.881	18.167	6.861
SPC__001712.LAB	11/15/23	12:45:31.039	19.264	0.091	-0.004	5.805	18.013	6.753
SPC__001713.LAB	11/15/23	12:46:34.990	19.666	0.080	-0.006	5.876	17.688	6.821
SPC__001714.LAB	11/15/23	12:47:38.829	19.503	0.091	-0.003	5.871	17.906	6.790
SPC__001715.LAB	11/15/23	12:48:42.734	19.370	0.113	-0.005	5.788	18.104	6.886
SPC__001716.LAB	11/15/23	12:49:46.627	19.339	0.114	-0.006	5.914	17.835	6.916
SPC__001717.LAB	11/15/23	12:50:50.524	19.622	0.115	-0.005	5.904	17.610	6.928
SPC__001718.LAB	11/15/23	12:51:54.468	19.660	0.113	-0.005	6.047	17.557	6.980
SPC__001719.LAB	11/15/23	12:52:58.375	19.547	0.110	-0.005	6.089	17.705	6.850
SPC__001720.LAB	11/15/23	12:54:02.307	19.291	0.114	-0.007	6.084	18.259	6.832
SPC__001721.LAB	11/15/23	12:55:06.128	19.636	0.104	-0.008	6.164	17.751	6.870
SPC__001722.LAB	11/15/23	12:56:10.137	19.517	0.099	-0.004	6.167	17.631	7.091
SPC__001723.LAB	11/15/23	12:57:13.946	19.287	0.108	-0.004	6.394	18.104	7.255
SPC__001724.LAB	11/15/23	12:58:17.874	19.734	0.099	-0.008	6.298	17.651	7.012
SPC__001725.LAB	11/15/23	12:59:21.718	19.521	0.110	-0.006	6.322	17.894	6.916
SPC__001726.LAB	11/15/23	13:00:25.681	20.001	0.068	-0.005	6.238	17.281	6.836
SPC__001727.LAB	11/15/23	13:01:29.520	20.005	0.060	-0.007	6.125	17.337	6.867
SPC__001728.LAB	11/15/23	13:02:33.478	19.735	0.107	-0.004	5.908	18.144	6.781
SPC__001729.LAB	11/15/23	13:03:37.327	19.909	0.056	-0.007	5.907	17.213	6.851
SPC__001730.LAB	11/15/23	13:04:41.218	19.763	0.087	-0.006	5.907	17.685	6.857
SPC__001731.LAB	11/15/23	13:05:45.112	19.743	0.076	-0.005	5.864	17.833	6.781
SPC__001732.LAB	11/15/23	13:06:49.013	19.831	0.056	-0.005	6.006	17.173	6.956
SPC__001733.LAB	11/15/23	13:07:52.951	19.629	0.091	-0.003	5.880	17.632	6.818
SPC__001734.LAB	11/15/23	13:08:56.913	19.819	0.026	-0.005	5.875	17.243	6.893
SPC__001735.LAB	11/15/23	13:10:01.094	19.602	0.075	-0.006	5.868	17.712	6.880
SPC__001736.LAB	11/15/23	13:11:04.606	19.993	0.044	-0.006	5.963	17.239	6.956
Mill On Run 3 Averages		**(actual)**	**19.368**	**0.088**	**-0.005**	**5.970**	**17.908**	**6.901**
Oxygen	**15.5%**	**(ppm,dry @7% O2)**	**60.065**	**0.274**				
DSCFM	**351,900**	**(lbs/hr)**	**34.554**	**0.117**		**M26A Average Moisture**	**17.0**	
metric tons/hr	**130.96**	**(lbs/ton clinker)**	**0.239**	**0.001**				

Company: Holcim; Midlothian TX
Source: Line 1 Main Stack; Raw Mill Off
Job ID: 23-3313
Train Type: EPA Method 26A

	4A 11/15/23 1432-1541	4B 11/15/23 1432-1541	5A 11/15/23 1556-1705	5B 11/15/23 1556-1705	6A 11/15/23 1719-1828	6B 11/15/23 1719-1828	Average
Initial Meter Volume, ft^3	904.288	428.837	949.293	484.860	997.561	537.490	
Final Meter Volume, ft^3	948.713	484.635	997.290	537.081	1044.123	588.199	
Intra-Port Leak Check Volume, ft^3	0.000	0.000	0.000	0.000	0.000	0.000	
Total Sample Volume, cf	**44.425**	**55.798**	**47.997**	**52.221**	**46.562**	**50.709**	**49.619**
DGM Calibration Factor	1.014	0.975	1.014	0.975	1.014	0.975	0.995
Average DGM Temp, F	60.9	79.8	62.4	82.8	64.8	78.2	71.5
Average DGM delta H, "H2O	1.78	2.49	2.16	2.20	2.05	2.04	2.12
Barometric Pressure, "Hg	29.00	29.00	29.00	29.00	29.00	29.00	29.00
Corrected Sample Vol,dscf	**44.439**	**51.882**	**47.920**	**48.253**	**46.262**	**47.237**	**47.665**
Corrected Sample Vol,dscm	**1.258**	**1.469**	**1.357**	**1.366**	**1.310**	**1.338**	**1.350**
Oxygen, %	14.1	14.1	14.0	14.0	13.6	13.6	13.9
Carbon Dioxide, %	10.7	10.7	10.8	10.8	11.4	11.4	11.0
Nitrogen, %	75.2	75.2	75.2	75.2	75.0	75.0	75.1
Stack Gas Excess Air, %	245.1	245.1	239.2	239.2	219.4	219.4	234.6
Total Moisture Catch Weight, grams	209.3	252.8	217.5	242.6	223.7	237.3	234.5
Stack Gas Moisture, %	**18.1**	**18.7**	**16.5**	**19.1**	**18.5**	**19.1**	**18.3**
Stack Gas Dry Molecular Weight, lb/lbmole	30.28	30.28	30.29	30.29	30.37	30.37	30.31
Stack Gas Wet Molecular Weight, lb/lbmole	28.05	27.98	28.26	27.94	28.08	28.01	28.05
Average Stack Temp, F	140.7	140.7	132.6	140.8	143.3	140.4	139.8
Stack Static (Gauge) Pressure, "H2O	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36
Stack Gas Actual Pressure, "Hg	28.97	28.97	28.97	28.97	28.97	28.97	28.97
Average Sqrt delta P	0.891	0.965	0.892	0.903	0.868	0.868	0.898
Pitot Tube Coefficient	0.82	0.85	0.82	0.85	0.82	0.85	0.84
Stack Gas Velocity, ft/second	**53.70**	**60.37**	**53.20**	**56.53**	**52.40**	**54.26**	**55.08**
Nozzle Inside Diameter, inches	0.250	0.250	0.250	0.250	0.250	0.250	
Total Sample Time, min	60	60	60	60	60	60	60
Isokinetic Rate, %	**96.8**	**101.3**	**102.0**	**101.1**	**104.2**	**103.0**	**101.4**
Stack Dimensions	161.5 in. ID	161.5 in. ID	161.5 in. ID	161.5 in. ID	161.5 in. ID	161.5 in. ID	
Stack Area, sq ft	142.26	142.26	142.26	142.26	142.26	142.26	142.26
Stack Gas Flow Rate, acfm	**458,400**	**515,300**	**454,100**	**482,500**	**447,300**	**463,100**	**470,117**
Stack Gas Flow Rate, acmm	12,981	14,592	12,859	13,663	12,666	13,114	13,313
Stack Gas Flow Rate, dscfm	**319,500**	**356,500**	**327,100**	**332,200**	**308,900**	**319,000**	**327,200**
Stack Gas Flow Rate, dscmm	9,047	10,095	9,262	9,407	8,747	9,033	9,265
ALT-009 Post Test Calibration	pass	pass	pass	pass	pass	pass	

Company: Holcim; Midlothian TX
Source: Line 1 Main Stack; Raw Mill Off
Job ID: 23-3313
Train Type: EPA Method 26A

"ND()" denotes values below detection limits
Note: Average EXCLUDES Non-detect runs' results

		4A 11/15/23 1432-1541	4B 11/15/23 1432-1541	5A 11/15/23 1556-1705	5B 11/15/23 1556-1705	6A 11/15/23 1719-1828	6B 11/15/23 1719-1828	Average
Hydrogen Fluoride	Catch Wt, mg	ND(0.113)	ND(0.161)	ND(0.147)	ND(0.142)	ND(0.15)	)(0.121)	D(0.139)
	Conc., mg/dscm	ND(0.090)	ND(0.110)	ND(0.108)	ND(0.104)	ND(0.115)	)(0.090)	D(0.103)
	Conc., mg/dscm @7% O2	ND(0.184)	ND(0.224)	ND(0.218)	ND(0.209)	ND(0.218)	)(0.172)	D(0.204)
	Conc., mg/dscm @12% CO2	ND(0.101)	ND(0.123)	ND(0.120)	ND(0.116)	ND(0.121)	)(0.095)	D(0.113)
	Conc., ppmvd	ND(0.108)	ND(0.132)	ND(0.130)	ND(0.125)	ND(0.138)	)(0.109)	D(0.124)
	Conc., ppmvd @7% O2	ND(0.221)	ND(0.269)	ND(0.262)	ND(0.252)	ND(0.262)	)(0.207)	D(0.246)
	Conc., ppmvd @12% CO2	ND(0.121)	ND(0.148)	ND(0.145)	ND(0.139)	ND(0.145)	)(0.114)	D(0.135)
	Emission Rate, lb/hr	ND(0.107)	ND(0.146)	ND(0.133)	ND(0.129)	ND(0.132)	)(0.108)	D(0.126)
	Clinker Rates (mtph and lbs/ton)	130.96	ND(0.0009)	130.96	ND(0.0009)	130.96	ND(0.0008)	D(0.0009)
Chlorine	Catch Wt, mg	1.24	1.59	0.533	1.05	0.945	)(0.285)	0.893
	Conc., mg/dscm	0.986	1.082	0.393	0.769	0.721	)(0.213)	0.658
	Conc., mg/dscm @7% O2	2.015	2.212	0.791	1.548	1.374	)(0.406)	1.323
	Conc., mg/dscm @12% CO2	1.105	1.214	0.436	0.854	0.759	)(0.224)	0.728
	Conc., ppmvd	0.334	0.367	0.133	0.261	0.245	)(0.072)	0.223
	Absolute Difference, ppmvd (<0.2 required)		0.03		0.13		0.17	
	Conc., ppmvd @7% O2	0.684	0.751	0.268	0.525	0.466	)(0.138)	0.449
	Conc., ppmvd @12% CO2	0.375	0.412	0.148	0.290	0.258	)(0.076)	0.247
	Emission Rate, lb/hr	1.180	1.445	0.481	0.956	0.835	)(0.255)	0.816
	Clinker Rates (mtph and lbs/ton)	130.96	0.0091	130.96	0.0050	130.96	ND(0.0038)	< 0.0059

Holcim Midlothian TX
Line 1 Main Stack: Raw Mill Off
Run 1

Spectrum	Date	Time	HCN PCA 191c R1 191c		HF ppm (10) 19	SF6 (10) 191C	Ethylene (100,3000) 19	H2O% (40) 191C	CO2% (40) 191C
SPC__001807.LAB	11/15/23	14:32:58.170	23.681		0.113	-0.008	6.878	16.004	8.899
SPC__001808.LAB	11/15/23	14:34:01.784	24.114		0.055	-0.008	6.838	16.768	8.542
SPC__001809.LAB	11/15/23	14:35:05.967	23.518		0.129	-0.008	6.854	17.709	8.441
SPC__001810.LAB	11/15/23	14:36:09.778	22.876		0.042	-0.011	6.858	19.277	8.237
SPC__001811.LAB	11/15/23	14:37:13.381	23.189		0.049	-0.009	6.824	19.171	8.180
SPC__001812.LAB	11/15/23	14:38:17.278	22.797		0.028	-0.007	6.871	19.311	8.191
SPC__001813.LAB	11/15/23	14:39:21.525	22.672		0.035	-0.009	6.641	19.669	8.057
SPC__001814.LAB	11/15/23	14:40:25.072	22.649		0.019	-0.007	6.836	19.818	8.148
SPC__001815.LAB	11/15/23	14:41:28.968	22.759		0.035	-0.005	6.844	19.403	8.153
SPC__001816.LAB	11/15/23	14:42:33.166	22.563		0.020	-0.005	6.855	18.773	8.230
SPC__001817.LAB	11/15/23	14:43:37.119	22.852		0.027	-0.008	6.919	18.938	8.208
SPC__001818.LAB	11/15/23	14:44:40.664	22.589		0.018	-0.008	6.758	19.170	8.180
SPC__001819.LAB	11/15/23	14:45:44.561	22.286		-0.002	-0.006	6.872	19.789	8.157
SPC__001820.LAB	11/15/23	14:46:48.837	22.740		0.015	-0.007	6.749	19.643	8.066
SPC__001821.LAB	11/15/23	14:47:52.399	22.503		-0.003	-0.007	6.809	19.303	8.277
SPC__001822.LAB	11/15/23	14:48:56.251	22.799		0.019	-0.007	6.817	19.427	8.477
SPC__001823.LAB	11/15/23	14:50:00.150	22.789		-0.001	-0.009	6.782	19.686	8.303
SPC__001824.LAB	11/15/23	14:51:04.046	22.942		0.002	-0.008	6.703	19.674	8.158
SPC__001825.LAB	11/15/23	14:52:07.946	22.773		0.001	-0.008	6.608	18.968	8.192
SPC__001826.LAB	11/15/23	14:53:11.887	22.923		-0.001	-0.008	6.762	18.616	8.254
SPC__001827.LAB	11/15/23	14:54:16.115	22.945		0.009	-0.007	6.648	18.488	8.115
SPC__001828.LAB	11/15/23	14:55:19.638	22.723		0.010	-0.008	6.567	18.843	8.051
SPC__001829.LAB	11/15/23	14:56:23.582	22.828		-0.001	-0.007	6.682	18.681	8.092
SPC__001830.LAB	11/15/23	14:57:27.564	22.797		-0.019	-0.005	6.673	18.702	8.080
SPC__001831.LAB	11/15/23	14:58:31.814	22.973		-0.012	-0.007	6.768	18.805	8.119
SPC__001832.LAB	11/15/23	14:59:35.579	22.941		-0.015	-0.008	6.640	19.260	8.127
SPC__001833.LAB	11/15/23	15:00:39.123	22.461		-0.010	-0.009	6.632	19.931	8.134
SPC__001834.LAB	11/15/23	15:01:43.285	22.383		-0.001	-0.004	6.488	19.406	8.006
SPC__001835.LAB	11/15/23	15:02:46.964	22.469		-0.013	-0.007	6.487	18.773	8.125
SPC__001836.LAB	11/15/23	15:03:50.907	22.595		-0.027	-0.006	6.474	18.499	8.272
SPC__001837.LAB	11/15/23	15:04:54.712	22.417		-0.021	-0.006	6.465	18.815	8.477
SPC__001838.LAB	11/15/23	15:05:58.608	22.058		-0.035	-0.007	6.391	18.948	8.268
SPC__001839.LAB	11/15/23	15:07:02.504	22.347		-0.009	-0.005	6.299	18.548	8.127
SPC__001840.LAB	11/15/23	15:08:06.821	22.464		-0.025	-0.008	6.307	19.079	8.116
SPC__001841.LAB	11/15/23	15:09:10.299	22.148		-0.039	-0.008	6.228	19.451	8.016
SPC__001842.LAB	11/15/23	15:10:14.255	22.328		-0.015	-0.008	6.317	18.810	8.134
SPC__001843.LAB	11/15/23	15:11:18.146	22.498		-0.035	-0.003	6.321	18.755	8.094
SPC__001844.LAB	11/15/23	15:12:22.412	22.533		-0.018	-0.004	6.275	18.830	8.092
SPC__001845.LAB	11/15/23	15:13:25.890	22.352		-0.041	-0.008	6.380	19.082	8.108
SPC__001846.LAB	11/15/23	15:14:29.817	22.404		-0.032	-0.008	6.336	19.421	7.955
SPC__001847.LAB	11/15/23	15:15:33.687	22.061		-0.034	-0.008	6.411	19.328	8.022
SPC__001848.LAB	11/15/23	15:16:37.584	22.445		-0.027	-0.008	6.557	19.128	8.018
SPC__001849.LAB	11/15/23	15:17:41.867	22.362		-0.008	-0.008	6.346	19.512	7.975
SPC__001850.LAB	11/15/23	15:18:45.377	21.815		-0.040	-0.008	6.201	19.746	7.990
SPC__001851.LAB	11/15/23	15:19:49.353	22.086		-0.040	-0.009	6.015	19.317	7.960
SPC__001852.LAB	11/15/23	15:20:53.171	22.039		-0.036	-0.006	6.039	19.288	8.239
SPC__001853.LAB	11/15/23	15:21:57.074	21.958		-0.034	-0.005	5.998	19.738	8.100
SPC__001854.LAB	11/15/23	15:23:00.969	21.888		-0.044	-0.006	6.032	19.826	8.103
SPC__001855.LAB	11/15/23	15:24:04.869	22.188		-0.031	-0.006	6.186	19.110	8.081
SPC__001856.LAB	11/15/23	15:25:08.764	22.503		-0.033	-0.006	6.206	18.676	8.068
SPC__001857.LAB	11/15/23	15:26:12.708	22.162		-0.036	-0.007	6.147	19.554	8.110
SPC__001858.LAB	11/15/23	15:27:16.563	22.234		-0.036	-0.006	6.071	19.430	8.153
SPC__001859.LAB	11/15/23	15:28:20.458	21.870		-0.030	-0.007	6.225	18.979	8.225
SPC__001860.LAB	11/15/23	15:29:24.355	21.915		-0.030	-0.007	6.302	19.015	8.250
SPC__001861.LAB	11/15/23	15:30:28.297	21.762		-0.029	-0.007	6.358	19.192	8.229
SPC__001862.LAB	11/15/23	15:31:32.151	21.917		-0.044	-0.005	6.374	19.052	8.162
SPC__001863.LAB	11/15/23	15:32:36.049	21.640		-0.043	-0.006	6.281	19.583	8.079
SPC__001864.LAB	11/15/23	15:33:39.947	22.444		-0.047	-0.009	6.487	18.753	8.163
SPC__001865.LAB	11/15/23	15:34:43.843	22.866		-0.033	-0.007	6.206	18.885	8.031
SPC__001866.LAB	11/15/23	15:35:48.123	21.739		-0.044	-0.008	5.925	19.513	8.212
SPC__001867.LAB	11/15/23	15:36:51.675	21.666		-0.036	-0.006	5.959	19.357	8.381
SPC__001868.LAB	11/15/23	15:37:55.580	22.011		-0.034	-0.005	5.881	18.597	8.182
SPC__001869.LAB	11/15/23	15:38:59.432	22.166		-0.048	-0.006	5.936	18.523	8.169
SPC__001870.LAB	11/15/23	15:40:03.382	21.916		-0.040	-0.005	5.863	19.165	8.070
SPC__001871.LAB	11/15/23	15:41:07.261	21.812		-0.052	-0.004	5.889	19.360	8.105
Mill Off Run 1 Averages		**(actual)**	**22.464**	**<**	**0.032**	**-0.007**	**6.452**	**19.060**	**8.168**
Oxygen	**14.1%**	**(ppm,dry @7% O2)**	**56.273**	**<**	**0.080**				
DSCFM	**338,000**	**(lbs/hr)**	**39.155**	**<**	**0.041**		**M26A Average Moisture**	**18.4**	
metric tons/hr	**130.96**	**(lbs/ton clinker)**	**0.271**	**<**	**0.0003**				

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill Off
Run 2

Spectrum	Date	Time	HCN PCA 191c R1 191c	HF ppm (10) 19	SF6 (10) 191C	Ethylene (100,3000) 191C	H2O% (40) 191C	CO2% (40) 191C
SPC_001885.LAB	11/15/23	15:57:40.634	22.397	-0.025	-0.008	6.834	18.029	8.160
SPC_001886.LAB	11/15/23	15:58:44.529	22.253	-0.026	-0.006	7.012	18.289	8.191
SPC_001887.LAB	11/15/23	15:59:48.781	22.485	-0.038	-0.007	7.049	18.270	8.154
SPC_001888.LAB	11/15/23	16:00:52.328	22.517	-0.031	-0.005	6.999	18.467	8.205
SPC_001889.LAB	11/15/23	16:01:56.224	22.294	-0.039	-0.009	6.809	18.897	8.159
SPC_001890.LAB	11/15/23	16:03:00.213	22.261	-0.035	-0.004	6.702	18.888	8.226
SPC_001891.LAB	11/15/23	16:04:04.063	22.235	-0.040	-0.007	6.702	18.436	8.273
SPC_001892.LAB	11/15/23	16:05:08.316	22.363	-0.034	-0.007	6.459	18.717	8.161
SPC_001893.LAB	11/15/23	16:06:11.815	22.481	-0.032	-0.004	6.348	18.567	8.160
SPC_001894.LAB	11/15/23	16:07:16.099	22.003	-0.042	-0.007	6.106	19.164	8.102
SPC_001895.LAB	11/15/23	16:08:19.609	21.750	-0.034	-0.005	5.960	19.066	8.406
SPC_001896.LAB	11/15/23	16:09:23.508	21.714	-0.036	-0.007	6.014	18.821	8.364
SPC_001897.LAB	11/15/23	16:10:27.407	21.980	-0.050	-0.006	5.871	18.907	8.126
SPC_001898.LAB	11/15/23	16:11:31.306	21.368	-0.062	-0.006	5.846	19.815	8.066
SPC_001899.LAB	11/15/23	16:12:35.329	21.827	-0.048	-0.008	5.981	18.725	8.098
SPC_001900.LAB	11/15/23	16:13:39.620	21.719	-0.037	-0.007	6.075	18.449	8.186
SPC_001901.LAB	11/15/23	16:14:43.048	21.672	-0.044	-0.004	6.114	18.629	8.151
SPC_001902.LAB	11/15/23	16:15:46.943	21.482	-0.027	-0.005	6.117	19.029	8.124
SPC_001903.LAB	11/15/23	16:16:50.892	21.275	-0.044	-0.006	6.208	19.229	8.144
SPC_001904.LAB	11/15/23	16:17:54.739	21.517	-0.037	-0.005	6.340	18.556	8.182
SPC_001905.LAB	11/15/23	16:18:58.686	21.546	-0.037	-0.008	6.401	18.869	8.117
SPC_001906.LAB	11/15/23	16:20:02.488	21.542	-0.035	-0.006	6.288	19.751	8.076
SPC_001907.LAB	11/15/23	16:21:06.444	21.219	-0.035	-0.007	6.410	19.190	8.185
SPC_001908.LAB	11/15/23	16:22:10.524	21.610	-0.040	-0.007	6.596	18.711	8.190
SPC_001909.LAB	11/15/23	16:23:14.182	21.709	-0.040	-0.007	6.379	18.900	8.132
SPC_001910.LAB	11/15/23	16:24:18.465	21.170	-0.042	-0.006	6.404	19.265	8.468
SPC_001911.LAB	11/15/23	16:25:22.023	21.532	-0.055	-0.004	6.410	18.916	8.365
SPC_001912.LAB	11/15/23	16:26:25.876	21.734	-0.047	-0.007	6.415	18.829	8.210
SPC_001913.LAB	11/15/23	16:27:29.848	21.498	-0.047	-0.006	6.332	19.305	8.097
SPC_001914.LAB	11/15/23	16:28:33.668	21.614	-0.043	-0.007	6.346	19.394	8.142
SPC_001915.LAB	11/15/23	16:29:37.567	21.573	-0.036	-0.007	6.383	19.365	8.063
SPC_001916.LAB	11/15/23	16:30:41.945	21.512	-0.053	-0.007	6.460	18.936	8.100
SPC_001917.LAB	11/15/23	16:31:45.403	21.560	-0.059	-0.008	6.519	18.969	8.101
SPC_001918.LAB	11/15/23	16:32:49.256	21.773	-0.052	-0.006	6.471	18.859	8.052
SPC_001919.LAB	11/15/23	16:33:53.150	21.638	-0.049	-0.006	6.529	19.096	8.148
SPC_001920.LAB	11/15/23	16:34:57.074	21.622	-0.042	-0.005	6.558	18.976	8.087
SPC_001921.LAB	11/15/23	16:36:01.335	21.636	-0.046	-0.006	6.464	19.209	8.085
SPC_001922.LAB	11/15/23	16:37:04.894	21.447	-0.044	-0.008	6.439	19.653	8.069
SPC_001923.LAB	11/15/23	16:38:08.743	21.453	-0.040	-0.007	6.287	19.658	7.971
SPC_001924.LAB	11/15/23	16:39:12.931	21.359	-0.050	-0.008	6.400	19.454	8.084
SPC_001925.LAB	11/15/23	16:40:16.578	21.318	-0.064	-0.005	6.340	19.523	8.335
SPC_001926.LAB	11/15/23	16:41:20.840	21.027	-0.049	-0.010	6.570	19.269	8.594
SPC_001927.LAB	11/15/23	16:42:24.719	20.984	-0.045	-0.010	6.686	19.599	8.358
SPC_001928.LAB	11/15/23	16:43:28.627	21.270	-0.049	-0.009	6.659	19.537	8.259
SPC_001929.LAB	11/15/23	16:44:32.172	21.162	-0.053	-0.006	6.570	19.548	8.284
SPC_001930.LAB	11/15/23	16:45:36.025	21.277	-0.044	-0.006	6.243	19.592	8.127
SPC_001931.LAB	11/15/23	16:46:40.306	21.118	-0.063	-0.005	6.166	19.949	8.155
SPC_001932.LAB	11/15/23	16:47:43.818	20.984	-0.042	-0.009	6.016	20.024	7.983
SPC_001933.LAB	11/15/23	16:48:47.715	21.186	-0.048	-0.007	5.916	20.169	7.984
SPC_001934.LAB	11/15/23	16:49:51.875	21.276	-0.068	-0.008	5.857	20.293	8.029
SPC_001935.LAB	11/15/23	16:50:55.552	21.145	-0.056	-0.007	5.711	20.262	7.986
SPC_001936.LAB	11/15/23	16:51:59.404	20.989	-0.066	-0.006	5.792	20.299	8.094
SPC_001937.LAB	11/15/23	16:53:03.408	21.148	-0.058	-0.009	5.655	20.353	8.087
SPC_001938.LAB	11/15/23	16:54:07.298	20.919	-0.053	-0.007	5.608	20.563	8.160
SPC_001939.LAB	11/15/23	16:55:11.130	20.594	-0.053	-0.006	5.584	20.293	8.093
SPC_001940.LAB	11/15/23	16:56:14.993	20.607	-0.080	-0.006	5.514	19.931	8.326
SPC_001941.LAB	11/15/23	16:57:18.889	20.618	-0.058	-0.009	5.820	20.066	8.441
SPC_001942.LAB	11/15/23	16:58:23.173	20.678	-0.048	-0.008	5.937	20.524	8.326
SPC_001943.LAB	11/15/23	16:59:26.680	20.867	-0.059	-0.008	6.007	20.173	8.320
SPC_001944.LAB	11/15/23	17:00:30.668	21.115	-0.058	-0.006	6.164	20.409	8.278
SPC_001945.LAB	11/15/23	17:01:34.523	21.061	-0.056	-0.007	6.226	20.615	8.330
SPC_001946.LAB	11/15/23	17:02:38.377	20.972	-0.050	-0.007	6.319	19.782	8.276
SPC_001947.LAB	11/15/23	17:03:42.275	21.077	-0.067	-0.008	6.356	20.751	8.279
SPC_001948.LAB	11/15/23	17:04:46.556	20.786	-0.033	-0.008	6.519	19.948	8.335
Mill Off Run 2 Averages		**(actual)**	**21.477**	**<** **0.032**	**-0.007**	**6.285**	**19.371**	**8.185**
Oxygen	**14.0%**	**(ppm,dry @7% O2)**	**52.634**	**<** **0.078**				
DSCFM	**329,650**	**(lbs/hr)**	**36.243**	**<** **0.040**		**M26A Average Moisture**	**17.8**	
metric tons/hr	**130.96**	**(lbs/ton clinker)**	**0.251**	**<** **0.0003**				

Holcim Midlothian TX
Line 1 Main Stack: Raw Mill Off
Run 3

Spectrum	Date	Time	HCN PCA 191c R1 191c		HF ppm (10) 19	SF6 (10) 191C	Ethylene (100,3000) 191C	H2O% (40) 191C	CO2% (40) 191C
SPC__001962.LAB	11/15/23	17:19:40.737	21.027		-0.044	-0.010	6.823	19.281	8.443
SPC__001963.LAB	11/15/23	17:20:45.019	21.196		-0.055	-0.010	6.745	19.643	8.411
SPC__001964.LAB	11/15/23	17:21:48.882	21.034		-0.045	-0.009	6.746	20.586	8.393
SPC__001965.LAB	11/15/23	17:22:52.430	21.180		-0.039	-0.009	6.706	19.689	8.347
SPC__001966.LAB	11/15/23	17:23:56.675	21.472		-0.056	-0.006	6.632	20.476	8.308
SPC__001967.LAB	11/15/23	17:25:00.224	21.563		-0.052	-0.010	6.738	20.688	8.339
SPC__001968.LAB	11/15/23	17:26:04.239	21.468		-0.042	-0.007	6.640	19.749	8.257
SPC__001969.LAB	11/15/23	17:27:08.021	21.710		-0.065	-0.011	6.680	20.685	8.308
SPC__001970.LAB	11/15/23	17:28:12.029	21.539		-0.049	-0.007	6.571	20.084	8.427
SPC__001971.LAB	11/15/23	17:29:15.820	21.388		-0.055	-0.008	6.670	21.301	8.514
SPC__001972.LAB	11/15/23	17:30:19.713	20.772		-0.049	-0.009	6.822	20.506	8.417
SPC__001973.LAB	11/15/23	17:31:23.605	20.933		-0.058	-0.009	6.711	21.497	8.253
SPC__001974.LAB	11/15/23	17:32:27.503	20.213		-0.061	-0.006	6.537	21.000	8.168
SPC__001975.LAB	11/15/23	17:33:31.403	20.122		-0.050	-0.010	6.417	20.483	8.025
SPC__001976.LAB	11/15/23	17:34:35.298	19.833		-0.053	-0.010	6.349	20.693	8.066
SPC__001977.LAB	11/15/23	17:35:39.304	19.508		-0.047	-0.008	6.306	20.700	8.011
SPC__001978.LAB	11/15/23	17:36:43.210	19.466		-0.052	-0.007	6.151	20.776	7.990
SPC__001979.LAB	11/15/23	17:37:46.988	19.240		-0.021	-0.009	6.275	20.829	8.035
SPC__001980.LAB	11/15/23	17:38:51.275	19.396		-0.060	-0.011	6.286	20.521	8.034
SPC__001981.LAB	11/15/23	17:39:54.880	19.406		-0.075	-0.009	6.175	20.441	8.119
SPC__001982.LAB	11/15/23	17:40:58.680	19.651		-0.076	-0.009	6.121	21.270	8.104
SPC__001983.LAB	11/15/23	17:42:02.820	19.686		-0.076	-0.009	6.112	20.034	8.223
SPC__001984.LAB	11/15/23	17:43:06.521	19.706		-0.076	-0.009	6.047	20.645	8.228
SPC__001985.LAB	11/15/23	17:44:10.374	19.999		-0.075	-0.006	6.099	20.139	8.475
SPC__001986.LAB	11/15/23	17:45:14.272	20.232		-0.072	-0.008	6.336	20.015	8.616
SPC__001987.LAB	11/15/23	17:46:18.205	20.739		-0.066	-0.009	6.336	20.160	8.505
SPC__001988.LAB	11/15/23	17:47:22.121	20.249		-0.070	-0.009	6.165	20.553	8.416
SPC__001989.LAB	11/15/23	17:48:25.963	20.537		-0.065	-0.008	6.080	19.650	8.327
SPC__001990.LAB	11/15/23	17:49:29.963	20.562		-0.065	-0.012	5.862	20.958	8.173
SPC__001991.LAB	11/15/23	17:50:33.757	20.312		-0.063	-0.009	5.958	20.261	8.245
SPC__001992.LAB	11/15/23	17:51:37.655	20.553		-0.070	-0.007	5.926	21.125	8.269
SPC__001993.LAB	11/15/23	17:52:41.553	20.321		-0.067	-0.008	6.214	19.894	8.361
SPC__001994.LAB	11/15/23	17:53:45.449	20.621		-0.073	-0.009	6.125	20.934	8.305
SPC__001995.LAB	11/15/23	17:54:49.345	20.165		-0.059	-0.006	6.214	20.021	8.353
SPC__001996.LAB	11/15/23	17:55:53.355	20.634		-0.090	-0.006	6.203	20.838	8.333
SPC__001997.LAB	11/15/23	17:56:57.458	20.402		-0.053	-0.009	6.184	19.982	8.447
SPC__001998.LAB	11/15/23	17:58:01.438	20.461		-0.072	-0.007	6.060	21.178	8.311
SPC__001999.LAB	11/15/23	17:59:05.202	20.298		-0.064	-0.008	5.990	20.267	8.224
SPC__002000.LAB	11/15/23	18:00:08.832	20.313		-0.064	-0.009	5.968	21.251	8.543
SPC__002001.LAB	11/15/23	18:01:12.775	20.161		-0.048	-0.012	5.918	20.303	8.469
SPC__002002.LAB	11/15/23	18:02:16.672	20.018		-0.074	-0.010	6.075	20.551	8.401
SPC__002003.LAB	11/15/23	18:03:20.636	20.289		-0.068	-0.006	6.076	20.056	8.393
SPC__002004.LAB	11/15/23	18:04:24.494	20.289		-0.076	-0.010	6.050	21.396	8.282
SPC__002005.LAB	11/15/23	18:05:28.700	20.292		-0.059	-0.004	6.246	19.965	8.411
SPC__002006.LAB	11/15/23	18:06:32.576	20.521		-0.083	-0.008	6.095	20.749	8.360
SPC__002007.LAB	11/15/23	18:07:36.113	20.205		-0.066	-0.009	6.099	19.754	8.423
SPC__002008.LAB	11/15/23	18:08:40.016	20.448		-0.099	-0.008	6.045	20.787	8.379
SPC__002009.LAB	11/15/23	18:09:43.906	20.286		-0.065	-0.006	6.220	19.606	8.465
SPC__002010.LAB	11/15/23	18:10:48.191	20.585		-0.071	-0.009	6.298	20.463	8.438
SPC__002011.LAB	11/15/23	18:11:51.803	20.737		-0.076	-0.009	6.345	20.791	8.454
SPC__002012.LAB	11/15/23	18:12:55.597	20.912		-0.068	-0.006	6.616	20.376	8.579
SPC__002013.LAB	11/15/23	18:14:00.048	21.145		-0.077	-0.009	6.630	20.509	8.546
SPC__002014.LAB	11/15/23	18:15:03.394	21.317		-0.059	-0.006	6.902	20.193	8.682
SPC__002015.LAB	11/15/23	18:16:07.290	21.432		-0.067	-0.009	6.917	20.111	8.848
SPC__002016.LAB	11/15/23	18:17:11.319	21.511		-0.062	-0.011	7.099	19.473	8.996
SPC__002017.LAB	11/15/23	18:18:15.086	21.855		-0.080	-0.011	7.181	19.222	8.911
SPC__002018.LAB	11/15/23	18:19:18.980	22.337		-0.060	-0.010	7.203	19.081	8.780
SPC__002019.LAB	11/15/23	18:20:22.878	21.975		-0.053	-0.010	7.114	19.796	8.675
SPC__002020.LAB	11/15/23	18:21:27.162	22.260		-0.075	-0.007	7.105	18.999	8.640
SPC__002021.LAB	11/15/23	18:22:30.714	22.462		-0.067	-0.010	6.994	19.789	8.639
SPC__002022.LAB	11/15/23	18:23:34.611	22.329		-0.051	-0.011	6.901	20.017	8.587
SPC__002023.LAB	11/15/23	18:24:38.500	22.346		-0.071	-0.010	6.682	20.056	8.605
SPC__002024.LAB	11/15/23	18:25:42.753	22.644		-0.074	-0.006	6.792	19.823	8.638
SPC__002025.LAB	11/15/23	18:26:46.279	22.803		-0.064	-0.011	6.703	19.827	8.546
SPC__002026.LAB	11/15/23	18:27:50.156	22.524		-0.069	-0.010	6.806	20.025	8.633
Mill Off Run 34 Averages		**(actual)**	**20.794**	**<**	**0.032**	**-0.009**	**6.432**	**20.316**	**8.402**
Oxygen	**13.6%**	**(ppm,dry @7% O2)**	**48.760**	**<**	**0.075**				
DSCFM	**313,950**	**(lbs/hr)**	**33.831**	**<**	**0.039**		**M26A Average Moisture**	**18.8**	
metric tons/hr	**130.96**	**(lbs/ton clinker)**	**0.234**	**<**	**0.0003**				

Company: Holcim; Midlothian TX
Source: Line 2 Main Stack; Raw Mill Off
Job ID: 23-3313
Train Type: EPA Method 26A

	1A 11/16/23 1420-1557	1B 11/16/23 1420-1557	2A 11/16/23 1619-1725	2B 11/16/23 1619-1725	3A 11/16/23 1741-1847	3B 11/16/23 1741-1847	Average
Initial Meter Volume, ft^3	586.362	45.696	625.768	84.844	665.199	122.214	
Final Meter Volume, ft^3	625.646	84.622	664.560	122.165	705.513	160.039	
Intra-Port Volume and/or Leak Check Correction, ft^3	0.000	0.000	0.000	0.000	0.000	0.000	
Total Sample Volume, cf	**39.284**	**38.926**	**38.792**	**37.321**	**40.314**	**37.825**	**38.744**
DGM Calibration Factor	0.975	1.014	0.975	1.014	0.975	1.014	0.995
Average DGM Temp, F	70.5	70.5	69.3	73.8	69.0	73.3	71.1
Average DGM delta H, "H2O	1.29	1.34	1.31	1.34	1.29	1.33	1.32
Barometric Pressure, "Hg	28.75	28.75	28.75	28.75	28.75	28.75	28.75
Corrected Sample Vol, dscf	**36.729**	**37.854**	**36.353**	**36.069**	**37.798**	**36.590**	**36.899**
Corrected Sample Vol, dscm	**1.040**	**1.072**	**1.029**	**1.021**	**1.070**	**1.036**	**1.045**
Sample Volume (at Stack Conditions), acf	**53.078**	**54.570**	**54.219**	**53.796**	**55.830**	**54.046**	**54.257**
Sample Volume (at Stack Conditions), acm	**1.503**	**1.545**	**1.535**	**1.523**	**1.581**	**1.530**	**1.536**
Oxygen, %	13.0	13.0	12.9	12.9	12.9	12.9	12.9
Carbon Dioxide, %	12.7	12.7	13.2	13.2	13.3	13.3	13.1
Nitrogen, %	74.3	74.3	73.9	73.9	73.8	73.8	74.0
Stack Gas Excess Air, %	196.5	196.5	195.2	195.2	196.0	196.0	195.9
Total Moisture Catch Weight, grams	207.2	180.8	213.9	201.0	220.3	209.6	210.3
Stack Gas Moisture, %	**18.6**	**18.4**	**20.6**	**20.6**	**20.0**	**20.0**	**19.7**
Stack Gas Dry Molecular Weight, lb/lbmole	30.55	30.55	30.63	30.63	30.64	30.64	30.61
Stack Gas Wet Molecular Weight, lb/lbmole	28.22	28.24	28.03	28.03	28.12	28.12	28.13
Average Stack Temp, F	136.4	136.4	140.4	140.4	139.1	139.1	138.6
Stack Static (Gauge) Pressure, "H2O	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25
Stack Gas Actual Pressure, "Hg	28.73	28.73	28.73	28.73	28.73	28.73	28.73
Average Sqrt delta P *	0.714	0.714	0.716	0.716	0.713	0.713	0.714
Pitot Tube Coefficient	0.84	0.84	0.85	0.85	0.85	0.85	0.85
Stack Gas Velocity, ft/second	**43.98**	**43.96**	**44.93**	**44.93**	**44.62**	**44.62**	**44.51**
Nozzle Inside Diameter, inches	0.250	0.250	0.250	0.250	0.250	0.250	
Total Sample Time, min	60	60	60	60	60	60	60
Isokinetic Rate, %	**98.4**	**101.2**	**98.4**	**97.6**	**102.0**	**98.8**	**99.4**
Stack Dimensions	34.063 in. ID	34.063 in. ID	34.063 in. ID	34.063 in. ID	34.063 in. ID	34.063 in. ID	
Stack Area, sq ft	146.81	146.81	146.81	146.81	146.81	146.81	146.81
Actual Stack Gas Flow Rate, acfm	**387,400**	**387,200**	**395,800**	**395,800**	**393,000**	**393,000**	**392,000**
Actual Stack Gas Flow Rate, acmm	10,970	10,964	11,208	11,208	11,129	11,129	11,101
Stack Gas Flow Rate, dscfm	**268,100**	**268,600**	**265,400**	**265,400**	**266,100**	**266,100**	**266,600**
Stack Gas Flow Rate, dscmm	7,592	7,606	7,515	7,515	7,535	7,535	7,550
ASTM 7459-08; Max Sampling Deviation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
ASTM 7459-08; Stack Flow Deviation	6.3%	6.3%	5.4%	5.4%	6.6%	6.6%	
ALT-009 Post Test Calibration	pass	pass	pass	pass	pass	pass	

Company: Holcim; Midlothian TX
Source: Line 2 Main Stack; Raw Mill Off
Job ID: 23-3313
Train Type: EPA Method 26A

NOTE: Average INCLUDES Non-detect runs' results

"ND()" denotes values below detection limits

		1A 11/16/23 1420-1557	1B 11/16/23 1420-1557	2A 11/16/23 1619-1725	2B 11/16/23 1619-1725	3A 11/16/23 1741-1847	3B 11/16/23 1741-1847	Average
Hydrogen Fluoride	Catch Wt, mg	ND(0.247)	ND(0.161)	ND(0.168)	ND(0.153)	ND(0.155)	ND(0.155)	ND(0.173)
	Conc., mg/dscm	ND(0.238)	ND(0.150)	ND(0.163)	ND(0.150)	ND(0.145)	ND(0.150)	ND(0.166)
	Conc., mg/dscm @ 7% O2	ND(0.418)	ND(0.264)	ND(0.284)	ND(0.260)	ND(0.252)	ND(0.260)	ND(0.290)
	Conc., mg/dscm @ 12% CO2	ND(0.224)	ND(0.142)	ND(0.148)	ND(0.136)	ND(0.131)	ND(0.135)	ND(0.153)
	Conc., ppmvd	ND(0.286)	ND(0.181)	ND(0.196)	ND(0.180)	ND(0.174)	ND(0.180)	ND(0.199)
	Conc., ppmvd @ 7% O2	ND(0.502)	ND(0.318)	ND(0.341)	ND(0.313)	ND(0.303)	ND(0.313)	ND(0.348)
	Conc., ppmvd @ 12% CO2	ND(0.270)	ND(0.171)	ND(0.178)	ND(0.164)	ND(0.157)	ND(0.162)	ND(0.184)
	Emission Rate, lb/hr	ND(0.241)	ND(0.153)	ND(0.162)	ND(0.149)	ND(0.144)	ND(0.149)	ND(0.166)
	Clinker Rates (mtph and lbs/ton)	123.76	ND(0.0014)	123.76	ND(0.0011)	123.72	ND(0.0011)	ND(0.0012)
Chlorine	Catch Wt, mg	1.08	1.350	1.560	1.160	1.53	1.52	1.37
	Conc., mg/dscm	1.038	1.259	1.516	1.136	1.430	1.467	1.308
	Conc., mg/dscm @ 7% O2	1.827	2.216	2.634	1.974	2.484	2.549	2.281
	Conc., mg/dscm @ 12% CO2	0.981	1.190	1.378	1.033	1.290	1.324	1.199
	Conc., ppmvd	0.352	0.427	0.514	0.385	0.485	0.498	0.444
	Absolute Difference, ppmvd (<0.2 required)		0.07		0.13		0.01	
	Conc., ppmvd @ 7% O2	0.620	0.752	0.894	0.670	0.843	0.865	0.774
	Conc., ppmvd @ 12% CO2	0.333	0.404	0.468	0.350	0.438	0.449	0.407
	Emission Rate, lb/hr	1.055	1.282	1.507	1.129	1.425	1.462	1.310
	Clinker Rates (mtph and lbs/ton)	123.76	0.0086	123.76	0.0097	123.72	0.0106	0.0096

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill Off
Run 1

Spectrum	Date	Time	HCN PCA 191c R1 191c	HF ppm (10) 191C	SF6 (10) 191C	Ethylene (100,3000) 191C	H2O% (40) 191C	CO2% (40) 191C
SPC__002138.LAB	11/16/23	14:20:49.160	22.622	0.393	-0.014	8.059	21.088	9.364
SPC__002139.LAB	11/16/23	14:21:53.320	22.054	0.397	-0.015	8.016	20.273	9.455
SPC__002140.LAB	11/16/23	14:22:56.961	22.621	0.361	-0.012	7.864	21.633	9.337
SPC__002141.LAB	11/16/23	14:24:00.902	22.009	0.329	-0.014	8.145	20.680	9.486
SPC__002142.LAB	11/16/23	14:25:04.815	22.415	0.334	-0.016	7.944	21.858	9.420
SPC__002143.LAB	11/16/23	14:26:09.000	22.163	0.326	-0.015	8.012	20.960	9.523
SPC__002144.LAB	11/16/23	14:27:12.572	21.358	0.313	-0.013	7.857	21.057	9.524
SPC__002145.LAB	11/16/23	14:28:16.486	21.169	0.316	-0.014	7.604	20.701	9.528
SPC__002146.LAB	11/16/23	14:29:20.422	21.525	0.285	-0.012	7.331	21.393	9.480
SPC__002147.LAB	11/16/23	14:30:24.324	21.165	0.276	-0.011	7.466	20.525	9.489
SPC__002148.LAB	11/16/23	14:31:28.185	21.252	0.266	-0.014	7.713	21.269	9.500
SPC__002149.LAB	11/16/23	14:32:32.083	21.600	0.275	-0.012	8.074	20.206	9.507
SPC__002150.LAB	11/16/23	14:33:35.982	22.690	0.258	-0.013	7.871	21.075	9.454
SPC__002151.LAB	11/16/23	14:34:39.888	22.744	0.235	-0.010	8.236	20.863	9.545
SPC__002152.LAB	11/16/23	14:35:44.042	23.304	0.226	-0.011	8.307	20.712	9.658
SPC__002153.LAB	11/16/23	14:36:47.730	22.893	0.228	-0.012	8.308	21.254	9.675
SPC__002154.LAB	11/16/23	14:37:51.594	22.678	0.222	-0.009	8.356	20.540	9.611
SPC__002155.LAB	11/16/23	14:38:55.534	22.410	0.220	-0.013	8.270	21.118	9.630
SPC__002156.LAB	11/16/23	14:39:59.481	22.282	0.210	-0.010	8.829	20.785	9.680
SPC__002157.LAB	11/16/23	14:41:03.291	22.119	0.214	-0.013	8.483	20.683	9.746
SPC__002158.LAB	11/16/23	14:42:07.239	22.434	0.195	-0.012	8.362	20.787	9.747
SPC__002159.LAB	11/16/23	14:43:11.386	22.225	0.198	-0.011	8.023	21.381	9.717
SPC__002160.LAB	11/16/23	14:44:14.998	22.013	0.199	-0.013	8.091	20.619	9.746
SPC__002161.LAB	11/16/23	14:45:18.961	21.645	0.203	-0.012	7.800	21.575	9.594
SPC__002162.LAB	11/16/23	14:46:22.920	21.905	0.180	-0.012	7.964	21.101	9.578
SPC__002163.LAB	11/16/23	14:47:27.031	21.186	0.189	-0.013	8.698	21.344	9.886
SPC__002164.LAB	11/16/23	14:48:30.663	21.417	0.175	-0.015	8.261	22.093	9.787
SPC__002165.LAB	11/16/23	14:49:34.500	21.913	0.177	-0.014	8.117	21.588	9.522
SPC__002166.LAB	11/16/23	14:50:38.412	21.649	0.191	-0.014	7.923	22.007	9.516
SPC__002167.LAB	11/16/23	14:51:42.300	22.243	0.190	-0.011	8.221	20.304	9.723
SPC__002168.LAB	11/16/23	14:52:46.201	21.322	0.167	-0.013	7.864	21.339	9.511
SPC__002169.LAB	11/16/23	14:53:50.122	22.122	0.144	-0.009	7.926	20.572	9.706
SPC__002170.LAB	11/16/23	14:54:54.011	22.032	0.134	-0.012	7.870	21.664	9.544
SPC__002171.LAB	11/16/23	14:55:58.259	22.155	0.148	-0.015	8.013	20.551	9.475
SPC__002172.LAB	11/16/23	14:57:02.107	22.095	0.148	-0.015	7.870	21.285	9.301
SPC__002173.LAB	11/16/23	14:58:05.740	22.259	0.153	-0.011	8.263	20.991	9.598
SPC__002174.LAB	11/16/23	14:59:09.736	23.287	0.120	-0.013	8.395	20.745	9.578
SPC__002175.LAB	11/16/23	15:00:13.519	23.876	0.145	-0.015	8.550	21.931	9.425
SPC__002176.LAB	11/16/23	15:01:17.402	21.160	0.129	-0.013	7.316	20.490	7.994
	Lost RTO							
SPC__002203.LAB	11/16/23	15:30:02.782	19.466	0.103	-0.012	7.211	18.516	7.412
SPC__002204.LAB	11/16/23	15:31:06.993	22.852	0.012	-0.010	8.160	18.652	8.665
SPC__002205.LAB	11/16/23	15:32:10.518	22.140	0.042	-0.010	7.582	18.865	8.239
SPC__002206.LAB	11/16/23	15:33:14.447	21.181	0.032	-0.011	7.160	18.656	7.841
SPC__002207.LAB	11/16/23	15:34:18.595	21.081	0.041	-0.013	7.099	17.399	7.762
SPC__002208.LAB	11/16/23	15:35:22.255	23.333	0.064	-0.012	8.629	18.064	9.180
SPC__002209.LAB	11/16/23	15:36:26.225	23.523	0.067	-0.013	8.162	19.015	8.957
SPC__002210.LAB	11/16/23	15:37:30.344	23.938	0.019	-0.013	8.461	19.249	9.248
SPC__002211.LAB	11/16/23	15:38:33.918	23.658	0.017	-0.014	8.335	19.511	9.223
SPC__002212.LAB	11/16/23	15:39:37.821	25.336	0.034	-0.014	8.649	19.266	9.593
SPC__002213.LAB	11/16/23	15:40:42.051	25.179	0.039	-0.013	8.737	20.229	9.728
SPC__002214.LAB	11/16/23	15:41:45.628	24.118	0.038	-0.011	8.800	20.473	9.733
SPC__002215.LAB	11/16/23	15:42:49.819	24.868	0.020	-0.012	8.954	19.509	9.844
SPC__002216.LAB	11/16/23	15:43:53.422	24.570	0.028	-0.012	8.806	19.776	9.908
SPC__002217.LAB	11/16/23	15:44:57.330	24.677	0.005	-0.012	8.706	20.459	9.801
SPC__002218.LAB	11/16/23	15:46:01.481	24.921	-0.000	-0.011	8.705	20.275	9.766
SPC__002219.LAB	11/16/23	15:47:05.478	24.567	0.005	-0.011	8.661	20.038	9.904
SPC__002220.LAB	11/16/23	15:48:09.028	23.893	0.002	-0.013	9.162	20.465	10.287
SPC__002221.LAB	11/16/23	15:49:13.256	24.391	0.033	-0.011	9.255	20.415	9.959
SPC__002222.LAB	11/16/23	15:50:16.892	23.509	0.019	-0.011	9.054	21.288	9.669
SPC__002223.LAB	11/16/23	15:51:20.728	24.843	0.030	-0.012	8.839	20.477	9.754
SPC__002224.LAB	11/16/23	15:52:24.623	24.721	0.007	-0.012	8.784	20.981	9.700
SPC__002225.LAB	11/16/23	15:53:28.611	24.665	0.006	-0.012	8.757	20.633	9.791
SPC__002226.LAB	11/16/23	15:54:32.431	24.696	0.008	-0.013	8.777	21.200	9.769
SPC__002227.LAB	11/16/23	15:55:36.328	24.398	0.028	-0.013	8.812	20.324	9.849
SPC__002228.LAB	11/16/23	15:56:40.526	23.732	-0.007	-0.012	8.746	21.958	9.659
Mill Off Run 1 Averages		**(actual)**	**22.773**	**0.147**	**-0.012**	**8.235**	**20.565**	**9.458**
Oxygen	**13.0%**	**(ppm,dry @7% O2)**	**49.165**	**0.318**				
DSCFM	**268,350**	**(lbs/hr)**	**31.553**	**0.151**		**M26A Average Moisture**	**18.5**	
metric tons/hr	**123.76**	**(lbs/ton clinker)**	**0.231**	**0.0011**				

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill Off
Run 2

Spectrum	Date	Time	HCN PCA 191c R1 191c	HF ppm (10) 191C	SF6 (10) 191C	Ethylene (100,3000) 191C	H2O% (40) 191C	CO2% (40) 191C
SPC__002247.LAB	11/16/23	16:19:41.050	23.615	-0.031	-0.015	8.187	21.774	9.564
SPC__002248.LAB	11/16/23	16:20:44.979	24.003	-0.005	-0.012	8.349	20.830	9.720
SPC__002249.LAB	11/16/23	16:21:48.899	23.246	-0.024	-0.011	8.064	21.796	9.614
SPC__002250.LAB	11/16/23	16:22:52.801	23.591	-0.029	-0.011	8.337	21.267	9.631
SPC__002251.LAB	11/16/23	16:23:56.739	23.381	-0.031	-0.013	8.184	21.968	9.632
SPC__002252.LAB	11/16/23	16:25:00.609	23.865	-0.031	-0.014	8.192	21.577	9.483
SPC__002253.LAB	11/16/23	16:26:04.453	23.714	-0.040	-0.014	7.904	22.302	9.384
SPC__002254.LAB	11/16/23	16:27:08.354	23.965	0.000	-0.011	8.350	20.978	9.659
SPC__002255.LAB	11/16/23	16:28:12.293	23.391	-0.042	-0.013	8.112	21.495	9.501
SPC__002256.LAB	11/16/23	16:29:16.151	24.020	-0.015	-0.013	8.754	20.392	9.744
SPC__002257.LAB	11/16/23	16:30:20.053	24.479	0.003	-0.015	8.406	21.631	9.538
SPC__002258.LAB	11/16/23	16:31:24.391	24.421	-0.005	-0.013	8.597	20.379	9.642
SPC__002259.LAB	11/16/23	16:32:27.840	24.043	-0.038	-0.010	8.793	21.771	9.629
SPC__002260.LAB	11/16/23	16:33:31.869	24.106	0.008	-0.012	8.606	20.454	9.698
SPC__002261.LAB	11/16/23	16:34:35.640	24.269	-0.029	-0.013	8.380	21.457	9.570
SPC__002262.LAB	11/16/23	16:35:39.541	24.259	-0.001	-0.012	8.688	20.051	9.876
SPC__002263.LAB	11/16/23	16:36:43.768	23.154	-0.038	-0.011	8.468	22.026	9.611
SPC__002264.LAB	11/16/23	16:37:47.379	23.733	-0.021	-0.013	8.715	20.517	9.758
SPC__002265.LAB	11/16/23	16:38:51.603	22.952	0.057	-0.016	8.437	22.248	9.503
SPC__002266.LAB	11/16/23	16:39:55.157	23.625	0.073	-0.015	8.318	21.386	9.548
SPC__002267.LAB	11/16/23	16:40:59.044	24.751	0.032	-0.010	8.557	20.693	9.727
SPC__002268.LAB	11/16/23	16:42:02.944	23.591	0.012	-0.016	8.387	21.804	9.587
SPC__002269.LAB	11/16/23	16:43:06.847	23.521	-0.017	-0.015	8.149	21.385	9.550
SPC__002270.LAB	11/16/23	16:44:10.738	23.436	-0.014	-0.011	8.035	21.272	9.607
SPC__002271.LAB	11/16/23	16:45:14.686	23.276	-0.006	-0.015	8.098	22.312	9.500
SPC__002272.LAB	11/16/23	16:46:18.798	23.348	-0.019	-0.011	8.418	21.695	9.605
SPC__002273.LAB	11/16/23	16:47:22.740	23.140	-0.027	-0.015	8.584	21.077	9.794
SPC__002274.LAB	11/16/23	16:48:26.339	22.759	-0.021	-0.013	8.528	22.315	9.754
SPC__002275.LAB	11/16/23	16:49:30.246	22.745	-0.016	-0.014	8.756	22.056	9.675
SPC__002276.LAB	11/16/23	16:50:34.359	23.692	-0.026	-0.013	9.024	20.155	9.819
SPC__002277.LAB	11/16/23	16:51:38.351	23.104	-0.020	-0.016	8.564	21.112	9.571
SPC__002278.LAB	11/16/23	16:52:42.060	23.435	-0.026	-0.015	8.593	21.578	9.527
SPC__002279.LAB	11/16/23	16:53:45.839	25.289	-0.003	-0.013	8.729	20.765	9.758
SPC__002280.LAB	11/16/23	16:54:49.758	23.989	-0.031	-0.013	8.605	21.323	9.577
SPC__002281.LAB	11/16/23	16:55:53.650	24.457	-0.006	-0.011	9.128	20.551	9.715
SPC__002282.LAB	11/16/23	16:56:57.528	25.370	-0.012	-0.012	9.582	20.932	9.804
SPC__002283.LAB	11/16/23	16:58:01.520	24.204	-0.003	-0.013	8.893	21.785	9.585
SPC__002284.LAB	11/16/23	16:59:05.374	24.856	-0.007	-0.010	8.881	20.259	9.766
SPC__002285.LAB	11/16/23	17:00:09.264	24.030	-0.027	-0.015	8.669	21.464	9.588
SPC__002286.LAB	11/16/23	17:01:13.164	24.061	-0.009	-0.013	8.923	20.400	9.790
SPC__002287.LAB	11/16/23	17:02:17.019	24.278	-0.011	-0.013	9.003	20.782	9.841
SPC__002288.LAB	11/16/23	17:03:20.911	23.834	-0.032	-0.011	8.756	21.319	9.655
SPC__002289.LAB	11/16/23	17:04:25.136	24.551	-0.015	-0.014	8.882	20.461	9.784
SPC__002290.LAB	11/16/23	17:05:28.715	24.391	-0.009	-0.015	8.391	21.299	9.545
SPC__002291.LAB	11/16/23	17:06:32.626	23.517	-0.033	-0.016	8.068	22.243	9.469
SPC__002292.LAB	11/16/23	17:07:36.951	24.856	-0.025	-0.015	8.874	20.570	9.728
SPC__002293.LAB	11/16/23	17:08:40.456	24.261	-0.023	-0.015	8.278	22.551	9.439
SPC__002294.LAB	11/16/23	17:09:44.419	24.328	-0.005	-0.016	8.408	22.079	9.518
SPC__002295.LAB	11/16/23	17:10:48.250	24.474	-0.019	-0.011	8.996	21.263	9.723
SPC__002296.LAB	11/16/23	17:11:52.380	23.630	-0.051	-0.013	9.111	22.021	9.620
SPC__002297.LAB	11/16/23	17:12:56.011	24.066	-0.044	-0.013	8.793	21.108	9.583
SPC__002298.LAB	11/16/23	17:14:00.038	24.187	-0.031	-0.014	8.541	20.507	9.681
SPC__002299.LAB	11/16/23	17:15:04.074	24.765	-0.015	-0.013	8.635	21.643	9.656
SPC__002300.LAB	11/16/23	17:16:07.714	23.722	-0.047	-0.013	8.671	20.599	9.765
SPC__002301.LAB	11/16/23	17:17:11.924	23.866	-0.047	-0.014	9.074	21.191	9.807
SPC__002302.LAB	11/16/23	17:18:15.759	23.633	-0.037	-0.014	9.169	20.758	9.727
SPC__002303.LAB	11/16/23	17:19:19.397	24.913	-0.048	-0.012	8.873	21.089	9.665
SPC__002304.LAB	11/16/23	17:20:23.618	24.378	-0.016	-0.015	8.534	21.216	9.525
SPC__002305.LAB	11/16/23	17:21:27.331	24.492	-0.023	-0.013	8.553	20.643	9.607
SPC__002306.LAB	11/16/23	17:22:31.094	23.750	-0.072	-0.011	8.544	21.960	9.607
SPC__002307.LAB	11/16/23	17:23:35.350	24.641	-0.041	-0.010	8.727	20.835	9.724
SPC__002308.LAB	11/16/23	17:24:39.150	24.692	-0.027	-0.011	8.561	21.434	9.697
Mill Off Run 2 Averages		**(actual)**	**23.969**	**<** **0.032**	**-0.013**	**8.587**	**21.271**	**9.645**
Oxygen	**12.9%**	**(ppm,dry @7% O2)**	**52.452**	**<** **0.070**				
DSCFM	**265,400**	**(lbs/hr)**	**33.714**	**<** **0.033**		**M26A Average Moisture**	**20.6**	
metric tons/hr	**123.76**	**(lbs/ton clinker)**	**0.247**	**<** **0.0002**				

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill Off
Run 3

Spectrum	Date	Time	HCN PCA 191c R1 191c	HF ppm (10) 191C	SF6 (10) 191C	Ethylene (100,3000) 191C	H2O% (40) 191C	CO2% (40) 191C
SPC__002327.LAB	11/16/23	17:45:36.902	23.893	-0.046	-0.013	8.210	21.492	9.595
SPC__002328.LAB	11/16/23	17:46:40.808	23.948	-0.021	-0.011	8.671	20.394	9.808
SPC__002329.LAB	11/16/23	17:47:44.702	23.831	-0.062	-0.015	9.590	21.217	10.248
SPC__002330.LAB	11/16/23	17:48:48.605	23.474	-0.061	-0.013	9.208	21.921	9.680
SPC__002331.LAB	11/16/23	17:49:52.503	23.819	-0.058	-0.013	9.342	21.606	9.762
SPC__002332.LAB	11/16/23	17:50:56.414	24.255	-0.030	-0.016	8.884	21.409	9.520
SPC__002333.LAB	11/16/23	17:52:00.327	24.744	-0.026	-0.015	8.715	21.384	9.571
SPC__002334.LAB	11/16/23	17:53:04.196	24.756	-0.022	-0.012	8.849	21.341	9.706
SPC__002335.LAB	11/16/23	17:54:08.128	24.459	-0.036	-0.015	8.787	21.464	9.711
SPC__002336.LAB	11/16/23	17:55:11.993	24.082	-0.063	-0.016	8.624	21.977	9.542
SPC__002337.LAB	11/16/23	17:56:15.881	24.285	-0.044	-0.011	8.767	21.478	9.624
SPC__002338.LAB	11/16/23	17:57:19.785	24.951	-0.020	-0.011	8.900	20.248	9.794
SPC__002339.LAB	11/16/23	17:58:23.704	24.990	-0.050	-0.012	8.718	20.902	9.681
SPC__002340.LAB	11/16/23	17:59:27.577	24.408	-0.036	-0.015	8.515	21.385	9.559
SPC__002341.LAB	11/16/23	18:00:31.525	25.447	-0.039	-0.013	8.675	20.918	9.708
SPC__002342.LAB	11/16/23	18:01:35.850	24.037	-0.063	-0.012	8.507	21.487	9.624
SPC__002343.LAB	11/16/23	18:02:39.728	24.576	-0.050	-0.012	8.906	20.713	9.779
SPC__002344.LAB	11/16/23	18:03:43.259	24.775	-0.052	-0.013	8.608	21.444	9.669
SPC__002345.LAB	11/16/23	18:04:47.124	24.394	-0.036	-0.015	8.286	21.630	9.484
SPC__002346.LAB	11/16/23	18:05:51.249	24.269	-0.042	-0.014	8.700	20.703	9.797
SPC__002347.LAB	11/16/23	18:06:54.899	24.939	-0.052	-0.012	8.894	20.615	9.823
SPC__002348.LAB	11/16/23	18:07:58.765	24.209	-0.080	-0.013	8.572	22.032	9.620
SPC__002349.LAB	11/16/23	18:09:02.665	24.158	-0.041	-0.013	9.237	20.338	9.814
SPC__002350.LAB	11/16/23	18:10:06.883	23.379	-0.075	-0.013	8.857	21.846	9.688
SPC__002351.LAB	11/16/23	18:11:10.469	23.579	-0.077	-0.016	8.276	21.615	9.556
SPC__002352.LAB	11/16/23	18:12:14.682	23.837	-0.064	-0.008	8.761	20.238	9.792
SPC__002353.LAB	11/16/23	18:13:18.396	23.460	-0.060	-0.013	8.421	22.238	9.576
SPC__002354.LAB	11/16/23	18:14:22.171	23.603	-0.073	-0.012	8.709	21.786	9.706
SPC__002355.LAB	11/16/23	18:15:26.317	24.027	-0.079	-0.016	8.714	21.835	9.511
SPC__002356.LAB	11/16/23	18:16:29.963	24.838	-0.045	-0.012	8.947	20.758	9.723
SPC__002357.LAB	11/16/23	18:17:34.213	24.303	-0.055	-0.016	8.994	22.138	9.542
SPC__002358.LAB	11/16/23	18:18:38.013	25.207	-0.033	-0.015	8.914	20.828	9.369
SPC__002359.LAB	11/16/23	18:19:41.667	23.408	-0.056	-0.011	10.181	21.218	9.850
SPC__002360.LAB	11/16/23	18:20:45.555	24.101	-0.048	-0.012	9.063	21.019	9.658
SPC__002361.LAB	11/16/23	18:21:49.482	25.466	-0.063	-0.011	9.077	20.580	9.699
SPC__002362.LAB	11/16/23	18:22:53.647	23.850	-0.081	-0.013	8.714	21.412	9.632
SPC__002363.LAB	11/16/23	18:23:57.506	24.436	-0.045	-0.010	8.562	20.314	9.712
SPC__002364.LAB	11/16/23	18:25:01.601	25.154	-0.060	-0.013	8.767	20.707	9.800
SPC__002365.LAB	11/16/23	18:26:05.145	23.921	-0.097	-0.014	8.414	22.005	9.588
SPC__002366.LAB	11/16/23	18:27:08.947	24.029	-0.090	-0.012	8.469	21.377	9.640
SPC__002367.LAB	11/16/23	18:28:12.846	24.546	-0.045	-0.012	8.722	20.165	9.722
SPC__002368.LAB	11/16/23	18:29:16.754	25.114	-0.058	-0.017	8.624	22.019	9.333
SPC__002369.LAB	11/16/23	18:30:20.648	22.524	-0.088	-0.015	11.443	20.792	10.227
SPC__002370.LAB	11/16/23	18:31:24.582	25.068	-0.041	-0.013	9.144	21.483	9.630
SPC__002371.LAB	11/16/23	18:32:28.444	24.318	-0.059	-0.017	8.746	22.144	9.554
SPC__002372.LAB	11/16/23	18:33:32.431	24.445	-0.071	-0.014	8.932	21.621	9.708
SPC__002373.LAB	11/16/23	18:34:36.608	24.931	-0.050	-0.013	8.524	21.119	9.612
SPC__002374.LAB	11/16/23	18:35:40.236	22.947	-0.089	-0.017	9.259	21.983	9.821
SPC__002375.LAB	11/16/23	18:36:44.060	25.079	-0.059	-0.018	8.865	21.116	9.663
SPC__002376.LAB	11/16/23	18:37:48.259	24.328	-0.057	-0.010	8.562	21.884	9.672
SPC__002377.LAB	11/16/23	18:38:51.838	23.610	-0.084	-0.015	8.831	22.477	9.649
SPC__002378.LAB	11/16/23	18:39:55.777	24.749	-0.062	-0.015	8.727	20.434	9.579
SPC__002379.LAB	11/16/23	18:40:59.659	25.137	-0.070	-0.013	8.509	21.722	9.543
SPC__002380.LAB	11/16/23	18:42:03.525	24.525	-0.051	-0.016	8.397	20.807	9.568
SPC__002381.LAB	11/16/23	18:43:07.751	24.722	-0.075	-0.015	8.630	21.934	9.562
SPC__002382.LAB	11/16/23	18:44:11.327	25.294	-0.061	-0.015	9.009	20.321	9.877
SPC__002383.LAB	11/16/23	18:45:15.222	23.868	-0.074	-0.011	9.229	21.297	9.703
SPC__002384.LAB	11/16/23	18:46:19.182	24.319	-0.059	-0.012	9.368	21.012	9.862
SPC__002385.LAB	11/16/23	18:47:23.039	24.204	-0.090	-0.013	9.141	22.044	9.718
Mill Off Run 3 Averages		**(actual)**	**24.322**	**< 0.032**	**-0.013**	**8.859**	**21.295**	**9.681**
Oxygen	**12.9%**	**(ppm,dry @7% O2)**	**52.825**	**< 0.070**				
DSCFM	**266,100**	**(lbs/hr)**	**34.044**	**< 0.033**		**M26A Average Moisture**	**20.0**	
metric tons/hr	**123.72**	**(lbs/ton clinker)**	**0.250**	**< 0.0002**				

Company: Holcim; Midlothian TX
Source: Line 2 Main Stack; Raw Mill On
Job ID: 23-3313
Train Type: EPA Method 26A

	4A 11/17/23 806-912	4B 11/17/23 806-912	5A 11/17/23 930-1036	5B 11/17/23 930-1036	6A 11/17/23 1058-1204	6B 11/17/23 1058-1204	Average
Initial Meter Volume, ft^3	705.736	160.151	758.867	206.376	810.735	254.891	
Final Meter Volume, ft^3	756.120	206.222	810.588	253.666	861.545	302.737	
Intra-Port Volume and/or Leak Check Correction, ft^3	0.000	0.000	0.000	0.000	0.000	0.000	
Total Sample Volume, cf	**50.384**	**46.071**	**51.721**	**47.290**	**50.810**	**47.846**	**49.020**
DGM Calibration Factor	0.975	1.014	0.975	1.014	0.975	1.014	0.995
Average DGM Temp, F	64.3	61.9	66.2	63.5	68.0	67.3	65.2
Average DGM delta H, "H2O	2.21	2.15	2.28	2.22	2.23	2.16	2.21
Barometric Pressure, "Hg	28.70	28.70	28.70	28.70	28.70	28.70	28.70
Corrected Sample Vol, dscf	**47.693**	**45.556**	**48.790**	**46.627**	**47.761**	**46.828**	**47.209**
Corrected Sample Vol, dscm	**1.351**	**1.290**	**1.382**	**1.320**	**1.352**	**1.326**	**1.337**
Sample Volume (at Stack Conditions), acf	**69.491**	**65.892**	**72.181**	**68.384**	**69.989**	**68.284**	**69.037**
Sample Volume (at Stack Conditions), acm	**1.968**	**1.866**	**2.044**	**1.936**	**1.982**	**1.934**	**1.955**
Oxygen, %	14.0	14.0	13.9	13.9	13.9	13.9	13.9
Carbon Dioxide, %	11.3	11.3	11.4	11.4	11.5	11.5	11.4
Nitrogen, %	74.7	74.7	74.7	74.7	74.6	74.6	74.7
Stack Gas Excess Air, %	244.7	244.7	238.8	238.8	239.9	239.9	241.1
Total Moisture Catch Weight, grams	229.6	211.0	255.1	233.2	239.0	228.5	233.6
Stack Gas Moisture, %	**18.5**	**17.9**	**19.8**	**19.1**	**19.1**	**18.7**	**18.9**
Stack Gas Dry Molecular Weight, lb/lbmole	30.37	30.37	30.38	30.38	30.40	30.40	30.38
Stack Gas Wet Molecular Weight, lb/lbmole	28.08	28.15	27.93	28.02	28.03	28.08	28.05
Average Stack Temp, F	140.8	140.8	140.3	140.3	139.8	139.8	140.3
Stack Static (Gauge) Pressure, "H2O	-0.35	-0.35	-0.35	-0.35	-0.35	-0.35	-0.35
Stack Gas Actual Pressure, "Hg	28.67	28.67	28.67	28.67	28.67	28.67	28.67
Average Sqrt delta P *	0.933	0.933	0.949	0.949	0.935	0.935	0.939
Pitot Tube Coefficient	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Stack Gas Velocity, ft/second	**58.57**	**58.50**	**59.71**	**59.61**	**58.70**	**58.65**	**58.96**
Nozzle Inside Diameter, inches	0.250	0.250	0.250	0.250	0.250	0.250	
Total Sample Time, min	60	60	60	60	60	60	60
Isokinetic Rate, %	**96.7**	**91.8**	**98.6**	**93.5**	**97.2**	**94.9**	**95.5**
Stack Dimensions	34.063 in. ID	34.063 in. ID	34.063 in. ID	34.063 in. ID	34.063 in. ID	34.063 in. ID	
Stack Area, sq ft	146.81	146.81	146.81	146.81	146.81	146.81	146.81
Actual Stack Gas Flow Rate, acfm	**515,900**	**515,300**	**526,000**	**525,100**	**517,100**	**516,600**	**519,300**
Actual Stack Gas Flow Rate, acmm	14,609	14,592	14,895	14,869	14,643	14,629	14,706
Stack Gas Flow Rate, dscfm	**354,100**	**356,300**	**355,500**	**358,000**	**352,800**	**354,300**	**355,200**
Stack Gas Flow Rate, dscmm	10,027	10,089	10,067	10,137	9,990	10,033	10,057
ASTM 7459-08; Max Sampling Deviation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
ASTM 7459-08; Stack Flow Deviation	4.2%	4.2%	2.0%	2.0%	4.6%	4.6%	
ALT-009 Post Test Calibration	pass	FAIL	pass	FAIL	pass	pass	

Company: Holcim; Midlothian TX
Source: Line 2 Main Stack; Raw Mill On
Job ID: 23-3313
Train Type: EPA Method 26A

NOTE: Average INCLUDES Non-detect runs' results

"ND()" denotes values below detection limits

		4A 11/17/23 806-912	4B 11/17/23 806-912	5A 11/17/23 930-1036	5B 11/17/23 930-1036	6A 11/17/23 1058-1204	6B 11/17/23 1058-1204	Average
Hydrogen Fluoride	Catch Wt, mg	ND(0.161)	ND(0.178)	ND(0.147)	ND(0.147)	ND(0.147)	ND(0.165)	ND(0.158)
	Conc., mg/dscm	ND(0.119)	ND(0.138)	ND(0.106)	ND(0.111)	ND(0.109)	ND(0.124)	ND(0.118)
	Conc., mg/dscm @ 7% O2	ND(0.240)	ND(0.278)	ND(0.211)	ND(0.221)	ND(0.216)	ND(0.247)	ND(0.236)
	Conc., mg/dscm @ 12% CO2	ND(0.127)	ND(0.147)	ND(0.112)	ND(0.117)	ND(0.113)	ND(0.130)	ND(0.124)
	Conc., ppmvd	ND(0.143)	ND(0.166)	ND(0.128)	ND(0.134)	ND(0.131)	ND(0.150)	ND(0.142)
	Conc., ppmvd @ 7% O2	ND(0.289)	ND(0.334)	ND(0.254)	ND(0.266)	ND(0.260)	ND(0.297)	ND(0.283)
	Conc., ppmvd @ 12% CO2	ND(0.152)	ND(0.176)	ND(0.135)	ND(0.141)	ND(0.136)	ND(0.156)	ND(0.149)
	Emission Rate, lb/hr	ND(0.158)	ND(0.184)	ND(0.142)	ND(0.149)	ND(0.144)	ND(0.165)	ND(0.157)
	Clinker Rates (mtph and lbs/ton)	123.78	ND(0.0013)	123.78	ND(0.0011)	123.76	ND(0.0011)	ND(0.0012
Chlorine	Catch Wt, mg	0.684	0.586	0.911	0.825	0.748	0.804	0.760
	Conc., mg/dscm	0.506	0.454	0.659	0.625	0.553	0.606	0.567
	Conc., mg/dscm @ 7% O2	1.020	0.915	1.309	1.241	1.099	1.204	1.131
	Conc., mg/dscm @ 12% CO2	0.538	0.482	0.694	0.658	0.577	0.633	0.597
	Conc., ppmvd	0.172	0.154	0.224	0.212	0.188	0.206	0.192
	Absolute Difference, ppmvd (<0.2 required)		0.02		0.01		0.02	
	Conc., ppmvd @ 7% O2	0.346	0.310	0.444	0.421	0.373	0.408	0.384
	Conc., ppmvd @ 12% CO2	0.182	0.164	0.235	0.223	0.196	0.215	0.203
	Emission Rate, lb/hr	0.672	0.606	0.878	0.838	0.731	0.805	0.755
	Clinker Rates (mtph and lbs/ton)	123.78	0.0047	123.78	0.0063	123.76	0.0056	0.0055

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill On
Run 1

Spectrum	Date	Time	HCN PCA 191c R1 191c	HF ppm (10) 191C	SF6 (10) 191C	Ethylene (100,3000) 191C	H2O% (40) 191C	CO2% (40) 191C
SPC__002465.LAB	11/17/23	08:07:21.238	20.815	-0.027	-0.010	8.341	20.444	8.402
SPC__002466.LAB	11/17/23	08:08:25.137	21.812	-0.037	-0.011	8.580	18.688	8.508
SPC__002467.LAB	11/17/23	08:09:29.286	21.790	-0.028	-0.012	8.471	18.274	8.547
SPC__002468.LAB	11/17/23	08:10:32.965	21.875	-0.028	-0.010	8.057	18.943	8.388
SPC__002469.LAB	11/17/23	08:11:36.827	22.272	-0.030	-0.014	8.248	18.280	8.467
SPC__002470.LAB	11/17/23	08:12:40.759	21.939	-0.022	-0.014	8.274	18.954	8.404
SPC__002471.LAB	11/17/23	08:13:44.708	22.512	-0.031	-0.012	8.403	18.134	8.521
SPC__002472.LAB	11/17/23	08:14:48.524	22.633	-0.020	-0.013	8.766	18.314	8.593
SPC__002473.LAB	11/17/23	08:15:52.417	22.353	-0.028	-0.014	8.953	18.473	8.735
SPC__002474.LAB	11/17/23	08:16:56.633	22.340	-0.022	-0.016	8.794	18.749	8.648
SPC__002475.LAB	11/17/23	08:18:00.251	21.989	-0.023	-0.015	8.679	18.840	8.651
SPC__002476.LAB	11/17/23	08:19:04.169	22.295	-0.015	-0.010	8.750	18.348	8.603
SPC__002477.LAB	11/17/23	08:20:08.095	22.165	-0.039	-0.012	8.755	18.485	8.639
SPC__002478.LAB	11/17/23	08:21:11.907	22.335	-0.021	-0.012	8.782	18.591	8.596
SPC__002479.LAB	11/17/23	08:22:16.236	21.695	-0.033	-0.013	8.841	19.333	8.514
SPC__002480.LAB	11/17/23	08:23:19.813	21.998	-0.037	-0.013	8.669	19.251	8.478
SPC__002481.LAB	11/17/23	08:24:23.646	22.527	-0.027	-0.013	8.603	19.359	8.532
SPC__002482.LAB	11/17/23	08:25:27.537	22.256	-0.022	-0.013	8.306	19.988	8.469
SPC__002483.LAB	11/17/23	08:26:31.387	22.636	-0.027	-0.014	8.342	19.067	8.508
SPC__002484.LAB	11/17/23	08:27:35.601	22.038	-0.049	-0.013	8.346	19.694	8.532
SPC__002485.LAB	11/17/23	08:28:39.181	22.285	-0.037	-0.013	8.556	19.622	8.464
SPC__002486.LAB	11/17/23	08:29:43.078	22.286	-0.041	-0.014	8.073	19.404	8.421
SPC__002487.LAB	11/17/23	08:30:46.980	22.333	-0.043	-0.014	8.203	19.505	8.386
SPC__002488.LAB	11/17/23	08:31:50.878	21.827	-0.047	-0.012	8.431	19.924	8.407
SPC__002489.LAB	11/17/23	08:32:55.060	22.253	-0.039	-0.014	8.427	18.959	8.448
SPC__002490.LAB	11/17/23	08:33:58.759	22.286	-0.038	-0.011	8.359	18.551	8.528
SPC__002491.LAB	11/17/23	08:35:02.558	21.906	-0.033	-0.012	8.703	18.303	8.665
SPC__002492.LAB	11/17/23	08:36:06.500	21.886	-0.046	-0.014	8.568	19.072	8.486
SPC__002493.LAB	11/17/23	08:37:10.447	21.682	-0.044	-0.012	8.646	18.768	8.606
SPC__002494.LAB	11/17/23	08:38:14.259	22.104	-0.058	-0.012	8.747	18.305	8.582
SPC__002495.LAB	11/17/23	08:39:18.394	21.483	-0.034	-0.013	9.000	18.650	8.633
SPC__002496.LAB	11/17/23	08:40:22.088	22.023	-0.040	-0.013	8.748	18.393	8.537
SPC__002497.LAB	11/17/23	08:41:25.936	21.687	-0.052	-0.014	8.093	19.680	8.435
SPC__002498.LAB	11/17/23	08:42:30.126	21.450	-0.048	-0.011	8.186	18.981	8.554
SPC__002499.LAB	11/17/23	08:43:33.728	21.782	-0.057	-0.010	8.528	18.134	8.692
SPC__002500.LAB	11/17/23	08:44:37.715	21.425	-0.048	-0.013	8.570	18.613	8.642
SPC__002501.LAB	11/17/23	08:45:41.525	21.384	-0.040	-0.015	8.507	19.214	8.532
SPC__002502.LAB	11/17/23	08:46:45.435	21.995	-0.061	-0.015	8.798	18.692	8.504
SPC__002503.LAB	11/17/23	08:47:49.317	21.630	-0.046	-0.012	8.662	19.190	8.617
SPC__002504.LAB	11/17/23	08:48:53.658	21.073	-0.030	-0.014	9.184	19.762	8.647
SPC__002505.LAB	11/17/23	08:49:57.148	20.616	-0.047	-0.010	9.213	19.608	8.581
SPC__002506.LAB	11/17/23	08:51:01.313	21.120	-0.059	-0.018	9.657	19.490	8.510
SPC__002507.LAB	11/17/23	08:52:05.178	21.671	-0.061	-0.014	8.770	20.114	8.439
SPC__002508.LAB	11/17/23	08:53:08.818	21.559	-0.052	-0.013	8.523	20.251	8.470
SPC__002509.LAB	11/17/23	08:54:12.695	21.743	-0.054	-0.012	8.781	19.433	8.599
SPC__002510.LAB	11/17/23	08:55:16.907	21.386	-0.051	-0.012	8.695	19.725	8.522
SPC__002511.LAB	11/17/23	08:56:20.503	21.779	-0.049	-0.014	8.766	19.302	8.553
SPC__002512.LAB	11/17/23	08:57:24.380	21.412	-0.044	-0.013	8.585	19.925	8.527
SPC__002513.LAB	11/17/23	08:58:28.275	21.799	-0.053	-0.012	8.629	18.859	8.573
SPC__002514.LAB	11/17/23	08:59:32.175	21.502	-0.043	-0.013	8.545	19.263	8.555
SPC__002515.LAB	11/17/23	09:00:36.318	21.242	-0.045	-0.011	8.834	18.862	8.677
SPC__002516.LAB	11/17/23	09:01:39.964	21.152	-0.065	-0.013	8.618	19.479	8.543
SPC__002517.LAB	11/17/23	09:02:43.912	21.475	-0.058	-0.012	8.843	18.517	8.648
SPC__002518.LAB	11/17/23	09:03:47.854	21.351	-0.049	-0.012	8.600	18.869	8.617
SPC__002519.LAB	11/17/23	09:04:51.749	21.034	-0.059	-0.012	8.946	18.997	8.714
SPC__002520.LAB	11/17/23	09:05:55.555	20.758	-0.046	-0.014	9.445	19.321	8.718
SPC__002521.LAB	11/17/23	09:06:59.488	20.986	-0.038	-0.011	8.988	19.338	8.640
SPC__002522.LAB	11/17/23	09:08:03.436	20.764	-0.052	-0.013	9.216	19.081	8.599
SPC__002523.LAB	11/17/23	09:09:07.291	21.571	-0.042	-0.012	8.766	18.678	8.508
SPC__002524.LAB	11/17/23	09:10:11.176	21.569	-0.035	-0.013	8.630	18.548	8.533
SPC__002525.LAB	11/17/23	09:11:15.073	21.261	-0.039	-0.010	9.169	18.746	8.645
SPC__002526.LAB	11/17/23	09:12:18.993	21.148	-0.047	-0.013	9.028	20.030	8.488
Mill On Run 1 Averages		**(actual)**	**21.741**	**<** **0.032**	**-0.013**	**8.664**	**19.070**	**8.551**
Oxygen	**14.0%**	**(ppm,dry @7% O2)**	**53.542**	**<** **0.079**				
DSCFM	**355,200**	**(lbs/hr)**	**39.726**	**<** **0.043**		**M26A Average Moisture**	**18.2**	
metric tons/hr	**123.78**	**(lbs/ton clinker)**	**0.291**	**<** **0.0003**				

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill On
Run 2

Spectrum	Date	Time	HCN PCA 191c R1 191c	HF ppm (10) 191C	SF6 (10) 191C	Ethylene (100,3000) 191C	H2O% (40) 191C	CO2% (40) 191C
SPC__002543.LAB	11/17/23	09:31:05.682	20.759	-0.056	-0.013	8.854	19.443	8.495
SPC__002544.LAB	11/17/23	09:32:09.857	21.266	-0.063	-0.012	8.616	18.952	8.513
SPC__002545.LAB	11/17/23	09:33:13.767	21.935	-0.052	-0.009	8.483	18.327	8.528
SPC__002546.LAB	11/17/23	09:34:17.293	21.436	-0.049	-0.013	8.277	18.769	8.557
SPC__002547.LAB	11/17/23	09:35:21.299	21.336	-0.058	-0.010	8.468	18.420	8.707
SPC__002548.LAB	11/17/23	09:36:25.359	21.066	-0.056	-0.011	8.441	19.412	8.620
SPC__002549.LAB	11/17/23	09:37:29.074	21.518	-0.050	-0.012	8.287	19.258	8.454
SPC__002550.LAB	11/17/23	09:38:32.913	20.696	-0.060	-0.012	8.374	19.580	8.489
SPC__002551.LAB	11/17/23	09:39:36.891	21.359	-0.057	-0.012	8.118	19.373	8.420
SPC__002552.LAB	11/17/23	09:40:40.670	20.696	-0.054	-0.010	8.052	19.665	8.494
SPC__002553.LAB	11/17/23	09:41:44.577	20.255	-0.058	-0.012	8.137	19.617	8.515
SPC__002554.LAB	11/17/23	09:42:48.511	19.664	-0.061	-0.012	8.409	19.953	8.548
SPC__002555.LAB	11/17/23	09:43:52.690	20.326	-0.065	-0.010	8.333	19.560	8.499
SPC__002556.LAB	11/17/23	09:44:56.382	20.106	-0.072	-0.014	8.019	20.071	8.414
SPC__002557.LAB	11/17/23	09:46:00.484	20.727	-0.068	-0.011	8.007	19.243	8.433
SPC__002558.LAB	11/17/23	09:47:04.073	20.603	-0.058	-0.013	8.010	19.119	8.474
SPC__002559.LAB	11/17/23	09:48:07.940	20.897	-0.053	-0.012	8.169	18.479	8.705
SPC__002560.LAB	11/17/23	09:49:11.830	21.024	-0.062	-0.012	8.226	18.618	8.626
SPC__002561.LAB	11/17/23	09:50:15.767	20.879	-0.059	-0.011	8.049	19.235	8.462
SPC__002562.LAB	11/17/23	09:51:19.678	21.312	-0.059	-0.012	8.037	18.579	8.526
SPC__002563.LAB	11/17/23	09:52:23.563	20.704	-0.056	-0.014	7.979	18.834	8.523
SPC__002564.LAB	11/17/23	09:53:27.416	21.125	-0.056	-0.013	8.348	18.254	8.712
SPC__002565.LAB	11/17/23	09:54:31.323	20.449	-0.054	-0.015	8.723	19.253	8.628
SPC__002566.LAB	11/17/23	09:55:35.592	21.224	-0.069	-0.014	8.900	18.827	8.617
SPC__002567.LAB	11/17/23	09:56:39.384	21.178	-0.052	-0.009	8.471	18.922	8.461
SPC__002568.LAB	11/17/23	09:57:43.003	21.771	-0.063	-0.012	8.691	18.210	8.688
SPC__002569.LAB	11/17/23	09:58:46.893	21.412	-0.067	-0.012	8.687	18.767	8.555
SPC__002570.LAB	11/17/23	09:59:50.845	22.072	-0.070	-0.012	8.340	18.617	8.539
SPC__002571.LAB	11/17/23	10:00:54.723	21.543	-0.071	-0.012	8.162	19.328	8.458
SPC__002572.LAB	11/17/23	10:01:58.588	21.637	-0.067	-0.013	7.961	19.881	8.450
SPC__002573.LAB	11/17/23	10:03:02.480	20.894	-0.048	-0.011	8.313	19.346	8.607
SPC__002574.LAB	11/17/23	10:04:06.380	21.032	-0.078	-0.012	8.417	19.927	8.565
SPC__002575.LAB	11/17/23	10:05:10.277	21.108	-0.080	-0.010	8.158	20.237	8.375
SPC__002576.LAB	11/17/23	10:06:14.170	21.669	-0.070	-0.012	8.286	18.965	8.579
SPC__002577.LAB	11/17/23	10:07:18.069	20.678	-0.057	-0.014	8.894	19.912	8.599
SPC__002578.LAB	11/17/23	10:08:22.299	20.711	-0.075	-0.013	9.030	19.708	8.586
SPC__002579.LAB	11/17/23	10:09:25.898	22.042	-0.065	-0.010	8.683	19.117	8.564
SPC__002580.LAB	11/17/23	10:10:29.840	20.369	-0.070	-0.011	8.826	19.226	8.755
SPC__002581.LAB	11/17/23	10:11:33.687	20.646	-0.073	-0.012	9.099	18.763	8.740
SPC__002582.LAB	11/17/23	10:12:37.632	21.165	-0.071	-0.012	8.389	19.185	8.604
SPC__002583.LAB	11/17/23	10:13:41.449	21.440	-0.072	-0.013	8.239	19.160	8.623
SPC__002584.LAB	11/17/23	10:14:45.333	21.620	-0.059	-0.015	8.437	18.391	8.746
SPC__002585.LAB	11/17/23	10:15:49.236	21.573	-0.055	-0.013	8.090	19.269	8.576
SPC__002586.LAB	11/17/23	10:16:53.208	21.362	-0.065	-0.009	8.028	18.692	8.642
SPC__002587.LAB	11/17/23	10:17:57.073	21.244	-0.065	-0.013	7.896	18.834	8.645
SPC__002588.LAB	11/17/23	10:19:01.207	21.265	-0.071	-0.011	8.042	19.322	8.640
SPC__002589.LAB	11/17/23	10:20:05.095	21.470	-0.083	-0.010	7.987	18.526	8.623
SPC__002590.LAB	11/17/23	10:21:08.709	21.185	-0.060	-0.011	8.045	19.016	8.636
SPC__002591.LAB	11/17/23	10:22:12.887	21.551	-0.029	-0.012	8.367	18.044	8.774
SPC__002592.LAB	11/17/23	10:23:16.507	21.184	-0.069	-0.014	8.534	18.960	8.654
SPC__002593.LAB	11/17/23	10:24:20.420	21.846	-0.071	-0.013	8.438	18.501	8.667
SPC__002594.LAB	11/17/23	10:25:24.363	21.828	-0.063	-0.012	8.140	19.679	8.450
SPC__002595.LAB	11/17/23	10:26:28.572	21.537	-0.083	-0.012	8.061	19.799	8.489
SPC__002596.LAB	11/17/23	10:27:32.097	21.413	-0.072	-0.013	8.408	19.262	8.623
SPC__002597.LAB	11/17/23	10:28:35.988	20.655	-0.063	-0.010	8.646	20.073	8.562
SPC__002598.LAB	11/17/23	10:29:39.886	21.149	-0.070	-0.012	8.448	19.746	8.519
SPC__002599.LAB	11/17/23	10:30:44.114	21.876	-0.070	-0.011	8.387	19.357	8.541
SPC__002600.LAB	11/17/23	10:31:47.677	21.505	-0.072	-0.014	8.099	20.034	8.401
SPC__002601.LAB	11/17/23	10:32:51.575	22.177	-0.065	-0.011	8.323	19.258	8.506
SPC__002602.LAB	11/17/23	10:33:55.585	21.828	-0.072	-0.011	8.224	20.043	8.529
SPC__002603.LAB	11/17/23	10:34:59.728	21.896	-0.071	-0.011	8.390	19.475	8.504
SPC__002604.LAB	11/17/23	10:36:03.259	22.244	-0.068	-0.012	8.508	18.632	8.606
Mill On Run 2 Averages		**(actual)**	**21.212**	**<** **0.032**	**-0.012**	**8.346**	**19.178**	**8.565**
Oxygen	**13.9%**	**(ppm,dry @7% O2)**	**52.291**	**<** **0.079**				
DSCFM	**356,750**	**(lbs/hr)**	**39.532**	**<** **0.044**		**M26A Average Moisture**	**19.5**	
metric tons/hr	**123.78**	**(lbs/ton clinker)**	**0.290**	**<** **0.0003**				

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill On
Run 3

Spectrum	Date	Time	HCN PCA 191c R1 191c		HF ppm (10) 191C	SF6 (10) 191C	Ethylene (100,3000) 191C	H2O% (40) 191C	CO2% (40) 191C
SPC__002625.LAB	11/17/23	10:59:24.511	20.457		-0.062	-0.011	8.881	19.335	8.722
SPC__002626.LAB	11/17/23	11:00:28.418	20.728		-0.075	-0.012	8.617	18.894	8.671
SPC__002627.LAB	11/17/23	11:01:32.650	20.289		-0.063	-0.014	8.849	18.811	8.716
SPC__002628.LAB	11/17/23	11:02:36.225	20.529		-0.079	-0.015	9.151	18.889	8.792
SPC__002629.LAB	11/17/23	11:03:40.135	21.031		-0.082	-0.013	8.708	19.258	8.647
SPC__002630.LAB	11/17/23	11:04:44.292	21.194		-0.068	-0.010	8.707	19.318	8.580
SPC__002631.LAB	11/17/23	11:05:47.894	21.188		-0.092	-0.012	8.505	19.171	8.627
SPC__002632.LAB	11/17/23	11:06:51.841	21.691		-0.072	-0.012	8.608	18.910	8.662
SPC__002633.LAB	11/17/23	11:07:55.722	21.130		-0.076	-0.012	8.734	18.660	8.619
SPC__002634.LAB	11/17/23	11:08:59.600	21.464		-0.071	-0.013	9.024	18.484	8.696
SPC__002635.LAB	11/17/23	11:10:03.519	21.691		-0.085	-0.015	8.962	18.591	8.647
SPC__002636.LAB	11/17/23	11:11:07.361	21.422		-0.074	-0.014	9.033	18.619	8.605
SPC__002637.LAB	11/17/23	11:12:11.316	21.558		-0.081	-0.015	9.104	18.726	8.639
SPC__002638.LAB	11/17/23	11:13:15.169	21.250		-0.069	-0.016	9.341	19.427	8.611
SPC__002639.LAB	11/17/23	11:14:19.355	21.799		-0.080	-0.010	9.187	19.756	8.573
SPC__002640.LAB	11/17/23	11:15:22.945	21.398		-0.093	-0.011	8.724	20.055	8.468
SPC__002641.LAB	11/17/23	11:16:26.850	21.522		-0.081	-0.014	8.625	19.963	8.416
SPC__002642.LAB	11/17/23	11:17:30.740	21.772		-0.088	-0.013	8.337	19.993	8.359
SPC__002643.LAB	11/17/23	11:18:34.633	21.824		-0.086	-0.013	8.177	20.209	8.385
SPC__002644.LAB	11/17/23	11:19:38.537	22.112		-0.077	-0.012	8.135	19.855	8.392
SPC__002645.LAB	11/17/23	11:20:42.433	21.552		-0.085	-0.011	8.340	20.216	8.455
SPC__002646.LAB	11/17/23	11:21:46.362	20.947		-0.092	-0.014	8.232	20.294	8.505
SPC__002647.LAB	11/17/23	11:22:50.223	20.832		-0.080	-0.013	8.434	20.007	8.511
SPC__002648.LAB	11/17/23	11:23:54.116	20.642		-0.085	-0.013	8.574	20.001	8.569
SPC__002649.LAB	11/17/23	11:24:58.320	21.323		-0.082	-0.013	8.430	19.484	8.538
SPC__002650.LAB	11/17/23	11:26:01.921	21.221		-0.065	-0.013	8.474	19.038	8.553
SPC__002651.LAB	11/17/23	11:27:05.811	21.639		-0.083	-0.012	8.569	19.002	8.513
SPC__002652.LAB	11/17/23	11:28:09.775	21.905		-0.072	-0.012	8.404	19.008	8.533
SPC__002653.LAB	11/17/23	11:29:13.610	21.805		-0.071	-0.010	8.459	19.076	8.524
SPC__002654.LAB	11/17/23	11:30:17.505	21.320		-0.064	-0.012	8.302	19.527	8.442
SPC__002655.LAB	11/17/23	11:31:21.725	21.223		-0.079	-0.013	8.611	18.880	8.611
SPC__002656.LAB	11/17/23	11:32:25.304	21.359		-0.076	-0.014	8.386	18.827	8.602
SPC__002657.LAB	11/17/23	11:33:29.487	21.773		-0.067	-0.009	8.268	18.825	8.600
SPC__002658.LAB	11/17/23	11:34:33.380	21.605		-0.074	-0.011	8.315	18.796	8.682
SPC__002659.LAB	11/17/23	11:35:36.968	21.699		-0.079	-0.015	8.345	18.534	8.675
SPC__002660.LAB	11/17/23	11:36:40.866	21.341		-0.083	-0.011	8.466	18.572	8.660
SPC__002661.LAB	11/17/23	11:37:44.813	21.289		-0.085	-0.011	8.319	18.776	8.658
SPC__002662.LAB	11/17/23	11:38:48.683	20.912		-0.082	-0.010	8.327	19.178	8.542
SPC__002663.LAB	11/17/23	11:39:52.545	21.218		-0.070	-0.012	8.389	19.729	8.431
SPC__002664.LAB	11/17/23	11:40:56.450	21.028		-0.074	-0.012	8.136	20.353	8.409
SPC__002665.LAB	11/17/23	11:42:00.354	20.920		-0.067	-0.010	8.673	19.748	8.485
SPC__002666.LAB	11/17/23	11:43:04.273	21.346		-0.099	-0.012	8.980	19.883	8.397
SPC__002667.LAB	11/17/23	11:44:08.133	21.917		-0.078	-0.014	8.449	19.875	8.364
SPC__002668.LAB	11/17/23	11:45:12.037	21.806		-0.090	-0.012	8.415	19.901	8.371
SPC__002669.LAB	11/17/23	11:46:15.929	22.119		-0.080	-0.012	8.219	19.752	8.423
SPC__002670.LAB	11/17/23	11:47:20.132	21.069		-0.083	-0.012	8.698	19.995	8.544
SPC__002671.LAB	11/17/23	11:48:23.725	20.972		-0.084	-0.011	8.657	20.179	8.735
SPC__002672.LAB	11/17/23	11:49:27.621	21.416		-0.089	-0.010	8.529	19.958	8.457
SPC__002673.LAB	11/17/23	11:50:31.548	21.264		-0.086	-0.011	8.712	19.354	8.473
SPC__002674.LAB	11/17/23	11:51:35.867	22.184		-0.090	-0.013	8.604	18.769	8.484
SPC__002675.LAB	11/17/23	11:52:39.663	22.431		-0.092	-0.012	8.288	18.396	8.454
SPC__002676.LAB	11/17/23	11:53:43.228	21.988		-0.077	-0.011	8.231	18.935	8.535
SPC__002677.LAB	11/17/23	11:54:47.128	22.096		-0.093	-0.012	8.391	18.881	8.587
SPC__002678.LAB	11/17/23	11:55:51.000	21.733		-0.080	-0.014	8.594	18.647	8.671
SPC__002679.LAB	11/17/23	11:56:54.897	21.701		-0.080	-0.015	8.440	18.756	8.559
SPC__002680.LAB	11/17/23	11:57:59.092	21.591		-0.081	-0.010	8.077	19.137	8.476
SPC__002681.LAB	11/17/23	11:59:02.736	20.798		-0.084	-0.012	8.522	18.892	8.649
SPC__002682.LAB	11/17/23	12:00:06.638	21.550		-0.093	-0.013	8.470	18.508	8.589
SPC__002683.LAB	11/17/23	12:01:10.487	20.943		-0.073	-0.012	8.304	19.002	8.563
SPC__002684.LAB	11/17/23	12:02:14.658	21.286		-0.078	-0.012	8.343	18.540	8.533
SPC__002685.LAB	11/17/23	12:03:18.366	21.429		-0.082	-0.010	8.140	18.706	8.546
SPC__002686.LAB	11/17/23	12:04:22.184	21.827		-0.081	-0.014	7.958	19.074	8.429
Mill On Run 3 Averages		**(actual)**	**21.404**	**<**	**0.032**	**-0.012**	**8.530**	**19.257**	**8.551**
Oxygen	**13.9%**	**(ppm,dry @7% O2)**	**52.408**	**<**	**0.078**				
DSCFM	**353,550**	**(lbs/hr)**	**39.265**	**<**	**0.043**		**M26A Average Moisture**	**18.9**	
metric tons/hr	**123.76**	**(lbs/ton clinker)**	**0.288**	**<**	**0.0003**				

Appendix B

Field Data
and
CEM/FTIR Data

EPA Method 1
Traverse Point Location for Circular Ducts

Plant	Holcim
City	Midlothian
State	TX
Location	Kiln #1 Main Stack
Stack ID (inches)	161.5
Nipple Length	49
Nearest Upstream Disturbance (Bend, ID FAN, etc)	
Distance (inches)	1219
Type of Disturbance	ID Fan
Nearest Downstream Disturbance (Bend, or Stack Outlet)	
Distance (inches)	462
Type of Disturbance	Stack Outlet

See Report Text

For Figure of Location

Sampler: Previous Data Date: 09/05/07

(Mark with an "x")

Particulate Traverse? [x] Yes [ ] No

Stack Schematic (Draw by hand after printing)

Number of Traverse Points Required: 6

Traverse Point Number	Fraction of Stack Internal Diam.	Stack ID (Inches)	Diameter Frac. x Stack ID	Nipple Length (inches)	Traverse Point Distance from outside Nipple
1	0.044	161.5	7.11	49	56 1/8 in.
2	0.146	161.5	23.58	49	72 5/8 in.
3	0.296	161.5	47.80	49	96 3/4 in.
4	0.704	161.5	113.70	49	162 3/4 in.
5	0.854	161.5	137.92	49	186 7/8 in.
6	0.956	161.5	154.39	49	203 3/8 in.

EPA Method 2
Gas Velocity and Cyclonic Flow Check

Plant	LafargeHolcim Midlothian Facility	Run Date	11 / 3 /20
City	Midlothian, TX	Clock Time	15:00
Sampling Location	Kiln System #1 Stack		
Operator	HF/JH/KW/MK	Run No.	
Ambient Temperature	~70 deg. F		
Barometric Pressure	29.5.0 in. Hg	Mol. Wt.	~28.3
Static Pressure	- 0.67 in. H2O	Pitot Cp	0.84
Stack ID Side 1	161.5 in.		
Side 2	161.5 in.		

Traverse point number	Position in.	Velocity head Δp in. H2O	Stack temperature deg. F	Cyclonic Flow Determination	
				Δp at 0° reference	Angle (∝) which yields a null Δp
1	See M-1 Data		139		10
2			140		10
3			140		8
1			140		12
2			141		11
3			139		7
1			141		7
2			141		6
3			140		7
1			142		14
2			139		9
3			138		7
				Average angle (∝)*	9.0°

* Average of α must be ≤20° to be acceptable

cyclonic.wk1

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 15 /23	Kiln System Stack	Method 26A	Kiln 1 - ON OFF -M5-3 1A

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
M. Powell	29.02	-.35	62	NK	161.5" (K1)	0.820.84	8' eff., 9' Glass Liner (K1	.250 .250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	MC-22	1.72	1.014	84	84	K -M5-	0.001 CU. FT	0.001 CU. FT	14 - 12.5%	13 - 14%	2.62 2.72
			PITOT LEAK CHECK ---->		☒ PASSED	☐ FAILED	@ 10 "Hg	@ 8 "Hg	On - Off	On - Off	NTP

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN / OUT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	900	751.876	.86	2.3	255	135	66	252	63	4
2	5		755.99	.88	2.4	256	135	64	253	58	4
3	10		760.26	.86	2.3	255	135	63	261	56	4
	15	915	764.59	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)			INITIAL / FINAL	LEAK RATE: / CU.FT @ / INCHES Hg / CU.FT @ / INCHES Hg							
B-1	15	918	764.59	.86	2.3	254	136	63	251	56	4
2	20		768.62	.82	2.2	255	135	62	254	54	3
3	25		772.77	.82	2.2	255	136	62	253	53	3
	30	933	776.879	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)			INITIAL / FINAL	LEAK RATE: / CU.FT @ / INCHES Hg / CU.FT @ / INCHES Hg							
C-1	30	936	776.879	.82	2.2	256	136	62	256	52	3
2	35		780.66	.88	2.4	252	135	61	255	50	5
3	40		785.23	.88	2.4	252	136	61	249	49	6
	45	951	789.375	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)			INITIAL / FINAL	LEAK RATE: / CU.FT @ / INCHES Hg / CU.FT @ / INCHES Hg							
D-1	45	954	789.375	.81	2.2	251	135	62	257	50	6
2	50		793.56	.83	2.3	256	136	62	251	50	6
3	55		797.81	.92	2.5	256	135	63	259	50	7
	60	1009	802.152	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.					

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** 1A Recovery Date 11/15/23

Run No. **Kiln 1 Run 3 Mill ON OFF-26A-** 3A Recovered by SG

Filter Number(s) NA 5C5

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		806.4	838.5	647.6	759.7	775.2	950.6	g
Initial weight		752.2	738.4	617.1	745.7	769.7	934.7	g
Net weight		54.2	100.1	30.5	~~5.5~~ 13.0	~~5.5~~ 5.5	15.9	g

Description of impinger water Clean 30 % spent

B/W Sil gel color

Total moisture = 219.2 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter N/A

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 1 Run 1 Mill ON OFF-26A-H2SO4-** 1A Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 1 Run 1 Mill ON OFF-26A-NaOH -** 1A Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER 3
Holcim (US) Inc; Midlothian, TX	11 / 15 /23	Kiln System Stack	Method 26A	Kiln - ON OFF -M5- LB

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
Eagle Mtn	~29.80	-.36	~60	LB	161.5" (K1)	0.84	8' eff., 9' Glass Liner (K1	.250 .250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~~17-20%~~ 15%	15	1.65	0.975	6M	5M	K -M5-	.001 CU. FT @ 17 "Hg	.001 CU. FT @ 17 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.68

PITOT LEAK CHECK ---> [] PASSED [] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN / OUT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	9:00	261.182	1	2.68	255	137	69	252	60	6
2	5		266.11	1.2	3.2	254	137	69	255	60	~~6~~ 7
3	10		271.48	1.1	2.9	255	139	71	255	58	6
	15	9:15	276.623	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

B-1	15	9:18	276.623	.85	2.2	252	140	74	256	61	6
2	20		281.54	.88	2.3	248	142	78	255	62	7
3	25		286.05	.81	2.1	254	140	79	255	62	6
	30	9:33	291.371	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

C-1	30	9:36	291.371	.90	~~2.3~~ 2.4	255	138	74	255	62	6
2	35		295.51	.96	2.5	256	138	76	250	62	6
3	40		299.39	.90	~~2.3~~ 2.4	255	137	79	253	62	6
	45	9:51	303.792	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

D-1	45	9:59	303.792	.87	2.2	255	138	76	255	64	6
2	50		308.23	.85	2.2	253	137	77	255	64	6
3	55		312.73	.83	2.0	256	134	78	255	64	5
	60	10:09	317.21	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.	317.21				

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/15/23

Run No. **Kiln Run Mill ON OFF-26A-** 13 Recovered by GCS

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		795.6	809.0	706.7	783.2	786.5	933.4	g
Initial weight		737.2	751.8	667.9	755.9	767.1	893.8	g
Net weight		58.4	57.2	38.8	27.3	14.4	39.6	g

Description of impinger water Clear 60 % spent

B/W Sil gel color

Total moisture = _____ grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln Run Mill ON OFF-26A-H2SO4-** 13 Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln Run Mill ON OFF-26A-NaOH** 13 Liquid level marked/sealed ✓

A

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 15 /23	Kiln System Stack	Method 26A	Kiln 1 - (ON) OFF -M5- 2A

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
M. Powell	29.60	-.35	60	NA	161.5" (K1)	0.82 ~~0.84~~	8' eff., 9' Glass Liner (K1	.280 .280 .280	.280
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	M5-22	1.72	1.014	SH	SH	K -M5-	0.001 CU. FT @ 10 "Hg	0.001 CU. FT @ 9 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	272

PITOT LEAK CHECK ----> [X] PASSED [ ] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN / OUT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	1032	~~802.531~~ 802.531	.93	2.5	256	134	52	253	48	5
2	5		806.96	.84	2.4	255	135	53	257	47	5
3	10		811.24	.93	2.5	253	136	53	280	47	5
	15	1047	815.655	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL / FINAL		LEAK RATE: / CU.FT @ / CU.FT @ /			INCHES Hg INCHES Hg				
B-1	15	1050	815.655	.81	2.2	256	134	53	251	48	5
2	20		819.38	.93	2.5	255	135	54	254	46	5
3	25		823.97	.83	2.3	254	136	54	253	46	6
	30	1105	828.242	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL / FINAL		LEAK RATE: / CU.FT @ / CU.FT @ /			INCHES Hg INCHES Hg				
C-1	30	1108	828.242	.92	2.5	253	134	52	251	47	7
2	35		832.66	.99	2.7	255	135	52	260	47	8
3	40		837.141	.85	2.3	255	136	53	254	47	6
	45	1123	841.256	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL / FINAL		LEAK RATE: / CU.FT @ / CU.FT @ /			INCHES Hg INCHES Hg				
D-1	45	1126	841.286	.87	2.4	255	134	53	252	48	7
2	50		845.45	.85	2.3	256	135	54	256	49	7
3	55		849.71	.83	2.3	255	134	54	259	50	7
	60	1141	854.001	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.					

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/14/23

Run No. **Kiln 1 Run 2 Mill ON OFF-26A-2A** Recovered by 426

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		834.5	846.9	655.0	747.7	758.1	939.5	g
Initial weight		742.8	751.0	643.6	740.3	755.2	925.4	g
Net weight		91.7	95.9	11.4	7.4	2.9	14.1	g

Description of impinger water Clear 30 % spent

BW Sil gel color

Total moisture = 223.4 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter NA

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 1 Run 2 Mill ON OFF-26A-H2SO4-** 2A — Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 1 Run 2 Mill ON OFF-26A-NaOH-** 2A — Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 15 /23	Kiln 1 System Stack	Method 26A	Kiln 1 - (ON) OFF -M5- 2B

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
Gage Mages	29.00	-.36	~65	N/A	161.5" (K1)	0.84	8' eff., 9' Glass Liner (K1	.250 .252 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	15	~~1.75~~ 1.65	.975	6M	8M	K -M5-	.001 CU. FT @ 12 "Hg	.004 CU. FT @ 12 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.65

PITOT LEAK CHECK ----> [] PASSED / [] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN / OUT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
1 A-1	0	10:32	317.364	.85	2.3	252	140	76	252	~~45~~ 60	5
2	5		322.08	.83	2.2	251	140	76	254	60	5
3	10		326.48	.80	2.1	253	137	78	254	60	5
	15	10:47	330.926	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

C B-1	15	10:50	330.926	.90	2.4	253	137	81	255	58	6
2	20		336.14	.97	2.6	253	137	80	253	58	6
3	25		340.21	.90	2.4	252	137	81	255	56	6
	30	11:05	344.876	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

B C-1	30	11:08	344.876	.84	2.3	257	137	81	257	60	6
2	35		349.38	.90	2.4	259	137	81	254	60	6
3	40		354.16	.80	2.1	259	134	83	255	59	6
	45	11:23	358.416	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

A D-1	45	11:26	358.416	.9	2.4	254	139	81	252	60	6
2	50		362.79	1.0	2.7	255	137	82	255	59	7
3	55		367.83	1.0	2.7	253	136	83	254	58	7
	60	11:41	372.771	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.	372.771				

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/15/23

Run No. **Kiln 1 Run 2 Mill ON OFF-26A-2B** Recovered by SCS

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight	886.5	804.8	804.8	620.6	752.9	752.2	943.1	g
Initial weight		748.4	743.9	612.8	743.0	748.6	930.5	g
Net weight		138.2	60.9	7.8	9.9	3.6	12.6	g

Description of impinger water Clear 30 % spent

BIW Sil gel color

Total moisture = 233.0 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter N/A

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 1 Run 2 Mill ON OFF-26A-H2SO4-2B** Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 1 Run 2 Mill ON OFF-26A-NaOH-2B** Liquid level marked/sealed ✓

A

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 15 /23	Kiln System Stack	Method 26A	Kiln - (ON) OFF -M5- 3 A

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
M. Powell	29.97	-.35	80	N/A	161.5" (K1)	0.820.84	8' eff., 9' Glass Liner (K1	.250	.290
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	MS-22	1.72	1.014	8H	8H	K -M5-	0.007 CU. FT @ 10 "Hg	_____ CU. FT @ _____ "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.72

PITOT LEAK CHECK ----> ☐ PASSED ☐ FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN / OUT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	1202	854.291	.84	2.4	288	135	52	287	50	5
2	5		858.67	.93	2.3	255	136	52	254	50	5
3	10		862.34	.83	2.3	285	134	52	251	51	5
	15	1217	867.249	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL ____/____ LEAK RATE: ____/____ CU.FT @ ____/____ INCHES Hg
FINAL ____/____ CU.FT @ ____/____ INCHES Hg

B-1	15	1220	867.249	.82	2.2	255	135	51	249	50	5
2	20		871.31	.96	2.6	255	134	52	252	46	6
3	25		875.16	.82	2.2	255	135	52	251	46	5
	30	1235	878.842	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL ____/____ LEAK RATE: ____/____ CU.FT @ ____/____ INCHES Hg
FINAL ____/____ CU.FT @ ____/____ INCHES Hg

C-1	30	1239	878.842	.93	2.5	256	134	52	253	48	7
2	35		882.94	.97	2.6	253	135	52	254	47	8
3	40		887.42	.91	2.5	254	136	53	252	46	8
	45	1253	891.711	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL ____/____ LEAK RATE: ____/____ CU.FT @ ____/____ INCHES Hg
FINAL ____/____ CU.FT @ ____/____ INCHES Hg

D-1	45	1256	891.711	.93	2.5	256	137	53	284	47	8
2	50		896.01	.86	2.3	255	134	54	257	48	6
3	55		900.02	.92	2.5	253	135	55	259	49	8
	60	1311	904.052	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.					

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/15/23

Run No. **Kiln 1 Run 3 Mill ON OFF-26A-3A** Recovered by CG

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		831.5	828.8	629.2	752.4	746.0	968.1	g
Initial weight		746.4	739.9	619.2	744.7	744.3	950.6	g
Net weight		85.1	88.9	10.0	7.7	1.7	17.5	g

Description of impinger water Clear 60 % spent

B/W Sil gel color

Total moisture = 210.9 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter NA

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 1 Run 3 Mill ON OFF-26A-H2SO4-3A** Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 1 Run 3 Mill ON OFF-26A-NaOH -3A** Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 15 /23	Kiln System Stack	Method 26A	Kiln -(ON) OFF -M5- 3 (5)

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp 845	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
Gage Mayo	~29.00	-.36	~65	N/A	161.5" (K1)	0.84	8' eff., 9' Glass Liner (K1	.250 .250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20% 15%	15	1.68	.975	SM	SM	K -M5-	.001 CU. FT @ 12 "Hg	.001 CU. FT @ 12 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.68

PITOT LEAK CHECK ----> [] PASSED [] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN / OUT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	12:02	372.800	1.0	2.7	254	136	81	255	60	11
2	5		377.62[illegible]	1.0	2.7	257	138	81	254	60	11
3	10		382.13	1.0	2.7	257	137	83	259	58	12
	15	12:17	387.023	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

B-1	15	12:20	387.023	.86	2.3	248	138	82	253	61	11
2	20		392.48	.89	2.4	249	138	82	251	58	12
3	25		396.44	.83	2.2	255	137	84	252	56	10
	30	12:35	401.086	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

C-1	30	12:38	401.086	.92	2.5	245	138	81	257	59	12
2	35		405.91	.96	2.6	249	138	81	253	59	13
3	40		410.91	.98	2.35	255	136	83	255	59	11
	45	12:53	415.205	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

D-1	45	12:56	415.205	.87	2.3	257	138	81	254	59	11
2	50		420.03	.84	2.3	256	136	82	254	57	11
3	55		424.73	.82	2.2	251	134	83	258	56	10
	60	13:11	428.963	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.	428.963				

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/15/23

Run No. **Kiln 1 Run 3 Mill ON OFF-26A-** 3B Recovered by 4C

Filter Number(s) _____

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		852.8	795.4	680.8	763.7	765.3	954.8	g
Initial weight		738.5	745.1	670.4	761.0	763.3	940.7	g
Net weight		154.3	50.3	10.4	2.7	2.0	14.1	g

Description of impinger water Clear 50 % spent

B/W Sil gel color

Total moisture = 233.8 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 1 Run 3 Mill ON OFF-26A-H2SO4-** 3B Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 1 Run 3 Mill ON OFF-26A-NaOH-** 3B Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

A

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 15 /23	Kiln 1 System Stack	Method 26A	Kiln 1 - ON OFF -M5- 4A

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
M. Powell	29.97	-.35	60	NA	161.5" (K1)	0.82 0.84	8' eff., 9' Glass Liner (K1	.250 .250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	M5-22	1.72	1.014	84	84	K -M5-	0.001 CU. FT @ 10 "Hg	0.001 CU. FT @ 12 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.72

PITOT LEAK CHECK ----> [X] PASSED [ ] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN / OUT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	1432	904.288	.68	1.8	256	135	59	251	60	4
2	5		908.35	.68	1.8	254	132	59	259	60	4
3	10		911.599	.64	1.7	283	131	60	251	59	4
	15	1447	915.019	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL / FINAL		LEAK RATE: / CU.FT @ / INCHES Hg / CU.FT @ / INCHES Hg							
B-1	15	1450	915.019	.69	1.9	256	129	59	283	61	6
2	20		918.92	.62	1.7	256	130	60	257	60	6
3	25		922.79	.68	1.8	253	131	61	254	60	7
	30	1505	926.616	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL / FINAL		LEAK RATE: / CU.FT @ / INCHES Hg / CU.FT @ / INCHES Hg							
C-1	30	1508	926.616	.56	1.5	256	132	61	256	60	5
2	35		929.34	.69	1.9	255	131	62	253	61	7
3	40		933.93	.65	1.8	253	130	62	258	62	7
	45	1523	937.679	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL / FINAL		LEAK RATE: / CU.FT @ / INCHES Hg / CU.FT @ / INCHES Hg							
D-1	45	1526	937.679	.65	1.8	252	129	62	254	63	7
2	50		941.44	.69	1.9	251	131	63	253	62	8
3	55		945.13	.65	1.8	251	130	63	256	62	8
	60	1541	948.713	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.					

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/15/23

Run No. **Kiln 1 Run 4 Mill ON OFF-26A-** 4A Recovered by MCS

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		836.0	823.9	658.4	750.3	759.7	951.6	g
Initial weight		744.0	736.8	645.2	746.3	758.9	939.4	g
Net weight		92.0	87.1	13.2	4.0	0.8	12.2	g

Description of impinger water Clear 65 % spent

B/W Sil gel color

Total moisture = 209.3 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 1 Run 4 Mill ON OFF-26A-H2SO4-** 4A Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 1 Run 4 Mill ON OFF-26A-NaOH-** 4A Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11/15/23	Kiln System Stack	Method 26A	Kiln - ON / OFF - M26A-1B

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
Gary Mayo	29.00	-.36	45	N/A	161.5" (K1)	0.85 ~~0.84~~ SCS	8' eff., 9' Glass Liner (K1	.250 .250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20% (15%)	15	1.68	.975	S01	S01	K -M5-	.001 CU. FT @ 12 "Hg	.001 CU. FT @ 12 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.68

PITOT LEAK CHECK ----> ☐ PASSED ☐ FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN / OUT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
~~DA-1~~	0	14:32	~~426.837~~ 444.210	.86	2.3	255	140	76	262	60	4
2	5		433.14	.82	2.2	250	140	77	255	60	4
3	10			.80	2.1	251	142	79	255	58	5
	15	14:47	~~456.228~~	End of Port							

INTRA-PORT LEAK CHECK? INITIAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg
DGM VOLUME (CU. FT) FINAL 444.210 444.210 CU.FT @ _____ INCHES Hg

~~CB-1~~	15	14:50	~~456.228~~	.91	2.4	248	141	78	255	58	5
2	20		445.85	.96	2.6	252	140	79	256	56	5
3	25		450.42	.89	2.4	254	140	80	254	54	5
	30	15:05	456.228	End of Port							

INTRA-PORT LEAK CHECK? INITIAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg
DGM VOLUME (CU. FT) FINAL _____ _____ CU.FT @ _____ INCHES Hg

~~C-1~~	30	15:08	456.228	.85	2.3	246	138	80	253	60	5
2	35		460.90	.84	2.4	251	138	81	254	60	6
3	40		466.45	.81	2.2	250	138	82	257	60	5
	45	15:23	470.708	End of Port							

INTRA-PORT LEAK CHECK? INITIAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg
DGM VOLUME (CU. FT) FINAL _____ _____ CU.FT @ _____ INCHES Hg

~~D-1~~	45	15:26	470.708	1.2	3.2	249	143	81	254	55	9
2	50		474.76	1.1	2.9	255	144	82	254	55	8
3	55		479.51	1.1	2.9	257	144	83	255	56	8
	60	15:41	484.635	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.	484.635				

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/15/23

Run No. **Kiln (Run 4 Mill ON (OFF)-26A-** 4B Recovered by YCG

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		913.3	806.5	620.2	751.7	755.3	956.0	g
Initial weight		746.0	750.9	613.7	745.3	751.6	942.7	g
Net weight		167.3	55.6	6.5	6.4	3.7	13.3	g

Description of impinger water Clear 50 % spent

S/W Sil gel color

Total moisture = 252.8 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse
container no. **Kiln (Run 4 Mill ON (OFF)-26A-H2SO4-** 4B

Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse
container no. **Kiln (Run 4 Mill ON (OFF)-26A-NaOH -** 4B

Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11/15/23	Kiln 1 System Stack	Method 26A	Kiln C - ON/OFF -M26A-1

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
M. Powell	29.88	-.35	60	NA	161.5" (K1)	0.82 0.84	8' eff., 9' Glass Liner (K1	.250 .250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	MS-22	1.72	1.014	3A	3A	K -M5-	0.001 CU. FT @ 10 "Hg	0.000 CU. FT @ 10 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.72

PITOT LEAK CHECK ----> [X] PASSED [ ] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN / OUT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	1550	949.293	.68	1.8	253	132	60	252	60	6
2	5		953.17	.66	1.8	255	130	61	251	58	6
3	10		956.79	.68	1.8	252	131	62	250	59	6
	15	1611	960.362	End of Port							

INTRA-PORT LEAK CHECK? LEAK RATE: ____ CU.FT @ ____ INCHES Hg
DGM VOLUME (CU. FT) INITIAL ____ FINAL ____ ____ CU.FT @ ____ INCHES Hg

B-1	15	1614	960.362	.64	1.7	253	134	62	251	61	6
2	20		963.98	.73	2.0	254	132	62	250	62	7
3	25		967.79	.76	2.1	253	130	61	259	61	8
	30	1629	971.864	End of Port							

INTRA-PORT LEAK CHECK? LEAK RATE: ____ CU.FT @ ____ INCHES Hg
DGM VOLUME (CU. FT) INITIAL ____ FINAL ____ ____ CU.FT @ ____ INCHES Hg

C-1	30	1632	971.864	.83	2.3	254	131	61	253	62	8
2	35		976.25	.86	2.3	256	134	62	254	61	8
3	40		980.32	.89	2.4	255	135	63	256	62	8
	45	1647	984.549	End of Port							

INTRA-PORT LEAK CHECK? LEAK RATE: ____ CU.FT @ ____ INCHES Hg
DGM VOLUME (CU. FT) INITIAL ____ FINAL ____ ____ CU.FT @ ____ INCHES Hg

D-1	45	1650	984.549	.92	2.5	255	136	64	254	63	9
2	50		988.79	.97	2.6	254	134	65	255	62	9
3	55		993.05	.97	2.6	254	132	66	251	62	9
	60	1705	997.29	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.					

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/15/23

Run No. **Kiln (Run 5 Mill ON OFF-26A-5A** Recovered by GLS

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		847.6	841.5	627.5	767.1	742.9	986.9	g
Initial weight		750.2	755.2	616.9	761.4	741.3	968.0	g
Net weight		97.4	86.3	10.6	2.7	1.6	18.9	g

Description of impinger water Clear 90 % spent

B/W Sil gel color

Total moisture = 217.5 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln(Run 5 Mill ON OFF-26A-H2SO4-** 5A Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln (Run 5 Mill ON OFF-26A-NaOH** 5A Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 15 /23	Kiln System Stack	Method 26A	Kiln - ON OFF -M5- 5B

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
Joey Wiley	29.61	-.36	~65	N/A	161.5" (K1)	0.84	8' eff., 9' Glass Liner (K1	.250 .250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	15	1.68	.975	5M	5M	K -M5-	.001 CU. FT @ 12 "Hg	.001 CU. FT @ 13 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.68

15

PITOT LEAK CHECK ---> ☐ PASSED ☐ FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN / OUT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	15:56	484.860	.90	2.4	250	141	82	257	60	10
2	5		490.19	.92	2.5	249	138	82	252	60	12
3	10		494.22	.92	2.5	255	136	83	256	60	13
	15	16:11	498.479	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

B-1	15	16:14	498.479	.81	2.2	263	144	82	258	62	14
2	20		502.35	.84	2.2	265	142	82	260	62	14
3	25		508.25	.83	2.2	255	142	82	255	62	14
	30	16:29	511.880	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

C-1	30	16:32	511.880	.78	2.1	258	141	83	256	61	14
2	35		516.46	.77	2.1	259	140	83	256	61	14
3	40		520.98	.69	1.84	256	140	83	254	62	~~14~~ 13
	45	16:47	524.791	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

D-1	45	16:50	524.791	.79	2.1	248	143	83	256	64	14
2	50		528.88	.78	2.1	253	143	84	255	64	14
3	55		532.69	.78	2.1	253	146	85	255	64	14
	60	17:05	537.081	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.	537.081				

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/15/23

Run No. **Kiln 1 Run 5 Mill ON OFF-26A-** 5B Recovered by GCS

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		909.2	809.2	677.3	741.6	749.0	968.9	g
Initial weight		742.7	761.2	668.1	739.3	746.7	954.6	g
Net weight		166.5	48.0	9.2	2.3	2.3	14.3	g

Description of impinger water Clear 80 % spent

B/W Sil gel color

Total moisture = 242.6 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 1 Run 5 Mill ON OFF-26A-H2SO4-** 5B Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 1 Run 5 Mill ON OFF-26A-NaOH** 5B Liquid level marked/sealed ✓

A

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11/15/23	Kiln 1 System Stack	Method 26A	Kiln 1 - ON OFF -M5~~6~~ 6A

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
M. Ravell	29.97	-0.35	60	N/A	161.5" (K1)	0.82 0.84	8' eff., 9' Glass Liner (K1	.280 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	MS-22	L72	1.014	8H	8H	K -M5-	0.001 CU. FT @ 10 "Hg	0.001 CU. FT @ 5 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.72

PITOT LEAK CHECK ----> [X] PASSED [ ] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN / OUT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	1719	997.561	.96	2.6	255	144	62	252	62	4
2	5		1001.27	.95	2.6	256	146	63	253	61	4
3	10		1006.31	.97	2.6	252	145	64	255	60	5
	15	1734	1010.861	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL / FINAL /		LEAK RATE: / CU.FT @ / INCHES Hg / CU.FT @ / INCHES Hg							
B-1	15	1737	1010.861	.83	2.3	251	144	64	252	62	4
2	20		1015.02	.84	2.3	253	143	64	249	60	4
3	25		1019.05	.79	2.1	254	143	65	250	60	4
	30	1752	1022.937	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL / FINAL /		LEAK RATE: / CU.FT @ / INCHES Hg / CU.FT @ / INCHES Hg							
C-1	30	1755	1022.937	.64	1.7	250	142	64	256	61	4
2	35		1026.51	.68	1.8	249	143	65	259	59	4
3	40		1030.09	.62	1.7	252	143	66	258	58	4
	45	1810	1033.471	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL / FINAL /		LEAK RATE: / CU.FT @ / INCHES Hg / CU.FT @ / INCHES Hg							
D-1	45	1813	1033.471	.63	1.7	257	141	66	252	60	5
2	50		1036.98	.59	1.6	255	144	67	253	60	5
3	55		1040.416	.62	1.7	252	142	68	255	61	5
	60	1828	1044.123	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.					

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/16/23

Run No. **Kiln Run 6 Mill ON OFF-26A-6A** Recovered by GCS

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		868.0	755.5	658.4	745.8	735.6	972.9	g
Initial weight		745.0	737.2	642.9	740.4	735.4	951.6	g
Net weight		123.0	58.3	15.5	5.4	0.2	21.3	g

Description of impinger water Clear 70 % spent

B/W Sil gel color

Total moisture = 223.7 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse
container no. **Kiln Run 6 Mill ON OFF-26A-H2SO4-** 6A

Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse
container no. **Kiln Run 6 Mill ON OFF-26A-NaOH -** 6A

Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11/15/23	Kiln i System Stack	Method 26A	Kiln - ON OFF -M5 3

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
Gage Mayer	~29.00	-.36	60	N/A	161.5" (K1)	0.85 0.84	8' eff., 9' Glass Liner (K1	.250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20% 15%	15	1.65	.975	SM	SM	K -M5-	.001 CU. FT @ 12 "Hg	.001 CU. FT @ 12 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.68

PITOT LEAK CHECK ----> [] PASSED [] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN / OUT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
D A-1	0	17:19	537.490	.96	2.6	260	144	78	255	64	11
2	5		542.723	.95	2.6	260	144	78	255	64	11
3	10		547.21	.97	2.6	258	142	79	255	63	11
	15	17:34	552.178	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

C B-1	15	17:37	552.178	.83	2.2	258	140	78	256	61	11
2	20		557.02	.84	2.2	255	142	78	259	61	11
3	25		560.93	.79	2.1	255	141	78	257	61	11
	30	17:52	565.079	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

B C-1	30	17:35	565.079	.64	1.7	256	142	78	256	60	10
2	35		569.69	.68	1.8	255	140	78	250	60	10
3	40		572.83	.62	1.7	256	138	78	256	59	10
	45	18:10	576.320	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

A D-1	45	18:13	576.320	.63	1.7	249	138	78	249	61	10
2	50		580.13	.59	1.6	247	138	78	255	61	10
3	55		583.22	.62	1.7	252	136	79	255	63	10
	60	18:28	588.199	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.	588.199				

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/16/23

Run No. **Kiln) Run 6 Mill ON OFF-26A-GB** Recovered by SCS

Filter Number(s) _____

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		903.7	790.7	617.2	736.5	733.7	970.4	g
Initial weight		743.0	741.3	610.4	732.3	731.9	956.0	g
Net weight		160.7	49.4	6.8	4.2	1.2	14.4	g

Description of impinger water Clear 80 % spent

B/W Sil gel color

Total moisture = 237.3 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln / Run 6 Mill ON OFF-26A-H2SO4-** 6B Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln / Run 6 Mill ON OFF-26A-NaOH-** 6B Liquid level marked/sealed ✓

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/15/23

Run No. **Kiln / Run Mill ON OFF-26A-** FB Recovered by LS

Filter Number(s) _____

Field Blank #1

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		741.2	753.3	667.5	749.6	743.6	969.7	g
Initial weight		748.7	753.1	667.1	749.3	743.3	969.0	g
Net weight		-0.5						g

Description of impinger water Clear 75 % spent

B/W Sil gel color

Total moisture = _____ grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln / Run Mill ON OFF-26A-H2SO4-** FB

Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln / Run Mill ON OFF-26A-NaOH.** FB

Liquid level marked/sealed ✓

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/15/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/16/23

Run No. **Kiln / Run Mill ON OFF-26A-** FB Recovered by SC

Filter Number(s) _____

Field Blank #2

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		746.6	744.0	615.5	736.6	747.5	987.3	g
Initial weight		746.8	743.9	615.7	736.3	747.6	986.9	g
Net weight								g

Description of impinger water _____ 20 % spent

_____ B/W Sil gel color

Total moisture = _____ grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln / Run Mill ON OFF-26A-H2SO4-** FB Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln / Run Mill ON OFF-26A-NaOH** FB Liquid level marked/sealed ✓

Client: Holcim Midlothian
Test Location: Line 1 Main Stack; Raw Mill On
Date: Nov 15, 2023 Start Time: 09:00:18
Run number 1
One Minute Averages

	Out O2 %,dry	Out CO2 %,dry
9:01:16 AM	15.2	8.8
9:02:16 AM	15.3	8.8
9:03:16 AM	15.3	8.7
9:04:16 AM	15.2	8.8
9:05:16 AM	15.3	8.7
9:06:16 AM	15.3	8.8
9:07:16 AM	15.2	8.8
9:08:16 AM	15.3	8.7
9:09:16 AM	15.2	8.8
9:10:16 AM	15.3	8.7
9:11:16 AM	15.3	8.7
9:12:16 AM	15.2	9.0
9:13:16 AM	15.2	9.1
9:14:16 AM	15.2	8.9
9:15:16 AM	15.3	8.8
9:16:16 AM	15.3	8.8
9:17:16 AM	15.2	8.9
9:18:16 AM	15.3	8.7
9:19:16 AM	15.3	8.7
9:20:16 AM	15.2	8.7
9:21:16 AM	15.3	8.7
9:22:16 AM	15.2	8.7
9:23:16 AM	15.3	8.7
9:24:16 AM	15.2	8.7
9:25:16 AM	15.3	8.7
9:26:16 AM	15.2	8.7
9:27:16 AM	15.2	8.8
9:28:16 AM	15.2	8.9
9:29:16 AM	15.2	9.0
9:30:16 AM	15.2	9.0
9:31:16 AM	15.2	8.8
9:32:16 AM	15.2	8.8
9:33:16 AM	15.2	8.7
9:34:16 AM	15.2	8.8
9:35:16 AM	15.2	8.8
9:36:16 AM	15.2	8.7
9:37:16 AM	15.2	8.8
9:38:16 AM	15.3	8.6
9:39:16 AM	15.3	8.6
9:40:16 AM	15.3	8.6
9:41:16 AM	15.4	8.5
9:42:16 AM	15.4	8.6
9:43:16 AM	15.4	8.5
9:44:16 AM	15.4	8.7
9:45:16 AM	15.3	8.9
9:46:16 AM	15.3	8.8
9:47:16 AM	15.3	8.7
9:48:16 AM	15.4	8.5
9:49:16 AM	15.4	8.5
9:50:16 AM	15.4	8.5
9:51:16 AM	15.4	8.6
9:52:16 AM	15.3	8.8
9:53:16 AM	15.2	8.8
9:54:16 AM	15.3	8.7
9:55:16 AM	15.3	8.7
9:56:16 AM	15.3	8.7
9:57:16 AM	15.2	8.7
9:58:16 AM	15.3	8.7
9:59:16 AM	15.3	8.8
10:00:16 AM	15.2	9.0
10:01:16 AM	15.2	9.0
10:02:16 AM	15.2	8.9
10:03:16 AM	15.3	8.8
10:04:16 AM	15.2	8.7
10:05:16 AM	15.2	8.7
10:06:16 AM	15.3	8.7
10:07:16 AM	15.3	8.7
10:08:16 AM	15.3	8.7
10:09:16 AM	15.3	8.7
10:10:16 AM	15.2	8.9
10:11:16 AM	15.3	8.7
Run Avgs	15.3	8.7
Cal Gas	12.0	10.2
Initial Zero	0.3	0.1
Final Zero	0.5	0.1
Initial cal.	12.2	9.9
Final Cal.	12.1	9.9
Corrected Average	15.2	9.0

Client: Holcim Midlothian
Test Location: Line 1 Main Stack; Raw Mill On
Date: Nov 15, 2023 Start Time: 10:33:34
Run number 2
One Minute Averages

	Out O2 %,dry	Out CO2 %,dry
10:34:32 AM	15.2	8.8
10:35:32 AM	15.2	8.8
10:36:32 AM	15.2	8.7
10:37:32 AM	15.3	8.7
10:38:32 AM	15.3	8.6
10:39:32 AM	15.3	8.7
10:40:32 AM	15.3	8.8
10:41:32 AM	15.4	8.6
10:42:32 AM	15.3	8.7
10:43:32 AM	15.4	8.6
10:44:32 AM	15.4	8.6
10:45:32 AM	15.3	8.8
10:46:32 AM	15.4	8.7
10:47:32 AM	15.4	8.6
10:48:32 AM	15.4	8.9
10:49:32 AM	15.3	9.0
10:50:32 AM	15.3	8.8
10:51:32 AM	15.4	8.6
10:52:32 AM	15.4	8.6
10:53:32 AM	15.4	8.6
10:54:32 AM	15.4	8.5
10:55:32 AM	15.4	8.6
10:56:32 AM	15.5	8.5
10:57:32 AM	15.5	8.5
10:58:32 AM	15.4	8.6
10:59:32 AM	15.4	8.6
11:00:32 AM	15.4	8.6
11:01:32 AM	15.4	8.6
11:02:32 AM	15.4	8.7
11:03:32 AM	15.4	8.7
11:04:32 AM	15.3	8.9
11:05:32 AM	15.3	9.1
11:06:32 AM	15.2	8.9
11:07:32 AM	15.3	8.7
11:08:32 AM	15.3	8.6
11:09:32 AM	15.4	8.6
11:10:32 AM	15.4	8.6
11:11:32 AM	15.4	8.6
11:12:32 AM	15.4	8.7
11:13:32 AM	15.4	8.6
11:14:32 AM	15.4	8.6
11:15:32 AM	15.4	8.7
11:16:32 AM	15.4	8.6
11:17:32 AM	15.4	8.6
11:18:32 AM	15.4	8.6
11:19:32 AM	15.4	8.5
11:20:32 AM	15.3	9.0
11:21:32 AM	15.3	9.0
11:22:32 AM	15.4	8.7
11:23:32 AM	15.4	8.6
11:24:32 AM	15.5	8.5
11:25:32 AM	15.4	8.6
11:26:32 AM	15.4	8.5
11:27:32 AM	15.4	8.5
11:28:32 AM	15.4	8.7
11:29:32 AM	15.4	8.7
11:30:32 AM	15.4	8.7
11:31:32 AM	15.4	8.6
11:32:32 AM	15.4	8.6
11:33:32 AM	15.4	8.7
11:34:32 AM	15.4	8.6
11:35:32 AM	15.4	8.6
11:36:32 AM	15.3	9.0
11:37:32 AM	15.3	8.9
11:38:32 AM	15.2	9.0
11:39:32 AM	15.4	8.7
11:40:32 AM	15.4	8.7
11:41:32 AM	15.3	8.7
Run Avgs	15.4	8.7
Cal Gas	12.0	10.2
Initial Zero	0.3	0.1
Final Zero	0.5	0.1
Initial cal.	12.1	9.9
Final Cal.	12.3	9.8
Corrected Average	15.2	9.0

Client: Holcim Midlothian
Test Location: Line 1 Main Stack; Raw Mill On
Date: Nov 15, 2023 Start Time: 12:02:28
Run number 3
One Minute Averages

	Out O2 %,dry	Out CO2 %,dry
12:03:26 PM	15.4	8.6
12:04:26 PM	15.4	8.6
12:05:26 PM	15.4	8.6
12:06:26 PM	15.5	8.6
12:07:26 PM	15.5	8.5
12:08:26 PM	15.4	8.9
12:09:26 PM	15.4	8.9
12:10:26 PM	15.5	8.6
12:11:26 PM	15.4	8.7
12:12:26 PM	15.5	8.5
12:13:26 PM	15.4	8.7
12:14:26 PM	15.5	8.6
12:15:26 PM	15.5	8.5
12:16:26 PM	15.4	8.6
12:17:26 PM	15.5	8.6
12:18:26 PM	15.4	8.6
12:19:26 PM	15.4	8.6
12:20:26 PM	15.4	8.6
12:21:26 PM	15.4	8.7
12:22:26 PM	15.4	8.6
12:23:26 PM	15.5	8.6
12:24:26 PM	15.4	9.0
12:25:26 PM	15.3	9.0
12:26:26 PM	15.3	8.8
12:27:26 PM	15.4	8.7
12:28:26 PM	15.4	8.7
12:29:26 PM	15.4	8.7
12:30:26 PM	15.4	8.6
12:31:26 PM	15.3	8.7
12:32:26 PM	15.4	8.6
12:33:26 PM	15.5	8.5
12:34:26 PM	15.3	8.7
12:35:26 PM	15.4	8.7
12:36:26 PM	15.4	8.8
12:37:26 PM	15.4	8.7
12:38:26 PM	15.4	8.6
12:39:26 PM	15.4	8.7
12:40:26 PM	15.5	8.9
12:41:26 PM	15.4	8.9
12:42:26 PM	15.5	8.7
12:43:26 PM	15.5	8.5
12:44:26 PM	15.5	8.6
12:45:26 PM	15.5	8.5
12:46:26 PM	15.5	8.5
12:47:26 PM	15.5	8.5
12:48:26 PM	15.5	8.6
12:49:26 PM	15.5	8.7
12:50:26 PM	15.5	8.6
12:51:26 PM	15.4	8.7
12:52:26 PM	15.4	8.6
12:53:26 PM	15.5	8.5
12:54:26 PM	15.4	8.6
12:55:26 PM	15.5	8.6
12:56:26 PM	15.4	9.0
12:57:26 PM	15.3	9.0
12:58:26 PM	15.4	8.7
12:59:26 PM	15.4	8.6
1:00:26 PM	15.5	8.5
1:01:26 PM	15.5	8.5
1:02:26 PM	15.5	8.5
1:03:26 PM	15.6	8.5
1:04:26 PM	15.5	8.6
1:05:26 PM	15.6	8.5
1:06:26 PM	15.5	8.6
1:07:26 PM	15.6	8.5
1:08:26 PM	15.6	8.5
1:09:26 PM	15.5	8.6
1:10:26 PM	15.5	8.6
1:11:26 PM	15.5	8.6
Run Avgs	15.5	8.6
Cal Gas	12.0	10.2
Initial Zero	0.5	0.1
Final Zero	0.5	0.1
Initial cal.	12.3	9.8
Final Cal.	12.3	9.7
Corrected Average	15.2	9.0

Holcim, Midlothian TX Line 1 Main Stack; Raw Mill On November 15, 2023 Operator

					Run No. 1		09:00-10:09			Run No. 2		10:32-11:41			Run No. 3		12:02-13:11		
Cylinder ID	Gas Type	Value	Internal Response	Cal Error	Pre Run Bias	Percent Bias	Post Run Bias	Percent Bias	Percent Drift	Pre Run Bias	Percent Bias	Post Run Bias	Percent Bias	Percent Drift	Pre Run Bias	Percent Bias	Post Run Bias	Percent Bias	Percent Drift
	O2 Zero	Zero N2	0.0%	0.00%	0.3%	1.36%	0.3%	1.36%	0.00%	0.3%	1.36%	0.5%	2.27%	0.91%	0.5%	2.27%	0.5%	2.27%	0.00%
CC194988	O2 Mid	12.0%	12.0%	0.23%	12.2%	0.91%	12.1%	0.45%	-0.45%	12.1%	0.45%	12.3%	1.36%	0.91%	12.3%	1.36%	12.3%	1.36%	0.00%
CC427971	O2 Span	22.1%	21.9%	-0.73%															
	CO2 Zero	Zero N2	0.0%	0.00%	0.1%	0.55%	0.1%	0.55%	0.00%	0.1%	0.55%	0.1%	0.55%	0.00%	0.1%	0.55%	0.1%	0.55%	0.00%
CC194988	CO2 Mid	10.2%	10.0%	-0.88%	9.9%	-0.55%	9.9%	-0.55%	0.00%	9.9%	-0.55%	9.8%	-1.10%	-0.55%	9.8%	-1.10%	9.7%	-1.65%	-0.55%
CC427971	CO2 Span	18.2%	18.3%	0.66%															

Client: Holcim Midlothian
Test Location: Line 1 Main Stack; Raw Mill Off
Date: Nov 15, 2023 Start Time: 14:32:06
Run number 1
One Minute Averages

	Out O2 %,dry	Out CO2 %,dry
2:33:04 PM	14.0	10.9
2:34:04 PM	14.1	10.6
2:35:04 PM	14.1	10.6
2:36:04 PM	14.1	10.5
2:37:04 PM	14.1	10.4
2:38:04 PM	14.1	10.5
2:39:04 PM	14.2	10.3
2:40:04 PM	14.1	10.4
2:41:04 PM	14.1	10.5
2:42:04 PM	14.1	10.4
2:43:04 PM	14.0	10.5
2:44:04 PM	14.1	10.4
2:45:04 PM	14.1	10.5
2:46:04 PM	14.1	10.4
2:47:04 PM	14.2	10.3
2:48:04 PM	14.1	10.8
2:49:04 PM	14.1	10.8
2:50:04 PM	14.1	10.6
2:51:04 PM	14.2	10.5
2:52:04 PM	14.2	10.5
2:53:04 PM	14.2	10.5
2:54:04 PM	14.2	10.3
2:55:04 PM	14.2	10.2
2:56:04 PM	14.2	10.3
2:57:04 PM	14.3	10.2
2:58:04 PM	14.2	10.3
2:59:04 PM	14.2	10.3
3:00:04 PM	14.2	10.5
3:01:04 PM	14.2	10.4
3:02:04 PM	14.3	10.2
3:03:04 PM	14.2	10.3
3:04:04 PM	14.2	10.6
3:05:04 PM	14.1	10.7
3:06:04 PM	14.2	10.5
3:07:04 PM	14.2	10.3
3:08:04 PM	14.2	10.3
3:09:04 PM	14.2	10.3
3:10:04 PM	14.2	10.3
3:11:04 PM	14.2	10.2
3:12:04 PM	14.3	10.2
3:13:04 PM	14.2	10.3
3:14:04 PM	14.3	10.2
3:15:04 PM	14.3	10.2
3:16:04 PM	14.2	10.3
3:17:04 PM	14.3	10.2
3:18:04 PM	14.3	10.3
3:19:04 PM	14.3	10.2
3:20:04 PM	14.3	10.3
3:21:04 PM	14.2	10.5
3:22:04 PM	14.3	10.4
3:23:04 PM	14.2	10.4
3:24:04 PM	14.2	10.3
3:25:04 PM	14.3	10.2
3:26:04 PM	14.2	10.4
3:27:04 PM	14.2	10.4
3:28:04 PM	14.2	10.4
3:29:04 PM	14.1	10.5
3:30:04 PM	14.1	10.5
3:31:04 PM	14.1	10.4
3:32:04 PM	14.2	10.3
3:33:04 PM	14.1	10.4
3:34:04 PM	14.1	10.4
3:35:04 PM	14.2	10.3
3:36:04 PM	14.1	10.7
3:37:04 PM	14.3	10.6
3:38:04 PM	14.3	10.3
3:39:04 PM	14.3	10.3
3:40:04 PM	14.3	10.3
3:41:04 PM	14.2	10.3
3:42:04 PM	14.3	10.2
3:43:04 PM	14.2	10.3
Run Avgs	14.2	10.4
Cal Gas	12.0	10.2
Initial Zero	0.3	0.1
Final Zero	0.3	0.1
Initial cal.	12.2	9.9
Final Cal.	12.1	9.9
Corrected Average	14.1	10.7

Client: Holcim Midlothian
Test Location: Line 1 Main Stack; Raw Mill Off
Date: Nov 15, 2023 Start Time: 15:58:28
Run number 2
One Minute Averages

	Out O2 %,dry	Out CO2 %,dry
3:59:26 PM	14.2	10.3
4:00:26 PM	14.2	10.3
4:01:26 PM	14.1	10.4
4:02:26 PM	14.2	10.4
4:03:26 PM	14.2	10.5
4:04:26 PM	14.2	10.4
4:05:26 PM	14.2	10.4
4:06:26 PM	14.2	10.3
4:07:26 PM	14.3	10.3
4:08:26 PM	14.2	10.8
4:09:26 PM	14.2	10.6
4:10:26 PM	14.3	10.3
4:11:26 PM	14.3	10.3
4:12:26 PM	14.3	10.2
4:13:26 PM	14.3	10.3
4:14:26 PM	14.2	10.3
4:15:26 PM	14.3	10.3
4:16:26 PM	14.2	10.3
4:17:26 PM	14.2	10.3
4:18:26 PM	14.2	10.3
4:19:26 PM	14.2	10.3
4:20:26 PM	14.2	10.3
4:21:26 PM	14.2	10.4
4:22:26 PM	14.2	10.3
4:23:26 PM	14.2	10.4
4:24:26 PM	14.1	10.8
4:25:26 PM	14.2	10.6
4:26:26 PM	14.2	10.4
4:27:26 PM	14.3	10.3
4:28:26 PM	14.2	10.3
4:29:26 PM	14.2	10.3
4:30:26 PM	14.3	10.2
4:31:26 PM	14.2	10.3
4:32:26 PM	14.3	10.2
4:33:26 PM	14.2	10.3
4:34:26 PM	14.2	10.3
4:35:26 PM	14.3	10.2
4:36:26 PM	14.2	10.3
4:37:26 PM	14.3	10.2
4:38:26 PM	14.3	10.2
4:39:26 PM	14.3	10.3
4:40:26 PM	14.1	10.8
4:41:26 PM	14.0	10.9
4:42:26 PM	14.0	10.6
4:43:26 PM	14.0	10.5
4:44:26 PM	14.0	10.6
4:45:26 PM	14.1	10.3
4:46:26 PM	14.0	10.5
4:47:26 PM	14.1	10.3
4:48:26 PM	14.2	10.2
4:49:26 PM	14.2	10.3
4:50:26 PM	14.2	10.3
4:51:26 PM	14.2	10.4
4:52:26 PM	14.2	10.4
4:53:26 PM	14.2	10.4
4:54:26 PM	14.1	10.5
4:55:26 PM	14.2	10.4
4:56:26 PM	14.1	10.8
4:57:26 PM	14.0	10.8
4:58:26 PM	14.0	10.7
4:59:26 PM	14.0	10.7
5:00:26 PM	14.0	10.7
5:01:26 PM	13.9	10.7
5:02:26 PM	13.9	10.7
5:03:26 PM	14.0	10.7
5:04:26 PM	13.9	10.8
5:05:26 PM	13.9	10.8
5:06:26 PM	13.8	10.9
5:07:26 PM	13.8	10.8
Run Avgs	14.2	10.4
Cal Gas	12.0	10.2
Initial Zero	0.3	0.1
Final Zero	0.4	0.1
Initial cal.	12.1	9.9
Final Cal.	12.2	9.8
Corrected Average	14.0	10.8

Client: Holcim Midlothian
Test Location: Line 1 Main Stack; Raw Mill Off
Date: Nov 15, 2023 Start Time: 17:22:32
Run number 3
One Minute Averages

	Out O2 %,dry	Out CO2 %,dry
5:23:30 PM	14.0	10.7
5:24:30 PM	13.9	10.8
5:25:30 PM	13.9	10.7
5:26:30 PM	13.9	10.7
5:27:30 PM	13.9	10.8
5:28:30 PM	13.9	11.0
5:29:30 PM	13.8	11.1
5:30:30 PM	13.9	10.9
5:31:30 PM	13.9	10.8
5:32:30 PM	14.0	10.7
5:33:30 PM	14.1	10.4
5:34:30 PM	14.0	10.5
5:35:30 PM	14.1	10.4
5:36:30 PM	14.1	10.4
5:37:30 PM	14.0	10.5
5:38:30 PM	14.1	10.4
5:39:30 PM	14.0	10.5
5:40:30 PM	14.0	10.5
5:41:30 PM	14.0	10.6
5:42:30 PM	14.0	10.7
5:43:30 PM	14.0	10.7
5:44:30 PM	13.9	11.1
5:45:30 PM	13.9	11.0
5:46:30 PM	13.9	10.9
5:47:30 PM	13.9	10.9
5:48:30 PM	14.0	10.7
5:49:30 PM	14.0	10.6
5:50:30 PM	14.0	10.7
5:51:30 PM	14.0	10.7
5:52:30 PM	13.9	10.8
5:53:30 PM	13.9	10.8
5:54:30 PM	13.9	10.8
5:55:30 PM	13.9	10.8
5:56:30 PM	13.9	10.9
5:57:30 PM	13.8	10.9
5:58:30 PM	13.9	10.7
5:59:30 PM	13.9	10.8
6:00:30 PM	13.8	11.2
6:01:30 PM	13.9	11.0
6:02:30 PM	13.9	10.9
6:03:30 PM	13.9	10.8
6:04:30 PM	13.9	10.8
6:05:30 PM	13.8	10.9
6:06:30 PM	13.9	10.9
6:07:30 PM	13.8	10.9
6:08:30 PM	13.9	10.8
6:09:30 PM	13.8	10.9
6:10:30 PM	13.8	10.9
6:11:30 PM	13.8	10.9
6:12:30 PM	13.7	11.1
6:13:30 PM	13.7	11.1
6:14:30 PM	13.7	11.1
6:15:30 PM	13.7	11.2
6:16:30 PM	13.6	11.5
6:17:30 PM	13.6	11.5
6:18:30 PM	13.6	11.3
6:19:30 PM	13.6	11.2
6:20:30 PM	13.6	11.1
6:21:30 PM	13.7	11.0
6:22:30 PM	13.7	11.1
6:23:30 PM	13.8	11.0
6:24:30 PM	13.8	11.1
6:25:30 PM	13.8	11.1
6:26:30 PM	13.8	11.0
6:27:30 PM	13.8	11.1
6:28:30 PM	13.8	11.0
6:29:30 PM	13.8	11.0
6:30:30 PM	13.8	11.0
Run Avgs	13.9	10.9
Cal Gas	12.0	10.2
Initial Zero	0.4	0.1
Final Zero	0.5	0.1
Initial cal.	12.2	9.8
Final Cal.	12.3	9.7
Corrected Average	13.6	11.4

Holcim, Midlothian TX Line 1 Mill Off Main Stack November 15, 2023 Operator

Cylinder ID	Gas Type	Value	Internal Response	Cal Error	Run No. 4 14:32-15:41 Pre Run Bias	Percent Bias	Post Run Bias	Percent Bias	Percent Drift	Run No. 5 15:56-17:05 Pre Run Bias	Percent Bias	Post Run Bias	Percent Bias	Percent Drift	Run No. 6 17:19-18:28 Pre Run Bias	Percent Bias	Post Run Bias	Percent Bias	Percent Drift
	O2 Zero	Zero N2	0.0%	0.00%	0.3%	1.36%	0.3%	1.36%	0.00%	0.3%	1.36%	0.4%	1.81%	0.45%	0.4%	1.81%	0.5%	2.27%	0.45%
CC194988	O2 Mid	12.0%	12.1%	0.68%	12.2%	0.45%	12.1%	0.00%	-0.45%	12.1%	0.00%	12.2%	0.45%	0.45%	12.2%	0.45%	12.3%	0.91%	0.45%
CC427971	O2 Span	22.1%	22.2%	0.63%															
	CO2 Zero	Zero N2	0.0%	0.00%	0.1%	0.55%	0.1%	0.55%	0.00%	0.1%	0.55%	0.1%	0.55%	0.00%	0.1%	0.55%	0.1%	0.55%	0.00%
CC194988	CO2 Mid	10.2%	10.0%	-0.88%	9.9%	-0.55%	9.9%	-0.55%	0.00%	9.9%	-0.55%	9.8%	-1.10%	-0.55%	9.8%	-1.10%	9.7%	-1.65%	-0.55%
CC427971	CO2 Span	18.2%	18.2%	0.11%															

Holcim
Midlothian TX
Line 1 Main Stack; Mill On
HCN Analyte Spikes

	Date	**11/15/23**	**11/15/23**	**11/15/23**	**11/15/23**
	Time	**08:47-08:59**	**10:16-10:34**	**11:42-11:56**	**13:16-13:56**
		Main Pre 1	**Main Post 1**	**Main Post 2**	**Main Post 3**
		HCN	**HCN**	**HCN**	**HCN**
Cs	Spike Direct, ppm	197.48	197.48	197.48	197.48
	SF6 Tracer Direct, ppm	9.55	9.55	9.55	9.55
SF6	Diluted SF6 Tracer, ppm	0.829	0.826	0.747	0.805
	Diluted SF6 Tracer, ppm	0.803	0.795	0.720	0.811
	Average Diluted SF6 Tracer, ppm	0.816	0.811	0.734	0.808
DF	Dilution Ratio	11.71	11.79	13.02	11.82
	Total, ppm	34.551	32.644	29.886	31.374
	Total, ppm	34.229	32.137	29.895	31.851
Ct	Average Total, ppm	34.390	32.391	29.891	31.613
	Pre Spike Native , ppm	23.322	19.618	18.623	19.615
	Pre Spike Native , ppm	21.885	19.511	18.494	18.694
	Post Spike Native , ppm	22.264	20.280	19.480	21.048
	Post Spike Native , ppm	21.122	20.108	19.447	20.155
Cn	Average Native , ppm	22.148	19.879	19.011	19.878
	Spike Recovery	**83.8%**	**84.7%**	**81.4%**	**80.3%**
	CTS Direct (CC426155)				
	Ethylene Expected (ppm)	75.47			75.47
	Ethylene Measured (ppm)	73.88			74.09
	CTS Error	**-2.1%**			**-1.8%**

Holcim
Midlothian TX
Line 1 Main Stack; Mill Off
HCN Analyte Spikes

	Date	**11/15/23**	**11/15/23**	**11/15/23**	**11/15/23**
	Time	**14:15-14:37**	**15:42-16:08**	**17:07-17:36**	**18:30-18:54**
		Main Pre 1 HCN	**Main Post 1 HCN**	**Main Post 2 HCN**	**Main Post 3 HCN**
Cs	Spike Direct, ppm	197.48	197.48	197.48	197.48
	SF6 Tracer Direct, ppm	9.55	9.55	9.55	9.55
SF6	Diluted SF6 Tracer, ppm	0.844	0.843	0.816	0.840
	Diluted SF6 Tracer, ppm	0.841	0.839	0.818	0.852
	Average Diluted SF6 Tracer, ppm	0.843	0.841	0.817	0.846
DF	Dilution Ratio	11.34	11.36	11.69	11.29
	Total, ppm	35.036	33.941	32.031	33.916
	Total, ppm	34.896	34.479	32.256	34.300
Ct	Average Total, ppm	34.966	34.210	32.144	34.108
	Pre Spike Native , ppm	22.763	21.069	20.882	22.309
	Pre Spike Native , ppm	21.666	21.738	20.981	20.938
	Post Spike Native , ppm	23.189	22.003	19.833	21.508
	Post Spike Native , ppm	22.797	21.750	19.508	21.015
Cn	Average Native , ppm	22.604	21.640	20.301	21.443
	Spike Recovery	**82.4%**	**83.3%**	**80.4%**	**83.3%**
	CTS Direct				
	Ethylene Expected (ppm)	75.48			75.48
	Ethylene Measured (ppm)	73.81			74.01
	CTS Error	**-2.2%**			**-1.9%**

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill On
Pre Run 1 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__001491.LAB	11/15/23	08:46:04.170	23.528	-0.007
SPC__001492.LAB	11/15/23	08:47:08.083	23.322	-0.005
SPC__001493.LAB	11/15/23	08:48:11.985	21.885	-0.006
SPC__001494.LAB	11/15/23	08:49:15.930	20.761	0.015
SPC__001495.LAB	11/15/23	08:50:19.805	33.724	0.846
SPC__001496.LAB	11/15/23	08:51:23.771	34.551	0.829
SPC__001497.LAB	11/15/23	08:52:27.616	34.229	0.803
SPC__001498.LAB	11/15/23	08:53:31.573	33.270	0.742
SPC__001499.LAB	11/15/23	08:54:35.478	18.845	0.774
SPC__001500.LAB	11/15/23	08:55:39.321	0.606	0.014
SPC__001501.LAB	11/15/23	08:58:13.641	22.264	-0.005
SPC__001502.LAB	11/15/23	08:59:17.595	21.122	-0.005

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill On
Post Run 1 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__001573.LAB	11/15/23	10:14:54.758	19.636	-0.004
SPC__001574.LAB	11/15/23	10:15:58.905	19.618	-0.003
SPC__001575.LAB	11/15/23	10:17:02.564	19.511	-0.004
SPC__001576.LAB	11/15/23	10:18:06.513	18.787	0.007
SPC__001577.LAB	11/15/23	10:19:10.386	24.148	0.361
SPC__001578.LAB	11/15/23	10:20:14.597	37.417	1.345
SPC__001579.LAB	11/15/23	10:21:18.153	5.002	0.011
SPC__001580.LAB	11/15/23	10:22:22.068	19.021	-0.003
SPC__001581.LAB	11/15/23	10:23:25.930	29.965	0.691
SPC__001582.LAB	11/15/23	10:24:30.119	32.644	0.826
SPC__001583.LAB	11/15/23	10:25:34.128	32.137	0.795
SPC__001584.LAB	11/15/23	10:26:37.720	32.350	0.826
SPC__001585.LAB	11/15/23	10:27:41.526	19.642	0.781
SPC__001586.LAB	11/15/23	10:28:45.819	1.158	0.008
SPC__001587.LAB	11/15/23	10:29:49.346	0.208	0.003
SPC__001588.LAB	11/15/23	10:31:27.468	7.029	0.001
SPC__001589.LAB	11/15/23	10:32:31.133	20.280	-0.007
SPC__001590.LAB	11/15/23	10:33:35.046	20.108	-0.007

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill On
Post Run 2 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__001653.LAB	11/15/23	11:40:40.813	18.879	-0.004
SPC__001654.LAB	11/15/23	11:41:44.649	18.623	-0.006
SPC__001655.LAB	11/15/23	11:42:48.507	18.494	-0.006
SPC__001656.LAB	11/15/23	11:43:52.452	18.019	0.009
SPC__001657.LAB	11/15/23	11:44:56.342	24.679	0.424
SPC__001658.LAB	11/15/23	11:46:00.241	29.886	0.747
SPC__001659.LAB	11/15/23	11:47:04.152	29.895	0.720
SPC__001660.LAB	11/15/23	11:48:08.116	38.774	1.200
SPC__001661.LAB	11/15/23	11:49:11.888	6.433	0.206
SPC__001662.LAB	11/15/23	11:50:15.859	0.403	0.003
SPC__001663.LAB	11/15/23	11:51:19.686	0.302	0.007
SPC__001664.LAB	11/15/23	11:52:23.683	8.407	0.000
SPC__001665.LAB	11/15/23	11:53:27.505	19.794	-0.003
SPC__001666.LAB	11/15/23	11:54:31.510	19.890	-0.003
SPC__001667.LAB	11/15/23	11:55:35.294	19.684	-0.004
SPC__001668.LAB	11/15/23	11:56:39.196	19.480	-0.006
SPC__001669.LAB	11/15/23	11:57:43.088	19.447	-0.004

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill On
Post Run 3 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__001739.LAB	11/15/23	13:14:16.384	19.574	-0.005
SPC__001740.LAB	11/15/23	13:15:20.237	19.396	-0.008
SPC__001741.LAB	11/15/23	13:16:24.231	19.615	-0.005
SPC__001742.LAB	11/15/23	13:17:28.092	18.694	0.006
SPC__001743.LAB	11/15/23	13:18:31.891	22.960	0.274
SPC__001744.LAB	11/15/23	13:19:35.833	29.425	0.699
SPC__001745.LAB	11/15/23	13:20:39.735	31.732	0.811
SPC__001746.LAB	11/15/23	13:21:43.629	31.374	0.805
SPC__001747.LAB	11/15/23	13:22:47.483	31.851	0.811
SPC__001748.LAB	11/15/23	13:23:51.712	30.971	0.738
SPC__001749.LAB	11/15/23	13:24:55.274	26.032	0.789
SPC__001750.LAB	11/15/23	13:25:59.167	4.697	0.007
SPC__001751.LAB	11/15/23	13:27:03.064	0.268	0.002
SPC__001752.LAB	11/15/23	13:28:06.967	-0.024	0.002
SPC__001753.LAB	11/15/23	13:29:10.916	12.067	-0.001
SPC__001754.LAB	11/15/23	13:30:15.075	21.048	-0.008
SPC__001755.LAB	11/15/23	13:31:18.783	20.155	-0.005

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill On
Post Run 3 HCN Analyte Spike

Spectrum	Date	Time	Ethylene (100,3000) 191C
SPC__001776.LAB	11/15/23	13:53:40.521	73.896
SPC__001777.LAB	11/15/23	13:54:44.421	74.082
SPC__001778.LAB	11/15/23	13:55:48.323	74.093
SPC__001779.LAB	11/15/23	13:56:52.213	34.189

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill Off
Pre Run 1 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__001796.LAB	11/15/23	14:21:14.943	23.961	-0.007
SPC__001797.LAB	11/15/23	14:22:18.854	22.763	-0.008
SPC__001798.LAB	11/15/23	14:23:22.710	21.666	-0.004
SPC__001799.LAB	11/15/23	14:24:26.603	31.170	0.677
SPC__001800.LAB	11/15/23	14:25:30.500	33.561	0.776
SPC__001801.LAB	11/15/23	14:26:34.408	34.100	0.783
SPC__001802.LAB	11/15/23	14:27:38.458	35.036	0.844
SPC__001803.LAB	11/15/23	14:28:42.192	34.896	0.841
SPC__001804.LAB	11/15/23	14:29:46.080	27.287	0.887
SPC__001805.LAB	11/15/23	14:30:49.973	0.757	0.005
SPC__001806.LAB	11/15/23	14:31:53.877	1.508	0.010
SPC__001807.LAB	11/15/23	14:32:58.170	23.681	-0.008
SPC__001808.LAB	11/15/23	14:34:01.784	24.114	-0.008
SPC__001809.LAB	11/15/23	14:35:05.967	23.518	-0.008
SPC__001810.LAB	11/15/23	14:36:09.778	22.876	-0.009
SPC__001811.LAB	11/15/23	14:37:13.381	23.189	-0.009
SPC__001812.LAB	11/15/23	14:38:17.278	22.797	-0.007
SPC__001813.LAB	11/15/23	14:39:21.525	22.672	-0.009

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill Off
Post Run 1 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__001871.LAB	11/15/23	15:41:07.261	21.812	-0.004
SPC__001872.LAB	11/15/23	15:42:11.129	21.069	-0.008
SPC__001873.LAB	11/15/23	15:43:15.136	21.738	-0.005
SPC__001874.LAB	11/15/23	15:45:23.326	24.427	0.226
SPC__001875.LAB	11/15/23	15:46:27.224	30.655	0.630
SPC__001876.LAB	11/15/23	15:47:31.259	32.245	0.704
SPC__001877.LAB	11/15/23	15:48:35.011	33.941	0.843
SPC__001878.LAB	11/15/23	15:49:38.913	34.479	0.839
SPC__001879.LAB	11/15/23	15:50:42.902	40.431	1.213
SPC__001880.LAB	11/15/23	15:51:46.688	1.284	0.016
SPC__001881.LAB	11/15/23	15:52:51.013	0.410	0.002
SPC__001882.LAB	11/15/23	15:53:54.491	1.104	0.008
SPC__001883.LAB	11/15/23	15:54:58.491	23.758	-0.006
SPC__001884.LAB	11/15/23	15:56:02.299	23.611	-0.005
SPC__001885.LAB	11/15/23	15:57:40.634	22.397	-0.008
SPC__001886.LAB	11/15/23	15:58:44.529	22.253	-0.006
SPC__001887.LAB	11/15/23	15:59:48.781	22.485	-0.007
SPC__001888.LAB	11/15/23	16:00:52.328	22.517	-0.005
SPC__001889.LAB	11/15/23	16:01:56.224	22.294	-0.009
SPC__001890.LAB	11/15/23	16:03:00.213	22.261	-0.004
SPC__001891.LAB	11/15/23	16:04:04.063	22.235	-0.007
SPC__001892.LAB	11/15/23	16:05:08.316	22.363	-0.007
SPC__001893.LAB	11/15/23	16:06:11.815	22.481	-0.004
SPC__001894.LAB	11/15/23	16:07:16.099	22.003	-0.007
SPC__001895.LAB	11/15/23	16:08:19.609	21.750	-0.005

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill Off
Post Run 2 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__001946.LAB	11/15/23	17:02:38.377	21.165	-0.007
SPC__001947.LAB	11/15/23	17:03:42.275	20.882	-0.008
SPC__001948.LAB	11/15/23	17:04:46.556	20.981	-0.008
SPC__001949.LAB	11/15/23	17:05:50.121	21.122	-0.008
SPC__001950.LAB	11/15/23	17:06:53.968	21.330	-0.008
SPC__001951.LAB	11/15/23	17:07:57.907	20.158	-0.002
SPC__001952.LAB	11/15/23	17:09:02.144	24.616	0.308
SPC__001953.LAB	11/15/23	17:10:05.670	32.031	0.816
SPC__001954.LAB	11/15/23	17:11:09.555	32.256	0.818
SPC__001955.LAB	11/15/23	17:12:13.838	40.879	1.298
SPC__001956.LAB	11/15/23	17:13:17.323	3.530	0.026
SPC__001957.LAB	11/15/23	17:14:21.322	0.202	0.003
SPC__001958.LAB	11/15/23	17:15:25.515	1.230	0.008
SPC__001959.LAB	11/15/23	17:16:29.042	21.698	-0.010
SPC__001960.LAB	11/15/23	17:17:33.326	21.275	-0.008
SPC__001961.LAB	11/15/23	17:18:36.839	20.966	-0.006
SPC__001962.LAB	11/15/23	17:19:40.737	21.027	-0.010
SPC__001963.LAB	11/15/23	17:20:45.019	21.196	-0.010
SPC__001964.LAB	11/15/23	17:21:48.882	21.034	-0.009
SPC__001965.LAB	11/15/23	17:22:52.430	21.180	-0.009
SPC__001966.LAB	11/15/23	17:23:56.675	21.472	-0.006
SPC__001967.LAB	11/15/23	17:25:00.224	21.563	-0.010
SPC__001968.LAB	11/15/23	17:26:04.239	21.468	-0.007
SPC__001969.LAB	11/15/23	17:27:08.021	21.710	-0.011
SPC__001970.LAB	11/15/23	17:28:12.029	21.539	-0.007
SPC__001971.LAB	11/15/23	17:29:15.820	21.388	-0.008
SPC__001972.LAB	11/15/23	17:30:19.713	20.772	-0.009
SPC__001973.LAB	11/15/23	17:31:23.605	20.933	-0.009
SPC__001974.LAB	11/15/23	17:32:27.503	20.213	-0.006
SPC__001975.LAB	11/15/23	17:33:31.403	20.122	-0.010
SPC__001976.LAB	11/15/23	17:34:35.298	19.833	-0.010
SPC__001977.LAB	11/15/23	17:35:39.304	19.508	-0.008
SPC__001978.LAB	11/15/23	17:36:43.210	19.466	-0.007

Holcim Midlothian TX
Line 1 Main Stack; Raw Mill Off
Post Run 3 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C	Ethylene (100,3000) 191C
SPC__002027.LAB	11/15/23	18:28:54.053	22.543	-0.009	6.742
SPC__002028.LAB	11/15/23	18:29:57.952	22.386	-0.009	6.790
SPC__002029.LAB	11/15/23	18:31:01.851	22.309	-0.008	6.751
SPC__002030.LAB	11/15/23	18:32:05.746	20.938	0.005	6.268
SPC__002031.LAB	11/15/23	18:33:09.643	30.949	0.676	6.385
SPC__002032.LAB	11/15/23	18:34:13.926	33.916	0.840	6.239
SPC__002033.LAB	11/15/23	18:35:17.437	34.300	0.852	6.325
SPC__002034.LAB	11/15/23	18:36:21.314	43.068	1.349	6.008
SPC__002035.LAB	11/15/23	18:37:25.210	2.086	0.038	0.092
SPC__002036.LAB	11/15/23	18:38:29.212	0.477	0.004	0.230
SPC__002037.LAB	11/15/23	18:39:33.059	5.616	0.006	1.755
SPC__002038.LAB	11/15/23	18:40:36.950	23.034	-0.010	6.812
SPC__002039.LAB	11/15/23	18:41:41.137	22.640	-0.008	6.594
SPC__002040.LAB	11/15/23	18:42:44.719	21.960	-0.008	6.586
SPC__002041.LAB	11/15/23	18:43:48.617	21.948	-0.006	6.509
SPC__002042.LAB	11/15/23	18:44:52.514	21.508	-0.009	6.292
SPC__002043.LAB	11/15/23	18:45:56.402	21.015	-0.006	6.041
SPC__002044.LAB	11/15/23	18:47:00.671	9.307	-0.005	2.416
SPC__002045.LAB	11/15/23	18:48:04.288	0.055	0.002	0.092
SPC__002046.LAB	11/15/23	18:49:08.080	-0.018	0.003	0.044
SPC__002047.LAB	11/15/23	18:50:12.085	-0.236	0.002	0.076
SPC__002048.LAB	11/15/23	18:51:15.865	-0.267	-0.006	11.843
SPC__002049.LAB	11/15/23	18:52:19.953	-0.129	-0.012	73.697
SPC__002050.LAB	11/15/23	18:53:23.666	-0.275	-0.014	74.026
SPC__002051.LAB	11/15/23	18:54:27.603	-0.227	-0.011	74.004
SPC__002052.LAB	11/15/23	18:55:31.556	-0.214	-0.018	42.212

Holcim Midlothian TX
Line 1 Main Stack
CTS and HCN Analyte Spike Direct

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C	Ethylene (100,3000) 191C
SPC__001443.LAB	11/15/23	07:46:34.518	-0.290	-0.002	0.012
SPC__001444.LAB	11/15/23	07:47:38.632	-0.350	0.000	0.004
SPC__001445BKG.LAB	11/15/23	07:50:17.074	0.000	0.000	0.000
SPC__001446.LAB	11/15/23	07:51:27.137	-0.100	-0.002	0.006
SPC__001447BKG.LAB	11/15/23	07:54:08.833	0.000	0.000	0.000
SPC__001448.LAB	11/15/23	07:55:19.307	0.007	-0.001	0.000
SPC__001449BKG.LAB	11/15/23	07:57:54.271	0.000	0.000	0.000
SPC__001450.LAB	11/15/23	07:59:04.430	-0.107	-0.001	0.033
SPC__001451BKG.LAB	11/15/23	08:01:34.658	0.000	0.000	0.000
SPC__001452.LAB	11/15/23	08:02:45.164	-0.008	-0.000	0.009
SPC__001453.LAB	11/15/23	08:03:49.323	-0.119	0.000	-0.036
SPC__001454BKG.LAB	11/15/23	08:06:33.203	0.000	0.000	0.000
SPC__001455.LAB	11/15/23	08:07:43.583	-0.017	0.000	-0.046
SPC__001456.LAB	11/15/23	08:08:47.528	-0.104	-0.018	35.255
SPC__001457.LAB	11/15/23	08:09:51.498	0.105	-0.014	73.910
SPC__001458.LAB	11/15/23	08:10:55.291	-0.064	-0.011	73.820
SPC__001459.LAB	11/15/23	08:11:59.198	-0.012	-0.016	73.934
SPC__001460.LAB	11/15/23	08:13:03.139	-0.171	-0.012	43.711
SPC__001461.LAB	11/15/23	08:14:06.995	108.496	4.835	4.737
SPC__001462.LAB	11/15/23	08:15:10.936	73.565	3.412	1.234
SPC__001463.LAB	11/15/23	08:16:14.803	190.561	9.217	-0.507
SPC__001464.LAB	11/15/23	08:17:18.710	197.204	9.549	-0.735
SPC__001465.LAB	11/15/23	08:18:22.657	197.345	9.554	-0.747
SPC__001466.LAB	11/15/23	08:19:26.512	197.512	9.557	-0.778
SPC__001467.LAB	11/15/23	08:20:30.796	197.446	9.550	-0.868
SPC__001468.LAB	11/15/23	08:21:34.434	197.240	9.552	-0.807
SPC__001469.LAB	11/15/23	08:22:38.221	196.159	9.537	-0.704
SPC__001470.LAB	11/15/23	08:23:42.507	195.611	9.529	-0.826

EPA Method 1
Traverse Point Location for Circular Ducts

Plant	Holcim
City	Midlothian
State	TX
Location	Kiln #2 Main Stack
Stack ID (inches)	164.063
Nipple Length	7

Nearest Upstream Disturbance (Bend, ID FAN, etc)

Distance (inches)	1233	Type of Disturbance	ID Fan

Nearest Downstream Disturbance (Bend, or Stack Outlet)

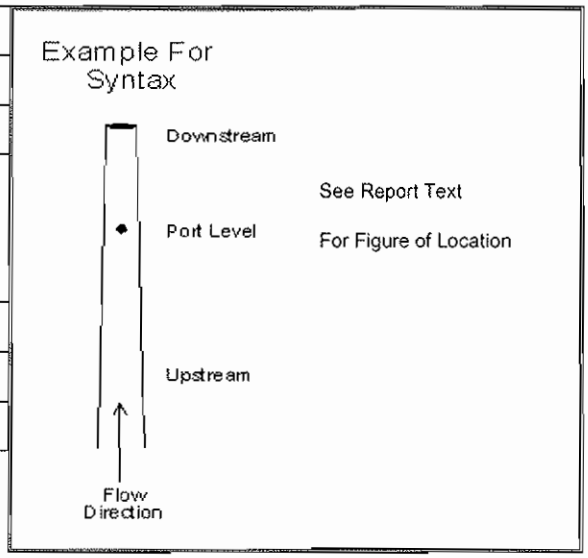
Distance (inches)	1002	Type of Disturbance	Stack Outlet

Sampler	Previous Data	Date	09/05/07

(Mark with an "x")

Particulate Traverse? [x] Yes [ ] No

Number of Traverse Points Required: 6



Stack Schematic (Draw by hand after printing)

Traverse Point Number	Fraction of Stack Internal Diam.	Stack ID (Inches)	Diameter Frac. x Stack ID	Nipple Length (Inches)	Traverse Point Distance from outside Nipple
1	0.044	164.063	7.22	7	14 1/4 in.
2	0.146	164.063	23.95	7	31 in.
3	0.296	164.063	48.56	7	55 1/2 in.
4	0.704	164.063	115.50	7	122 1/2 in.
5	0.854	164.063	140.11	7	147 1/8 in.
6	0.956	164.063	156.84	7	163 7/8 in.

EPA Method 2
Gas Velocity and Cyclonic Flow Check

Plant	LafargeHolcim Midlothian Facility	Run Date	11/5/20
City	Midlothian, TX	Clock Time	1255
Sampling Location	Kiln System #2 Stack		
Operator	MH/HE/JH/KW	Run No.	Cyclonic
Ambient Temperature	~75 deg. F		
Barometric Pressure	29.35 in. Hg	Mol. Wt.	~27.9
Static Pressure	-0.51 in. H2O	Pitot Cp	0.84
Stack ID Side 1	164.063 in.		
Side 2	164.063 in.		

Traverse point number	Position in.	Velocity head Δp in. H2O	Stack temperature deg. F	Cyclonic Flow Determination: Δp at 0° reference	Cyclonic Flow Determination: Angle (∝) which yields a null Δp
1	See		138		12
2	M1 Data		137		11
3			136		8
1			137		14
2			136		10
3			136		9
1			137		15
2			137		12
3			135		8
1			138		12
2			136		9
3			136		7
				Average angle (∝)*	10.6°

* Average of α must be ≤20° to be acceptable

cyclonic.wk1

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 16 /23	Kiln 2 System Stack	Method 26A	Kiln 2 - [illegible] -M5-6 1A

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	NOZZLE TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
Gage Mayer	~~28.00~~ 28.75	-.35	63	N/A	161.5" (K1)	0.85 0.84	8' eff., 9' Glass Liner (K1	.250 .250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 ~~20~~ 23%	M5-15	1.68	.975	5A	5A	K -M5-	.001 CU. FT @ 15 "Hg	0.004 CU. FT @ 15 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.55

PITOT LEAK CHECK ----> || PASSED || FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM TEMP (deg. F)	FILTER OUT TEMP (deg. F)	PROBE EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	14:20	586.362	.51	1.3	253	133	68	256	60	4
2	5		~~593.58~~ 590.12	.55	1.4	251	133	68	255	60	4
3	10		593.58	.56	1.4	252	135	69	252	55	5
	15	14:35	597.049	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg
FINAL _____ _____ CU.FT @ _____ INCHES Hg

B-1	15	14:37	597.049	.48	1.2	255	133	70	256	50	4
2	20		600.54	.49	1.2	256	134	70	254	53	4
3	25		603.70	.52	1.3	254	134	71	253	53	4
	30	14:52	606.949	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg
FINAL _____ _____ CU.FT @ _____ INCHES Hg

C-1	30	14:51	606.949	.52	1.3	254	134	71	252	53	4
2	35		610.34	~~.57~~ .54	1.4	256	139	71	249	53	4
3	40	15:30	613.93	.54	1.4	256	140	72	250	53	4
	45	~~15:40~~	616.620	End of Port							

INTRA-PORT LEAK CHECK? 15:40
DGM VOLUME (CU. FT) INITIAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg
FINAL _____ _____ CU.FT @ _____ INCHES Hg

D-1	45	~~15:42~~ 15:41	616.620	.48	1.2	254	139	72	255	51	4
2	50		619.32	.47	1.2	255	139	72	253	51	4
3	55		622.49	.46	1.2	253	140	72	255	51	4
	60	~~15:58~~	625.646	End of Port							

TOTAL TIME		DGM VOLUME	AVE START delta P	AVE delta H	AVE TEMP	PROBE TEMP
60 Min.	15:57	625.646				

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/16/23

Sample Location **Kiln/Mill ON OFF** Recovery Date 11/16/23

Run No. **Kiln 2 Run / Mill ON OFF-26A-** 1A Recovered by SC

Filter Number(s) N/A

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		762.5	757.2	653.1	784.9	890.2	978.1	g
Initial weight		749.1	741.6	645.4	754.3	761.3	967.1	g
Net weight		13.4	15.6	7.7	30.6	128.9	11	g

Description of impinger water clear 10 % spent

B/W Sil gel color

Total moisture = 207.2 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 2 Run 1 Mill ON OFF-26A-H2SO4-** 1A Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 2 Run 1 Mill ON OFF-26A-NaOH -** 1A Liquid level marked/sealed ✓

Train B

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11/16/23	Kiln 2 System Stack	Method 26A	Kiln 2 - ON (OFF) -M5 1 3

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (In. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
M. Powell	28.75	-.25	63	N/A	161.5" (K1)	0.85 0.84	8' eff., 9' Glass Liner (K1)	.250 .250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2)		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	M5-22	1.72	1.014	S/A	S/A	K -M5-	.001 CU. FT @ 10 "Hg	.001 CU. FT @ 10 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.61

PITOT LEAK CHECK ----> ☒ PASSED ☐ FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM INLET TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Silica Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (In. Hg)
A-1	0	1420	45.696	.51	1.3	255	133	67	256	66	5
2	5		49.06	.55	1.4	253	133	67	255	65	5
3	10		52.34	.56	1.5	254	135	67	252	63	5
	15	1435	55.555	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)			INITIAL ___/___ FINAL ___/___	LEAK RATE: ___/___ CU.FT @ ___/___ INCHES Hg ___/___ CU.FT @ ___/___ INCHES Hg							
B-1	15	1437	55.555	.48	1.3	252	137	68	254	64	5
2	20		58.75	.49	1.3	250	134	69	253	62	5
3	25		61.78	.52	1.4	253	134	70	255	60	5
	30	1452	64.879	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)			INITIAL ___/___ FINAL ___/___	LEAK RATE: ___/___ CU.FT @ ___/___ INCHES Hg ___/___ CU.FT @ ___/___ INCHES Hg							
C-1	30	1454	64.879	.53	1.4	251	138	71	250	60	5
2	35		67.96	.54	1.4	250	139	72	252	60	5
3	40		72.21	.54	1.4	250	140	73	254	61	5
	45	1540	75.409	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)			INITIAL ___/___ FINAL ___/___	LEAK RATE: ___/___ CU.FT @ ___/___ INCHES Hg ___/___ CU.FT @ ___/___ INCHES Hg							
D-1	45	1542	75.409	.48	1.3	252	139	73	255	61	4
2	50		78.56	.47	1.2	253	139	74	253	59	4
3	55		81.63	.46	1.2	253	140	75	256	58	4
	60	1557	84.622	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE STACK TEMP	AVE DGM INLET TEMP
60 Min.					

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/16/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/16/23

Run No. **Kiln 2 Run 1 Mill ON OFF-26A-** 1B Recovered by GCS

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		867.5	777.2	615.9	755.4	754.8	984.8	g
Initial weight		743.4	740.8	612.4	750.4	753.9	973.9	g
Net weight		124.1	36.4	3.5	5.0	0.9	10.9	g

Description of impinger water Clear 15 % spent

B/W Sil gel color

Total moisture = 180.8 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 2 Run 1 Mill ON OFF-26A-H2SO4-** 1B Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 2 Run 1 Mill ON OFF-26A-NaOH** 1B Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 16 /23	Kiln System Stack	Method 26A	Kiln 2 - ON OFF -M5 6-2A

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (In. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH & TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
Gage Mayer	29.75	-.25	69	N/A	161.5" (K1)	0.550.84	8' eff., 9' Glass Liner (K1	.250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	M5-15	1.68	.975	54	54	K -M5-	.001 CU. FT @ 10 "Hg	.001 CU. FT @ 10 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.55

PITOT LEAK CHECK ----> ☐ PASSED ☐ FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (In. Hg)
A-1	0	16.19	625.768	.52	1.3	256	140	68	259	60	4
2	5		629.02	.54	1.4	256	140	68	258	60	4
3	10		633.13	.55	1.4	255	140	69	258	58	4
	15	16.34	636.161	End of Port							
B-1	15	16.36	636.161	.49	1.2	248	141	68	250	55	4
2	20		639.06-642.31	.51	1.3	249	141	69	256	55	4
3	25		642.31	.51	1.3	253	142	69	253	55	4
	30	16.51	644.868	End of Port							
C-1	30	16.53	644.868	.53	1.4	256	142	69	253	55	4
2	35		648.33	.54	1.4	256	141	70	250	57	5
3	40		651.43	.54	1.4	258	141	70	258	58	5
	45	17.08	654.701	End of Port							
D-1	45	17.10	654.701	.49	1.2	253	140	70	255	55	4
2	50		658.54	.48	1.2	255	139	71	256	54	4
3	55		661.52	.46	1.2	255	138	71	255	54	4
	60	17.25	664.560	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE DGM TEMP	AVE STACK TEMP
60 Min.	664.560				

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/16/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/16/23

Run No. **Kiln 2 Run 3 Mill ON OFF-26A-** 2A Recovered by SCG

Filter Number(s) N/A

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		895.3	802.5	624.4	765.5	726.4	930.5	g
Initial weight		757.2	745.2	619.3	762.7	725.9	920.4	g
Net weight		138.1	57.3	5.1	2.8	0.5	10.1	g

Description of impinger water Clear 20 % spent

B/W Sil gel color

Total moisture = 213.9 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse
container no. **Kiln 2 Run 3 Mill ON OFF-26A-H2SO4-** 2A
Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse
container no. **Kiln 2 Run 2 Mill ON OFF-26A-NaOH** 2A
Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 16 /23	Kiln 2 System Stack	Method 26A	Kiln 2 - ON OFF -M26B

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	NOZZLE MATERIAL	NOZZLE NUMBER	NOZZLE DIAMETER
M. Powell	28.75	-0.25	65	NA	161.5" (K1)	0.85 0.84	8' eff., 9' Glass Liner (K1	.250 .252	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	MS-22	1.72	1.014	54	54	K -M5-	0.001 CU. FT @ 10 "Hg	0.001 CU. FT @ 5 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.62

PITOT LEAK CHECK ----> [X] PASSED [ ] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (in. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	SI Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	1619	84.844	.53	1.4	255	142	69	259	66	4
2	5		88.13	.54	1.4	254	143	70	258	64	4
3	10		91.38	.55	1.4	252	141	71	258	62	4
	15	1634	94.371	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)			INITIAL ___/___ FINAL ___/___	LEAK RATE: ___/___ CU.FT @ ___/___ INCHES Hg ___/___ CU.FT @ ___/___ INCHES Hg							
B-1	15	1636	94.371	.49	1.3	251	140	72	250	62	4
2	20		97.53	.50	1.3	250	139	73	256	58	4
3	25		100.67	.51	1.3	255	140	74	253	56	4
	30	1651	103.816	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)			INITIAL ___/___ FINAL ___/___	LEAK RATE: ___/___ CU.FT @ ___/___ INCHES Hg ___/___ CU.FT @ ___/___ INCHES Hg							
C-1	30	1653	103.816	.53	1.4	253	142	75	253	55	4
2	35		107.26	.54	1.4	252	141	75	250	55	4
3	40		110.24	.54	1.4	253	141	76	258	56	4
	45	1708	113.291	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)			INITIAL ___/___ FINAL ___/___	LEAK RATE: ___/___ CU.FT @ ___/___ INCHES Hg ___/___ CU.FT @ ___/___ INCHES Hg							
D-1	45	1710	113.291	.49	1.3	254	140	76	255	56	4
2	50		116.16	.48	1.3	250	139	75	256	59	4
3	55		119.65	.46	1.2	251	138	78	255	59	4
	60	1725	122.165	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE STACK TEMP	AVE DGM TEMP
60 Min.					

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/16/23

Sample Location **Kiln 2 Mill ON OFF** Recovery Date 11/16/23

Run No. **Kiln 2 Run Mill ON OFF-26A-** 2.3 Recovered by SCS

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		907.9	783.3	675.5	750.0	755.3	961.0	g
Initial weight		747.9	757.1	672.0	748.1	755.0	951.9	g
Net weight		160	26.2	3.5	1.9	0.3	9.1	g

Description of impinger water clear 20 % spent

B/V Sil gel color

Total moisture = 201.0 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse
container no. **Kiln 2 Run 2 Mill ON OFF-26A-H2SO4-** 2.3 Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse
container no. **Kiln 2 Run 2 Mill ON OFF-26A-NaOH-** 2.3 Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 16 /23	Kiln 2 System Stack	Method 26A	Kiln 2 - ON/OFF -M26-3A

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
Gage Mayed	28.75	~~-.32~~ -.35	63	NA	161.5" (K1)	0.84	8' eff., 9' Glass Liner (K1	.250 .250 -250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20% 20%	M5-15	1.68	.975	5A	5A	K -M5-	.001 CU. FT @ 10 "Hg	.001 CU. FT @ 10 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.55

PITOT LEAK CHECK ----> ☐ PASSED ☐ FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	SILICA EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	17:41	665.199	.51	~~1.3~~	255	140	67	252	60	4
2	5		668.75	.56	1.4	253	140	67	255	56	5
3	10		671.62	.56	1.4	256	138	68	256	56	5
	15	17:56	674.799	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

B-1	15	17:58	674.799	.48	1.2	257	137	68	257	56	3
2	20		678.98	.49	1.2	257	139	68	255	56	3
3	25		681.59	.52	1.3	253	136	69	255	58	4
	30	18:13	683.576	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

C-1	30	18:15	683.576	.51	1.3	258	139	70	253	59	4
2	35		686.17	.54	1.4	262	139	70	255	62	4
3	40			.53	1.4	259	139	71	256	63	4
	45	18:30	693.340	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

D-1	45	18:32	693.340	.47	1.2	255	141	69	256	60	3
2	50		697.42	.47	1.2	253	141	70	249	58	3
3	55		702.54	.46	1.2	255	140	71	255	55	4
	60	18:47	705.513	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE STACK TEMP	AVE DGM TEMP
60 Min.	705.513				

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/16/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/16/23

Run No. **Kiln2 Run3 Mill ON OFF-26A-3A** Recovered by SCS

Filter Number(s) N/A

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		909.9	771.4	648.1	745.8	742.6	993.7	g
Initial weight		747.2	737.4	642.6	743.9	742.0	978.1	g
Net weight		162.7	34.0	5.5	1.9	0.6	15.6	g

Description of impinger water clear 25 % spent

Blu Sil gel color

Total moisture = 220.3 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln2 Run 3 Mill ON OFF-26A-H2SO4-3A** Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 2 Run 3 Mill ON OFF-26A-NaOH-3A** Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11/16/23	Kiln 2 System Stack	Method 26A	Kiln 2 - ON/OFF - M26-3B

OPERATOR	AMBIENT PRESS (in. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
M. Powell	28.75	-0.25	65	N/A	161.5" (K1)	0.85 0.84	8' eff., 9' Glass Liner (K1	.250 .250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	MS-22	1.72	1.014	65A	5A	K -M5-	0.01 CU. FT @ 10 "Hg	0.00 CU. FT @ 6 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.60

PITOT LEAK CHECK ---> [X] PASSED [ ] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	SI Gn EXH TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	1741	122.214	.51	1.3	252	141	69	252	61	4
2	5		124.92	.56	1.5	253	140	70	255	56	5
3	10		128.42	.56	1.5	252	141	71	256	56	5
	15	1756	131.709	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL ____ FINAL ____		LEAK RATE: ____ CU.FT @ ____ INCHES Hg ____ CU.FT @ ____ INCHES Hg							
B-1	15	1758	131.709	.48	1.3	251	142	71	257	56	4
2	20		135.02	.49	1.3	250	143	72	255	57	4
3	25		138.56	.52	1.4	252	142	73	255	58	4
	30	1813	141.568	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL ____ FINAL ____		LEAK RATE: ____ CU.FT @ ____ INCHES Hg ____ CU.FT @ ____ INCHES Hg							
C-1	30	1815	141.568	.51	1.3	255	141	74	253	59	4
2	35		144.78	.54	1.4	256	142	75	255	61	4
3	40		148.99	.53	1.4	256	140	75	256	63	4
	45	1830	151.016	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL ____ FINAL ____		LEAK RATE: ____ CU.FT @ ____ INCHES Hg ____ CU.FT @ ____ INCHES Hg							
D-1	45	1832	151.016	.47	1.2	254	144	76	256	60	4
2	50		154.021	.47	1.2	253	143	76	249	59	4
3	55		157.05	.46	1.2	256	140	77	255	57	4
	60	1847	160.039	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP	AVE. TEMP
60 Min.					

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/16/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/16/23

Run No. **Kiln2 Run3 Mill ON OFF-26A- 3B** Recovered by SCS

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		896.0	768.5	619.1	741.6	741.9	1000.2	g
Initial weight		745.6	737.5	615.6	738.3	741.0	984.7	g
Net weight		150.4	31.0	3.5	3.3	0.9	15.5	g

Description of impinger water clear 30 % spent

B/W Sil gel color

Total moisture = 204.6 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln2 Run 3 Mill ON OFF-26A-H2SO4- 3B** Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 2 Run 3 Mill ON OFF-26A-NaOH 3B** Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 17 /23	Kiln 2 System Stack	Method 26A	Kiln 2 - ON OFF -M26-4A

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	NOZZLE TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
Gage Mayer	28.70	-.85 -.35 2m	65	NA	161.5" (K1)	0.85 0.84	8' eff., 9' Glass Liner (K1	.250 .250 -.250	.250
					164.063" (K2)	85	5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL. FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 20% 23%	vm5-15	1.68	.975	57	57	K -M5-	.001 CU. FT @ 12 "Hg	.001 CU. FT @ 12 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.55

PITOT LEAK CHECK ---> [] PASSED [] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (in. H2O)	delta H ORIFICE (in. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM INLET TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Ge EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	8:06	715.436	.79	2.0	257	140	62	256	52	5
2	5		709.93	.84	2.1	257	140	62	255	52	5
3	10		714.18	.83	2.1	259	141	63	260	52	5
	15	8:21	718.417	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

B-1	15	8:23	718.417	.85	2.2	255	141	63	262	52	5
2	20		722.61	.86	2.2	252	141	64	259	52	5
3	25		726.79	.87	2.2	248	142	64	257	52	5
	30	8:38	730.944	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

C-1	30	8:40	730.944	.88	2.2	251	140	65	255	53	5
2	35		735.16	.91	2.3	256	140	65	256	53	5
3	40		739.21	.90	2.3	255	139	66	255	55	5
	45	8:55	743.335	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

D-1	45	8:57	743.335	.92	2.3	255	143	65	255	57	5
2	50		747.47	.89	2.3	253	142	66	252	56	5
3	55		751.67	.90	2.3	256	141	67	251	53	5
	60	9:12	756.120	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. STACK TEMP	AVE. DGM TEMP
60 Min.	756.120				

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/17/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/17/23

Run No. **Kiln2 Run4 Mill ON OFF-26A-4A** Recovered by LGH

Filter Number(s) _____

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		899.7	786.4	624.0	748.1	749.6	948.4	g
Initial weight		740.3	746.1	616.6	744.8	748.7	930.1	g
Net weight		159.4	40.3	7.4	3.3	0.9	18.3	g

Description of impinger water Clear 60% % spent

B/W Sil gel color

Total moisture = 229.6 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln2Run 4Mill ON OFF-26A-H2SO4- 4A** Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 2Run 4Mill ON OFF-26A-NaOH 4A** Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11/17/23	Kiln 2 System Stack	Method 26A	Kiln 2 - ON OFF -M5/26 4/3

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	NOZZLE TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
M. Powell	29.70	-.35	65	N/A	161.5" (K1)	0.84	8' eff., 9' Glass Liner (K1	.250 .260 .250	.250 in
					164.063" (K2)	SCS	5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	MS-22	1.72	1.014	5A	5A	K -M5-	0.001 CU. FT @ 10 "Hg	0.001 CU. FT @ 7 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.47

PITOT LEAK CHECK ---> ☑ PASSED ☐ FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Sil Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	806	160.151	.79	2.6	254	139	59	256	64	5
2	5		164.18	.84	2.1	253	140	59	253	62	5
3	10		167.75	.83	2.1	255	140	60	260	60	5
	15	821	171.589	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL ✓ FINAL ✓		LEAK RATE: ✓ CU.FT @ ✓ INCHES Hg ✓ CU.FT @ ✓ INCHES Hg							
B-1	15	823	171.589	.85	2.1	254	141	60	262	60	5
2	20		175.41	.86	2.1	254	142	61	259	58	5
3	25		179.24	.87	2.1	253	141	62	257	56	5
	30	838	183.068	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL ✓ FINAL ✓		LEAK RATE: ✓ CU.FT @ ✓ INCHES Hg ✓ CU.FT @ ✓ INCHES Hg							
C-1	30	840	183.068	.88	2.2	250	140	62	255	56	5
2	35		186.84	.91	2.2	251	140	63	256	54	5
3	40		190.92	.90	2.2	252	141	63	255	54	5
	45	855	194.485	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL ✓ FINAL ✓		LEAK RATE: ✓ CU.FT @ ✓ INCHES Hg ✓ CU.FT @ ✓ INCHES Hg							
D-1	45	857	194.485	.92	2.3	255	142	64	255	55	NP 6
2	50		198.57	.89	2.2	257	143	65	252	57	6
3	55		202.33	.90	2.2	254	141	65	251	55	6
	60	912	206.222	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE STACK TEMP	AVE PROBE TEMP
60 Min.					

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/17/23

Sample Location **Kiln 2 Mill ON OFF** Recovery Date 11/17/23

Run No. **Kiln 2 Run 4 Mill ON OFF-26A-** 4B Recovered by LCM

Filter Number(s) NA

MOISTURE

745.7

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		882.2	785.4	676.3	751.6	~~744.9~~ 744.4	976.5	g
Initial weight		737.0	746.3	668.9	748.9	744.7	960.9	g
Net weight		145.2	39.1	7.4	2.7	1.0	15.6	g

Description of impinger water clean 50% % spent

B/W Sil gel color

Total moisture = 211.0 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 2 Run 4 Mill ON OFF-26A-H2SO4-** 4B — Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 2 Run 4 Mill ON OFF-26A-NaOH** 4B — Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 17 /23	Kiln 2 System Stack	Method 26A	Kiln - ON OFF -M5- 3A

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	NOZZLE TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
Guy Mayer	28.70	-.35	65	NA	161.5" (K1)	0.84	8' eff., 9' Glass Liner (K1	.250 .250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20% 23%	m5-15	1.68	.975	5A	5A	K -M5-	.001 CU. FT @ 17 "Hg	.001 CU. FT @ 12 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	255

PITOT LEAK CHECK ----> [] PASSED [] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY H2O (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM INLET TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	SI GeTeXT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	9:30	758.867	.88	2.2	255	139	66	255	65	6
2	5		762.95	.87	2.2	256	140	66	255	62	6
3	10		767.12	.89	2.3	255	141	66	263	60	6
	15	9:45	771.549	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)			INITIAL _____ FINAL _____	LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg							
B-1	15	9:47	771.549	.90	2.3	257	141	65	261	58	6
2	20		775.98	.88	2.2	255	140	66	259	53	6
3	25		780.37	.91	2.3	259	138	66	255	53	6
	30	10:02	784.756	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)			INITIAL _____ FINAL _____	LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg							
C-1	30	10:04	784.756	.92	2.3	261	141	66	258	53	6
2	35		789.08	.91	2.3	260	142	67	258	53	6
	40		793.81	.89	2.3	258	143	67	252	55	7
	45	10:19	797.738	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)			INITIAL _____ FINAL _____	LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg							
D-1	45	10:21	797.738	.93	~~2.3~~ 2.4	255	140	66	255	55	6
2	50		802.52	.92	2.3	256	140	66	256	59	6
3	55		806.24	.90	2.3	255	139	67	255	61	6
	60	10:36	810.588	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP	AVE. TEMP
60 Min.	810.588				

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/17/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/17/23

Run No. **Kiln 2 Run 5 Mill (ON) OFF-26A-5A** Recovered by LGH

Filter Number(s) _____

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		923.9	800.7	649.2	751.6	746.7	1010.2	g
Initial weight		748.1	751.8	641.7	749.3	745.8	993.5	g
Net weight		175.8	48.9	7.5	5.3	0.9	16.7	g

Description of impinger water Clear 80 % spent

B/W Sil gel color

Total moisture = 255.1 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 2 Run 5 Mill (ON) OFF-26A-H2SO4-** 5A — Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 2 Run 5 Mill (ON) OFF-26A-NaOH-** 5A — Liquid level marked/sealed ✓

B

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 17 /23	Kiln 2 System Stack	Method 26A	Kiln 2 - ON OFF -M5 ~~2~~ 3

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
M. Powell	~~29.70~~ 24.70	-035	65	N/A	161.5" (K1)	0.85 0.84	8' eff., 9' Glass Liner (K1	.250 .250 .250	.200
					164.063" (K2)	~~0.85~~	5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	MS-22	1.72	1.014	5A	5A	K -M5-	0.00 CU. FT @ 10 "Hg	0.001 CU. FT @ 6 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.47

PITOT LEAK CHECK ----> [X] PASSED [ ] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	IMPACT PITOT TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	SI Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	930	206.376	.88	2.2	250	139	54	255	62	5
2	5		210.27	.87	2.1	251	140	60	256	58	5
3	10		214.23	.89	2.2	253	141	61	263	56	5
	15	945	218.165	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL ~~—~~ / FINAL		LEAK RATE: ~~—~~ / CU.FT @ ~~—~~ / INCHES Hg CU.FT @ ~~—~~ / INCHES Hg							
B-1	15	947	218.165	.90	2.2	254	141	62	261	56	5
2	20		222.14	.88	2.2	252	140	63	259	64	5
3	25		226.23	.91	2.2	253	138	64	255	62	5
	30	1002	229.96	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL ~~—~~ / FINAL		LEAK RATE: ~~—~~ / CU.FT @ ~~—~~ / INCHES Hg CU.FT @ ~~—~~ / INCHES Hg							
C-1	30	1004	229.96	.92	2.3	256	141	63	~~258~~	62	5
2	35		233.88	.91	2.2	254	142	64	288	55	5
3	40		237.79	.89	2.2	257	143	63	282	58	5
	45	1019	241.682	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL ~~—~~ / FINAL		LEAK RATE: ~~—~~ / CU.FT @ ~~—~~ / INCHES Hg CU.FT @ ~~—~~ / INCHES Hg							
D-1	45	1021	241.682	.93	2.3	259	140	66	255	58	5
2	50		245.73	.92	2.3	257	140	67	~~286~~	56	5
3	55		249.72	.90	2.2	254	139	68	255	56	5
	60	1036	253.666	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE STACK TEMP	AVE IMPACT PITOT TEMP
60 Min.					

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/17/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/17/23

Run No. **Kiln 2 Run 5 Mill ON OFF-26A-** 5B Recovered by LGM

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		917.4	803.6	619.2	744.9	741.7	1014.9	g
Initial weight		759.4	755.7	613.4	739.0	741.2	999.8	g
Net weight		158.0	47.9	5.8	5.9	0.5	15.1	g

Description of impinger water clear 40 % spent

B/W Sil gel color

Total moisture = 233.2 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 2 Run 5 Mill ON OFF-26A-H2SO4-** 5B Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 2 Run 5 Mill ON OFF-26A-NaOH -** 5B Liquid level marked/sealed ✓

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	4 / 18 / 23	Kiln 2 System Stack	Method 26A	Kiln - ON OFF - M26 - 6A

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH & TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
Gage Mayfield	29.70	-.35	65	N/A	161.5" (K1)	0.84	8' eff., 9' Glass Liner (K1	.250 .250 - 250	.250
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	~~1-68~~	~~.975~~	.975	54	54	K -M5-	.001 CU. FT	.001 CU. FT	14 - 12.5%	13 - 14%	2.55
23%	M5-15	1.68	PITOT LEAK CHECK ----> ☐ PASSED ☐ FAILED				@ 11 "Hg	@ 11 "Hg	On - Off	On - Off	

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM INLET TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Si-Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (in. Hg)
A-1	0	10:58	810.735	.79	2.0	255	140	67	253	58	4
2	5		814.94	.83	2.1	256	139	67	258	58	5
3	10		818.27	.84	2.1	258	139	67	260	58	5
	15	11:13	822.981	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

B-1	15	11:15	822.981	.86	2.2	262	139	67	262	58	5
2	20		826.94	.87	2.2	259	138	68	262	56	5
3	25		830.49	.85	2.2	257	136	68	259	56	5
	30	11:30	836.071	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

C-1	30	11:32	836.071	.89	2.3	255	138	66	252	56	6
2	35		840.43	.90	2.3	259	140	67	255	56	6
3	40		844.72	.91	2.3	255	142	68	253	60	6
	45	11:47	848.925	End of Port							

INTRA-PORT LEAK CHECK?
DGM VOLUME (CU. FT) INITIAL _____ FINAL _____ LEAK RATE: _____ CU.FT @ _____ INCHES Hg _____ CU.FT @ _____ INCHES Hg

D-1	45	11:49	848.925	.93	2.4	254	143	~~67~~ 69	255	62	6
2	50		853.16	.91	2.3	251	143	~~67~~ 70	255	62	6
3	55		857.33	.90	2.3	255	141	~~68~~ 72	255	60	6
	60	12:04	861.545	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP	AVE. TEMP.
60 Min.	861.545				

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/17/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/17/23

Run No. **Kiln 2 Run 6 Mill (ON) OFF-26A-** 6A Recovered by LGH

Filter Number(s) N/A

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		916.8	791.1	624.3	748.9	748.1	959.8	g
Initial weight		748.0	748.6	617.5	745.7	746.5	948.2	g
Net weight		168.8	42.5	6.8	3.2	1.6	11.6	g

Description of impinger water Clear 75 % spent

B/W Sil gel color

Total moisture = 234.5 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 2 Run 6 Mill (ON) OFF-26A-H2SO4-** 6A Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 2 Run 6 Mill (ON) OFF-26A-NaOH** 6A Liquid level marked/sealed ✓

B

METHOD 26A FIELD DATA SHEET

PLANT AND CITY	DATE	SAMPLING LOCATION	SAMPLE TYPE	RUN NUMBER
Holcim (US) Inc; Midlothian, TX	11 / 17 /23	Kiln System Stack	Method 26A	Kiln 2 - ON OFF -M5-.3

OPERATOR	AMBIENT PRESS (In. Hg)	STATIC PRESSURE (in. Water)	AMBIENT TEMP (deg. F)	FILTER NUMBERS	STACK ID (In.)	PITOT Cp	PROBE LENGTH AND LINER TYPE	NOZZLE NUMBER	NOZZLE DIAMETER
M. Powell	29.70	-0.35	65	NA	161.5" (K1)	0.84	8' eff., 9' Glass Liner (K1	.250 .250 .250	.250 in
					164.063" (K2)		5' eff., 6' Glass Liner (K2		

ASSUMED MOISTURE (%)	DGM BOX No.	DGM H@	DGM CAL FACTOR (Y)	STACK THERM NO.	STACK PITOT NO.	ORSAT NO.	LEAK CHECK (INITIAL)	LEAK CHECK (FINAL)	O2 CONTENT %	CO2 CONTENT %	K FACTOR
~17 - 20%	M5-22	1.72	1.014	5A	5A	K -M5-	0.004 CU. FT @ 10 "Hg	0.004 CU. FT @ 6 "Hg	14 - 12.5% On - Off	13 - 14% On - Off	2.47

PITOT LEAK CHECK ----> [X] PASSED [ ] FAILED

TRAVERSE PORT/ /POINT NO.	ELAPSED TEST TIME (MIN)	CLOCK TIME (24-HR)	DGM READING Vm (cu. ft.)	delta P VELOCITY HEAD (In. H2O)	delta H ORIFICE (In. H2O)	PROBE TEMP (deg. F)	STACK TEMP (deg. F)	DGM IN TEMP (deg. F)	FILTER OVEN TEMP (deg. F)	Si Gel EXIT TEMP (deg. F)	SAMPLE TRAIN VAC (In. Hg)
A-1	0	1058	254.891	.79	2.0	255	140	65	233	60	5
2	5		258.53	.83	2.1	256	139	65	258	59	5
3	10		261.99	.84	2.1	258	139	66	260	57	5
	15	1113	266.067	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL / FINAL /		LEAK RATE: / CU.FT @ / INCHES Hg / CU.FT @ / INCHES Hg							
B-1	15	1115	266.067	.86	2.1	262	139	66	262	58	5
2	20		270.64	.87	2.1	259	138	67	262	57	5
3	25		274.56	.85	2.1	257	136	68	259	56	5
	30	1130	278.522	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL / FINAL /		LEAK RATE: / CU.FT @ / INCHES Hg / CU.FT @ / INCHES Hg							
C-1	30	1132	278.529	.84	2.2	255	138	66	252	56	5
2	35		282.34	.90	2.2	259	140	68	265	57	5
3	40		286.83	.92	2.3	255	142	64	283	60	5
	45	1147	290.744	End of Port							
INTRA-PORT LEAK CHECK? DGM VOLUME (CU. FT)		INITIAL / FINAL /		LEAK RATE: / CU.FT @ / INCHES Hg / CU.FT @ / INCHES Hg							
D-1	45	1149	290.744	.93	2.3	254	143	68	255	61	5
2	50		294.86	.91	2.2	251	143	69	255	62	5
3	55		298.72	.90	2.2	255	141	70	255	61	5
	60	1204	302.737	End of Port							

TOTAL TIME	DGM VOLUME	AVE SQRT delta P	AVE delta H	AVE. TEMP.	AVE. TEMP.
60 Min.					

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/17/23

Sample Location **Kiln 2 Mill ON OFF** Recovery Date 11/17/23

Run No. **Kiln 2 Run 6 Mill ON OFF-26A-6B** Recovered by LGH

Filter Number(s) NA

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		842.7	811.4	728.8	751.8	747.5	987.6	g
Initial weight		752.9	752.8	666.5	747.8	744.9	976.4	g
Net weight		89.8	58.6	62.3	4.0	2.6	11.2	g

Description of impinger water clean 70 % spent

B/W Sil gel color

Total moisture = 228.5 grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse container no. **Kiln 2 Run 6 Mill ON OFF-26A-H2SO4-6B** Liquid level ✓ marked/sealed _____

NaOH Impingers 5 and 6 contents and water rinse container no. **Kiln 2 Run 6 Mill ON OFF-26A-NaOH-6B** Liquid level ✓ marked/sealed _____

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/17/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/17/23

Run No. **Kiln 2 Run Mill (ON) OFF-26A-** Field Blank Recovered by CG BF

Filter Number(s) N/A

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		739.0	748.0	644.0	741.7	742.1	1010.4	g
Initial weight		739.0	748.1	644.2	741.8	742.2	1010.2	g
Net weight								g

Description of impinger water Clear 75 % spent

B/W Sil gel color

Total moisture = _____ grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse
container no. **Kiln 2 Run Mill (ON) OFF-26A-H2SO4-** FB

Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse
container no. **Kiln 2 Run Mill (ON) OFF-26A-NaOH** FB

Liquid level marked/sealed ✓

METHOD 26A
RECOVERY AND INTEGRITY DATA SHEET

Plant **Holcim USA- Midlothian, TX** Sample Date 11/16/23

Sample Location **Kiln Mill ON OFF** Recovery Date 11/17/23

Run No. **Kiln 2 Run 4 Mill ON OFF-26A-4A FB** Recovered by LGH

Filter Number(s) 141

Field Blank

MOISTURE

Impingers	1 50 ml 0.1N H_2SO_4 (knockout)	2 100 ml 0.1N H_2SO_4 (tipped)	3 100 ml 0.1N H_2SO_4 (tipped)	4 Knockout (untipped)	5 100 ml 0.1N NaOH (untipped)	6 100 ml 0.1N NaOH (untipped)	Silica gel (untipped)	
Final weight		741.7	741.3	615.7	746.4	743.8	930.3	g
Initial weight		741.8	741.4	615.8	746.5	743.8	930.4	g
Net weight								g

Description of impinger water clear 25 % spent

B/W Sil gel color

Total moisture = _____ grams

RECOVERED SAMPLE

Filter container number(s) **Noty Appliacable** Sealed _____

Description of particulate on filter _____

H_2SO_4 Impingers 1, 2, 3 and Knockout contents and water rinse
container no. **Kiln 2 Run Mill ON OFF-26A-H2SO4-** FB

Liquid level marked/sealed ✓

NaOH Impingers 5 and 6 contents and water rinse
container no. **Kiln 2 Run Mill ON OFF-26A-NaOH** FB

Liquid level marked/sealed ✓

Client: Holcim Midlothian
Test Location: Line 2 Main Stack; Raw Mill Off
Date: Nov 16, 2023 Start Time: 14:20:22
Run number 1
One Minute Averages

	Out O2 %,dry	Out CO2 %,dry
2:21:20 PM	13.2	12.4
2:22:20 PM	13.3	12.4
2:23:20 PM	13.2	12.6
2:24:20 PM	13.2	12.5
2:25:20 PM	13.1	12.6
2:26:20 PM	13.1	12.7
2:27:20 PM	13.1	12.6
2:28:20 PM	13.2	12.5
2:29:20 PM	13.2	12.5
2:30:20 PM	13.1	12.6
2:31:20 PM	13.1	12.5
2:32:20 PM	13.2	12.4
2:33:20 PM	13.2	12.5
2:34:20 PM	13.1	12.5
2:35:20 PM	13.0	12.7
2:36:20 PM	13.0	12.7
2:37:20 PM	13.0	12.7
2:38:20 PM	13.0	12.7
2:39:20 PM	13.0	12.7
2:40:20 PM	13.0	12.8
2:41:20 PM	13.0	12.8
2:42:20 PM	13.0	12.8
2:43:20 PM	13.0	12.9
2:44:20 PM	13.0	12.7
2:45:20 PM	13.0	12.8
2:46:20 PM	12.9	13.0
2:47:20 PM	12.9	13.2
2:48:20 PM	12.9	12.9
2:49:20 PM	13.0	12.7
2:50:20 PM	13.0	12.8
2:51:20 PM	13.0	12.7
2:52:20 PM	13.0	12.7
2:53:20 PM	13.0	12.8
2:54:20 PM	13.1	12.6
2:55:20 PM	13.2	12.4
2:56:20 PM	13.2	12.4
2:57:20 PM	13.1	12.7
2:58:20 PM	13.1	12.7
2:59:20 PM	13.1	12.7
3:00:20 PM	14.2	11.0
3:01:20 PM	14.8	10.0
3:02:00 PM	Process Problem/Down	
3:29:32 PM	Run Resumed	
3:29:54 PM	14.6	10.3
3:30:54 PM	14.0	11.3
3:31:54 PM	14.9	10.0
3:32:54 PM	14.9	9.8
3:33:54 PM	14.7	10.2
3:34:54 PM	13.8	11.6
3:35:54 PM	13.8	11.5
3:36:54 PM	13.6	11.8
3:37:54 PM	13.6	11.8
3:38:54 PM	13.4	12.3
3:39:54 PM	13.2	12.6
3:40:54 PM	13.1	12.7
3:41:54 PM	13.1	12.7
3:42:54 PM	13.1	12.8
3:43:54 PM	13.1	12.8
3:44:54 PM	13.1	12.7
3:45:54 PM	13.1	12.8
3:46:54 PM	13.0	13.1
3:47:54 PM	12.8	13.4
3:48:54 PM	13.0	12.8
3:49:54 PM	13.0	12.8
3:50:54 PM	13.1	12.7
3:51:54 PM	13.0	12.7
3:52:54 PM	13.0	12.8
3:53:54 PM	13.0	12.8
3:54:54 PM	13.0	12.9
3:55:54 PM	12.9	12.9
3:56:54 PM	13.0	12.8
3:57:54 PM	13.2	12.6
3:58:54 PM	13.3	12.2
3:59:54 PM	13.2	11.9
Run Avgs	13.2	12.4
Cal Gas	12.0	10.2
Initial Zero	0.2	0.1
Final Zero	0.4	0.3
Initial cal.	12.2	10.0
Final Cal.	12.3	10.0
Corrected Average	13.0	12.7

Client: Holcim Midlothian
Test Location: Line 2 Main Stack; Raw Mill Off
Date: Nov 16, 2023 Start Time: 16:19:32
Run number 2
One Minute Averages

	Out O2 %,dry	Out CO2 %,dry
4:20:30 PM	13.1	12.8
4:21:30 PM	13.0	12.8
4:22:30 PM	13.1	12.8
4:23:30 PM	13.1	12.8
4:24:30 PM	13.2	12.6
4:25:30 PM	13.2	12.6
4:26:30 PM	13.1	12.7
4:27:30 PM	13.1	12.6
4:28:30 PM	13.0	12.8
4:29:30 PM	13.2	12.6
4:30:30 PM	13.2	12.6
4:31:30 PM	13.1	12.7
4:32:30 PM	13.1	12.7
4:33:30 PM	13.1	12.7
4:34:30 PM	13.1	12.7
4:35:30 PM	13.0	12.9
4:36:30 PM	13.0	12.9
4:37:30 PM	13.0	12.7
4:38:30 PM	13.1	12.7
4:39:30 PM	13.1	12.7
4:40:30 PM	13.1	12.7
4:41:30 PM	13.1	12.8
4:42:30 PM	13.1	12.7
4:43:30 PM	13.1	12.7
4:44:30 PM	13.1	12.7
4:45:30 PM	13.0	12.8
4:46:30 PM	13.0	12.9
4:47:30 PM	13.0	13.1
4:48:30 PM	13.0	12.9
4:49:30 PM	13.0	12.9
4:50:30 PM	13.0	12.8
4:51:30 PM	13.1	12.7
4:52:30 PM	13.2	12.7
4:53:30 PM	13.2	12.7
4:54:30 PM	13.1	12.7
4:55:30 PM	13.0	12.8
4:56:30 PM	13.0	12.9
4:57:30 PM	13.1	12.7
4:58:30 PM	13.1	12.8
4:59:30 PM	13.1	12.7
5:00:30 PM	13.1	12.8
5:01:30 PM	13.1	12.8
5:02:30 PM	13.1	12.8
5:03:30 PM	13.0	12.8
5:04:30 PM	13.1	12.7
5:05:30 PM	13.2	12.6
5:06:30 PM	13.1	12.8
5:07:30 PM	13.2	12.7
5:08:30 PM	13.1	12.7
5:09:30 PM	13.1	12.7
5:10:30 PM	13.0	12.9
5:11:30 PM	13.0	12.8
5:12:30 PM	13.2	12.6
5:13:30 PM	13.1	12.8
5:14:30 PM	13.1	12.7
5:15:30 PM	13.0	12.9
5:16:30 PM	13.0	12.9
5:17:30 PM	13.0	12.8
5:18:30 PM	13.1	12.7
5:19:30 PM	13.2	12.6
5:20:30 PM	13.2	12.6
5:21:30 PM	13.2	12.7
5:22:30 PM	13.1	12.7
5:23:30 PM	13.1	12.8
5:24:30 PM	13.2	12.6
5:25:30 PM	13.1	12.8
5:26:30 PM	13.0	13.0
5:27:30 PM	13.0	12.9
Run Avgs	13.1	12.7
Cal Gas	12.0	10.2
Initial Zero	0.4	0.3
Final Zero	0.5	0.3
Initial cal.	12.3	10.0
Final Cal.	12.2	9.8
Corrected Average	12.9	13.2

Client: Holcim Midlothian
Test Location: Line 2 Main Stack; Raw Mill Off
Date: Nov 16, 2023 Start Time: 17:41:20
Run number 3
One Minute Averages

	Out O2 %,dry	Out CO2 %,dry
5:42:18 PM	12.8	11.7
5:43:18 PM	13.1	12.8
5:44:18 PM	13.2	12.6
5:45:18 PM	13.1	12.8
5:46:18 PM	13.0	12.9
5:47:18 PM	12.8	13.5
5:48:18 PM	13.0	12.8
5:49:18 PM	13.0	13.0
5:50:18 PM	13.2	12.6
5:51:18 PM	13.2	12.7
5:52:18 PM	13.1	12.8
5:53:18 PM	13.0	12.9
5:54:18 PM	13.1	12.7
5:55:18 PM	13.1	12.8
5:56:18 PM	13.1	12.7
5:57:18 PM	13.1	12.7
5:58:18 PM	13.2	12.7
5:59:18 PM	13.2	12.6
6:00:18 PM	13.2	12.7
6:01:18 PM	13.1	12.8
6:02:18 PM	13.2	12.7
6:03:18 PM	13.2	12.7
6:04:18 PM	13.2	12.7
6:05:18 PM	13.1	12.8
6:06:18 PM	13.1	12.8
6:07:18 PM	13.2	12.7
6:08:18 PM	13.0	12.9
6:09:18 PM	13.0	12.9
6:10:18 PM	13.1	12.7
6:11:18 PM	13.1	12.8
6:12:18 PM	13.1	12.8
6:13:18 PM	13.0	13.0
6:14:18 PM	13.1	12.8
6:15:18 PM	13.2	12.7
6:16:18 PM	13.0	12.8
6:17:18 PM	13.2	12.6
6:18:18 PM	13.3	12.6
6:19:18 PM	13.1	12.7
6:20:18 PM	13.1	12.8
6:21:18 PM	13.2	12.6
6:22:18 PM	13.1	12.8
6:23:18 PM	13.2	12.7
6:24:18 PM	13.2	12.8
6:25:18 PM	13.1	12.8
6:26:18 PM	13.2	12.7
6:27:18 PM	13.1	12.7
6:28:18 PM	13.3	12.4
6:29:18 PM	13.0	13.2
6:30:18 PM	13.1	12.8
6:31:18 PM	13.2	12.7
6:32:18 PM	13.1	12.8
6:33:18 PM	13.1	12.8
6:34:18 PM	13.2	12.8
6:35:18 PM	13.0	13.1
6:36:18 PM	13.2	12.7
6:37:18 PM	13.0	12.9
6:38:18 PM	13.1	12.9
6:39:18 PM	13.3	12.5
6:40:18 PM	13.3	12.6
6:41:18 PM	13.3	12.5
6:42:18 PM	13.3	12.6
6:43:18 PM	13.2	12.7
6:44:18 PM	13.0	13.0
6:45:18 PM	13.1	12.8
6:46:18 PM	13.0	12.9
6:47:18 PM	13.1	12.9
Run Avgs	13.1	12.8
Cal Gas	12.0	10.2
Initial Zero	0.5	0.3
Final Zero	0.5	0.3
Initial cal.	12.2	9.8
Final Cal.	12.3	9.9
Corrected Average	12.9	13.3

Holcim, Midlothian TX Line 2 Main Stack; Raw Mill Off November 16, 2023 Operator

					Run No. 1		14:20-15:57			Run No. 2		16:19-17:25			Run No. 3		17:41-18:47		
Cylinder ID	Gas Type	Value	Internal Response	Cal Error	Pre Run Bias	Percent Bias	Post Run Bias	Percent Bias	Percent Drift	Pre Run Bias	Percent Bias	Post Run Bias	Percent Bias	Percent Drift	Pre Run Bias	Percent Bias	Post Run Bias	Percent Bias	Percent Drift
	O2 Zero	Zero N2	0.0%	0.00%	0.2%	0.91%	0.4%	1.81%	0.91%	0.4%	1.81%	0.5%	2.27%	0.45%	0.5%	2.27%	0.5%	2.27%	0.00%
CC194988	O2 Mid	12.0%	12.2%	1.13%	12.2%	0.00%	12.3%	0.45%	0.45%	12.3%	0.45%	12.2%	0.00%	-0.45%	12.2%	0.00%	12.3%	0.45%	0.45%
CC427971	O2 Span	22.1%	22.1%	0.18%															
	CO2 Zero	Zero N2	0.0%	0.00%	0.1%	0.55%	0.3%	1.65%	1.10%	0.3%	1.65%	0.3%	1.65%	0.00%	0.3%	1.65%	0.3%	1.65%	0.00%
CC194988	CO2 Mid	10.2%	10.1%	-0.33%	10.0%	-0.55%	10.0%	-0.55%	0.00%	10.0%	-0.55%	9.8%	-1.65%	-1.10%	9.8%	-1.65%	9.9%	-1.10%	0.55%
CC427971	CO2 Span	18.2%	18.2%	0.11%															

Client: Holcim Midlothian
Test Location: Line 2 Main Stack; Raw Mill On
Date: Nov 17, 2023 Start Time: 08:06:12
Run number 1
One Minute Averages

	Out O2 %,dry	Out CO2 %,dry
8:07:10 AM	13.9	10.9
8:08:10 AM	14.0	10.8
8:09:10 AM	14.0	10.8
8:10:10 AM	14.1	10.7
8:11:10 AM	14.1	10.8
8:12:10 AM	14.1	10.7
8:13:10 AM	14.1	10.8
8:14:10 AM	14.0	10.9
8:15:10 AM	13.9	11.2
8:16:10 AM	13.9	11.0
8:17:10 AM	13.9	11.1
8:18:10 AM	14.0	11.0
8:19:10 AM	13.9	11.0
8:20:10 AM	14.0	10.9
8:21:10 AM	13.9	11.0
8:22:10 AM	14.0	10.9
8:23:10 AM	13.9	10.9
8:24:10 AM	14.0	11.0
8:25:10 AM	14.0	11.0
8:26:10 AM	14.0	10.9
8:27:10 AM	13.9	11.0
8:28:10 AM	14.0	10.9
8:29:10 AM	14.0	10.8
8:30:10 AM	14.1	10.8
8:31:10 AM	14.0	10.9
8:32:10 AM	14.0	10.8
8:33:10 AM	14.0	10.9
8:34:10 AM	13.9	11.0
8:35:10 AM	14.0	10.9
8:36:10 AM	13.9	11.0
8:37:10 AM	14.0	10.9
8:38:10 AM	13.9	11.0
8:39:10 AM	13.9	11.0
8:40:10 AM	14.0	10.9
8:41:10 AM	14.0	10.9
8:42:10 AM	14.0	11.0
8:43:10 AM	13.9	11.1
8:44:10 AM	14.0	11.0
8:45:10 AM	13.9	10.9
8:46:10 AM	14.0	10.9
8:47:10 AM	13.9	11.1
8:48:10 AM	13.9	11.2
8:49:10 AM	13.9	11.1
8:50:10 AM	13.8	11.0
8:51:10 AM	13.9	10.9
8:52:10 AM	13.9	11.0
8:53:10 AM	13.9	11.1
8:54:10 AM	13.9	11.0
8:55:10 AM	13.9	11.0
8:56:10 AM	13.9	11.1
8:57:10 AM	13.9	11.0
8:58:10 AM	13.9	11.0
8:59:10 AM	13.9	11.0
9:00:10 AM	13.9	11.1
9:01:10 AM	13.9	11.0
9:02:10 AM	13.9	11.0
9:03:10 AM	13.9	11.0
9:04:10 AM	13.9	11.2
9:05:10 AM	13.8	11.2
9:06:10 AM	13.9	11.1
9:07:10 AM	13.9	11.1
9:08:10 AM	13.9	10.9
9:09:10 AM	14.0	10.8
9:10:10 AM	13.9	11.0
9:11:10 AM	13.9	11.0
9:12:10 AM	13.9	11.0
9:13:10 AM	13.9	11.0
Run Avgs	13.9	11.0
Cal Gas	12.0	10.2
Initial Zero	0.2	0.2
Final Zero	0.2	0.2
Initial cal.	12.0	10.0
Final Cal.	12.0	9.9
Corrected Average	14.0	11.3

Client: Holcim Midlothian
Test Location: Line 2 Main Stack; Raw Mill On
Date: Nov 17, 2023 23 Start Time: 09:30:04
Run number 2
One Minute Averages

	Out O2 %,dry	Out CO2 %,dry
9:31:02 AM	13.9	11.0
9:32:02 AM	14.0	10.9
9:33:02 AM	14.1	10.9
9:34:02 AM	14.0	11.0
9:35:02 AM	13.9	11.1
9:36:02 AM	13.9	11.1
9:37:02 AM	14.0	10.9
9:38:02 AM	14.0	10.9
9:39:02 AM	14.1	10.9
9:40:02 AM	14.0	11.0
9:41:02 AM	14.0	11.0
9:42:02 AM	13.9	11.1
9:43:02 AM	14.0	11.0
9:44:02 AM	14.0	11.0
9:45:02 AM	14.1	10.8
9:46:02 AM	14.1	10.9
9:47:02 AM	14.0	11.0
9:48:02 AM	14.0	11.1
9:49:02 AM	14.0	11.0
9:50:02 AM	14.1	10.9
9:51:02 AM	14.0	10.9
9:52:02 AM	14.0	11.0
9:53:02 AM	13.9	11.1
9:54:02 AM	13.9	11.1
9:55:02 AM	13.9	11.0
9:56:02 AM	14.0	10.9
9:57:02 AM	13.9	11.1
9:58:02 AM	14.0	11.0
9:59:02 AM	14.0	10.9
10:00:02 AM	14.0	10.9
10:01:02 AM	14.0	10.9
10:02:02 AM	14.0	11.1
10:03:02 AM	13.9	11.1
10:04:02 AM	14.0	11.0
10:05:02 AM	14.1	10.9
10:06:02 AM	13.9	11.1
10:07:02 AM	13.8	11.1
10:08:02 AM	13.9	11.1
10:09:02 AM	14.0	11.0
10:10:02 AM	13.8	11.3
10:11:02 AM	13.9	11.2
10:12:02 AM	14.0	11.1
10:13:02 AM	14.0	11.1
10:14:02 AM	13.9	11.1
10:15:02 AM	14.0	11.0
10:16:02 AM	14.0	11.1
10:17:02 AM	14.0	11.1
10:18:02 AM	14.0	11.1
10:19:02 AM	14.0	11.1
10:20:02 AM	14.1	11.0
10:21:02 AM	14.0	11.1
10:22:02 AM	13.9	11.2
10:23:02 AM	14.0	11.1
10:24:02 AM	14.0	11.0
10:25:02 AM	14.0	10.9
10:26:02 AM	14.0	11.1
10:27:02 AM	13.9	11.1
10:28:02 AM	13.9	11.1
10:29:02 AM	14.0	11.0
10:30:02 AM	14.0	11.0
10:31:02 AM	14.1	10.9
10:32:02 AM	14.1	10.9
10:33:02 AM	14.0	11.1
10:34:02 AM	14.0	11.0
10:35:02 AM	14.0	11.0
10:36:02 AM	14.0	11.0
10:37:02 AM	14.0	11.1
Run Avgs	14.0	11.0
Cal Gas	12.0	10.2
Initial Zero	0.2	0.2
Final Zero	0.5	0.2
Initial cal.	12.0	9.9
Final Cal.	12.2	9.8
Corrected Average	13.9	11.4

Client: Holcim Midlothian
Test Location: Line 2 Main Stack; Raw Mill On
Date: Nov 17, 2023
Run number 3
One Minute Averages

	Out O2 %,dry	Out CO2 %,dry
11:01:08 AM	14.0	11.0
11:02:08 AM	14.0	11.0
11:03:08 AM	14.1	11.0
11:04:08 AM	14.2	10.9
11:05:08 AM	14.1	11.0
11:06:08 AM	14.0	11.1
11:07:08 AM	14.0	11.0
11:08:08 AM	14.1	10.9
11:09:08 AM	14.0	11.0
11:10:08 AM	14.0	11.0
11:11:08 AM	14.0	11.1
11:12:08 AM	14.2	11.1
11:13:08 AM	14.0	11.0
11:14:08 AM	14.1	10.9
11:15:08 AM	14.1	11.0
11:16:08 AM	14.2	10.9
11:17:08 AM	14.1	11.0
11:18:08 AM	14.2	11.1
11:19:08 AM	14.0	11.0
11:20:08 AM	13.9	10.9
11:21:08 AM	14.1	11.0
11:22:08 AM	14.0	11.0
11:23:08 AM	14.1	11.0
11:24:08 AM	14.1	11.0
11:25:08 AM	14.2	10.9
11:26:08 AM	14.0	11.0
11:27:08 AM	13.9	10.9
11:28:08 AM	14.0	11.1
11:29:08 AM	14.0	11.3
11:30:08 AM	14.2	10.9
11:31:08 AM	14.1	11.0
11:32:08 AM	14.0	11.1
11:33:08 AM	14.0	11.0
11:34:08 AM	14.1	10.9
11:35:08 AM	14.0	11.0
11:36:08 AM	14.0	11.0
11:37:08 AM	14.0	11.1
11:38:08 AM	14.0	11.0
11:39:08 AM	14.1	10.9
11:40:08 AM	14.2	10.8
11:41:08 AM	14.0	11.0
11:42:08 AM	14.0	10.9
11:43:08 AM	14.1	10.9
11:44:08 AM	14.1	10.8
11:45:08 AM	14.2	10.9
11:46:08 AM	14.0	11.1
11:47:08 AM	13.9	11.3
11:48:08 AM	14.0	11.2
11:49:08 AM	14.0	11.0
11:50:08 AM	14.1	10.9
11:51:08 AM	14.1	10.9
11:52:08 AM	14.2	10.8
11:53:08 AM	14.1	10.9
11:54:08 AM	14.1	11.0
11:55:08 AM	14.0	11.1
11:56:08 AM	14.0	11.0
11:57:08 AM	14.1	10.9
11:58:08 AM	14.0	11.0
11:59:08 AM	14.0	11.0
12:00:08 PM	14.0	11.0
12:01:08 PM	14.1	11.0
12:02:08 PM	14.2	10.9
12:03:08 PM	14.2	11.0
12:04:08 PM	14.2	10.9
12:05:08 PM	14.1	11.0
12:06:08 PM	14.0	11.0
12:07:08 PM	14.1	10.8
Run Avgs	14.1	11.0
Cal Gas	12.0	10.2
Initial Zero	0.5	0.2
Final Zero	0.5	0.3
Initial cal.	12.2	9.8
Final Cal.	12.2	9.8
Corrected Average	13.9	11.5

Holcim, Midlothian TX Line 2 Main Stack; Raw Mill On November 17, 2023 Operator

					Run No. 1		08:06-09:12			Run No. 2		09:30-10:36			Run No. 3		10:58-12:04		
Cylinder ID	Gas Type	Value	Internal Response	Cal Error	Pre Run Bias	Percent Bias	Post Run Bias	Percent Bias	Percent Drift	Pre Run Bias	Percent Bias	Post Run Bias	Percent Bias	Percent Drift	Pre Run Bias	Percent Bias	Post Run Bias	Percent Bias	Percent Drift
	O2 Zero	Zero N2	0.0%	0.00%	0.2%	0.91%	0.2%	0.91%	0.00%	0.2%	0.91%	0.5%	2.27%	1.36%	0.5%	2.27%	0.5%	2.27%	0.00%
CC194988	O2 Mid	12.0%	12.1%	0.68%	12.0%	-0.45%	12.0%	-0.45%	0.00%	12.0%	-0.45%	12.2%	0.45%	0.91%	12.2%	0.45%	12.2%	0.45%	0.00%
CC427971	O2 Span	22.1%	22.1%	0.18%															
	CO2 Zero	Zero N2	0.0%	0.00%	0.2%	1.10%	0.2%	1.10%	0.00%	0.2%	1.10%	0.2%	1.10%	0.00%	0.2%	1.10%	0.3%	1.65%	0.55%
CC194988	CO2 Mid	10.2%	10.0%	-0.88%	10.0%	0.00%	9.9%	-0.55%	-0.55%	9.9%	-0.55%	9.8%	-1.10%	-0.55%	9.8%	-1.10%	9.8%	-1.10%	0.00%
CC427971	CO2 Span	18.2%	18.2%	0.11%															

Holcim
Midlothian TX
Line 2 Main Stack; Mill Off
HCN Analyte Spikes

	Date	**11/16/23**	**11/16/23**	**11/16/23**	**11/16/23**
	Time	**13:46-14:07**	**15:57-16:14**	**17:32-17:48**	**18:48-19:09**
		Main Pre 1	**Main Post 1**	**Main Post 2**	**Main Post 3**
		HCN	**HCN**	**HCN**	**HCN**
Cs	Spike Direct, ppm	196.66	196.66	196.66	196.66
	SF6 Tracer Direct, ppm	9.53	9.53	9.53	9.53
SF6	Diluted SF6 Tracer, ppm	0.884	0.796	0.898	0.879
	Diluted SF6 Tracer, ppm	0.863	0.857	0.881	0.867
	Average Diluted SF6 Tracer, ppm	0.874	0.827	0.890	0.873
DF	Dilution Ratio	10.91	11.53	10.71	10.91
	Total, ppm	35.309	34.810	37.940	36.968
	Total, ppm	34.141	36.264	37.760	37.158
Ct	Average Total, ppm	34.725	35.537	37.850	37.063
	Pre Spike Native , ppm	19.192	23.732	23.417	24.079
	Pre Spike Native , ppm	20.943	23.424	22.836	23.525
	Post Spike Native , ppm	19.334	23.644	23.948	23.285
	Post Spike Native , ppm	19.734	23.274	23.831	24.712
Cn	Average Native , ppm	19.801	23.519	23.508	23.900
	Spike Recovery	**92.8%**	**82.4%**	**90.1%**	**85.2%**
	CTS Direct				
	Ethylene Expected (ppm)	75.48			75.48
	Ethylene Measured (ppm)	73.78			73.72
	CTS Error	**-2.3%**			**-2.3%**

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill Off
Pre Run 1 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__002109.LAB	11/16/23	13:45:22.116	16.589	-0.004
SPC__002110.LAB	11/16/23	13:46:25.702	19.192	-0.013
SPC__002111.LAB	11/16/23	13:47:29.605	20.943	-0.014
SPC__002112.LAB	11/16/23	13:48:33.504	22.692	0.114
SPC__002113.LAB	11/16/23	13:49:37.405	25.291	0.203
SPC__002114.LAB	11/16/23	13:50:41.691	34.526	0.901
SPC__002115.LAB	11/16/23	13:51:45.211	35.309	0.884
SPC__002116.LAB	11/16/23	13:52:49.380	34.141	0.863
SPC__002117.LAB	11/16/23	13:53:53.027	26.011	0.282
SPC__002118.LAB	11/16/23	13:54:56.898	26.134	0.636
SPC__002119.LAB	11/16/23	13:56:00.790	0.989	0.016
SPC__002120.LAB	11/16/23	13:57:04.827	0.452	0.009
SPC__002121.LAB	11/16/23	13:58:08.595	0.291	0.009
SPC__002122.LAB	11/16/23	13:59:12.543	0.259	0.008
SPC__002123.LAB	11/16/23	14:00:16.439	0.193	0.006
SPC__002124.LAB	11/16/23	14:01:20.299	0.214	0.006
SPC__002125.LAB	11/16/23	14:05:09.442	20.182	-0.012
SPC__002126.LAB	11/16/23	14:06:13.046	19.334	-0.012
SPC__002127.LAB	11/16/23	14:07:17.355	19.734	-0.012
SPC__002128.LAB	11/16/23	14:08:20.796	19.941	-0.014

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill Off
Post Run 1 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__002227.LAB	11/16/23	15:55:36.328	24.398	-0.013
SPC__002228.LAB	11/16/23	15:56:40.526	23.732	-0.012
SPC__002229.LAB	11/16/23	15:57:44.137	23.424	-0.016
SPC__002230.LAB	11/16/23	15:58:48.289	24.290	-0.016
SPC__002231.LAB	11/16/23	15:59:52.251	23.058	0.003
SPC__002232.LAB	11/16/23	16:00:56.153	26.699	0.297
SPC__002233.LAB	11/16/23	16:01:59.726	34.349	0.801
SPC__002234.LAB	11/16/23	16:03:03.627	34.810	0.796
SPC__002235.LAB	11/16/23	16:04:07.853	36.264	0.857
SPC__002236.LAB	11/16/23	16:05:11.461	34.253	0.689
SPC__002237.LAB	11/16/23	16:06:15.385	24.250	0.606
SPC__002238.LAB	11/16/23	16:07:19.456	0.772	0.007
SPC__002239.LAB	11/16/23	16:08:23.127	0.368	0.006
SPC__002240.LAB	11/16/23	16:09:27.091	0.160	0.008
SPC__002241.LAB	11/16/23	16:10:30.919	18.622	-0.010
SPC__002242.LAB	11/16/23	16:11:35.160	26.667	-0.011
SPC__002243.LAB	11/16/23	16:12:38.841	23.644	-0.013
SPC__002244.LAB	11/16/23	16:13:42.640	23.274	-0.011

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill Off
Post Run 2 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__002314.LAB	11/16/23	17:31:02.652	23.343	-0.016
SPC__002315.LAB	11/16/23	17:32:06.478	23.417	-0.015
SPC__002316.LAB	11/16/23	17:33:10.079	22.836	-0.006
SPC__002317.LAB	11/16/23	17:34:14.276	24.768	0.130
SPC__002318.LAB	11/16/23	17:35:18.175	34.445	0.653
SPC__002319.LAB	11/16/23	17:36:21.780	35.633	0.752
SPC__002320.LAB	11/16/23	17:37:25.732	37.940	0.898
SPC__002321.LAB	11/16/23	17:38:30.034	37.760	0.881
SPC__002322.LAB	11/16/23	17:39:33.449	36.585	1.180
SPC__002323.LAB	11/16/23	17:40:37.347	0.920	0.013
SPC__002324.LAB	11/16/23	17:41:41.335	0.404	0.001
SPC__002325.LAB	11/16/23	17:42:45.395	10.794	0.003
SPC__002326.LAB	11/16/23	17:43:49.063	27.846	-0.009
SPC__002327.LAB	11/16/23	17:45:36.902	23.893	-0.013
SPC__002328.LAB	11/16/23	17:46:40.808	23.948	-0.011
SPC__002329.LAB	11/16/23	17:47:44.702	23.831	-0.015

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill Off
Post Run 3 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C	Ethylene (100,3000) 191C
SPC__002385.LAB	11/16/23	18:47:23.039	24.045	-0.013	9.141
SPC__002386.LAB	11/16/23	18:48:26.987	24.079	-0.011	8.936
SPC__002387.LAB	11/16/23	18:49:30.819	23.525	-0.001	8.313
SPC__002388.LAB	11/16/23	18:50:35.085	28.754	0.383	7.960
SPC__002389.LAB	11/16/23	18:51:38.655	36.968	0.879	7.574
SPC__002390.LAB	11/16/23	18:52:42.514	37.158	0.867	7.743
SPC__002391.LAB	11/16/23	18:53:46.386	34.553	1.119	4.674
SPC__002392.LAB	11/16/23	18:54:50.303	0.711	0.010	0.024
SPC__002393.LAB	11/16/23	18:55:54.294	0.228	0.001	0.248
SPC__002394.LAB	11/16/23	18:56:58.088	4.152	0.003	1.569
SPC__002395.LAB	11/16/23	18:58:01.993	28.849	-0.014	10.189
SPC__002396.LAB	11/16/23	18:59:05.913	23.285	-0.016	8.907
SPC__002397.LAB	11/16/23	19:00:09.850	24.712	-0.015	8.607
SPC__002398.LAB	11/16/23	19:01:13.674	16.489	-0.007	6.144
SPC__002399.LAB	11/16/23	19:02:17.571	0.245	0.002	0.050
SPC__002400.LAB	11/16/23	19:03:21.502	-0.033	0.002	0.098
SPC__002401.LAB	11/16/23	19:04:25.774	0.202	0.004	-0.000
SPC__002402.LAB	11/16/23	19:05:29.296	0.069	0.001	-0.003
SPC__002403.LAB	11/16/23	19:06:33.535	0.058	0.001	0.085
SPC__002404.LAB	11/16/23	19:07:37.052	-0.020	-0.011	69.197
SPC__002405.LAB	11/16/23	19:08:40.957	-0.080	-0.010	73.724

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill Off
CTS and HCN Analyte Spike Direrct

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C	Ethylene (100,3000) 191C
SPC__002064.LAB	11/16/23	12:55:37.434	-0.209	-0.012	73.689
SPC__002065.LAB	11/16/23	12:56:41.313	-0.233	-0.010	73.844
SPC__002066.LAB	11/16/23	12:57:45.099	-0.174	-0.013	73.713
SPC__002067.LAB	11/16/23	12:58:48.996	-0.074	-0.011	73.538
SPC__002068.LAB	11/16/23	12:59:52.898	39.520	1.606	58.869
SPC__002069.LAB	11/16/23	13:00:56.893	194.229	9.453	-0.191
SPC__002070.LAB	11/16/23	13:02:01.062	196.494	9.511	-0.623
SPC__002071.LAB	11/16/23	13:03:04.968	196.644	9.521	-0.662
SPC__002072.LAB	11/16/23	13:04:08.525	196.685	9.533	-0.523
SPC__002073.LAB	11/16/23	13:05:12.422	170.579	7.987	1.992
SPC__002074.LAB	11/16/23	13:06:16.322	0.419	0.013	-0.013
SPC__002075.LAB	11/16/23	13:07:20.231	0.083	0.001	0.008

Holcim
Midlothian TX
Line 2 Main Stack; Mill On
HCN Analyte Spikes

	Date	**11/17/23**	**11/17/23**	**11/17/23**	**11/17/23**
	Time	**07:50-08:11**	**09:13-09:27**	**10:42-10:57**	**12:06-12:31**
		Main Pre 1	**Main Post 1**	**Main Post 2**	**Main Post 3**
		HCN	**HCN**	**HCN**	**HCN**
Cs	Spike Direct, ppm	197.32	197.32	197.32	197.32
	SF6 Tracer Direct, ppm	9.58	9.58	9.58	9.58
SF6	Diluted SF6 Tracer, ppm	0.810	0.886	0.776	0.790
	Diluted SF6 Tracer, ppm	0.810	0.893	0.768	0.795
	Average Diluted SF6 Tracer, ppm	0.810	0.890	0.772	0.793
DF	Dilution Ratio	11.83	10.77	12.41	12.09
	Total, ppm	33.484	34.274	33.058	33.206
	Total, ppm	33.647	34.760	33.139	32.990
Ct	Average Total, ppm	33.566	34.517	33.099	33.098
	Pre Spike Native , ppm	21.251	21.813	21.153	20.515
	Pre Spike Native , ppm	20.013	21.120	21.005	20.912
	Post Spike Native , ppm	21.790	20.765	21.588	20.145
	Post Spike Native , ppm	21.875	21.259	20.691	20.711
Cn	Average Native , ppm	21.232	21.239	21.109	20.571
	Spike Recovery	**84.7%**	**83.3%**	**86.1%**	**87.2%**
	CTS Direct				
	Ethylene Expected (ppm)	75.48			75.48
	Ethylene Measured (ppm)	73.59			73.84
	CTS Error	**-2.5%**			**-2.2%**

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill On
Pre Run 1 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__002448.LAB	11/17/23	07:49:15.007	21.117	-0.013
SPC__002449.LAB	11/17/23	07:50:18.933	21.251	-0.010
SPC__002450.LAB	11/17/23	07:51:22.774	20.013	-0.011
SPC__002451.LAB	11/17/23	07:52:27.009	24.868	0.284
SPC__002452.LAB	11/17/23	07:53:30.610	29.891	0.575
SPC__002453.LAB	11/17/23	07:54:34.464	30.517	0.591
SPC__002454.LAB	11/17/23	07:55:38.368	33.550	0.800
SPC__002455.LAB	11/17/23	07:56:42.261	33.734	0.812
SPC__002456.LAB	11/17/23	07:57:46.441	33.484	0.810
SPC__002457.LAB	11/17/23	07:58:50.064	33.647	0.810
SPC__002458.LAB	11/17/23	07:59:54.283	28.004	0.417
SPC__002459.LAB	11/17/23	08:00:57.866	28.247	0.622
SPC__002460.LAB	11/17/23	08:02:01.766	0.923	0.010
SPC__002461.LAB	11/17/23	08:03:05.616	0.328	0.009
SPC__002462.LAB	11/17/23	08:04:09.563	4.213	0.004
SPC__002463.LAB	11/17/23	08:05:13.758	24.859	-0.014
SPC__002464.LAB	11/17/23	08:06:17.666	22.626	-0.013
SPC__002465.LAB	11/17/23	08:07:21.238	20.815	-0.010
SPC__002466.LAB	11/17/23	08:08:25.137	21.812	-0.011
SPC__002467.LAB	11/17/23	08:09:29.286	21.790	-0.012
SPC__002468.LAB	11/17/23	08:10:32.965	21.875	-0.010
SPC__002469.LAB	11/17/23	08:11:36.827	22.272	-0.014

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill On
Post Run 1 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__002526.LAB	11/17/23	09:12:18.993	21.148	-0.013
SPC__002527.LAB	11/17/23	09:13:22.840	21.813	-0.014
SPC__002528.LAB	11/17/23	09:14:26.721	21.120	-0.002
SPC__002529.LAB	11/17/23	09:15:30.621	24.625	0.269
SPC__002530.LAB	11/17/23	09:16:34.511	32.079	0.725
SPC__002531.LAB	11/17/23	09:17:38.407	34.274	0.886
SPC__002532.LAB	11/17/23	09:18:42.359	34.760	0.893
SPC__002533.LAB	11/17/23	09:19:46.218	38.418	1.191
SPC__002534.LAB	11/17/23	09:20:50.111	16.687	-0.004
SPC__002535.LAB	11/17/23	09:21:54.076	0.512	0.004
SPC__002536.LAB	11/17/23	09:22:58.237	0.279	-0.001
SPC__002537.LAB	11/17/23	09:24:01.776	14.523	-0.008
SPC__002538.LAB	11/17/23	09:25:06.008	22.850	-0.013
SPC__002539.LAB	11/17/23	09:26:09.579	20.765	-0.013
SPC__002540.LAB	11/17/23	09:27:13.801	21.259	-0.011

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill On
Post Run 2 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C
SPC__002609.LAB	11/17/23	10:41:22.742	21.229	-0.012
SPC__002610.LAB	11/17/23	10:42:26.638	21.153	-0.013
SPC__002611.LAB	11/17/23	10:43:30.867	21.005	-0.012
SPC__002612.LAB	11/17/23	10:44:34.488	20.682	-0.003
SPC__002613.LAB	11/17/23	10:45:38.317	24.057	0.261
SPC__002614.LAB	11/17/23	10:46:42.252	30.888	0.668
SPC__002615.LAB	11/17/23	10:47:46.484	31.482	0.706
SPC__002616.LAB	11/17/23	10:48:50.006	33.058	0.776
SPC__002617.LAB	11/17/23	10:49:53.899	33.139	0.768
SPC__002618.LAB	11/17/23	10:50:57.887	38.296	1.172
SPC__002619.LAB	11/17/23	10:52:01.781	1.116	0.010
SPC__002620.LAB	11/17/23	10:53:05.557	0.321	-0.002
SPC__002621.LAB	11/17/23	10:54:09.522	2.636	0.004
SPC__002622.LAB	11/17/23	10:55:13.474	23.010	-0.013
SPC__002623.LAB	11/17/23	10:56:17.352	21.588	-0.013
SPC__002624.LAB	11/17/23	10:57:21.199	20.691	-0.011

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill On
Post Run 3 HCN Analyte Spike

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C	Ethylene (100,3000) 191C
SPC__002687.LAB	11/17/23	12:05:26.060	21.076	-0.013	7.905
SPC__002688.LAB	11/17/23	12:06:29.959	20.515	-0.011	8.237
SPC__002689.LAB	11/17/23	12:07:34.154	20.912	-0.013	8.886
SPC__002690.LAB	11/17/23	12:08:37.743	20.522	0.003	7.681
SPC__002691.LAB	11/17/23	12:09:41.679	29.442	0.617	7.747
SPC__002692.LAB	11/17/23	12:10:45.968	33.206	0.790	7.613
SPC__002693.LAB	11/17/23	12:11:49.424	32.990	0.795	7.745
SPC__002694.LAB	11/17/23	12:12:53.401	33.780	1.100	5.091
SPC__002695.LAB	11/17/23	12:13:57.178	0.705	0.008	0.028
SPC__002696.LAB	11/17/23	12:15:01.169	0.118	0.006	0.376
SPC__002697.LAB	11/17/23	12:16:05.325	15.154	-0.009	5.246
SPC__002698.LAB	11/17/23	12:17:09.148	22.070	-0.009	8.252
SPC__002699.LAB	11/17/23	12:18:12.812	20.145	-0.011	8.153
SPC__002700.LAB	11/17/23	12:19:16.708	20.711	-0.013	8.570
SPC__002701.LAB	11/17/23	12:20:20.609	16.700	-0.006	6.700
SPC__002702.LAB	11/17/23	12:21:24.490	2.768	0.000	0.969
SPC__002703.LAB	11/17/23	12:22:28.383	3.121	0.000	1.041
SPC__002704.LAB	11/17/23	12:23:32.282	0.339	-0.000	0.102
SPC__002705.LAB	11/17/23	12:24:36.175	0.067	0.001	0.057
SPC__002706.LAB	11/17/23	12:25:40.029	0.074	-0.001	0.038
SPC__002707.LAB	11/17/23	12:26:43.945	0.270	-0.004	-0.288
SPC__002708.LAB	11/17/23	12:27:47.814	0.199	-0.019	29.452
SPC__002709.LAB	11/17/23	12:28:51.718	-0.234	-0.014	73.658
SPC__002710.LAB	11/17/23	12:29:55.615	-0.049	-0.014	73.833
SPC__002711.LAB	11/17/23	12:30:59.536	-0.137	-0.018	73.840
SPC__002712.LAB	11/17/23	12:32:03.432	-0.325	-0.015	72.072

Holcim Midlothian TX
Line 2 Main Stack; Raw Mill On
CTS and HCN Analyte Spike Direct

Spectrum	Date	Time	HCN (200) PCA 191C 191c	SF6 (10) 191C	Ethylene (100,3000) 191C
SPC__002406BKG.LAB	11/17/23	06:54:22.814	0.000	0.000	0.000
SPC__002407.LAB	11/17/23	06:55:33.240	-0.087	0.005	-0.050
SPC__002408BKG.LAB	11/17/23	06:58:48.184	0.000	0.000	0.000
SPC__002409.LAB	11/17/23	06:59:58.189	-0.005	-0.002	0.033
SPC__002410BKG.LAB	11/17/23	07:02:26.457	0.000	0.000	0.000
SPC__002411.LAB	11/17/23	07:03:37.037	-0.048	0.001	0.032
SPC__002412BKG.LAB	11/17/23	07:06:06.105	0.000	0.000	0.000
SPC__002413.LAB	11/17/23	07:07:16.611	0.203	-0.003	0.018
SPC__002414.LAB	11/17/23	07:08:20.376	-0.059	-0.022	48.395
SPC__002415.LAB	11/17/23	07:10:16.702	-0.071	-0.013	73.653
SPC__002416.LAB	11/17/23	07:11:21.000	0.005	-0.014	73.520
SPC__002417.LAB	11/17/23	07:12:24.842	112.705	5.072	30.795
SPC__002418.LAB	11/17/23	07:13:28.431	197.016	9.583	-0.664
SPC__002419.LAB	11/17/23	07:14:32.280	197.617	9.585	-0.730
SPC__002420.LAB	11/17/23	07:15:36.261	196.781	9.578	-0.651
SPC__002421.LAB	11/17/23	07:16:40.123	196.103	9.556	-0.663

Appendix C

Ion Chromatography Analytical Report Data

Deeco, Inc.

3404 Lake Woodard Drive
Raleigh, NC 27604

Project No: 23-3313
Holcim Midlothian, TX

Hydrogen Fluoride & Chlorine

EPA Method 26A Analysis

Analytical Report
41653

el1

Element One, Inc.
6319-D Carolina Beach Rd., Wilmington, NC 28412
910-793-0128 FAX: 910-792-6853 e1lab@e1lab.com

The following data for Analytical Report 41653
has been reviewed for completeness, accuracy,
adherence to method protocol,
and compliance with quality assurance guidelines.

Review by:

Linda Ann Webb, M.S. Analytical Chemist
December 15, 2023

Report Reviewed and Finalized By:

Ken Smith, Laboratory Director
December 15, 2023

SUMMARY OF RESULTS

Summary of Analysis

Summary of Method 26A Analysis

Element	Line1-M26A-R1A e41653-1 Total mg	Line1-M26A-R2A e41653-2 Total mg	Line1-M26A-R3A e41653-3 Total mg
HF	< 0.126	< 0.155	< 0.139
Cl_2	< 0.176	0.582	< 0.300

Element	Line1-M26A-R4A e41653-4 Total mg	Line1-M26A-R5A e41653-5 Total mg	Line1-M26A-R6A e41653-6 Total mg
HF	< 0.113	< 0.147	< 0.150
Cl_2	1.24	0.533	0.945

Element	Line1-M26A-R1B e41653-7 Total mg	Line1-M26A-R2B e41653-8 Total mg	Line1-M26A-R3B e41653-9 Total mg
HF	< 0.132	< 0.149	< 0.155
Cl_2	< 0.203	< 0.348	< 0.350

Element	Line1-M26A-R4B e41653-10 Total mg	Line1-M26A-R5B e41653-11 Total mg	Line1-M26A-R6B e41653-12 Total mg
HF	< 0.161	< 0.142	< 0.121
Cl_2	1.59	1.05	< 0.285

Element	Line1-M26A-FBON e41653-13 Total mg	Line1-M26A-FBOFF e41653-14 Total mg
HF	< 0.182	< 0.189
Cl_2	< 0.153	< 0.153

Summary of Analysis

Summary of Method 26A Analysis

Element	Line2-M26A-R1A e41653-15 Total mg	Line2-M26A-R2A e41653-16 Total mg	Line2-M26A-R3A e41653-17 Total mg
HF	< 0.247	< 0.168	< 0.155
Cl_2	1.08	1.56	1.53

Element	Line2-M26A-R4A e41653-18 Total mg	Line2-M26A-R5A e41653-19 Total mg	Line2-M26A-R6A e41653-20 Total mg
HF	< 0.161	< 0.147	< 0.147
Cl_2	0.684	0.911	0.748

Element	Line2-M26A-R1B e41653-21 Total mg	Line2-M26A-R2B e41653-22 Total mg	Line2-M26A-R3B e41653-23 Total mg
HF	< 0.161	< 0.153	< 0.155
Cl_2	1.35	1.16	1.52

Element	Line2-M26A-R4B e41653-24 Total mg	Line2-M26A-R5B e41653-25 Total mg	Line2-M26A-R6B e41653-26 Total mg
HF	< 0.178	< 0.147	< 0.165
Cl_2	0.586	0.825	0.804

Element	Line2-M26A-FBOFF e41653-27 Total mg	Line2-M26A-FBON e41653-28 Total mg
HF	< 0.182	< 0.189
Cl_2	< 0.178	< 0.173

ANALYTICAL NARRATIVE

Element One Analytical Narrative

Client:	Deeco, Inc.	Element One #:	41653
Client ID:	23-3313 Holcim Midlothian, TX	Analyst:	LAW
Method:	M26A	Dates Received:	11.21.23
Analytes:	HF, Cl_2	Dates Analyzed:	12.06-15.23

Summary of Analysis

The samples were prepared and analyzed according to Method 26A protocol. The samples were analyzed for fluoride and chloride on Metrohm 861/788 and 881/858 ion chromatograph systems.

Detection Limits

The Metrohm reporting limit was 0.1 µg/mL for fluoride and chloride.

Analysis QA/QC

Duplicate analyses relative percent difference (RPD) and spike recovery data are summarized in the Quality Control section. All QA/QC data was within the criteria of the method.

Additional Comments

The reported results have not been corrected for any blank values or spike recovery values. Due to the sample matrix, it was necessary to analyze all samples at a minimum five-fold dilution to reduce interferences and to preserve the anion column. The reported results relate only to the items tested or calibrated.

QUALITY CONTROL SUMMARY

Summary of Quality Control Data

Summary of Method 26A Duplicate Analysis RPD

(Method 26A QC limits: <5% for RPD)

Element	Line1-M26A-R1A RPD	Line1-M26A-R2A RPD	Line1-M26A-R3A RPD
HF	NA	NA	NA
Cl_2	NA	0.6%	NA

Element	Line1-M26A-R4A RPD	Line1-M26A-R5A RPD	Line1-M26A-R6A RPD
HF	NA	NA	NA
Cl_2	2.7%	1.2%	1.9%

Element	Line1-M26A-R1B RPD	Line1-M26A-R2B RPD	Line1-M26A-R3B RPD
HF	NA	NA	NA
Cl_2	NA	NA	NA

Element	Line1-M26A-R4B RPD	Line1-M26A-R5B RPD	Line1-M26A-R6B RPD
HF	NA	NA	NA
Cl_2	0.5%	0.0%	NA

Element	Line 1-M26A-FBON RPD	Line 1-M26A-FBOFF RPD
HF	NA	NA
Cl_2	NA	NA

Summary of Quality Control Data

Summary of Method 26A Duplicate Analysis RPD

(Method 26A QC limits: <5% for RPD)

Element	Line2-M26A-R1A RPD	Line2-M26A-R2A RPD	Line2-M26A-R3A RPD
HF	NA	NA	NA
Cl_2	1.7%	1.5%	3.4%

Element	Line2-M26A-R4A RPD	Line2-M26A-R5A RPD	Line2-M26A-R6A RPD
HF	NA	NA	NA
Cl_2	0.0%	1.6%	1.5%

Element	Line2-M26A-R1B RPD	Line2-M26A-R2B RPD	Line2-M26A-R3B RPD
HF	NA	NA	NA
Cl_2	1.2%	0.3%	1.3%

Element	Line2-M26A-R4B RPD	Line2-M26A-R5B RPD	Line2-M26A-R6B RPD
HF	NA	NA	NA
Cl_2	1.2%	0.9%	0.4%

Element	Line2-M26A-FBOFF RPD	Line2-M26A-FBON RPD
HF	NA	NA
Cl_2	NA	NA

Summary of Quality Control Data

Summary of Method 26A Spike Recoveries

(Method 26A QC limits: 90-110% for Spike Recoveries)

Element	Line1-M26A-R3A Recovery	Line1-M26A-R3B Recovery
HF	108%	106%
Cl_2	92%	101%

Element	Line2-M26A-R3A Recovery	Line2-M26A-R3B Recovery
HF	110%	109%
Cl_2	103%	102%

Second Source Calibration Verification

*(*Laboratory QC limits: 90-110%)*

Element	DL 0.1mg/L Recovery	*QC 5.0mg/L Recovery
HF 41653 (1-14)	104%	104%
Cl_2 41653 (1-14)	101%	100%
HF 41653 (15-28)	105%	103%
Cl_2 41653 (15-28)	110%	106%

SAMPLE CUSTODY

DEECO, Inc

3404 Lake Woodard Dr.
Raleigh, NC 27604
919-250-0285

41653

Date:	11/22/23
Lab:	Element One
Train:	EPA Method 26

Plant Name: Holcim Plant Location: Midlothian TX Project Name: 23-3313 ~~3309~~

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments
B Dewees	11/27/23	Lua Barton	11.27.23	Per Marc LRB 11.27.23
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments

Field Sample No.	Date	Composite or Grab	Analysis Required	Sampling Train	Sample Description	Special Notes	Lab
Line1-1A-H_2SO_4	11/15/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 486.6 mL	Element One
Line1-1A-NaOH	11/15/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 377.2 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line1-1B-H_2SO_4	11/15/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 498.7 mL	Element One
Line1-1B-NaOH	11/15/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 384.7 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line1-2A-H_2SO_4	11/15/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 590.6 mL	Element One
Line1-2A-NaOH	11/15/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 332.4 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line1-2B-H_2SO_4	11/15/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 560.2 mL	Element One
Line1-2B-NaOH	11/15/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 346.6 mL **Sodium thiosulfate NOT ADDED!**	Element One

Samples received in good condition in Env. Exp. containers. No empty containers.

DEECO, Inc

3404 Lake Woodard Dr.
Raleigh, NC 27604
919-250-0285

41653

Date:	11/22/23
Lab:	Element One
Train:	EPA Method 26

Plant Name: Holcim | Plant Location: Midlothian TX | Project Name: 23-3313 ~~3309~~

Relinquished by: (Signature) B Deeker	Date/Time 11/27/23	Received by: (Signature) Lisa Bruton	Date/Time 11.27.23	Comments 2220 11.27.23	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments	

Field Sample No.	Date	Composite or Grab	Analysis Required	Sampling Train	Sample Description	Special Notes	Lab
Line1-3A-H_2SO_4	11/15/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 533.0 mL	Element One
Line1-3A-NaOH	11/15/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 298.2 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line1-3B-H_2SO_4	11/15/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 570.1 mL	Element One
Line1-3B-NaOH	11/15/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 347.7 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line1-4A-H_2SO_4	11/15/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 555.3 mL	Element One
Line1-4A-NaOH	11/15/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 421.8 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line1-4B-H_2SO_4	11/15/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 637.9 mL	Element One
Line1-4B-NaOH	11/15/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 363.3 mL **Sodium thiosulfate NOT ADDED!**	Element One

DEECO, Inc

3404 Lake Woodard Dr.
Raleigh, NC 27604
919-250-0285

41653

Date:	11/22/23
Lab:	Element One
Train:	EPA Method 26

Plant Name: Holcim Plant Location: Midlothian TX Project Name: 3313 23-~~3309~~

Relinquished by: (Signature) B Dewees	Date/Time 11/27/23	Received by: (Signature) Lisa Smith	Date/Time 11.27.23	Comments	226 11.27.23
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments	

Field Sample No.	Date	Composite or Grab	Analysis Required	Sampling Train	Sample Description	Special Notes	Lab
Line1-5A-H_2SO_4	11/15/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 552.2 mL	Element One
Line1-5A-NaOH	11/15/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 314.9 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line1-5B-H_2SO_4	11/15/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 542.8 mL	Element One
Line1-5B-NaOH	11/15/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 300.9 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line1-6A-H_2SO_4	11/15/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 519.5 mL	Element One
Line1-6A-NaOH	11/15/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 298.7 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line1-6B-H_2SO_4	11/15/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 570.1 mL	Element One
Line1-6B-NaOH	11/15/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 285.0 mL **Sodium thiosulfate NOT ADDED!**	Element One

41653

DEECO, Inc
3404 Lake Woodard Dr.
Raleigh, NC 27604
919-250-0285

Date:	11/22/23
Lab:	Element One
Train:	EPA Method 26

Plant Name: Holcim Plant Location: Midlothian TX Project Name: 23-~~3309~~ 3313

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments	
B Weber	11/27/23	Lisa Kuntz	11.27.23		aKB 11.27.23
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments	

Field Sample No.	Date	Composite or Grab	Analysis Required	Sampling Train	Sample Description	Special Notes	Lab
Line2-1A-H_2SO_4	11/16/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 471.8 mL	Element One
Line2-1A-NaOH	11/16/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 363.5 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line2-1B-H_2SO_4	11/16/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 458.3 mL	Element One
Line2-1B-NaOH	11/16/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 335.7 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line2-2A-H_2SO_4	11/16/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 599.1 mL	Element One
Line2-2A-NaOH	11/16/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 323.0 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line2-2B-H_2SO_4	11/16/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 607.5 mL	Element One
Line2-2B-NaOH	11/16/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 382.6 mL **Sodium thiosulfate NOT ADDED!**	Element One

DEECO, Inc

41563

3404 Lake Woodard Dr.
Raleigh, NC 27604
919-250-0285

Date:	11/06/23
Lab:	Element One
Train:	EPA Method 26A

Plant Name: Holcim Plant Location: Ste. Genevive MO Project Name: 23-3309

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments
B. Deewee	11/6/23	Lisa Barton	11.6-23	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments

Field Sample No.	Date	Composite or Grab	Analysis Required	Sampling Train	Sample Description	Special Notes	Lab
Cond1-FB-H_2SO_4	11/01/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses		Element One
Cond1-FB-NaOH	11/01/23	Comp.	Chloride ion as Diatomic Chlorine	EPA Method 26A	0.1N NaOH and DI Rinses	**Sodium thiosulfate not added**	Element One
Cond1-RB-H_2SO_4	11/01/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4	Archive pending FB analysis	Element One
Cond1-RB-NaOH	11/01/23	Comp.	Chloride ion as Diatomic Chlorine	EPA Method 26A	0.1N NaOH	Archive pending FB analysis	Element One
Cond1-RB-DI	11/01/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	DI Water	Archive pending FB analysis	Element One

DEECO, Inc

3404 Lake Woodard Dr.
Raleigh, NC 27604
919-250-0285

41653

Date:	11/22/23
Lab:	Element One
Train:	EPA Method 26

Plant Name: Holcim

Plant Location: Midlothian TX

Project Name: 23-~~3309~~ 3313

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments
B DeWees	11/27/23	Lisa Burton	11.27.23	LRB 11.27.23
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments

Field Sample No.	Date	Composite or Grab	Analysis Required	Sampling Train	Sample Description	Special Notes	Lab
Line2-3A-H_2SO_4	11/16/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 647.4 mL	Element One
Line2-3A-NaOH	11/16/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 339.8 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line2-3B-H_2SO_4	11/16/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 551.1 mL	Element One
Line2-3B-NaOH	11/16/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 332.3 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line2-4A-H_2SO_4	11/17/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 577.6 mL	Element One
Line2-4A-NaOH	11/17/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 358.9 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line2-4B-H_2SO_4	11/17/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 569.0 mL	Element One
Line2-4B-NaOH	11/17/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 352.9 mL **Sodium thiosulfate NOT ADDED!**	Element One

DEECO, Inc

3404 Lake Woodard Dr.
Raleigh, NC 27604
919-250-0285

41653

Date:	11/22/23
Lab:	Element One
Train:	EPA Method 26

Plant Name: Holcim

Plant Location: Midlothian TX

Project Name: 23-~~3309~~ 3313

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments
B. DeWeese	11/27/23 1429	Leah Brunton	11.27.23	LRB 11.27.23
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Comments

Field Sample No.	Date	Composite or Grab	Analysis Required	Sampling Train	Sample Description	Special Notes	Lab
Line2-5A-H_2SO_4	11/17/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 675.0 mL	Element One
Line2-5A-NaOH	11/17/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 366.0 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line2-5B-H_2SO_4	11/17/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 673.8 mL	Element One
Line2-5B-NaOH	11/17/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 371.3 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line2-6A-H_2SO_4	11/17/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 547.4 mL	Element One
Line2-6A-NaOH	11/17/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 359.3 mL **Sodium thiosulfate NOT ADDED!**	Element One
Line2-6B-H_2SO_4	11/17/23	Comp.	Fluoride ion as Hydrogen Fluoride	EPA Method 26A	0.1N H_2SO_4 and DI Rinses	Final Volume 628.9 mL	Element One
Line2-6B-NaOH	11/17/23	Comp.	Chloride ion as Chlorine (Cl_2)	EPA Method 26A	0.1N NaOH and DI Rinses	Final Volume 344.8 mL **Sodium thiosulfate NOT ADDED!**	Element One

ANALYTICAL DATA

Analytical Calculations

HF -

$$\textbf{Total HX (mg)} = \frac{[\textbf{X Results (µg/mL)*Dilution*Beginning Vol (mL)}]}{\textbf{1000}} \textbf{*Correction Factor}$$

Where-

X Results= Raw sample concentration (ppm) — *IC Data Sheet*

Dilution= $\frac{\text{Diluted Volume}}{\text{Aliquot}}$—*IC Run Sheet*

Beginning Volume--*Sample Submission*

1.053= Correction factor for hydrogen fluoride

Cl_2 -

$$\textbf{Total } X_2 \textbf{ (mg)} = \frac{\textbf{X Results (µg/mL)*Dilution*Beginning Volume (mL)}}{\textbf{1000}}$$

Where-

X Results= Raw sample concentration (ppm)—*Cl_2 IC Data Sheet*

Dilution= $\frac{\text{Diluted Volume}}{\text{Aliquot}}$—*IC Run Sheet*

Beginning Volume--*Sample Submission*

Analytical Calculations

Spike Recovery-

$$\textbf{Spike (\%)} = \frac{\textbf{(Spiked Result (µg/mL) – Sample Result (µg/mL))}}{\textbf{Spike Amount (µg/mL)}} \textbf{ X100}$$

Where-

Spike Result = Raw sample concentration (ppm)--*IC-Data Sheet*

Sample Result = Raw sample concentration (ppm)--*IC-Data Sheet*

Spike Amount—*IC-Data Sheet*

Duplicate Analysis RPD-

$$\textbf{RPD (\%)} = \frac{\textbf{(Duplicate Result (µg/mL) - Sample Result (µg/mL))}}{\textbf{Average (µg/mL)}} \textbf{ X100}$$

Where-

Sample Result and Duplicate Results=Raw sample concentration (ppm)--*IC-Data Sheet*

Average= $\frac{\textit{(Duplicate + Sample Results)}}{2}$

elementOne **AIR TESTING SAMPLE SUBMISSION FORM** **Lab ID 41653**

Analysis Due Date 12.05.23
QA/QC/Report Due Date 12.07.23

Client:	Deeco, Inc.
Project No	23-3313

Date Rec	11.21.23
Time Rec	1100

Volume Marked		Volume Loss			FH pH < 2		BH pH > 8		Ref. Method:
Y	N	Y	N	?	Y	N	Y	N	26A

Sample Identification

1	Line1-M26A-R1A	7	Line1-M26A-R1B	13	Line1-M26A-FBON
2	Line1-M26A-R2A	8	Line1-M26A-R2B	14	Line1-M26A-FBOFF
3	Line1-M26A-R3A	9	Line1-M26A-R3B		
	Line1-M26A-R3A Spike		Line1-M26A-R3B Spike		
4	Line1-M26A-R4A	10	Line1-M26A-R4B		
5	Line1-M26A-R5A	11	Line1-M26A-R5B		
6	Line1-M26A-R6A	12	Line1-M26A-R6B		

Analyses Requested		
	Samples 1-14	HF
	Samples 1-14	Cl_2

Runs/FB

	FH Impinger 1 (or Combined Imp)		FH Impinger 2		FH Impinger 3		BH Impinger 4 (or Combined Imp)		BH Impinger 5	
Lab ID	BV, ml	FV, ml	BV, ml	FV, ml	BV, ml	FV, ml	BV, ml	FV, ml	BV, ml	FV, ml
1	240						176			
2	295						335			
3.S	265						300			
4	215						425			
5	280						315			
6	285						300			
7	250						203			
8	283						348			
9.S	295						350			
10	305						365			
11	270						302			
12	230						285			
13	345						305			
14	360						305			

Lab Communications

See volumes on sample bottles. -KLL

Rec Runs/FB: H2SO4; NaOH; No RB received---11.27.23 LLB

SS Page 1 of 2
11/28/2023 9:44:26 AM
SS By LLB

Fit M26A Prep By / Date KLL 12.5.23 Line 1 HF
Labeled By / Date PER 11.28.23
ID Verification By/Date KLL 11.28.23
Bit M26A Prep By/Date LAW 12.7.23 1-14

elementOne **AIR TESTING SAMPLE SUBMISSION FORM** **Lab ID 41653**

Analysis Due Date 12.05.23
QA/QC/Report Due Date 12.07.23

Client:	Deeco, Inc.
Project No	23-3313

Date Rec	11.21.23
Time Rec	1100

Volume Marked		Volume Loss			FH pH < 2		BH pH > 8		Ref. Method:
Y	N	Y	N	?	Y	N	Y	N	26A

Sample Identification

15	Line2-M26A-R1A	21	Line2-M26A-R1B	27	Line2-M26A-FBOFF
16	Line2-M26A-R2A	22	Line2-M26A-R2B	28	Line2-M26A-FBON
17	Line2-M26A-R3A	23	Line2-M26A-R3B		
	Line2-M26A-R3A Spike		Line2-M26A-R3B Spike		
18	Line2-M26A-R4A	24	Line2-M26A-R4B		
19	Line2-M26A-R5A	25	Line2-M26A-R5B		
20	Line2-M26A-R6A	26	Line2-M26A-R6B		

Analyses Requested		
	Samples 15-28	HF
	Samples 15-28	Cl_2

Runs/FB

	FH Impinger 1 (or Combined Imp)		FH Impinger 2		FH Impinger 3		BH Impinger 4 (or Combined Imp)		BH Impinger 5	
Lab ID	BV, ml	FV, ml	BV, ml	FV, ml	BV, ml	FV, ml	BV, ml	FV, ml	BV, ml	FV, ml
15	470						300			
16	320						395			
17.S	295						340			
18	305						360			
19	280						370			
20	280						362			
21	305						335			
22	290						385			
23.S	295						335			
24	338						355			
25	280						375			
26	313						350			
27	285						355			
28	292						345			

Reagent Blanks

Lab ID	Fractions	BV, ml	FV, ml	Notes
	0.1 N H_2SO_4			
	0.1 N NaOH			
	DI H_2O			

SS Page 2 of 2
11/28/2023 9:44:26 AM
SS By _____

M26A Prep By / Date KH 12/13/23
Labeled By / Date PDF 11.28.23
ID Verification By/Date KH 11.28.23

Metrohm 861/788 Ion Chromatograph System

elementOne

M26A-HF IC Data Sheet

Lab ID #: 41653 (1-14)

Client: Deeco
Date: 12.08.23
Analyst: LAW
Detection Limit, (µg/ml): 0.10

Column: IonPac AS14A
Eluent: 8.0 mM Na_2CO_3/ 1.0 mM $NaHCO_3$
Flow Rate: 1.0 mL/min.
F⁻ to HF factor: 1.053

Sample ID	F⁻ µg/ml	Dilution	Final Vol, ml	HF, Total mg	Spike, µg/ml	% Recovery/ RPD	File Name	Date Time
LRB	0.000	1	10	< 0.001			_2023-12-06_	12/6/2023 19:19
LRB	0.000	1	10	< 0.001		NA	_2023-12-06_	12/6/2023 19:38
LRB SPK	5.140	1	10	0.054	5.00	103%	_2023-12-06_	12/6/2023 19:56
LRB SPK	5.094	1	10	0.054	5.00	102%	_2023-12-06_	12/6/2023 20:15
41653-1	0.022	5	240	< 0.126			_2023-12-06_	12/6/2023 20:34
41653-1 DUP	0.022	5	240	< 0.126		NA	_2023-12-06_	12/6/2023 20:52
41653-2	0.000	5	295	< 0.155			_2023-12-06_	12/6/2023 21:11
41653-2 DUP	0.024	5	295	< 0.155		NA	_2023-12-06_	12/6/2023 21:30
41653-3	0.026	5	265	< 0.139			_2023-12-06_	12/6/2023 23:41
41653-3 DUP	0.028	5	265	< 0.139		NA	_2023-12-07_	12/7/2023 0:00
41653-3 SPK	5.423	5	265	7.56	5.00	108%	_2023-12-07_	12/7/2023 0:19
41653-3 SPK DUP	5.368	5	265	7.49	5.00	107%	_2023-12-07_	12/7/2023 0:37
41653-4	0.025	5	215	< 0.113			_2023-12-06_	12/6/2023 21:49
41653-4 DUP	0.024	5	215	< 0.113		NA	_2023-12-06_	12/6/2023 22:07
41653-5	0.030	5	280	< 0.147			_2023-12-07_	12/7/2023 0:56
41653-5 DUP	0.024	5	280	< 0.147		NA	_2023-12-07_	12/7/2023 1:15
41653-6	0.024	5	285	< 0.15			_2023-12-07_	12/7/2023 1:34
41653-6 DUP	0.024	5	285	< 0.15		NA	_2023-12-07_	12/7/2023 1:52
41653-7	0.027	5	250	< 0.132			_2023-12-07_	12/7/2023 2:11
41653-7 DUP	0.027	5	250	< 0.132		NA	_2023-12-07_	12/7/2023 2:30
41658-8	0.000	5	283	< 0.149			_2023-12-07_	12/7/2023 10:07
41658-8 DUP	0.000	5	283	< 0.149		NA	_2023-12-07_	12/7/2023 10:26
41658-9	0.000	5	295	< 0.155			_2023-12-07_	12/7/2023 10:45
41658-9 DUP	0.000	5	295	< 0.155		NA	_2023-12-07_	12/7/2023 11:04
41658-9 SPK	5.265	5	295	8.17	5.00	105%	_2023-12-07_	12/7/2023 11:22
41658-9 SPK DUP	5.370	5	295	8.34	5.00	107%	_2023-12-07_	12/7/2023 11:41
41658-10	0.000	5	305	< 0.161			_2023-12-07_	12/7/2023 12:00
41658-10 DUP	0.000	5	305	< 0.161		NA	_2023-12-07_	12/7/2023 12:19
41658-11	0.067	5	270	< 0.142			_2023-12-07_	12/7/2023 12:37
41658-11 DUP	0.072	5	270	< 0.142		NA	_2023-12-07_	12/7/2023 12:56
41653-12	0.000	5	230	< 0.121			_2023-12-07_	12/7/2023 14:30
41653-12 DUP	0.000	5	230	< 0.121		NA	_2023-12-07_	12/7/2023 14:49
41653-13 FB	0.000	5	345	< 0.182			_2023-12-07_	12/7/2023 15:07
41653-13 FB DUP	0.000	5	345	< 0.182		NA	_2023-12-07_	12/7/2023 15:26
41653-14	0.000	5	360	< 0.189			_2023-12-07_	12/7/2023 15:45
41653-14 DUP	0.000	5	360	< 0.189		NA	_2023-12-07_	12/7/2023 16:03

Metrohm 861/788 Ion Chromatograph System

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M26A-HF IC Data Sheet

Lab ID #: 41653 (1-14)

Client: Deeco
Date: 12.08.23
Analyst: LAW
Detection Limit, (µg/ml): 0.10

Column: IonPac AS14A
Eluent: 8.0 mM Na_2CO_3/ 1.0 mM $NaHCO_3$
Flow Rate: 1.0 mL/min.
F^- to HF factor: 1.053

Standards	F^- µg/ml	Dilution	QC, µg/ml	% Relative Error	% Recovery	File Name	Date Time
0	0.000					_2023-12-06_	12/6/2023 15:34
0.1	0.104			4.0%	104%	_2023-12-06_	12/6/2023 15:53
1	0.949			-5.1%	95%	_2023-12-06_	12/6/2023 16:11
3	2.992			-0.3%	100%	_2023-12-06_	12/6/2023 16:30
5	5.102			2.0%	102%	_2023-12-06_	12/6/2023 16:49
10	9.953			-0.5%	100%	_2023-12-06_	12/6/2023 17:08
0.1	0.106			6.0%	106%	_2023-12-07_	12/7/2023 17:18
1	0.976			-2.4%	98%	_2023-12-07_	12/7/2023 17:37
3	2.995			-0.2%	100%	_2023-12-07_	12/7/2023 17:56
5	4.808			-3.8%	96%	_2023-12-07_	12/7/2023 18:15
10	10.701			7.0%	107%	_2023-12-07_	12/7/2023 18:33
Correlation-	0.9999						
QC	5.181		5.00		104%	_2023-12-06_	12/6/2023 17:26
QC	5.126		5.00		103%	_2023-12-06_	12/6/2023 17:45
QC	5.178		5.00		104%	_2023-12-06_	12/6/2023 22:26
QC	5.146		5.00		103%	_2023-12-06_	12/6/2023 22:45
QC	5.243		5.00		105%	_2023-12-07_	12/7/2023 2:48
QC	5.187		5.00		104%	_2023-12-07_	12/7/2023 3:07
QC	4.732		5.00		95%	_2023-12-07_	12/7/2023 9:30
QC	5.124		5.00		102%	_2023-12-07_	12/7/2023 13:15
QC	5.001		5.00		100%	_2023-12-07_	12/7/2023 13:34
QC	5.257		5.00		105%	_2023-12-07_	12/7/2023 16:22
QC	5.282		5.00		106%	_2023-12-07_	12/7/2023 18:52
DL	0.104		0.10		104%	_2023-12-06_	12/6/2023 18:41
DL	0.105		0.10		105%	_2023-12-06_	12/6/2023 19:00
DL	0.102		0.10		102%	_2023-12-07_	12/7/2023 16:41
DL	0.098		0.10		98%	_2023-12-07_	12/7/2023 19:11
35165-13 QC	7.872	1	7.63		109%	_2023-12-07_	12/7/2023 19:48
BLK	0.000					_2023-12-06_	12/6/2023 18:04
BLK	0.000					_2023-12-06_	12/6/2023 18:23
BLK	0.000					_2023-12-06_	12/6/2023 23:04
BLK	0.000					_2023-12-06_	12/6/2023 23:22
BLK	0.000					_2023-12-07_	12/7/2023 3:26
BLK	0.000					_2023-12-07_	12/7/2023 3:45
BLK	0.000					_2023-12-07_	12/7/2023 9:49
BLK	0.000					_2023-12-07_	12/7/2023 13:52
BLK	0.000					_2023-12-07_	12/7/2023 14:11
BLK	0.000					_2023-12-07_	12/7/2023 17:00
BLK	0.000					_2023-12-07_	12/7/2023 19:30

HF Data 2 of 2

elementOne
e 41653-HF

elementOne **IC Sample Sheet/Digestion Worksheet** **Lab ID #:** 41653 Line 1

Date: 12/8/23 (6) (KM 12/14/23)
Analyst: KLG
Batch name: 120823-41653 HF (6)

Column: IonPac AS14A
Conc. Eluent: 8.0 mM Na_2CO_3/ 1.0mM $NaHCO_3$
10mL Conc. Eluent Diluted to FV=1L with filtered UPDI
Regenerant: 100 mM H_3PO_4
Flow Rate: 1.0 mL/min.

Instrument: 861/788
Lot# IC11-70-4
Lot # IC11-96-3
Method: 300/26A

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
1	0.0		R2	AC lot #			
2	0.1	IF	~~.9997~~	BBCJ0574 Sigma			
3	1.0		12/6/23 KM .9999	MW 12/8			
4	3.0						
5	5.0						
6	10.0						
7	QC						
8	QC						
9	BLK						
10	BLK						
11	DL						
12	DL						
13	LRB						
14	LRB						
15	LRB+						
16	LRB+						
17	41653-1	Deeco	HF		—	5X	
18	-1dup	↓	↓		—	↓	
19	-2				—		
20	-2dup				—		
21	-4				—		
22	-4dup	↓	↓		—	↓	
23	QC						
24	QC						
25	BLK						

Manual integrations noted by M 12/14/23 KM
Curve IC Lot # ~~IC11-97-3~~ Comments: Curve lot: IC11-98-4 2. 1 of 3
Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: **IC ME Solution** HPS 2303029-250 **IC NO2 Solution** ~~HPS 2308942-250~~
QC: Spike 50 uL from 1000 ug/mL F, Cl, Br, and SO_4 Std. to 10mL sample; lot #'s listed above.
QC: Spike 20 uL from 1000 ug/mL NO_2, NO_3, and PO_4 Std. to 10mL sample; lot #'s listed above.
Submitted for QC- Date: 120823 Time: 4:00 By: MW QC Review- Date: / Time: _____ By: _____

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IC Sample Sheet/Digestion Worksheet

Lab ID #: 41653 Line 1

Date: 12/6/23
Analyst: ICC (12/6/23)
Batch name: 120623-41653 HF

Column: IonPac AS14A
Conc. Eluent: 8.0 mM Na_2CO_3/ 1.0mM $NaHCO_3$
10mL Conc. Eluent Diluted to FV=1L with filtered UPDI
Regenerant: 100 mM H_3PO_4
Flow Rate: 1.0 mL/min.

Instrument: 8621788
Lot# IC11-70-4
Lot # IC11-96-3
Method: 300/26A

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
26	BLK						
27	41653-3	Deco	HF		—	5X	
28	-3dup				—		
29	-3spk				5.423		
30	-3spk dup				5.368		
31	-5				—		
32	-5dup				—		
33	-6				—		
34	-6dup				—		
35	-7				—		
36	-7dup				—		
37	QC						
38	QC						
39	BLK						
40	BLK						
41	41653-8	Deco	HF		—	5X	
42	-8dup				—		
43	-9				—		
44	-9dup				—		
45	-9spk			5.265	~~5.265~~		
46	-9spkdup				5.370		
47	-10				—		
48	-10dup				—		
49	-11				—		
50	-11dup				—		

perchlorate all QC failed at end of this IC QC OK in 124,125

Manual integrations noted by M
Curve IC Lot #_____ Comments: P. 205-3
Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: IC ME Solution _____ IC NO2 Solution _____
QC: Spike 50 uL from 1000 ug/mL F, Cl, Br, and SO_4 Std. to 10mL sample; lot #'s listied above.
QC: Spike 20 uL from 1000 ug/mL NO_2, NO_3, and PO_4 Std. to 10mL sample; lot #'s listed above.
Submitted for QC- Date:_____ Time:_____ By:_____ QC Review- Date:_____ Time:_____ By:_____

elementOne

IC Sample Sheet/Digestion Worksheet

Lab ID #: 41653 Line 1

Date: 12/8/23
Analyst: KM (KM 12/14/23)
Batch name: 120823-41653

Column: IonPac AS14A
Conc. Eluent: 8.0 mM Na_2CO_3/ 1.0mM $NaHCO_3$
10mL Conc. Eluent Diluted to FV=1L with filtered UPDI
Regenerant: 100 mM H_3PO_4
Flow Rate: 1.0 mL/min.

Instrument: 861 | 788
Lot# IC11-70-4
Lot # IC11-96-3
Method: 300/26A

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
S1	QC						
S2	QC						
S3	BLK						
S4	BLK						
S5	41653-13FB	Deeco	HF		—	5X	
S6	-13FB dup	↓	↓		—	↓	
S7	-14FB				—		
S8	-14FB dup	↓	↓		—	↓	
S9	QC						
60	DL						
61	BLK						
62	0.1						
63	1.0						
64	3.0						
65	5.0						
66	10.0						
67	QC						
68	DL						
69	BLK						
70	35165-13QC		HF		2872	1X	TV=7.63
71	41653-12	Deeco	↓		—	5X	
72 immed	-12 dup	↓	↓		—	↓	

Manual integrations noted by M
Curve IC Lot #_____ Comments: p. 3 of 3
Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: **IC ME Solution** _____ **IC NO2 Solution** _____
QC: Spike 50 uL from 1000 ug/mL F, Cl, Br, and SO_4 Std. to 10mL sample; lot #'s listied above.
QC: Spike 20 uL from 1000 ug/mL NO_2, NO_3, and PO_4 Std. to 10mL sample; lot #'s listed above.
Submitted for QC- Date:_____ Time:_____ By:_____ QC Review- Date:_____ Time:_____ By:_____

Metrohm 861/788 Ion Chromatograph System

elementOne **M26A-HF IC Data Sheet** **Lab ID #: 41653(15-28)**

Client: Deeco
Date: 12.15.23
Analyst: LAW
Detection Limit, (µg/ml): 0.10

Column: IonPac AS14A
Eluent: 8.0 mM Na_2CO_3/ 1.0 mM $NaHCO_3$
Flow Rate: 1.0 mL/min.
F^- to HF factor: 1.053

Sample ID	F^- µg/ml	Dilution	Final Vol, ml	HF, Total mg	Spike, µg/ml	% Recovery/ RPD	File Name	Date Time
LRB	0.000	1	10	< 0.001			-5f5369ab:18c639c13f0:-78e3	12/13/2023 16:40
LRB	0.000	1	10	< 0.001		NA	-5f5369ab:18c639c13f0:-78e1	12/13/2023 16:59
LRB SPK	5.170	1	10	0.054	5.00	103%	-5f5369ab:18c639c13f0:-78df	12/13/2023 17:17
LRB SPK	5.263	1	10	0.055	5.00	105%	-5f5369ab:18c639c13f0:-78dd	12/13/2023 17:36
41653-15	0.000	5	470	< 0.247			-5f5369ab:18c639c13f0:-78db	12/13/2023 17:54
41653-15 DUP	0.000	5	470	< 0.247		NA	-5f5369ab:18c639c13f0:-78d9	12/13/2023 18:13
41653-16	0.000	5	320	< 0.168			-5f5369ab:18c639c13f0:-78d7	12/13/2023 18:31
41653-16 DUP	0.000	5	320	< 0.168		NA	-5f5369ab:18c639c13f0:-78d5	12/13/2023 18:50
41653-17	0.000	5	295	< 0.155			-5f5369ab:18c639c13f0:-78c7	12/13/2023 20:59
41653-17 DUP	0.000	5	295	< 0.155		NA	-5f5369ab:18c639c13f0:-78c5	12/13/2023 21:17
41653-17 SPK	5.446	5	295	8.46	5.00	109%	-5f5369ab:18c639c13f0:-7846	12/13/2023 21:36
41653-17 SPK DUP	5.489	5	295	8.52	5.00	110%	-5f5369ab:18c639c13f0:-7844	12/13/2023 21:54
41653-18	0.000	5	305	< 0.161			-5f5369ab:18c639c13f0:-78d3	12/13/2023 19:08
41653-18 DUP	0.000	5	305	< 0.161		NA	-5f5369ab:18c639c13f0:-78d1	12/13/2023 19:26
41653-19	0.043	5	280	< 0.147			-5f5369ab:18c639c13f0:-78bf	12/13/2023 22:13
41653-19 DUP	0.041	5	280	< 0.147		NA	-5f5369ab:18c639c13f0:-78bd	12/13/2023 22:31
41653-20	0.038	5	280	< 0.147			-5f5369ab:18c639c13f0:-78bb	12/13/2023 22:50
41653-20 DUP	0.035	5	280	< 0.147		NA	-5f5369ab:18c639c13f0:-78b9	12/13/2023 23:08
41653-21	0.028	5	305	< 0.161			-5f5369ab:18c639c13f0:-78b7	12/13/2023 23:27
41653-21 DUP	0.028	5	305	< 0.161		NA	-5f5369ab:18c639c13f0:-78b5	12/13/2023 23:45
41653-22	0.031	5	290	< 0.153			-5f5369ab:18c639c13f0:-78ab	12/14/2023 1:18
41653-22 DUP	0.031	5	290	< 0.153		NA	-5f5369ab:18c639c13f0:-78a9	12/14/2023 1:36
41653-23	0.035	5	295	< 0.155			-5f5369ab:18c639c13f0:-78a7	12/14/2023 1:55
41653-23 DUP	0.030	5	295	< 0.155		NA	-5f5369ab:18c639c13f0:-78a5	12/14/2023 2:13
41653-23 SPK	5.478	5	295	8.51	5.00	109%	-5f5369ab:18c639c13f0:-7842	12/14/2023 2:32
41653-23 SPK DUP	5.490	5	295	8.52	5.00	109%	-5f5369ab:18c639c13f0:-7840	12/14/2023 2:50
41653-24	0.042	5	338	< 0.178			-5f5369ab:18c639c13f0:-789f	12/14/2023 3:09
41653-24 DUP	0.037	5	338	< 0.178		NA	-5f5369ab:18c639c13f0:-789d	12/14/2023 3:27
41653-25	0.044	5	280	< 0.147			-5f5369ab:18c639c13f0:-789b	12/14/2023 3:46
41653-25 DUP	0.043	5	280	< 0.147		NA	-5f5369ab:18c639c13f0:-7899	12/14/2023 4:04
41653-26	0.040	5	313	< 0.165			-5f5369ab:18c639c13f0:-76ce	12/14/2023 5:37
41653-26 DUP	0.038	5	313	< 0.165		NA	-5f5369ab:18c639c13f0:-76cc	12/14/2023 5:55
41653-27	0.000	5	285	< 0.15			-5f5369ab:18c639c13f0:-788b	12/14/2023 6:13
41653-27 DUP	0.000	5	285	< 0.15		NA	-5f5369ab:18c639c13f0:-7889	12/14/2023 6:32
41653-28	0.000	5	292	< 0.154			-5f5369ab:18c639c13f0:-7887	12/14/2023 6:50
41653-28 DUP	0.000	5	292	< 0.154		NA	-5f5369ab:18c639c13f0:-7885	12/14/2023 7:09

Metrohm 861/788 Ion Chromatograph System

elementOne **M26A-HF IC Data Sheet** **Lab ID #: 41653(15-28)**

Client: Deeco
Date: 12.15.23
Analyst: LAW
Detection Limit, (µg/ml): 0.10

Column: IonPac AS14A
Eluent: 8.0 mM Na_2CO_3/ 1.0 mM $NaHCO_3$
Flow Rate: 1.0 mL/min.
F^- to HF factor: 1.053

Standards	F^- µg/ml	Dilution	QC, µg/ml	% Relative Error	% Recovery	File Name	Date Time
0	0.000					-5f5369ab:18c639c13f0:-75df	12/13/2023 12:58
0.1	0.100			0.0%	100%	-5f5369ab:18c639c13f0:-75dd	12/13/2023 13:17
1	0.987			-1.3%	99%	-5f5369ab:18c639c13f0:-75db	12/13/2023 13:35
3	3.097			3.2%	103%	-5f5369ab:18c639c13f0:-75d9	12/13/2023 13:54
5	4.885			-2.3%	98%	-5f5369ab:18c639c13f0:-75d7	12/13/2023 14:12
10	10.031			0.3%	100%	-5f5369ab:18c639c13f0:-75d5	12/13/2023 14:31
0.1	0.108			8.0%	108%	-5f5369ab:18c639c13f0:-778f	12/14/2023 8:23
1	1.009			0.9%	101%	-5f5369ab:18c639c13f0:-778d	12/14/2023 8:41
3	3.150			5.0%	105%	-5f5369ab:18c639c13f0:-778b	12/14/2023 9:00
5	5.273			5.5%	105%	-5f5369ab:18c639c13f0:-7789	12/14/2023 9:18
10	10.489			4.9%	105%	-5f5369ab:18c639c13f0:-7787	12/14/2023 9:37
Correlation-	0.9999						
QC	5.129		5.00		103%	-5f5369ab:18c639c13f0:-78ef	12/13/2023 14:49
QC	5.063		5.00		101%	-5f5369ab:18c639c13f0:-78ed	12/13/2023 15:08
QC	5.255		5.00		105%	-5f5369ab:18c639c13f0:-78cf	12/13/2023 19:45
QC	5.181		5.00		104%	-5f5369ab:18c639c13f0:-78cd	12/13/2023 20:03
QC	5.145		5.00		103%	-5f5369ab:18c639c13f0:-78b3	12/14/2023 0:04
QC	5.166		5.00		103%	-5f5369ab:18c639c13f0:-78b1	12/14/2023 0:22
QC	5.265		5.00		105%	-5f5369ab:18c639c13f0:-7897	12/14/2023 4:23
QC	5.183		5.00		104%	-5f5369ab:18c639c13f0:-7895	12/14/2023 4:41
QC	5.319		5.00		106%	-5f5369ab:18c639c13f0:-7795	12/14/2023 7:27
QC	5.340		5.00		107%	-5f5369ab:18c639c13f0:-774d	12/14/2023 9:55
DL	0.105		0.10		105%	-5f5369ab:18c639c13f0:-78e7	12/13/2023 16:03
DL	0.102		0.10		102%	-5f5369ab:18c639c13f0:-78e5	12/13/2023 16:22
DL	0.107		0.10		107%	-5f5369ab:18c639c13f0:-7793	12/14/2023 7:46
DL	0.107		0.10		107%	-5f5369ab:18c639c13f0:-774b	12/14/2023 10:14
36738-5QC	6.951	10	78.0		94%	-5f5369ab:18c639c13f0:-7704	12/14/2023 10:51
BLK	0.000					-5f5369ab:18c639c13f0:-78eb	12/13/2023 15:26
BLK	0.000					-5f5369ab:18c639c13f0:-78e9	12/13/2023 15:45
BLK	0.000					-5f5369ab:18c639c13f0:-78cb	12/13/2023 20:22
BLK	0.000					-5f5369ab:18c639c13f0:-78c9	12/13/2023 20:40
BLK	0.000					-5f5369ab:18c639c13f0:-78af	12/14/2023 0:41
BLK	0.000					-5f5369ab:18c639c13f0:-78ad	12/14/2023 0:59
BLK	0.000					-5f5369ab:18c639c13f0:-7893	12/14/2023 5:00
BLK	0.000					-5f5369ab:18c639c13f0:-7891	12/14/2023 5:18
BLK	0.000					-5f5369ab:18c639c13f0:-7791	12/14/2023 8:04
BLK	0.000					-5f5369ab:18c639c13f0:-7749	12/14/2023 10:32

(15-28)

elementOne **IC Sample Sheet/Digestion Worksheet** **Lab ID #:** 41653

Date: 12/13/23 Column: IonPac AS14A Instrument: 881/858

Analyst: KLG Conc. Eluent: 8.0 mM Na_2CO_3/ 1.0mM $NaHCO_3$ Lot# IC11-87-1

Batch name: 121323-41653 HF 10mL Conc. Eluent Diluted to FV=1L with filtered UPDI

Regenerant: 100 mM H_3PO_4 Lot # IC11-98-2

Flow Rate: 1.0 mL/min. Method: 300/26A

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
1	0.0		F2	AC lot#			
2	0.1	F	.9998 06	BBCJ0574 Sigma			
3	1.0						
4	3.0						
5	5.0						
6	10.0						
7	AC						
8	AC						
9	BLK						
10	BLK						
11	DL						
12	DL						
13	LRB						
14	LRB						
15	LRB+						
16	LRB+						
17	41653-15	Deco	HF		—	5V	
18	-15dup	↓	↓		—	↓	
19	-16				—		
20	-16dup				—		
21	-18				—		
22	-18dup	↓	↓		—	↓	
23	AC						
24	AC						
25	BLK						

Manual integrations noted by M

Curve IC Lot # IC11-101-1 Comments: p. 1 of 3

Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: IC ME Solution HP 2303027-250 IC NO2 Solution HP 2308942-250

QC: Spike 50 uL from 1000 ug/mL F, Cl, Br, and SO_4 Std. to 10mL sample; lot #'s listied above.

QC: Spike 20 uL from 1000 ug/mL NO_2, NO_3, and PO_4 Std. to 10mL sample; lot #'s listed above.

Submitted for QC- Date: 12-14-23 Time: 1:48 By: [illegible] QC Review- Date: [illegible] Time: _____ By: _____

(15-28)

elementOne **IC Sample Sheet/Digestion Worksheet** **Lab ID #:** 41653

Date: 12/13/23 Column: IonPac AS14A Instrument: 881/858

Analyst: KH Conc. Eluent: 8.0 mM Na_2CO_3/ 1.0mM $NaHCO_3$ Lot# IC11-87-1

Batch name: 121323-41653 HF 10mL Conc. Eluent Diluted to FV=1L with filtered UPDI

Regenerant: 100 mM H_3PO_4 Lot # IC11-98-2

Flow Rate: 1.0 mL/min. Method: 300.0(26A)

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
26	BLK						
27	41653-17	Deeco	HF		—	5X	
28	-17dup				—		
29	-17spk			Lmw 12.14 5.446	~~5.122~~		peak joined w/ interfering to early peak
30	-17spk dup			5.489	~~5.191~~		
31	-19				—		
32	-19dup				—		
33	-20				—		
34	-20dup				—		
35	-21				—		
36	-21dup	↓	↓		—	↓	
37	QC						
38	QC						
39	BLK						
40	BLK						
41	41653-22	Deeco	HF		—	5X	
42	-22dup				—		
43	-23				—		
44	-23dup				—		
45	-23spk			Lmw 12.14 5.478	~~5.198~~		peak co-eluting w/ interfering peak to E-
46	-23spk dup			5.490	~~5.298~~		
47	-24				—		
48	-24dup				—		
49	-25				—		
50	-25dup	↓	↓		—	↓	

Manual integrations noted by M

Curve IC Lot#_____ Comments: p. 2 of 3

Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: IC ME Solution_____ IC NO2 Solution _____

QC: Spike 50 uL from 1000 ug/mL F, Cl, Br, and SO_4 Std. to 10mL sample; lot #'s listied above.

QC: Spike 20 uL from 1000 ug/mL NO_2, NO_3, and PO_4 Std. to 10mL sample; lot #'s listed above.

Submitted for QC- Date:_____ Time:_____ By:_____ QC Review- Date:_____ Time:_____ By:_____

(15-28)

elementOne **IC Sample Sheet/Digestion Worksheet** **Lab ID #:** 41653

Date: 12/13/23 Column: IonPac AS14A Instrument: 881/858

Analyst: KM Conc. Eluent: 8.0 mM Na_2CO_3/ 1.0mM $NaHCO_3$ Lot# 1C11-87-1

Batch name: 121323-41653HF 10mL Conc. Eluent Diluted to FV=1L with filtered UPDI

Regenerant: 100 mM H_3PO_4 Lot # 1C11-98-2

Flow Rate: 1.0 mL/min. Method: 300.26A

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
51	QC						
52	QC						
53	BLK						
54	BLK						
55	41653-26	Deeco	HF	—		5X	
56	-26dup	↓	↓	—		↓	
57	-27			—			
58	-27dup			—			
59	-28			—			
60	-28dup	↓	↓	—		↓	
61	QC						
62	DL						
63	BLK						
64	0.1						
65	1.0						
66	3.0						
67	5.0						
68	10.0						
69	QC						
70	DL						
71	BLK						
72	36738-SQC		HF	6.951		1X	TV=6.96

Manual integrations noted by M

Curve IC Lot #_____ Comments: p. 3 of 3

Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: **IC ME Solution** _____ **IC NO2 Solution** _____

QC: Spike 50 uL from 1000 ug/mL F, Cl, Br, and SO4 Std. to 10mL sample; lot #'s listed above.

QC: Spike 20 uL from 1000 ug/mL NO_2, NO_3, and PO_4 Std. to 10mL sample; lot #'s listed above.

Submitted for QC- Date:_____ Time:_____ By:_____ QC Review- Date:_____ Time:_____ By:_____

Metrohm 881/858 Ion Chromatograph System

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M26A-Cl_2 IC Data Sheet

Lab ID #: 41653 (1-14)

Client: Deeco
Date: 12.12.23
Analyst: LAW
Detection Limit, (µg/ml): 0.10

Column: IonPac AS14A
Eluent: 8.0 mM Na_2CO_3/ 1.0 mM $NaHCO_3$
Flow Rate: 1.0 mL/min.

Sample ID	Cl^- µg/ml	Dilution	Final Vol, ml	Cl_2, Total mg	Spike, µg/ml	% RPD/ Recovery	File Name	Date Time
LRB	-0.047	1	10	< 0.001			-4101620d:18c44c79eeb:-79d1	12/7/2023 20:50
LRB	-0.037	1	10	< 0.001		NA	-4101620d:18c44c79eeb:-79cf	12/7/2023 21:14
LRB SPK	5.167	1	10	0.052	5.00	104%	-4101620d:18c44c79eeb:-79cd	12/7/2023 21:37
LRB SPK	5.249	1	10	0.052	5.00	106%	-4101620d:18c44c79eeb:-79cb	12/7/2023 22:01
41653-1	0.077	10	176	< 0.176			-4101620d:18c44c79eeb:-79c9	12/7/2023 22:24
41653-1 DUP	0.079	10	176	< 0.176		NA	-4101620d:18c44c79eeb:-79c7	12/7/2023 22:48
41653-2	0.174	10	335	0.583			-4101620d:18c44c79eeb:-731b	12/8/2023 14:41
41653-2 DUP	0.173	10	335	0.580		0.6%	-4101620d:18c44c79eeb:-7319	12/8/2023 15:05
41653-3	0.075	10	300	< 0.3			-4101620d:18c44c79eeb:-732b	12/8/2023 11:33
41653-3 DUP	0.024	10	300	< 0.3		NA	-4101620d:18c44c79eeb:-7329	12/8/2023 11:57
41653-3 SPK	4.750	10	300	14.3	5.00	94%	-4101620d:18c44c79eeb:-7327	12/8/2023 12:20
41653-3 SPK DUP	4.543	10	300	13.6	5.00	90%	-4101620d:18c44c79eeb:-7325	12/8/2023 12:44
41653-4	0.288	10	425	1.22			-4101620d:18c44c79eeb:-7317	12/8/2023 15:28
41653-4 DUP	0.296	10	425	1.26		2.7%	-4101620d:18c44c79eeb:-7315	12/8/2023 15:52
41653-5	0.170	10	315	0.536			-4101620d:18c44c79eeb:-7313	12/8/2023 16:15
41653-5 DUP	0.168	10	315	0.529		1.2%	-4101620d:18c44c79eeb:-7311	12/8/2023 16:39
41653-6	0.312	10	300	0.936			-4101620d:18c44c79eeb:-730f	12/8/2023 17:02
41653-6 DUP	0.318	10	300	0.954		1.9%	-4101620d:18c44c79eeb:-730d	12/8/2023 17:26
41653-7	-0.019	10	203	< 0.203			-4101620d:18c44c79eeb:-730b	12/8/2023 17:49
41653-7 DUP	-0.164	10	203	< 0.203		NA	-4101620d:18c44c79eeb:-7309	12/8/2023 18:13
41653-8	0.057	10	348	< 0.348			-4101620d:18c44c79eeb:-6f10	12/11/2023 13:15
41653-8 DUP	0.009	10	348	< 0.348		NA	-4101620d:18c44c79eeb:-6f0e	12/11/2023 13:38
41653-9	0.040	10	350	< 0.35			-4101620d:18c44c79eeb:-6cf0	12/11/2023 16:42
41653-9 DUP	0.039	10	350	< 0.35		NA	-4101620d:18c44c79eeb:-6cee	12/11/2023 17:06
41653-9 SPK	5.037	10	350	17.6	5.00	100%	-4101620d:18c44c79eeb:-6cec	12/11/2023 17:29
41653-9 SPK DUP	5.070	10	350	17.7	5.00	101%	-4101620d:18c44c79eeb:-6cea	12/11/2023 17:53
41653-10	0.436	10	365	1.59			-4101620d:18c44c79eeb:-6ce8	12/11/2023 18:16
41653-10 DUP	0.434	10	365	1.58		0.5%	-4101620d:18c44c79eeb:-6ce6	12/11/2023 18:40
41653-11	0.347	10	302	1.05			-4101620d:18c44c79eeb:-6ce4	12/11/2023 19:03
41653-11 DUP	0.347	10	302	1.05		0.0%	-4101620d:18c44c79eeb:-6ce2	12/11/2023 19:27
41653-12	0.065	10	285	< 0.285			-4101620d:18c44c79eeb:-7013	12/9/2023 1:16
41653-12 DUP	-0.153	10	285	< 0.285		NA	-4101620d:18c44c79eeb:-7011	12/9/2023 1:39
41653-13 FB ON	0.072	5	305	< 0.153			-4101620d:18c44c79eeb:-700f	12/9/2023 2:03
41653-13 FB ON DUP	-0.148	5	305	< 0.153		NA	-4101620d:18c44c79eeb:-700d	12/9/2023 2:26
41653-14 FB OFF	0.000	5	305	< 0.153			-4101620d:18c44c79eeb:-700b	12/9/2023 2:50
41653-14 FB OFF DU	0.063	5	305	< 0.153		NA	-4101620d:18c44c79eeb:-7009	12/9/2023 3:13

elementOne
e 41653-Cl_2

Metrohm 881/858 Ion Chromatograph System

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M26A-Cl_2 IC Data Sheet

Lab ID #: 41653 (1-14)

Client: Deeco
Date: 12.12.23
Analyst: LAW
Detection Limit, (µg/ml): 0.10

Column: IonPac AS14A
Eluent: 8.0 mM Na_2CO_3/ 1.0 mM $NaHCO_3$
Flow Rate: 1.0 mL/min.

Standards	Cl^- µg/ml	Dilution	QC µg/ml	%Relative Error	% Recovery	File Name	Date Time
0	0.000					-4101620d:18c44c79eeb:-6d00	12/7/2023 16:08
0.1	0.102			2.0%	102%	-4101620d:18c44c79eeb:-6cfe	12/7/2023 16:32
1	0.979			-2.1%	98%	-4101620d:18c44c79eeb:-6cfc	12/7/2023 16:55
3	2.956			-1.5%	99%	-4101620d:18c44c79eeb:-6cfa	12/7/2023 17:19
5	5.089			1.8%	102%	-4101620d:18c44c79eeb:-6cf8	12/7/2023 17:42
10	9.973			-0.3%	100%	-4101620d:18c44c79eeb:-6cf6	12/7/2023 18:06
0.1	0.098			-2.0%	98%	-4101620d:18c44c79eeb:-7001	12/9/2023 4:47
1	0.990			-1.0%	99%	-4101620d:18c44c79eeb:-6ffb	12/9/2023 5:58
3	3.034			1.1%	101%	-4101620d:18c44c79eeb:-6ff9	12/9/2023 6:21
5	5.012			0.2%	100%	-4101620d:18c44c79eeb:-6ff7	12/9/2023 6:45
10	10.178			1.8%	102%	-4101620d:18c44c79eeb:-6cda	12/11/2023 21:01
Correlation-	0.999804						
QC	5.090		5.00		102%	-4101620d:18c44c79eeb:-79dd	12/7/2023 18:29
QC	4.724		5.00		94%	-4101620d:18c44c79eeb:-79db	12/7/2023 18:53
QC	4.667		5.00		93%	-4101620d:18c44c79eeb:-732d	12/8/2023 11:10
QC	4.869		5.00		97%	-4101620d:18c44c79eeb:-7323	12/8/2023 13:07
QC	4.911		5.00		98%	-4101620d:18c44c79eeb:-7321	12/8/2023 13:31
QC	4.981		5.00		100%	-4101620d:18c44c79eeb:-7033	12/8/2023 19:00
QC	4.589		5.00		92%	-4101620d:18c44c79eeb:-7019	12/9/2023 0:05
QC	5.273		5.00		105%	-4101620d:18c44c79eeb:-7003	12/9/2023 4:24
QC	4.991		5.00		100%	-4101620d:18c44c79eeb:-6fe5	12/9/2023 10:16
QC	4.689		5.00		94%	-4101620d:18c44c79eeb:-6f12	12/11/2023 12:51
QC	4.549		5.00		91%	-4101620d:18c44c79eeb:-6cf2	12/11/2023 16:19
QC	5.042		5.00		101%	-4101620d:18c44c79eeb:-6ce0	12/11/23 19:50
DL	0.101		0.10		101%	-4101620d:18c44c79eeb:-79d5	12/7/2023 20:03
DL	0.090		0.10		90%	-4101620d:18c44c79eeb:-6cde	12/11/2023 20:14
40034-7 QC	3.930	20	78.0		101%	-4101620d:18c44c79eeb:-7007	12/9/2023 3:37
40034-7 QC DUP	3.894	20	78.0		100%	-4101620d:18c44c79eeb:-7005	12/9/2023 4:00
BLK	0.000					-4101620d:18c44c79eeb:-79d9	12/7/2023 19:16
BLK	0.000					-4101620d:18c44c79eeb:-79d7	12/7/2023 19:40
BLK	0.000					-4101620d:18c44c79eeb:-731f	12/8/2023 13:54
BLK	0.000					-4101620d:18c44c79eeb:-731d	12/8/2023 14:18
BLK	0.000					-4101620d:18c44c79eeb:-702f	12/8/2023 19:47
BLK	0.000					-4101620d:18c44c79eeb:-7015	12/9/2023 0:52
BLK	0.000					-4101620d:18c44c79eeb:-6fff	12/9/2023 5:11
BLK	0.000					-4101620d:18c44c79eeb:-6fef	12/9/2023 8:19
BLK	0.000					-4101620d:18c44c79eeb:-6fef	12/9/2023 8:19
BLK	0.000					-4101620d:18c44c79eeb:-6cdc	12/11/2023 20:37

elementOne

Cl_2-Data 2 of 2

e 41653-Cl_2

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IC Sample Sheet/Digestion Worksheet

Lab ID #: 41165 (Cl)

Date: 12.07.23
Analyst: LW

Column: IonPac AS14A
Conc. Eluent: 8.0 mM Na_2CO_3/ 1.0mM $NaHCO_3$
10mL Conc. Eluent Diluted to FV=1L with filtered UPDI
Regenerant: 100mM H_3PO_4
Flow Rate: 1.0 mL/min.

Instrument: 881/858
Lot# IC11-70-4
Lot # IC11-98-2
Method: 26A NaOH

Batch name: #120723-41653

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
1	0.0			QC	manual	R²	
2	0.1		Cl⁻	4308554	RICK	.999804	
3	1.0						
4	3.0						
5	5.0						
6	10.0						
7	QC						
8	QC						
9	Blk						
10	Blk						
11	DL						
12	DL						
13	LRB						
14	LRB						
15	LRB+						
16	LRB+						
17	41653-1	Deeco	Cl_2		—	10X	
18	-1D	→ QC in	& restart here	Rerun	—		instrument
19	-3			3–9	—		restart day restart @ 3
20	-3D			MW 1208	—		mis-aliquot
21	-3+			~~4.750~~	~~2.580~~		of spike
22	-3+D			4.543	4.478		
23	QC				✓		
24	QC						
25	Blk						

Manual integrations noted by M
Curve IC Lot # IC11-99-2 Sodium Thiosulfate Lot # IC11-73-4 Comments: pg 1 of 1
Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: **IC ME Solution** 2303624-250 (HP)
QC: Spike 50 uL from 1000 ug/mL Br Std. to 10mL sample; lot #'s listied above.
Submitted for QC- Date: 12.12.23 Time: 8:30 By: LW QC Review- Date: ✓ Time:_______ By:_______

(1-14)

elementOne **IC Sample Sheet/Digestion Worksheet** **Lab ID #:** 41653

Date: 120723 Column: IonPac AS14A Instrument: 881/858

Analyst: LW Conc. Eluent: 8.0 mM Na_2CO_3/ 1.0mM $NaHCO_3$ Lot# 1C11-70-4

10mL Conc. Eluent Diluted to FV=1L with filtered UPDI

Batch name: 120723-41653 Regenerant: 100mM H_3PO_4 Lot # 1C11-98-2

Flow Rate: 1.0 mL/min. Method: 26A NaOH

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
26	BLK						
27	41653-2	Deeco	~~HF~~ Cl2		0.174	10X	
28	-2D				0.173		
29	-4				0.288		
30	-4D				0.296		
31	-5			0.168	—	ND 12.11.23	
32	-5D			0.170	—		
33	-6			0.317	0.185		
34	-6D			0.318	0.192		
35	-7			—	0.428		
36	-7D			—	0.425		
37	CCV	Bad QC					
38	CCV						
39	BLK	Bad Blk					
40	BLK						
41	41653-8	Deeco	Cl2			10X	did not run DUP
42	(9) -8D	SKIPPED SD Sample		needs all	—		
43	42 (9D)				—		
44	43 (9+) 9D				—		
45	44 (9+D) 9+						
46	45 (10) 9+D						
47	46 (10D)						
48	47 (11) 10D						
49	48 (11D)						
50	49 (CCV) 11D						

Manual integra

Curve IC Lot #_____ Sodium Thiosulfate Lot #_____ Comments: pg 2 of

Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: **IC ME Solution** _____

QC: Spike 50 uL from 1000 ug/mL Br Std. to 10mL sample; lot #'s listied above.

Submitted for QC- Date:_____ Time:_____ By:_____ QC Review- Date:_____ Time:_____ By:_____

(1-14)

elementOne **IC Sample Sheet/Digestion Worksheet** **Lab ID #:** 41653

Date: 120723 Column: IonPac AS14A Instrument: 881 | 858

Analyst: LMO Conc. Eluent: 8.0 mM Na_2CO_3/ 1.0mM $NaHCO_3$ Lot# 1C11-70-4

10mL Conc. Eluent Diluted to FV=1L with filtered UPDI

Batch name: 120723-41653 Regenerant: 100mM H_3PO_4 Lot # 1C11-98-2

Flow Rate: 1.0 mL/min. Method: 26A NaOH

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
51	QC						
52	QC / BLK						
53	BLK BLK						
54	BLK CB						
55	12 12 / 12D	Deeco	Cl2		—	10X	
56	12D-12D FB	↓	↓		—	↓	
57	13FB13 FB ON				—	5X	
58	13FB-13 FB ON				—		
59	14FB-14 FB OFF				—		
60	14FB-14 FB OFF	↓			—	↓	
61	40298-10034-17-GC				3,844	20X	TV=78.00
62	40298-7 GC		↓		3930	↓	
63	CC						
64	DL use as 0.1						
65	BLK						
66	0.1						
67	1.0						
68	30						
69	50						
70	100 run last again						
71	CC Bad CC						
72	DL						
73	BLK						
74	41653-3	Deeco	Cl2			10X	
75	-3D	↓	↓			↓	

Manual integra

Curve IC Lot #_____ Sodium Thiosulfate Lot #_____ Comments: pg 30F

Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: IC ME Solution _____

QC: Spike 50 uL from 1000 ug/mL Br Std. to 10mL sample; lot #'s listied above.

Submitted for QC- Date:_____ Time:_____ By:_____ QC Review- Date:_____ Time:_____ By:_____

elementOne **IC Sample Sheet/Digestion Worksheet** Rechecks (1-14) **Lab ID #:** 41653

Date: 120723 Column: IonPac AS14A Instrument: 881/858
Analyst: LW Conc. Eluent: 8.0 mM Na_2CO_3/ 1.0mM $NaHCO_3$ Lot# 1C11-70-4
10mL Conc. Eluent Diluted to FV=1L with filtered UPDI
Batch name: 120723-41653 Regenerant: 100mM H_3PO_4 Lot # 1C11-98-2
Flow Rate: 1.0 mL/min. Method: 26A NaOH

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
~~76~~	~~41653-3~~	Deeco	Cl2			10X	
~~77~~	~~-3D~~		↓			↓	
1	BLK	after Peristaltic fix					
2	QC						
3	~~QC~~ 41653-8		Cl2		—	10X	
4	-8D				—		
5	-9				—		
6	-9D				—		Stained soiled sample replaced
7	-9+				5.037		
8	-9+D				5.070		
9	-10				0.436		
10	-10D				0.434		
11	-11				0.347		
12	-11D		↓		0.347	↓	
13	QC						
14	DLBI						
15	BLK						
16	10.0						

Manual integra
Curve IC Lot #_____ Sodium Thiosulfate Lot #_____ Comments: pg 40 of 4
Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: **IC ME Solution** _____
QC: Spike 50 uL from 1000 ug/mL Br Std. to 10mL sample; lot #'s listied above.
Submitted for QC- Date:_____ Time:_____ By:_____ QC Review- Date:_____ Time:_____ By:_____

Metrohm 881/858 Ion Chromatograph System

elementOne

M26A-Cl_2 IC Data Sheet

Lab ID #: 41653 (15-28)

Client: Deeco
Date: 12.15.23
Analyst: LAW
Detection Limit, (µg/ml): 0.10

Column: Metrosep IonPac AS14A
Eluent: 8.0 mM Na_2CO_3/ 1.0 mM $NaHCO_3$
Flow Rate: 1.0 mL/min.

Sample ID	Cl^- µg/ml	Dilution	Final Vol, ml	Cl_2, Total mg	Spike, µg/ml	% RPD/ Recovery	File Name	Date Time
LRB	0.000	1	10	< 0.001			_2023-12-13_	12/13/2023 23:35
LRB	0.000	1	10	< 0.001		NA	_2023-12-14_	12/14/2023 0:05
LRB SPK	4.568	1	10	0.046	5.00	91%	_2023-12-14_	12/14/2023 0:35
LRB SPK	5.334	1	10	0.053	5.00	107%	_2023-12-14_	12/14/2023 1:05
41653-15	0.363	10	300	1.09			_2023-12-14_	12/14/2023 1:34
41653-15 DUP	0.357	10	300	1.07		1.7%	_2023-12-14_	12/14/2023 2:04
41653-16	0.476	10	325	1.55			_2023-12-14_	12/14/2023 2:34
41653-16 DUP	0.483	10	325	1.57		1.5%	_2023-12-14_	12/14/2023 3:03
41653-17	0.440	10	340	1.50			_2023-12-14_	12/14/2023 6:31
41653-17 DUP	0.455	10	340	1.55		3.4%	_2023-12-14_	12/14/2023 7:01
41653-17 SPK	5.766	10	340	19.6	5.00	107%	_2023-12-14_	12/14/2023 7:31
41653-17 SPK DUP	5.392	10	340	18.3	5.00	99%	_2023-12-14_	12/14/2023 8:00
41653-18	0.190	10	360	0.684			_2023-12-14_	12/14/2023 3:33
41653-18 DUP	0.190	10	360	0.684		0.0%	_2023-12-14_	12/14/2023 4:03
41653-19	0.248	10	370	0.918			_2023-12-14_	12/14/2023 8:30
41653-19 DUP	0.244	10	370	0.903		1.6%	_2023-12-14_	12/14/2023 9:00
41653-20	0.205	10	362	0.742			_2023-12-14_	12/14/2023 9:29
41653-20 DUP	0.208	10	362	0.753		1.5%	_2023-12-14_	12/14/2023 9:59
41653-21	0.404	10	335	1.35			_2023-12-14_	12/14/2023 10:29
41653-21 DUP	0.399	10	335	1.34		1.2%	_2023-12-14_	12/14/2023 10:59
41653-22	0.300	10	385	1.16			_2023-12-14_	12/14/2023 13:27
41653-22 DUP	0.301	10	385	1.16		0.3%	_2023-12-14_	12/14/2023 13:57
41653-23	0.456	10	335	1.53			_2023-12-14_	12/14/2023 14:27
41653-23 DUP	0.450	10	335	1.51		1.3%	_2023-12-14_	12/14/2023 14:56
41653-23 SPK	5.284	10	335	17.7	5.00	97%	_2023-12-14_	12/14/2023 15:26
41653-23 SPK DUP	5.749	10	335	19.3	5.00	106%	_2023-12-14_	12/14/2023 15:56
41653-24	0.164	10	355	0.582			_2023-12-14_	12/14/2023 16:25
41653-24 DUP	0.166	10	355	0.589		1.2%	_2023-12-14_	12/14/2023 16:55
41653-25	0.219	10	375	0.821			_2023-12-14_	12/14/2023 17:25
41653-25 DUP	0.221	10	375	0.829		0.9%	_2023-12-14_	12/14/2023 17:54
41653-26	0.230	10	350	0.805			_2023-12-14_	12/14/2023 20:23
41653-26 DUP	0.229	10	350	0.802		0.4%	_2023-12-14_	12/14/2023 20:53
41653-27 FB	0.000	5	355	< 0.178			_2023-12-14_	12/14/2023 21:22
41653-27 FB DUP	0.000	5	355	< 0.178		NA	_2023-12-14_	12/14/2023 21:52
41653-28 FB	0.000	5	345	< 0.173			_2023-12-14_	12/14/2023 22:22
41653-28 FB DUP	0.000	5	345	< 0.173		NA	_2023-12-14_	12/14/2023 22:51

elementOne
e 36275-Cl_2

Metrohm 881/858 Ion Chromatograph System

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M26A-Cl_2 IC Data Sheet

Lab ID #: 41653 (15-28)

Client: Deeco
Date: 12.15.23
Analyst: LAW
Detection Limit, (µg/ml): 0.10

Column: Metrosep IonPac AS14A
Eluent: 8.0 mM Na_2CO_3/ 1.0 mM $NaHCO_3$
Flow Rate: 1.0 mL/min.

Standards	Cl^- µg/ml	Dilution	QC µg/ml	%Relative Error	% Recovery	File Name	Date Time
0	0.000					_2023-12-13_	12/13/2023 17:39
0.1	0.104			4.0%	104%	_2023-12-13_	12/13/2023 18:09
1	0.924			-7.6%	92%	_2023-12-13_	12/13/2023 18:38
3	2.902			-3.3%	97%	_2023-12-13_	12/13/2023 19:08
5	5.304			6.1%	106%	_2023-12-13_	12/13/2023 19:38
10	9.866			-1.3%	99%	_2023-12-13_	12/13/2023 20:08
0.1	0.108			8.0%	108%	_2023-12-15_	12/15/2023 0:50
1	0.999			-0.1%	100%	_2023-12-15_	12/15/2023 1:20
3	2.986			-0.5%	100%	_2023-12-15_	12/15/2023 1:50
5	5.264			5.3%	105%	_2023-12-15_	12/15/2023 2:19
10	10.940			9.4%	109%	_2023-12-15_	12/15/2023 2:49
Correlation-	0.9999						
QC	5.318		5.00		106%	_2023-12-13_	12/13/2023 20:37
QC	5.424		5.00		108%	_2023-12-13_	12/13/2023 21:07
QC	5.466		5.00		109%	_2023-12-14_	12/14/2023 4:32
QC	4.861		5.00		97%	_2023-12-14_	12/14/2023 5:02
QC	5.195		5.00		104%	_2023-12-14_	12/14/2023 11:28
QC	5.293		5.00		106%	_2023-12-14_	12/14/2023 11:58
QC	4.148		5.00		83%	_2023-12-14_	12/14/2023 18:24
QC	5.142		5.00		103%	_2023-12-14_	12/14/2023 18:54
QC	5.231		5.00		105%	_2023-12-14_	12/14/2023 23:21
QC	4.746		5.00		95%	_2023-12-15_	12/15/2023 3:19
DL	0.110		0.10		110%	_2023-12-13_	12/13/2023 22:36
DL	0.104		0.1		104%	_2023-12-13_	12/13/23 23:06
DL	0.110		0.1		110%	_2023-12-14_	12/14/2023 23:51
DL	0.110		0.10		110%	_2023-12-15_	12/15/2023 3:48
40034-7QC	3.720	20	78.0		95%	_2023-12-15_	12/15/2023 4:48
BLK	0.000					_2023-12-13_	12/13/2023 21:37
BLK	0.000					_2023-12-13_	12/13/2023 22:06
BLK	0.000					_2023-12-14_	12/14/2023 5:32
BLK	0.000					_2023-12-14_	12/14/2023 6:02
BLK	0.000					_2023-12-14_	12/14/2023 12:28
BLK	0.000					_2023-12-14_	12/14/2023 12:57
BLK	0.000					_2023-12-14_	12/14/2023 19:23
BLK	0.000					_2023-12-14_	12/14/2023 19:53
BLK	0.000					_2023-12-15_	12/15/2023 0:20
BLK	0.000					_2023-12-15_	12/15/2023 4:18

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e 36275-Cl_2

Cl_2-Data 2 of 2

(15-28)

elementOne **IC Sample Sheet/Digestion Worksheet** **Lab ID #:** 41653

Date: 12/13/23 Column: ~~Metrosep A Supp 5~~ Ion Pac AS14A Instrument: 861 | 788

Analyst: KKH Conc. Eluent: ~~3.2~~ 3.5 mM Na_2CO_3/ ~~1.0~~ 1.0 mM $NaHCO_3$ Lot# IC11-87-1

10mL Conc. Eluent Diluted to FV=1L with filtered UPDI

Batch name: 121323-41653 Cl2 Regenerant: 100mM ~~H_2SO_4~~ H_3PO_4 Lot # IC11-98-2

Flow Rate: ~~.7~~ mL/min. Method: 26A NaOH

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
1	0.0		R^2	QC lot #			
2	0.1	Cl	.9999	430853	9 Ricca		
3	1.0						
4	3.0						
5	5.0						
6	10.0						
7	QC						
8	QC						
9	BLK						
10	BLK						
11	DL						
12	DL						
13	LFB						
14	LFB						
15	LFB+						
16	LFB+						
17	41653-15	Deeo	Cl2		0.357	10X	
18	-15dup	↓	↓		0.363	↓	
19	-16				0.476		
20	-16dup				0.483		
21	-18				0.190		
22	-18dup	↓	↓		0.190	↓	
23	QC						
24	QC						
25	BLK						

Manual integra

Curve IC Lot # IC11-101-4 Sodium Thiosulfate Lot # ~~IC11-71~~ IC11-73-4 (KH 12/16/23) Comments: p. 1 of 3

Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: **IC ME Solution** MP 2303029-250

QC: Spike 50 uL from 1000 ug/mL Br Std. to 10mL sample; lot #'s listied above.

Submitted for QC- Date:_____ Time:_____ By:_____ QC Review- Date:_____ Time:_____ By:_____

(15-25)

elementOne **IC Sample Sheet/Digestion Worksheet** **Lab ID #:** 41653

Date: 12/13/23 Column: IonPac AS14A Instrument: 861/788

Analyst: KH Conc. Eluent: 8.0 mM Na_2CO_3/ 1.0mM $NaHCO_3$ Lot# IC11-87-1

10mL Conc. Eluent Diluted to FV=1L with filtered UPDI

Batch name: 121323-41653 Cl2 Regenerant: 100mM H_3PO_4 Lot # IC11-98-2

Flow Rate: 1.0 mL/min. Method: 26A NaOH

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
26	BLK						
27	41653-17	Deeco	Cl2		5.440	10X	
28	-17dup				0.455		
29	-17spk				5.766		
30	-17spkdup				5.392		
31	-19				0.248		
32	-19dup				0.244		
33	-20				0.205		
34	-20dup				0.208		
35	-21				0.404		
36	-21dup	↓	↓		0.399	↓	
37	QC						
38	QC						
39	BLK						
40	BLK						
41	41653-22	Deeco	Cl2	0.300	0.32X	10X	
42	-22dup			0.301	0.317		
43	-23				0.456		
44	-23dup				0.450		
45	-23spk				5.284		
46	-23spkdup				5.749		
47	-24				0.164		
48	24dup				0.166		
49	-25				0.219		
50	-25dup	↓	↓		0.221	↓	

Manual integrations noted by M

Curve IC Lot #_____ Sodium Thiosulfate Lot #_____ Comments: p. 2 of 3

Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: **IC ME Solution** _____

QC: Spike 50 uL from 1000 ug/mL Br Std. to 10mL sample; lot #'s listied above.

Submitted for QC- Date:_____ Time:_____ By:_____ QC Review- Date:_____ Time:_____ By:_____

(15-28)

elementOne **IC Sample Sheet/Digestion Worksheet** **Lab ID #:** 41653

Date: 12/13/23 Column: IonPac AS14A Instrument: 861/788

Analyst: KW Conc. Eluent: 8.0 mM Na_2CO_3/ 1.0mM $NaHCO_3$ Lot# IC11-87-1

10mL Conc. Eluent Diluted to FV=1L with filtered UPDI

Batch name: 121323-41653Cl2 Regenerant: 100mM H_3PO_4 Lot # IC11-98-2

Flow Rate: 1.0 mL/min. Method: 26A NaOH

AS LOC.	Sample ID	Client	Analyte	Results (ug/mL)	Results (ug/mL)	Dilution	Wt (g) / FV (mL)
51	QC						
52	QC						
53	BLK						
54	BLK						
55	41653-26	Deco	Cl2		0.230	10X	
56	-26dup	↓	↓		0.229	↓	
57	-27FB				—	5X	
58	-27FBdup				—	↓	
59	-28FB				—		
60	-28FBdup	↓	↓		—	↓	
61	QC						
62	DL						
63	BLK						
64	0.1						
65	1.0						
66	3.0						
67	5.0						
68	10.0						
69	QC						
70	DL						
71	BLK						
72	40034-7QC		Cl2		3.720	10X	TV=78.0

Manual integra

Curve ICV Lot #_____ Sodium Thiosulfate Lot #_____ Comments: p. 3 of 3

Spike 50 uL from 1000 ug/mL Std. to 10mL sample Lot #'s: IC ME Solution _____

QC: Spike 50 uL from 1000 ug/mL Br Std. to 10mL sample; lot #'s listied above.

Submitted for QC- Date:_____ Time:_____ By:_____ QC Review- Date:_____ Time:_____ By:_____

Appendix D

Plant Process Data

Holcim Midlothian TX Line 1 Main Stack Mill On Run 1 Date/Time	Clinker mtph
11/15/2023 9:00	131.0
11/15/2023 9:01	131.0
11/15/2023 9:02	130.9
11/15/2023 9:03	131.0
11/15/2023 9:04	131.0
11/15/2023 9:05	131.0
11/15/2023 9:06	130.9
11/15/2023 9:07	131.0
11/15/2023 9:08	130.9
11/15/2023 9:09	131.0
11/15/2023 9:10	131.0
11/15/2023 9:11	131.0
11/15/2023 9:12	131.0
11/15/2023 9:13	130.9
11/15/2023 9:14	131.0
11/15/2023 9:15	131.0
11/15/2023 9:16	130.9
11/15/2023 9:17	131.0
11/15/2023 9:18	131.0
11/15/2023 9:19	131.0
11/15/2023 9:20	130.9
11/15/2023 9:21	130.9
11/15/2023 9:22	131.0
11/15/2023 9:23	131.0
11/15/2023 9:24	131.0
11/15/2023 9:25	131.0
11/15/2023 9:26	130.9
11/15/2023 9:27	131.0
11/15/2023 9:28	130.9
11/15/2023 9:29	130.9
11/15/2023 9:30	131.0
11/15/2023 9:31	130.9
11/15/2023 9:32	130.9
11/15/2023 9:33	131.0
11/15/2023 9:34	130.9
11/15/2023 9:35	130.9
11/15/2023 9:36	130.9
11/15/2023 9:37	131.0
11/15/2023 9:38	131.0
11/15/2023 9:39	130.9
11/15/2023 9:40	130.9
11/15/2023 9:41	131.0
11/15/2023 9:42	130.9

Holcim Midlothian TX Line 1 Main Stack Mill On Run 1 Date/Time	Clinker mtph
11/15/2023 9:43	131.0
11/15/2023 9:44	130.9
11/15/2023 9:45	131.0
11/15/2023 9:46	131.0
11/15/2023 9:47	130.9
11/15/2023 9:48	130.9
11/15/2023 9:49	130.9
11/15/2023 9:50	131.0
11/15/2023 9:51	131.0
11/15/2023 9:52	130.9
11/15/2023 9:53	131.0
11/15/2023 9:54	130.9
11/15/2023 9:55	130.9
11/15/2023 9:56	130.9
11/15/2023 9:57	131.0
11/15/2023 9:58	131.0
11/15/2023 9:59	130.9
11/15/2023 10:00	131.0
11/15/2023 10:01	130.9
11/15/2023 10:02	131.0
11/15/2023 10:03	130.9
11/15/2023 10:04	131.0
11/15/2023 10:05	131.0
11/15/2023 10:06	130.9
11/15/2023 10:07	130.9
11/15/2023 10:08	131.0
11/15/2023 10:09	131.0
Averages	**131.0**

Holcim Midlothian TX Line 1 Main Stack Mill On Run 2 Date/Time	Clinker mtph
11/15/2023 10:37	130.9
11/15/2023 10:38	131.0
11/15/2023 10:39	131.0
11/15/2023 10:40	130.9
11/15/2023 10:41	131.0
11/15/2023 10:42	130.9
11/15/2023 10:43	131.0
11/15/2023 10:44	130.9
11/15/2023 10:45	131.0
11/15/2023 10:46	130.9
11/15/2023 10:47	131.0
11/15/2023 10:48	131.0
11/15/2023 10:49	131.0
11/15/2023 10:50	130.9
11/15/2023 10:51	130.9
11/15/2023 10:52	131.0
11/15/2023 10:53	131.0
11/15/2023 10:54	131.0
11/15/2023 10:55	130.9
11/15/2023 10:56	130.9
11/15/2023 10:57	131.0
11/15/2023 10:58	131.0
11/15/2023 10:59	131.0
11/15/2023 11:00	130.9
11/15/2023 11:01	131.0
11/15/2023 11:02	131.0
11/15/2023 11:03	130.9
11/15/2023 11:04	131.0
11/15/2023 11:05	130.9
11/15/2023 11:06	130.9
11/15/2023 11:07	131.0
11/15/2023 11:08	131.0
11/15/2023 11:09	130.9
11/15/2023 11:10	130.9
11/15/2023 11:11	131.0
11/15/2023 11:12	130.9
11/15/2023 11:13	131.0
11/15/2023 11:14	130.9
11/15/2023 11:15	130.9
11/15/2023 11:16	131.0
11/15/2023 11:17	131.0
11/15/2023 11:18	131.0
11/15/2023 11:19	130.9

Holcim Midlothian TX Line 1 Main Stack Mill On Run 2 Date/Time	Clinker mtph
11/15/2023 11:20	130.9
11/15/2023 11:21	131.0
11/15/2023 11:22	130.9
11/15/2023 11:23	131.0
11/15/2023 11:24	131.0
11/15/2023 11:25	131.0
11/15/2023 11:26	131.0
11/15/2023 11:27	131.0
11/15/2023 11:28	131.0
11/15/2023 11:29	130.9
11/15/2023 11:30	131.0
11/15/2023 11:31	130.9
11/15/2023 11:32	130.9
11/15/2023 11:33	131.0
11/15/2023 11:34	130.9
11/15/2023 11:35	130.9
11/15/2023 11:36	131.0
11/15/2023 11:37	130.9
11/15/2023 11:38	131.0
11/15/2023 11:39	130.9
11/15/2023 11:40	130.9
11/15/2023 11:41	131.0
Averages	**131.0**

Holcim Midlothian TX Line 1 Main Stack Mill On Run 3 Date/Time	Clinker mtph
11/15/2023 12:02	131.0
11/15/2023 12:03	130.9
11/15/2023 12:04	130.9
11/15/2023 12:05	130.9
11/15/2023 12:06	130.9
11/15/2023 12:07	131.0
11/15/2023 12:08	131.0
11/15/2023 12:09	130.9
11/15/2023 12:10	130.9
11/15/2023 12:11	131.0
11/15/2023 12:12	130.9
11/15/2023 12:13	131.0
11/15/2023 12:14	131.0
11/15/2023 12:15	131.0
11/15/2023 12:16	131.0
11/15/2023 12:17	131.0
11/15/2023 12:18	131.0
11/15/2023 12:19	131.0
11/15/2023 12:20	131.0
11/15/2023 12:21	130.9
11/15/2023 12:22	130.9
11/15/2023 12:23	130.9
11/15/2023 12:24	130.9
11/15/2023 12:25	131.0
11/15/2023 12:26	131.0
11/15/2023 12:27	130.9
11/15/2023 12:28	131.0
11/15/2023 12:29	131.0
11/15/2023 12:30	130.9
11/15/2023 12:31	130.9
11/15/2023 12:32	131.0
11/15/2023 12:33	131.0
11/15/2023 12:34	131.0
11/15/2023 12:35	131.0
11/15/2023 12:36	131.0
11/15/2023 12:37	131.0
11/15/2023 12:38	130.9
11/15/2023 12:39	131.0
11/15/2023 12:40	131.0
11/15/2023 12:41	130.9
11/15/2023 12:42	131.0
11/15/2023 12:43	130.9
11/15/2023 12:44	130.9

Holcim Midlothian TX Line 1 Main Stack Mill On Run 3 Date/Time	Clinker mtph
11/15/2023 12:45	130.9
11/15/2023 12:46	131.0
11/15/2023 12:47	130.9
11/15/2023 12:48	130.9
11/15/2023 12:49	131.0
11/15/2023 12:50	130.9
11/15/2023 12:51	131.0
11/15/2023 12:52	131.0
11/15/2023 12:53	131.0
11/15/2023 12:54	130.9
11/15/2023 12:55	131.0
11/15/2023 12:56	131.0
11/15/2023 12:57	131.0
11/15/2023 12:58	131.0
11/15/2023 12:59	131.0
11/15/2023 13:00	131.0
11/15/2023 13:01	130.9
11/15/2023 13:02	130.9
11/15/2023 13:03	130.9
11/15/2023 13:04	131.0
11/15/2023 13:05	130.9
11/15/2023 13:06	131.0
11/15/2023 13:07	130.9
11/15/2023 13:08	131.0
11/15/2023 13:09	130.9
11/15/2023 13:10	131.0
11/15/2023 13:11	131.0
Averages	**131.0**

Holcim Midlothian TX Line 1 Main Stack Mill Off Run 1 Date/Time	Clinker mtph
11/15/2023 12:02	131.0
11/15/2023 12:03	130.9
11/15/2023 12:04	130.9
11/15/2023 12:05	130.9
11/15/2023 12:06	130.9
11/15/2023 12:07	131.0
11/15/2023 12:08	131.0
11/15/2023 12:09	130.9
11/15/2023 12:10	130.9
11/15/2023 12:11	131.0
11/15/2023 12:12	130.9
11/15/2023 12:13	131.0
11/15/2023 12:14	131.0
11/15/2023 12:15	131.0
11/15/2023 12:16	131.0
11/15/2023 12:17	131.0
11/15/2023 12:18	131.0
11/15/2023 12:19	131.0
11/15/2023 12:20	131.0
11/15/2023 12:21	130.9
11/15/2023 12:22	130.9
11/15/2023 12:23	130.9
11/15/2023 12:24	130.9
11/15/2023 12:25	131.0
11/15/2023 12:26	131.0
11/15/2023 12:27	130.9
11/15/2023 12:28	131.0
11/15/2023 12:29	131.0
11/15/2023 12:30	130.9
11/15/2023 12:31	130.9
11/15/2023 12:32	131.0
11/15/2023 12:33	131.0
11/15/2023 12:34	131.0
11/15/2023 12:35	131.0
11/15/2023 12:36	131.0
11/15/2023 12:37	131.0
11/15/2023 12:38	130.9
11/15/2023 12:39	131.0
11/15/2023 12:40	131.0
11/15/2023 12:41	130.9
11/15/2023 12:42	131.0
11/15/2023 12:43	130.9
11/15/2023 12:44	130.9

Holcim Midlothian TX Line 1 Main Stack Mill Off Run 1 Date/Time	Clinker mtph
11/15/2023 12:45	130.9
11/15/2023 12:46	131.0
11/15/2023 12:47	130.9
11/15/2023 12:48	130.9
11/15/2023 12:49	131.0
11/15/2023 12:50	130.9
11/15/2023 12:51	131.0
11/15/2023 12:52	131.0
11/15/2023 12:53	131.0
11/15/2023 12:54	130.9
11/15/2023 12:55	131.0
11/15/2023 12:56	131.0
11/15/2023 12:57	131.0
11/15/2023 12:58	131.0
11/15/2023 12:59	131.0
11/15/2023 13:00	131.0
11/15/2023 13:01	130.9
11/15/2023 13:02	130.9
11/15/2023 13:03	130.9
11/15/2023 13:04	131.0
11/15/2023 13:05	130.9
11/15/2023 13:06	131.0
11/15/2023 13:07	130.9
11/15/2023 13:08	131.0
11/15/2023 13:09	130.9
11/15/2023 13:10	131.0
11/15/2023 13:11	131.0
Averages	**131.0**

Holcim Midlothian TX Line 1 Main Stack Mill Off Run 2 Date/Time	Clinker mtph
11/15/2023 15:55	131.0
11/15/2023 15:56	130.9
11/15/2023 15:57	131.0
11/15/2023 15:58	130.9
11/15/2023 15:59	131.0
11/15/2023 16:00	131.0
11/15/2023 16:01	130.9
11/15/2023 16:02	131.0
11/15/2023 16:03	131.0
11/15/2023 16:04	130.9
11/15/2023 16:05	131.0
11/15/2023 16:06	130.9
11/15/2023 16:07	131.0
11/15/2023 16:08	131.0
11/15/2023 16:09	130.9
11/15/2023 16:10	131.0
11/15/2023 16:11	131.0
11/15/2023 16:12	131.0
11/15/2023 16:13	131.0
11/15/2023 16:14	130.9
11/15/2023 16:15	130.9
11/15/2023 16:16	131.0
11/15/2023 16:17	131.0
11/15/2023 16:18	131.0
11/15/2023 16:19	131.0
11/15/2023 16:20	131.0
11/15/2023 16:21	131.0
11/15/2023 16:22	131.0
11/15/2023 16:23	131.0
11/15/2023 16:24	130.9
11/15/2023 16:25	131.0
11/15/2023 16:26	131.0
11/15/2023 16:27	130.9
11/15/2023 16:28	131.0
11/15/2023 16:29	130.9
11/15/2023 16:30	130.9
11/15/2023 16:31	130.9
11/15/2023 16:32	130.9
11/15/2023 16:33	131.0
11/15/2023 16:34	130.9
11/15/2023 16:35	131.0
11/15/2023 16:36	130.9
11/15/2023 16:37	130.9

Holcim Midlothian TX Line 1 Main Stack Mill Off Run 2 Date/Time	Clinker mtph
11/15/2023 16:38	131.0
11/15/2023 16:39	131.0
11/15/2023 16:40	131.0
11/15/2023 16:41	131.0
11/15/2023 16:42	131.0
11/15/2023 16:43	130.9
11/15/2023 16:44	130.9
11/15/2023 16:45	131.0
11/15/2023 16:46	130.9
11/15/2023 16:47	130.9
11/15/2023 16:48	131.0
11/15/2023 16:49	130.9
11/15/2023 16:50	131.0
11/15/2023 16:51	131.0
11/15/2023 16:52	131.0
11/15/2023 16:53	130.9
11/15/2023 16:54	130.9
11/15/2023 16:55	131.0
11/15/2023 16:56	131.0
11/15/2023 16:57	131.0
11/15/2023 16:58	131.0
11/15/2023 16:59	130.9
11/15/2023 17:00	130.9
11/15/2023 17:01	130.9
11/15/2023 17:02	130.9
11/15/2023 17:03	130.9
11/15/2023 17:04	131.0
11/15/2023 17:05	131.0
Averages	**131.0**

Holcim Midlothian TX Line 1 Main Stack Mill Off Run 3 Date/Time	Clinker mtph
11/15/2023 17:19	131.0
11/15/2023 17:20	130.9
11/15/2023 17:21	131.0
11/15/2023 17:22	130.9
11/15/2023 17:23	131.0
11/15/2023 17:24	131.0
11/15/2023 17:25	130.9
11/15/2023 17:26	130.9
11/15/2023 17:27	131.0
11/15/2023 17:28	131.0
11/15/2023 17:29	131.0
11/15/2023 17:30	130.9
11/15/2023 17:31	130.9
11/15/2023 17:32	130.9
11/15/2023 17:33	130.9
11/15/2023 17:34	131.0
11/15/2023 17:35	130.9
11/15/2023 17:36	130.9
11/15/2023 17:37	130.9
11/15/2023 17:38	131.0
11/15/2023 17:39	131.0
11/15/2023 17:40	130.9
11/15/2023 17:41	131.0
11/15/2023 17:42	131.0
11/15/2023 17:43	130.9
11/15/2023 17:44	130.9
11/15/2023 17:45	131.0
11/15/2023 17:46	131.0
11/15/2023 17:47	131.0
11/15/2023 17:48	131.0
11/15/2023 17:49	131.0
11/15/2023 17:50	131.0
11/15/2023 17:51	131.0
11/15/2023 17:52	131.0
11/15/2023 17:53	131.0
11/15/2023 17:54	131.0
11/15/2023 17:55	130.9
11/15/2023 17:56	131.0
11/15/2023 17:57	130.9
11/15/2023 17:58	131.0
11/15/2023 17:59	131.0
11/15/2023 18:00	131.0
11/15/2023 18:01	130.9

Holcim Midlothian TX Line 1 Main Stack Mill Off Run 3 Date/Time	Clinker mtph
11/15/2023 18:02	131.0
11/15/2023 18:03	131.0
11/15/2023 18:04	130.9
11/15/2023 18:05	131.0
11/15/2023 18:06	131.0
11/15/2023 18:07	130.9
11/15/2023 18:08	131.0
11/15/2023 18:09	131.0
11/15/2023 18:10	131.0
11/15/2023 18:11	131.0
11/15/2023 18:12	131.0
11/15/2023 18:13	131.0
11/15/2023 18:14	130.9
11/15/2023 18:15	131.0
11/15/2023 18:16	130.9
11/15/2023 18:17	131.0
11/15/2023 18:18	131.0
11/15/2023 18:19	131.0
11/15/2023 18:20	131.0
11/15/2023 18:21	130.9
11/15/2023 18:22	131.0
11/15/2023 18:23	130.9
11/15/2023 18:24	131.0
11/15/2023 18:25	130.9
11/15/2023 18:26	131.0
11/15/2023 18:27	131.0
11/15/2023 18:28	130.9
Averages	**131.0**

Holcim Midlothian TX Line 2 Main Stack Mill Off Run 1 Date/Time	Clinker mtph
11/16/2023 14:20	123.8
11/16/2023 14:21	123.8
11/16/2023 14:22	123.7
11/16/2023 14:23	123.8
11/16/2023 14:24	123.8
11/16/2023 14:25	123.7
11/16/2023 14:27	123.7
11/16/2023 14:28	123.8
11/16/2023 14:29	123.8
11/16/2023 14:30	123.7
11/16/2023 14:31	123.8
11/16/2023 14:32	123.8
11/16/2023 14:33	123.7
11/16/2023 14:34	123.8
11/16/2023 14:35	123.8
11/16/2023 14:36	123.7
11/16/2023 14:37	123.7
11/16/2023 14:38	123.7
11/16/2023 14:39	123.7
11/16/2023 14:40	123.8
11/16/2023 14:41	123.8
11/16/2023 14:42	123.7
11/16/2023 14:43	123.8
11/16/2023 14:44	123.8
11/16/2023 14:45	123.8
11/16/2023 14:46	123.8
11/16/2023 14:47	123.8
11/16/2023 14:48	123.7
11/16/2023 14:49	123.8
11/16/2023 14:50	123.8
11/16/2023 14:51	123.8
11/16/2023 14:52	123.7
11/16/2023 14:53	123.8
11/16/2023 14:54	123.8
11/16/2023 14:55	123.8
11/16/2023 14:56	123.7
11/16/2023 14:57	123.8
11/16/2023 14:58	123.7
11/16/2023 14:59	123.8
11/16/2023 15:00	123.8
11/16/2023 15:01	123.7
11/16/2023 15:02	123.7
11/16/2023 15:03	123.7

Holcim Midlothian TX Line 2 Main Stack Mill Off Run 1 Date/Time	Clinker mtph
11/16/2023 15:04	123.7
11/16/2023 15:05	123.8
11/16/2023 15:06	123.7
11/16/2023 15:07	123.7
11/16/2023 15:08	123.7
11/16/2023 15:09	123.7
11/16/2023 15:10	123.8
11/16/2023 15:11	123.7
11/16/2023 15:12	123.7
11/16/2023 15:13	123.7
11/16/2023 15:14	123.8
11/16/2023 15:15	123.7
11/16/2023 15:16	123.7
11/16/2023 15:17	123.8
11/16/2023 15:18	123.8
11/16/2023 15:19	123.8
11/16/2023 15:20	123.7
11/16/2023 15:21	123.8
11/16/2023 15:22	123.8
11/16/2023 15:23	123.7
11/16/2023 15:24	123.7
11/16/2023 15:25	123.8
11/16/2023 15:26	123.7
11/16/2023 15:27	123.7
11/16/2023 15:28	123.7
11/16/2023 15:29	123.8
11/16/2023 15:30	123.8
11/16/2023 15:31	123.8
11/16/2023 15:32	123.8
11/16/2023 15:33	123.7
11/16/2023 15:34	123.8
11/16/2023 15:35	123.8
11/16/2023 15:36	123.8
11/16/2023 15:37	123.8
11/16/2023 15:38	123.7
11/16/2023 15:39	123.7
11/16/2023 15:40	123.8
11/16/2023 15:41	123.7
11/16/2023 15:42	123.8
11/16/2023 15:43	123.7
11/16/2023 15:44	123.7
11/16/2023 15:45	123.7
11/16/2023 15:46	123.8

Holcim Midlothian TX Line 2 Main Stack Mill Off Run 1 Date/Time	Clinker mtph
11/16/2023 15:47	123.8
11/16/2023 15:48	123.8
11/16/2023 15:49	123.7
11/16/2023 15:50	123.8
11/16/2023 15:51	123.8
11/16/2023 15:52	123.7
11/16/2023 15:53	123.8
11/16/2023 15:54	123.8
11/16/2023 15:55	123.8
11/16/2023 15:56	123.7
11/16/2023 15:57	123.8
Average	**123.7551**

Holcim Midlothian TX Line 2 Main Stack Mill Off Run 2 Date/Time	Clinker mtph
11/16/2023 16:20	123.7
11/16/2023 16:21	123.7
11/16/2023 16:22	123.7
11/16/2023 16:23	123.8
11/16/2023 16:24	123.8
11/16/2023 16:25	123.7
11/16/2023 16:26	123.7
11/16/2023 16:27	123.7
11/16/2023 16:28	123.8
11/16/2023 16:29	123.8
11/16/2023 16:30	123.8
11/16/2023 16:31	123.8
11/16/2023 16:32	123.7
11/16/2023 16:33	123.8
11/16/2023 16:34	123.7
11/16/2023 16:35	123.8
11/16/2023 16:36	123.7
11/16/2023 16:37	123.8
11/16/2023 16:38	123.8
11/16/2023 16:39	123.8
11/16/2023 16:40	123.7
11/16/2023 16:41	123.8
11/16/2023 16:42	123.8
11/16/2023 16:43	123.7
11/16/2023 16:44	123.7
11/16/2023 16:45	123.8
11/16/2023 16:46	123.8
11/16/2023 16:47	123.7
11/16/2023 16:48	123.8
11/16/2023 16:49	123.7
11/16/2023 16:50	123.7
11/16/2023 16:51	123.8
11/16/2023 16:52	123.8
11/16/2023 16:53	123.7
11/16/2023 16:54	123.7
11/16/2023 16:55	123.8
11/16/2023 16:56	123.8
11/16/2023 16:57	123.8
11/16/2023 16:58	123.7
11/16/2023 16:59	123.7
11/16/2023 17:00	123.8
11/16/2023 17:01	123.7
11/16/2023 17:02	123.8

Holcim Midlothian TX Line 2 Main Stack Mill Off Run 2 Date/Time	Clinker mtph
11/16/2023 17:03	123.7
11/16/2023 17:04	123.7
11/16/2023 17:05	123.8
11/16/2023 17:06	123.7
11/16/2023 17:07	123.7
11/16/2023 17:08	123.7
11/16/2023 17:09	123.8
11/16/2023 17:10	123.8
11/16/2023 17:11	123.8
11/16/2023 17:12	123.8
11/16/2023 17:13	123.7
11/16/2023 17:14	123.8
11/16/2023 17:15	123.8
11/16/2023 17:16	123.8
11/16/2023 17:17	123.8
11/16/2023 17:18	123.8
11/16/2023 17:19	123.8
11/16/2023 17:20	123.7
11/16/2023 17:21	123.8
11/16/2023 17:22	123.7
11/16/2023 17:23	123.7
11/16/2023 17:24	123.7
11/16/2023 17:25	123.8
Average	**123.7545**

Holcim Midlothian TX Line 2 Main Stack Mill Off Run 3 Date/Time	Clinker mtph
11/16/2023 17:41	123.8
11/16/2023 17:42	123.7
11/16/2023 17:43	123.8
11/16/2023 17:44	123.7
11/16/2023 17:45	123.7
11/16/2023 17:46	123.8
11/16/2023 17:47	123.8
11/16/2023 17:48	123.7
11/16/2023 17:49	123.7
11/16/2023 17:50	123.8
11/16/2023 17:51	123.8
11/16/2023 17:52	123.8
11/16/2023 17:53	123.8
11/16/2023 17:54	123.7
11/16/2023 17:55	123.7
11/16/2023 17:56	123.7
11/16/2023 17:57	123.7
11/16/2023 17:58	123.7
11/16/2023 17:59	123.7
11/16/2023 18:00	123.7
11/16/2023 18:01	123.8
11/16/2023 18:02	123.7
11/16/2023 18:03	123.7
11/16/2023 18:04	123.7
11/16/2023 18:05	123.7
11/16/2023 18:06	123.7
11/16/2023 18:07	123.7
11/16/2023 18:08	123.7
11/16/2023 18:09	123.8
11/16/2023 18:10	123.8
11/16/2023 18:11	123.7
11/16/2023 18:12	123.7
11/16/2023 18:13	123.7
11/16/2023 18:14	123.7
11/16/2023 18:15	123.7
11/16/2023 18:16	123.7
11/16/2023 18:17	123.7
11/16/2023 18:18	123.7
11/16/2023 18:19	123.8
11/16/2023 18:20	123.7
11/16/2023 18:21	123.7
11/16/2023 18:22	123.7
11/16/2023 18:23	123.8

Holcim Midlothian TX Line 2 Main Stack Mill Off Run 3 Date/Time	Clinker mtph
11/16/2023 18:24	123.7
11/16/2023 18:25	123.7
11/16/2023 18:26	123.7
11/16/2023 18:27	123.7
11/16/2023 18:28	123.7
11/16/2023 18:29	123.8
11/16/2023 18:30	123.7
11/16/2023 18:31	123.7
11/16/2023 18:32	123.7
11/16/2023 18:33	123.7
11/16/2023 18:34	123.7
11/16/2023 18:35	123.7
11/16/2023 18:36	123.7
11/16/2023 18:37	123.7
11/16/2023 18:38	123.7
11/16/2023 18:39	123.7
11/16/2023 18:40	123.7
11/16/2023 18:41	123.7
11/16/2023 18:42	123.7
11/16/2023 18:43	123.7
11/16/2023 18:44	123.7
11/16/2023 18:45	123.7
11/16/2023 18:46	123.7
11/16/2023 18:47	123.7
Average	**123.7209**

Holcim Midlothian TX Line 2 Main Stack Mill On Run 1 Date/Time	Clinker mtph
11/17/2023 8:06	123.8
11/17/2023 8:07	123.7
11/17/2023 8:08	123.7
11/17/2023 8:09	123.8
11/17/2023 8:10	123.8
11/17/2023 8:11	123.8
11/17/2023 8:12	123.7
11/17/2023 8:13	123.8
11/17/2023 8:14	123.8
11/17/2023 8:15	123.8
11/17/2023 8:16	123.8
11/17/2023 8:17	123.8
11/17/2023 8:18	123.8
11/17/2023 8:19	123.7
11/17/2023 8:20	123.8
11/17/2023 8:21	123.7
11/17/2023 8:22	123.8
11/17/2023 8:23	123.8
11/17/2023 8:24	123.8
11/17/2023 8:25	123.8
11/17/2023 8:26	123.8
11/17/2023 8:27	123.8
11/17/2023 8:28	123.8
11/17/2023 8:29	123.8
11/17/2023 8:30	123.8
11/17/2023 8:31	123.8
11/17/2023 8:32	123.7
11/17/2023 8:33	123.8
11/17/2023 8:34	123.7
11/17/2023 8:35	123.8
11/17/2023 8:36	123.8
11/17/2023 8:37	123.8
11/17/2023 8:38	123.8
11/17/2023 8:39	123.7
11/17/2023 8:40	123.8
11/17/2023 8:41	123.8
11/17/2023 8:42	123.8
11/17/2023 8:43	123.8
11/17/2023 8:44	123.7
11/17/2023 8:45	123.7
11/17/2023 8:46	123.8
11/17/2023 8:47	123.8
11/17/2023 8:48	123.8

Holcim Midlothian TX Line 2 Main Stack Mill On Run 1 Date/Time	Clinker mtph
11/17/2023 8:49	123.7
11/17/2023 8:50	123.8
11/17/2023 8:51	123.7
11/17/2023 8:52	123.8
11/17/2023 8:53	123.8
11/17/2023 8:54	123.7
11/17/2023 8:55	123.8
11/17/2023 8:56	123.8
11/17/2023 8:57	123.8
11/17/2023 8:58	123.8
11/17/2023 8:59	123.7
11/17/2023 9:00	123.8
11/17/2023 9:01	123.8
11/17/2023 9:02	123.8
11/17/2023 9:03	123.8
11/17/2023 9:04	123.8
11/17/2023 9:05	123.7
11/17/2023 9:06	123.8
11/17/2023 9:07	123.8
11/17/2023 9:08	123.7
11/17/2023 9:09	123.8
11/17/2023 9:10	123.8
11/17/2023 9:11	123.8
11/17/2023 9:12	123.7
Average	**123.7746**

Holcim Midlothian TX Line 2 Main Stack Mill On Run 2 Date/Time	Clinker mtph
11/17/2023 9:30	123.8
11/17/2023 9:31	123.8
11/17/2023 9:32	123.8
11/17/2023 9:33	123.8
11/17/2023 9:34	123.8
11/17/2023 9:35	123.8
11/17/2023 9:36	123.8
11/17/2023 9:37	123.8
11/17/2023 9:38	123.8
11/17/2023 9:39	123.8
11/17/2023 9:40	123.8
11/17/2023 9:41	123.8
11/17/2023 9:42	123.8
11/17/2023 9:43	123.7
11/17/2023 9:44	123.8
11/17/2023 9:45	123.8
11/17/2023 9:46	123.8
11/17/2023 9:47	123.8
11/17/2023 9:48	123.8
11/17/2023 9:49	123.7
11/17/2023 9:50	123.7
11/17/2023 9:51	123.8
11/17/2023 9:52	123.7
11/17/2023 9:53	123.8
11/17/2023 9:54	123.8
11/17/2023 9:55	123.8
11/17/2023 9:56	123.8
11/17/2023 9:57	123.8
11/17/2023 9:58	123.7
11/17/2023 9:59	123.7
11/17/2023 10:00	123.8
11/17/2023 10:01	123.8
11/17/2023 10:02	123.8
11/17/2023 10:03	123.8
11/17/2023 10:04	123.8
11/17/2023 10:05	123.8
11/17/2023 10:06	123.8
11/17/2023 10:07	123.7
11/17/2023 10:08	123.8
11/17/2023 10:09	123.8
11/17/2023 10:10	123.8
11/17/2023 10:11	123.8
11/17/2023 10:12	123.8

Holcim Midlothian TX Line 2 Main Stack Mill On Run 2 Date/Time	Clinker mtph
11/17/2023 10:13	123.7
11/17/2023 10:14	123.8
11/17/2023 10:15	123.8
11/17/2023 10:16	123.8
11/17/2023 10:17	123.8
11/17/2023 10:18	123.8
11/17/2023 10:19	123.8
11/17/2023 10:20	123.8
11/17/2023 10:21	123.8
11/17/2023 10:22	123.8
11/17/2023 10:23	123.8
11/17/2023 10:24	123.8
11/17/2023 10:25	123.8
11/17/2023 10:26	123.8
11/17/2023 10:27	123.7
11/17/2023 10:28	123.8
11/17/2023 10:29	123.7
11/17/2023 10:30	123.8
11/17/2023 10:31	123.7
11/17/2023 10:32	123.8
11/17/2023 10:33	123.8
11/17/2023 10:34	123.8
11/17/2023 10:35	123.8
11/17/2023 10:36	123.7
Average	**123.7821**

Holcim Midlothian TX Line 2 Main Stack Mill On Run 3 Date/Time	Clinker mtph
11/17/2023 10:58	123.8
11/17/2023 10:59	123.8
11/17/2023 11:00	123.8
11/17/2023 11:01	123.8
11/17/2023 11:02	123.8
11/17/2023 11:03	123.8
11/17/2023 11:04	123.8
11/17/2023 11:05	123.8
11/17/2023 11:06	123.8
11/17/2023 11:07	123.7
11/17/2023 11:08	123.8
11/17/2023 11:09	123.7
11/17/2023 11:10	123.7
11/17/2023 11:11	123.8
11/17/2023 11:12	123.7
11/17/2023 11:13	123.8
11/17/2023 11:14	123.8
11/17/2023 11:15	123.7
11/17/2023 11:16	123.8
11/17/2023 11:17	123.7
11/17/2023 11:18	123.7
11/17/2023 11:19	123.7
11/17/2023 11:20	123.7
11/17/2023 11:21	123.7
11/17/2023 11:22	123.8
11/17/2023 11:23	123.8
11/17/2023 11:24	123.8
11/17/2023 11:25	123.7
11/17/2023 11:26	123.8
11/17/2023 11:27	123.8
11/17/2023 11:28	123.7
11/17/2023 11:29	123.8
11/17/2023 11:30	123.7
11/17/2023 11:31	123.8
11/17/2023 11:32	123.8
11/17/2023 11:33	123.8
11/17/2023 11:34	123.7
11/17/2023 11:35	123.8
11/17/2023 11:36	123.7
11/17/2023 11:37	123.7
11/17/2023 11:38	123.8
11/17/2023 11:39	123.8
11/17/2023 11:40	123.8

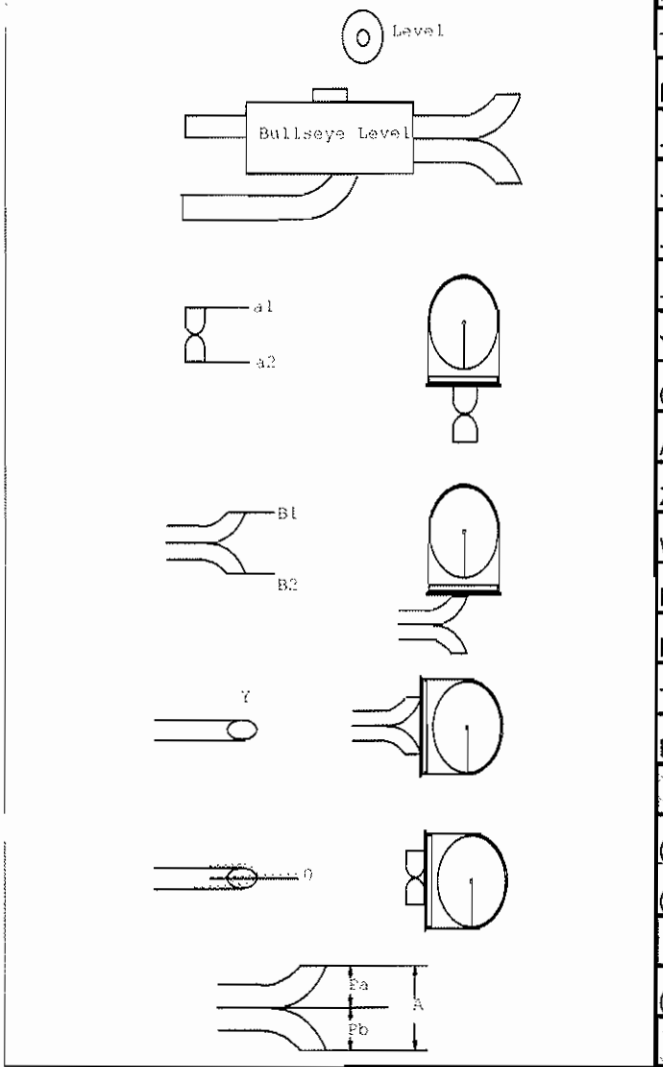
Holcim Midlothian TX Line 2 Main Stack Mill On Run 3 Date/Time	Clinker mtph
11/17/2023 11:41	123.8
11/17/2023 11:42	123.7
11/17/2023 11:43	123.7
11/17/2023 11:44	123.7
11/17/2023 11:45	123.7
11/17/2023 11:46	123.8
11/17/2023 11:47	123.8
11/17/2023 11:48	123.8
11/17/2023 11:49	123.8
11/17/2023 11:50	123.8
11/17/2023 11:51	123.7
11/17/2023 11:52	123.8
11/17/2023 11:53	123.8
11/17/2023 11:54	123.8
11/17/2023 11:55	123.8
11/17/2023 11:56	123.8
11/17/2023 11:57	123.7
11/17/2023 11:58	123.8
11/17/2023 11:59	123.8
11/17/2023 12:00	123.8
11/17/2023 12:01	123.8
11/17/2023 12:02	123.7
11/17/2023 12:03	123.7
11/17/2023 12:04	123.7
Average	**123.7627**

Appendix E

Calibration Documents

Probe or Pitot No:	5A

Pitot Tube Inspection Sheet



Date	01/03/23
Tube Assembly Level?	Yes
Ports Damaged?	No
-10 deg < a1 < +10 deg	2
-10 deg < a2 < +10 deg	1
-5 deg < B1 < +5 deg	1
-5 deg < B2 < +5 deg	1
Y (gamma)	1
0 (theta)	1
A (alpha)	0.951
Z = A (sin y) < 0.125"?	yes
W = A (sin 0) < 0.031"?	yes
Pa =	0.475
Pb =	0.476
Tube Diameter (Dt) =	0.376
Pa = Pb +- 0.063"?	yes
(1.05 x Dt)?	0.3948
(1.50 x Dt)?	0.564
(1.05 x Dt)< P < (1.50 x Dt)?	yes
Eligible for Default Pitot Calibration Factor (Cp = 0.84)?	**Yes**

Thermocouple Calibration

Type of Reference Thermometer?	Mercury	Date	01/03/23
Barometeric Pressure?	29.52	Ambient Temperature?	68

Source	Reference Temp, F	Thermocouple Temp, F	Absolute Temp Difference
cold air	37	38	-0.20%
medium air	215	215	0.00%
hot air	325	325	0.00%

Windtunnel Calibration

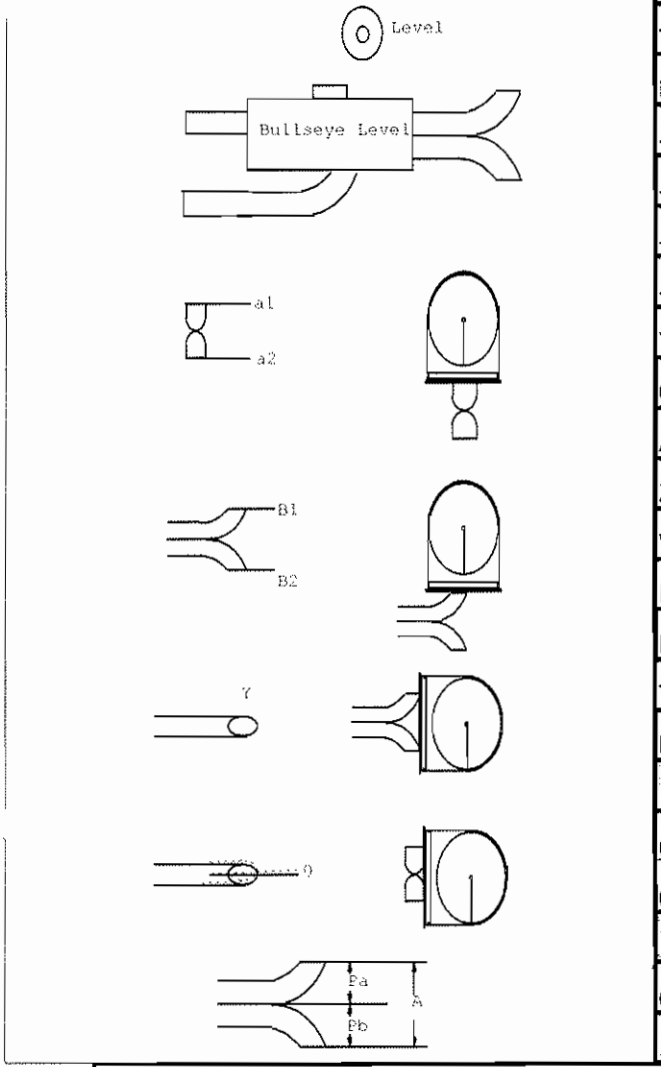
Pitot Reading	Reference (0.99)	5A S-Type Pitot	Cp
ΔP_1	0.31	0.44	0.84
ΔP_2	0.31	0.43	0.85
ΔP_3	0.31	0.43	0.85
		Average Pitot Tube Calibration Factor--->	**0.85**

Thermocouple Calibration Check (EPA ALT-011 Procedure), performed on 1/3/23

Source	Ref. Temp. F	Thermocouple Temp. F	± 2 deg F?
Ambient	68	66.9	Yes

Probe or Pitot No:	8H

Pitot Tube Inspection Sheet



Date	12/19/22
Tube Assembly Level?	Yes
Ports Damaged?	No
-10 deg < a1 < +10 deg	1
-10 deg < a2 < +10 deg	1
-5 deg < B1 < +5 deg	2
-5 deg < B2 < +5 deg	1
Y (gamma)	1
0 (theta)	1
A (alpha)	0.997
Z = A (sin y) < 0.125"?	yes
W = A (sin 0) < 0.031"?	yes
Pa =	0.499
Pb =	0.498
Tube Diameter (Dt) =	0.377
Pa = Pb +- 0.063"?	yes
(1.05 x Dt)?	0.39585
(1.50 x Dt)?	0.5655
(1.05 x Dt)< P < (1.50 x Dt)?	yes
Eligible for Default Pitot Calibration Factor (Cp = 0.84)?	**Yes**

Thermocouple Calibration

Type of Reference Thermometer?	Mercury	Date	12/19/22
Barometeric Pressure?	30.19	Ambient Temperature?	68.3

Source	Reference Temp, F	Thermocouple Temp, F	Absolute Temp Difference
Ice Bath	36	37	-0.20%
Hot Water	215	215	0.00%
Hot Oil	325	324	0.13%

Windtunnel Calibration

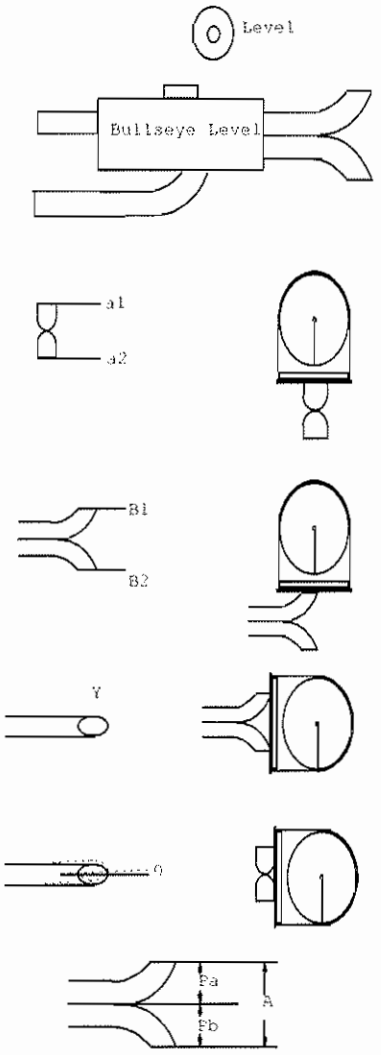
Pitot Reading	Reference (0.99)	8H S-Type Pitot	Cp
ΔP_1	0.54	0.81	0.82
ΔP_2	0.54	0.8	0.82
ΔP_3	0.55	0.79	0.83
		Average Pitot Tube Calibration Factor--->	**0.82**

Thermocouple Calibration Check (EPA ALT-011 Procedure), performed on 12/19/22

Source	Ref. Temp. F	Thermocouple Temp. F	± 2 deg F?
Ambient	68.3	68.9	Yes

Probe or Pitot No:	8M

Pitot Tube Inspection Sheet



Date	12/19/22
Tube Assembly Level?	Yes
Ports Damaged?	No
-10 deg < a1 < +10 deg	1
-10 deg < a2 < +10 deg	1
-5 deg < B1 < +5 deg	1
-5 deg < B2 < +5 deg	1
Y (gamma)	1
0 (theta)	1
A (alpha)	0.932
Z = A (sin y) < 0.125"?	yes
W = A (sin 0) < 0.031"?	yes
Pa =	0.466
Pb =	0.466
Tube Diameter (Dt) =	0.377
Pa = Pb +- 0.063"?	yes
(1.05 x Dt)?	0.39585
(1.50 x Dt)?	0.5655
(1.05 x Dt)< P < (1.50 x Dt)?	yes
Eligible for Default Pitot Calibration Factor (Cp = 0.84)?	**Yes**

Thermocouple Calibration

Type of Reference Thermometer?	Mercury	Date	12/19/22
Barometeric Pressure?	30.18	Ambient Temperature?	69

Source	Reference Temp, F	Thermocouple Temp, F	Absolute Temp Difference
cold air	37	38	-0.20%
medium air	215	214	0.15%
hot air	325	323	0.25%

Windtunnel Calibration

Pitot Reading	Reference (0.99)	8M S-Type Pitot	Cp
ΔP_1	0.31	0.44	0.84
ΔP_2	0.32	0.43	0.86
ΔP_3	0.31	0.44	0.84
		Average Pitot Tube Calibration Factor--->	**0.85**

Thermocouple Calibration Check (EPA ALT-011 Procedure), performed on 12/19/22

Source	Ref. Temp. F	Thermocouple Temp. F	± 2 deg F?
Ambient	69	68.1	Yes

METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

Quality - Service - Reliability

ENVIRONMENTAL SUPPLY COMPANY

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 data and information in the GREEN cells, YELLOW cells are calculated.

				INITIAL	FINAL	AVG (P_{bar})
DATE:	12/28/21	METER SERIAL #:	M5-15	BAROMETRIC PRESSURE (in Hg):	30.03	30.03	30.03
METER PART #:	M5-15	CRITICAL ORIFICE SET SERIAL #:	14315				

IF Y VARIATION EXCEEDS 2.00%, ORIFICE SHOULD BE RECALIBRATED

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)	TEMPERATURES °F AMBIENT	DGM INLET INITIAL	DGM INLET FINAL	DGM OUTLET INITIAL	DGM OUTLET FINAL	DGM AVG	ELAPSED TIME (MIN) θ	DGM ΔH (in H_2O)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	Y VARIATION (%)	$\Delta H_@$
12	1	0.3283				0.000						0							
	2					0.000						0							
	3					0.000						0							
																AVG =			
15	1	0.4094	18	353.924	359.213	5.289	75	62	65	62	62	62.75	10.00	0.8	5.3733	5.3168	0.989		1.62
	2	0.4094	18	359.213	364.553	5.340	76	65	66	62	63	64	10.00	0.8	5.4122	5.3119	0.981		1.62
	3					0.000						0							
																AVG =	0.985	1.09	
19	1	0.5047	18	364.553	371.213	6.660	76	66	70	63	65	66	10.00	1.3	6.7325	6.5483	0.973		1.72
	2	0.5047	18	371.213	377.910	6.697	76	70	72	65	66	68.25	10.00	1.3	6.7411	6.5483	0.971		1.72
	3					0.000						0							
																AVG =	0.972	-0.29	
23	1	0.6426	18	377.910	386.465	8.555	77	70	74	66	68	69.5	10.00	2.1	8.6078	8.3298	0.968		1.71
	2	0.6426	18	386.465	395.066	8.601	77	74	75	68	69	71.5	10.00	2.1	8.6215	8.3298	0.966		1.71
	3					0.000						0							
																AVG =	0.967	-0.81	
32	1	0.8587				0.000						0							
	2					0.000						0							
	3					0.000						0							
																AVG =			

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:
The following equations are used to calculate the standard volumes of air passed through the DGM, Vm (std), and the critical orifice, Vcr (std), and the DGM calibration factor, Y. These equations are automatically calculated in the

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = 0.975

AVERAGE $\Delta H_@$ = 1.68

(1) $$Vm_{(std)} = K_1 * Vm * \frac{Pbar + (\Delta H / 13.6)}{Tm}$$

= 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) $$Vcr_{(std)} = K' * \frac{Pbar * \Theta}{\sqrt{Tamb}}$$

= 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) $$Y = \frac{Vcr_{(std)}}{Vm_{(std)}}$$

= DGM calibration factor

Potentiometer Check, °F (per manufacturer procedure)

0	@ 0 F
496	@ 500 F
1000	@ 1000 F

Avg Absolute Difference = 0.1%

METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

ENVIRONMENTAL SUPPLY COMPANY — Quality - Service - Reliability

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 data and information in the GREEN cells, YELLOW cells are calculated.

				INITIAL	FINAL	AVG (P_{bar})
DATE:	12/09/22	METER SERIAL #:	m5-22	BAROMETRIC PRESSURE (in Hg):	30.01	29.99	30
METER PART #:	m5-22	CRITICAL ORIFICE SET SERIAL #:	1431S				

IF Y VARIATION EXCEEDS 2.00%, ORIFICE SHOULD BE RECALIBRATED

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)	TEMPERATURES °F AMBIENT	DGM INLET INITIAL	DGM INLET FINAL	DGM OUTLET INITIAL	DGM OUTLET FINAL	DGM AVG	ELAPSED TIME (MIN) θ	DGM ΔH (in H_2O)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	Y VARIATION (%)	$\Delta H_@$
12	1	0.3283				0.000						0							
	2					0.000						0							
	3					0.000						0							
																AVG =			
15	1	0.4094	18	944.228	949.609	5.381	67	66	68	66	66	66.5	10.00	0.9	5.4237	5.3517	0.987		1.78
	2	0.4094	18	949.609	954.989	5.380	67	68	71	66	67	68	10.00	0.9	5.4073	5.3517	0.990		1.78
	3					0.000						0							
																AVG =	0.988	-0.68	
19	1	0.5047	18	955.204	961.820	6.616	67	71	73	73	68	71.25	10.00	1.3	6.6153	6.5975	0.997		1.68
	2	0.5047	18	961.820	968.443	6.623	67	72	74	68	69	70.75	10.00	1.3	6.6286	6.5975	0.995		1.68
	3	0.5047				0.000						0							
																AVG =	0.996	0.13	
23	1	0.6426	17	969.005	977.347	8.342	67	72	75	69	70	71.5	10.00	2.2	8.3556	8.4001	1.005		1.76
	2	0.6426	17	978.606	986.992	8.386	67	69	70	69	69	69.25	10.00	2.2	8.4354	8.4001	0.996		1.76
	3					0.000						0							
																AVG =	1.001	0.56	
32	1	0.8587				0.000						0							
	2					0.000						0							
	3					0.000						0							
																AVG =			

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:
The following equations are used to calculate the standard volumes of air passed through the DGM, Vm (std), and the critical orifice, Vcr (std), and the DGM calibration factor, Y. These equations are automatically calculated

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = 0.995

AVERAGE $\Delta H_@$ = 1.74

(1) $$Vm_{(std)} = K_1 * Vm * \frac{Pbar + (\Delta H / 13.6)}{Tm}$$

= 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) $$Vcr_{(std)} = K' * \frac{Pbar * \Theta}{\sqrt{Tamb}}$$

= 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) $$Y = \frac{Vcr_{(std)}}{Vm_{(std)}}$$

= DGM calibration factor

Potentiometer Check, °F (per manufacturer procedure)		
	0	@ 0 F
	500	@ 500 F
	1004	@ 1000 F

Avg Absolute Difference = 0.1%

Company: Holcim; Midlothian TX
Source: Line 2 Main Stack; Raw Mill On
Job ID: 23-3313
Train Type: EPA Method 26A

Alt-009 Alternate Post Test Calibration Data	M5-15 4A 11/17/23 806-912	M5-22 4B 11/17/23 806-912	M5-15 5A 11/17/23 930-1036	M5-22 5B 11/17/23 930-1036	M5-15 6A 11/17/23 1058-1204	M5-22 6B 11/17/23 1058-1204	M5-15 Average	M5-22 Average
Vm	50.384	46.071	51.721	47.29	50.81	47.846		
Tm	524.3	521.9	526.2	523.5	528	527.3		
Pb	28.7	28.7	28.7	28.7	28.7	28.7		
Havg	2.21	2.15	2.28	2.22	2.23	2.16		
H@	1.68	1.72	1.68	1.72	1.68	1.72		
Md	30.368	30.368	30.38	30.38	30.396	30.396		
(Havg)^0.5	1.4856936	1.46605629	1.51095943	1.48873171	1.49118973	1.46883424		
Run Time, Min	60	60	60	60	60	60		
Calculated Gamma (Yqa)	1.015	1.081	1.008	1.070	1.014	1.047	1.012	1.066
Meter Gamma	0.975	1.014	0.975	1.014	0.975	1.014	0.975	1.014
% difference from Actual Y	4.1%	6.6%	3.3%	5.6%	4.0%	3.3%	3.8%	5.1%

Company: **Holcim; Midlothian TX**
Source: **Line 2 Main Stack; Raw Mill On**
Job ID: **23-3313**
Train Type: **EPA Method 26A**

Alt-009 Alternate Post Test Calibration Data	M5-15 4A 11/17/23 806-912	M5-22 4B 11/17/23 806-912	M5-15 5A 11/17/23 930-1036	M5-22 5B 11/17/23 930-1036	M5-15 6A 11/17/23 1058-1204	M5-22 6B 11/17/23 1058-1204	M5-15 Average	M5-22 Average
Vm	50.384	46.071	51.721	47.29	50.81	47.846		
Tm	524.3	521.9	526.2	523.5	528	527.3		
Pb	28.7	28.7	28.7	28.7	28.7	28.7		
Havg	2.21	2.15	2.28	2.22	2.23	2.16		
H@	1.68	1.72	1.68	1.72	1.68	1.72		
Md	30.368	30.368	30.38	30.38	30.396	30.396		
(Havg)^0.5	1.4856936	1.46605629	1.51095943	1.48873171	1.49118973	1.46883424		
Run Time, Min	60	60	60	60	60	60		
Calculated Gamma (Yqa)	1.015	1.081	1.008	1.070	1.014	1.047	1.012	1.066
Meter Gamma	0.975	1.014	0.975	1.014	0.975	1.014	0.975	1.014
% difference from Actual Y	4.1%	6.6%	3.3%	5.6%	4.0%	3.3%	3.8%	5.1%

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 STANDARD

Part Number:	E04NI77E15A3796	Reference Number:	122-402389886-1A
Cylinder Number:	CC194988	Cylinder Volume:	151.0 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22022	Valve Outlet:	590
Gas Code:	CO,CO2,O2,BALN	Certification Date:	Mar 30, 2022

Expiration Date: Mar 30, 2030

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 MONOXIDE	65.00 PPM	63.33 PPM	G1	+/- 0.7% NIST Traceable	03/30/2022
CARBON DIOXIDE	10.00 %	10.16 %	G1	+/- 0.8% NIST Traceable	03/29/2022
OXYGEN	12.00 %	11.95 %	G1	+/- 0.4% NIST Traceable	03/29/2022
NITROGEN	Balance				

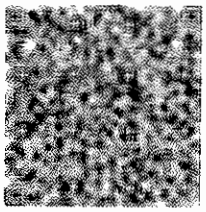
CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09010213	KAL004779	98.48 PPM CARBON MONOXIDE/NITROGEN	+/- 0.5%	Oct 16, 2024
NTRM	19060402	6162642Y	11.105 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Dec 04, 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)	Mar 01, 2022
Horiba VIA510 CO 1G46EA07	Nondispersive Infrared (NDIR)	Mar 09, 2022
Siemens Oxymat 61 M3299 O2	Paramagnetic	Mar 01, 2022

Triad Data Available Upon Request



Approved for Release

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Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E04NI59E15A38X3	Reference Number:	122-124583867-1
Cylinder Number:	CC427971	Cylinder Volume:	158.2 CF
Laboratory:	124 - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22016	Valve Outlet:	590
Gas Code:	CO,CO2,O2,BALN	Certification Date:	Oct 25, 2016

Expiration Date: Oct 25, 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 volume/volume 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 MONOXIDE	120.0 PPM	119.3 PPM	G1	+/- 0.6% NIST Traceable	10/25/2016
CARBON DIOXIDE	18.00 %	18.18 %	G1	+/- 0.6% NIST Traceable	10/25/2016
OXYGEN	22.00 %	22.06 %	G1	+/- 0.3% NIST Traceable	10/25/2016
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	14060333	CC432495	252.5 PPM CARBON MONOXIDE/NITROGEN	+/- 0.3%	Feb 21, 2020
NTRM	12061551	CC354889	19.87 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 27, 2018
NTRM	12062003	CC367399	22.883 % OXYGEN/NITROGEN	+/- 0.2%	Apr 24, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA510 CO2 2L6YXWY0	Nondispersive Infrared (NDIR)	Oct 13, 2016
Horiba VIA510 CO RS2EGL6K	Nondispersive Infrared (NDIR)	Oct 13, 2016
Horiba MPA510 O2 41499150042	Paramagnetic	Oct 13, 2016

Triad Data Available Upon Request

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Airgas Specialty Gases
Airgas USA LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Part Number:	X02NI99C15A54F5	Reference Number:	122-402705571-1
Cylinder Number:	CC426155	Cylinder Volume:	144.0 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
Analysis Date:	Mar 28, 2023	Valve Outlet:	350
Lot Number:	122-402705571-1		

Expiration Date: Mar 28, 2031

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
ETHYLENE	75.00 PPM	75.47 PPM	+/- 2%
NITROGEN	Balance		

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CERTIFICATE OF ACCURACY: *GMACS-c Calibration Standard*

SAY LABORATORY

AIRGAS SPECIALTY GASES
Exploratory Products Group
6141 Easton Road
Plumsteadville, PA 18949

Work Order #: 160-402845895-1
Sales Order #: 1123601913
PO #: 7100179560

CUSTOMER INFORMATION

Customer: DEECO Inc.
Address 1: 3404 Lake Woodard Road
Address 2:
City / State / Zip: Raleigh, NC 27604

PRODUCT INFORMATION

COMPOSITION	CONCENTRATION	UNCERTAINTY (Abs)	UNCERTAINTY (Rel)
Hydrogen Cyanide	199.1 PPM	5.7 PPM	2.9 %
Sulfur Hexafluoride	10.0 PPM	0.07 PPM	0.7 %
Nitrogen	Balance		

CYLINDER #: CC768233
CYLINDER TYPE: 150A Aluminum
CGA: 350 SS
CYLINDER PRESSURE: 2000 psig

AIRGAS PART #: X03NI99C15AC0Y6
CERTIFICATION DATE: 8-Sep-2023
EXPIRATION DATE: 8-Mar-2024
MIXTURE DEW POINT: N/A

CERTIFICATION DATA

BLENDING PROCESS: GravStat™ Gravimetry

COMPONENT	CONCENTRATION	UNCERTAINTY (Abs)	UNCERTAINTY (Rel)
Hydrogen Cyanide	200.40 PPM	3.0 PPM	1.5 %
lfur Hexafluoride	10.01 PPM	0.07 PPM	0.7 %

CONFIRMING ANALYSIS: FTIR Spectroscopy
INSTRUMENT / MODEL: CAI Model 700 FTIR

COMPONENT	CONCENTRATION	UNCERTAINTY (Abs)	UNCERTAINTY (Rel)
Hydrogen Cyanide	197.9 PPM	4.9 PPM	2.5 %

REFERENCE STANDARD: GMPS-c 200 PPM Hydrogen Cyanide
CYLINDER NUMBER: CC768217
EXPIRATION DATE: 2/27/2024

COMPONENT	CONCENTRATION	UNCERTAINTY (Abs)	UNCERTAINTY (Rel)
Hydrogen Cyanide	197.1 PPM	4.8 PPM	2.4 %

CALIBRATION CURVE DATA	Curve Order	Correlation	Slope (X2)	Slope (X)	Intercept
Point-to-Point Matching Std	Linear / Direct Ratio	N/A	N/A	N/A	N/A

INTERLOCK STATISTICS

	CONCENTRATION	UNCERTAINTY (Abs)	UNCERTAINTY (Rel)
BLEND RESULT:	200.40 PPM	3.0 PPM	1.5 %
ANALYSIS RESULT:	197.9 PPM	4.9 PPM	2.5 %
INTERLOCK RESULT:	199.1 PPM	5.7 PPM	2.9 %

COMMENTS / SPECIAL INSTRUCTIONS

1. A GMACS-c ("Candidate GMACS") is made and certified according to the EPA GMACS Procedure (Alt-114) found at: https://cfpub.epa.gov
2. Do not use this standard if pressure is less than 200 psig.
3. Do not use or store this product at or below the stated dew point.

APPROVED BY: _____ BOB GRASMEDER

Airgas
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CERTIFICATE OF ACCURACY: *GMACS-c Calibration Standard*

SAY LABORATORY

AIRGAS SPECIALTY GASES
Exploratory Products Group
6141 Easton Road
Plumsteadville, PA 18949

Work Order #: 160-402845897-1
Sales Order #: 1123601913
PO #: 7100179560

CUSTOMER INFORMATION

Customer: DEECO Inc.
Address 1: 3404 Lake Woodard Road
Address 2:
City / State / Zip: Raleigh, NC 27604

PRODUCT INFORMATION

COMPOSITION	CONCENTRATION	UNCERTAINTY (Abs)	UNCERTAINTY (Rel)
Hydrogen Cyanide	49.9 PPM	2.3 PPM	4.6 %
Sulfur Hexafluoride	5.0 PPM	0.07 PPM	1.3 %
Nitrogen	Balance		

CYLINDER #:	CC768222	AIRGAS PART #:	X03NI99C15AC0W8
CYLINDER TYPE:	150A Aluminum	CERTIFICATION DATE:	7-Sep-2023
CGA:	350 SS	EXPIRATION DATE:	7-Mar-2024
CYLINDER PRESSURE:	2000 psig	MIXTURE DEW POINT:	N/A

CERTIFICATION DATA

BLENDING PROCESS: GravStat™ Gravimetry

COMPONENT	CONCENTRATION	UNCERTAINTY (Abs)	UNCERTAINTY (Rel)
Hydrogen Cyanide	50.02 PPM	0.9 PPM	1.8 %
lfur Hexafluoride	5.02 PPM	0.07 PPM	1.3 %

CONFIRMING ANALYSIS: FTIR Spectroscopy
INSTRUMENT / MODEL: CAI Model 700 FTIR

COMPONENT	CONCENTRATION	UNCERTAINTY (Abs)	UNCERTAINTY (Rel)
Hydrogen Cyanide	49.8 PPM	2.1 PPM	4.2 %

REFERENCE STANDARD: GMPS-c 50 PPM Hydrogen Cyanide
CYLINDER NUMBER: CC768196
EXPIRATION DATE: 2/29/2024

COMPONENT	CONCENTRATION	UNCERTAINTY (Abs)	UNCERTAINTY (Rel)
Hydrogen Cyanide	48.9 PPM	1.7 PPM	3.4 %

CALIBRATION CURVE DATA	Curve Order	Correlation	Slope (X2)	Slope (X)	Intercept
Point-to-Point Matching Std	Linear / Direct Ratio	N/A	N/A	N/A	N/A

INTERLOCK STATISTICS

	CONCENTRATION	UNCERTAINTY (Abs)	UNCERTAINTY (Rel)
BLEND RESULT:	50.02 PPM	0.9 PPM	1.8 %
ANALYSIS RESULT:	49.8 PPM	2.1 PPM	4.2 %
INTERLOCK RESULT:	49.9 PPM	2.3 PPM	4.6 %

COMMENTS / SPECIAL INSTRUCTIONS

A GMACS-c ("Candidate GMACS") is made and certified according to the EPA GMACS Procedure (Alt-114) found at: https://cfpub.epa.gov

2. Do not use this standard if pressure is less than 200 psig.

3. Do not use or store this product at or below the stated dew point.

APPROVED BY: _____ BOB GRASMEDER

Client: Holcim Midlothian
Test Location: Line 1 Main Stack Stratification Check
Date: Nov 15 23 Start Time: 09:00:18
Run number 1
One Minute Averages

	Reference Out O2 %,wet	Plant Out O2 %,wet
9:01:16 AM	12.6	11.6
9:02:16 AM	12.7	11.6
9:03:16 AM	12.7	11.6
9:04:16 AM	12.6	11.6
9:05:16 AM	12.7	11.6
9:06:16 AM	12.7	11.6
Point 1	12.7	11.6
9:07:16 AM	12.6	11.6
9:08:16 AM	12.7	11.5
9:09:16 AM	12.6	11.5
9:10:16 AM	12.7	11.4
9:11:16 AM	12.7	11.5
9:12:16 AM	12.6	11.5
Point 2	12.6	11.5
9:13:16 AM	12.6	11.4
9:14:16 AM	12.6	11.4
9:15:16 AM	12.6	11.5
9:16:16 AM	12.6	11.5
9:17:16 AM	12.6	11.4
9:18:16 AM	12.7	11.5
Point 3	12.6	11.4
All Points	12.6	11.5

Run #	Date/Time	O2_RAW (PCT)
RM On 1	11/15/2023 9:00	11.60
	11/15/2023 9:01	11.60
	11/15/2023 9:02	11.60
	11/15/2023 9:03	11.60
	11/15/2023 9:04	11.60
	11/15/2023 9:05	11.60
		11.60
	11/15/2023 9:06	11.55
	11/15/2023 9:07	11.50
	11/15/2023 9:08	11.47
	11/15/2023 9:09	11.40
	11/15/2023 9:10	11.50
	11/15/2023 9:11	11.45
		11.48
	11/15/2023 9:12	11.40
	11/15/2023 9:13	11.40
	11/15/2023 9:14	11.47
	11/15/2023 9:15	11.50
	11/15/2023 9:16	11.40
	11/15/2023 9:17	11.48
		11.44

Client: Holcim Midlothian
Test Location: Line 2 Main Stack Stratification Check
Date: Nov 16 23 Start Time: 14:20:22
Run number 1
One Minute Averages

	Reference Out O2 %,wet	Plant Out O2 %,wet
2:21:20 PM	11.0	9.9
2:22:20 PM	11.0	9.9
2:23:20 PM	10.9	9.8
2:24:20 PM	10.9	9.8
2:25:20 PM	10.9	9.8
2:26:20 PM	10.8	9.7
Point 1	10.9	9.8
2:27:20 PM	10.9	9.7
2:28:20 PM	10.9	9.8
2:29:20 PM	10.9	9.8
2:30:20 PM	10.9	9.8
2:31:20 PM	10.9	9.8
2:32:20 PM	10.9	9.8
Point 2	10.9	9.8
2:33:20 PM	10.9	9.8
2:34:20 PM	10.9	9.8
2:35:20 PM	10.8	9.7
2:36:20 PM	10.8	9.6
2:37:20 PM	10.8	9.6
2:38:20 PM	10.8	9.7
Point 3	10.8	9.7
All Points	10.9	9.8

Run #	Date/Time	O2_RAW (PCT)
RM Off 1	11/16/2023 14:20	9.9
	11/16/2023 14:21	9.9
	11/16/2023 14:22	9.8
	11/16/2023 14:23	9.8
	11/16/2023 14:24	9.8
	11/16/2023 14:25	9.7
		9.8
	11/16/2023 14:26	9.7
	11/16/2023 14:27	9.8
	11/16/2023 14:28	9.8
	11/16/2023 14:29	9.8
	11/16/2023 14:30	9.8
	11/16/2023 14:31	9.8
		9.8
	11/16/2023 14:32	9.8
	11/16/2023 14:33	9.8
	11/16/2023 14:34	9.7
	11/16/2023 14:35	9.6
	11/16/2023 14:36	9.6
	11/16/2023 14:37	9.7
		9.7

Holcim Midlothian TX
Line 1 Main Stack
Pretest

Spectrum	Date	Time	HCN PCA 191c R1 191c	SF6 (10) 191C	Ethylene (100,3000) 191C	HF ppm (10) 191C	SNR 2500	sBeam @ 2500
SPC__000830BKG.LAB	11/14/23	06:57:22.688	0.000	0.000	0.000	0.000	NaN	1.41
SPC__000831.LAB	11/14/23	06:58:33.020	-0.004	-0.001	-0.037	0.011	6779.16	1.42
SPC__000832BKG.LAB	11/14/23	07:01:13.650	0.000	0.000	0.000	0.000	5353.34	1.42
SPC__000833.LAB	11/14/23	07:02:24.028	-0.064	0.003	-0.062	0.018	5553.53	1.42
SPC__000834.LAB	11/14/23	07:03:28.036	-0.154	-0.000	0.013	0.007	4837.84	1.42
SPC__000835.LAB	11/14/23	07:04:32.104	0.035	0.001	-0.014	0.003	5479.59	1.42
SPC__000836BKG.LAB	11/14/23	07:07:39.052	0.000	0.000	0.000	0.000	5734.58	1.42
SPC__000837.LAB	11/14/23	07:08:49.639	-0.051	-0.001	-0.019	-0.002	6223.51	1.42
SPC__000838.LAB	11/14/23	07:09:53.338	-0.032	-0.003	0.027	-0.000	5809.30	1.42
SPC__000839.LAB	11/14/23	07:10:57.234	0.046	-0.000	-0.014	-0.017	3759.60	1.42
SPC__000840.LAB	11/14/23	07:12:01.138	-0.011	-0.001	-0.102	0.016	4373.66	1.42
SPC__000841.LAB	11/14/23	07:13:05.164	0.080	-0.001	-0.068	0.002	5347.95	1.42
SPC__000842.LAB	11/14/23	07:14:08.941	0.059	-0.001	-0.051	-0.012	5012.46	1.42
SPC__000843.LAB	11/14/23	07:15:12.843	-0.029	-0.002	-0.084	-0.006	4706.13	1.42
	Standard Deviation x 3		**0.156**			**0.032**		
	Averages						**5033.23**	**1.42**
SPC__000844.LAB	11/14/23	07:16:16.794	-0.021	-0.000	-0.077	-0.004	6290.82	1.42
SPC__000845.LAB	11/14/23	07:17:20.692	-0.021	-0.003	-0.037	-0.004	5389.04	1.42
SPC__000846.LAB	11/14/23	07:18:24.552	0.032	-0.002	-0.038	0.008	4608.29	1.42
SPC__000847.LAB	11/14/23	07:19:28.498	-0.103	-0.000	-0.020	0.146	2080.90	1.43
SPC__000848.LAB	11/14/23	07:20:32.403	0.008	-0.001	-0.030	0.183	4977.24	1.43
SPC__000849.LAB	11/14/23	07:21:36.307	0.024	-0.000	-0.049	0.176	5158.81	1.43
SPC__000850.LAB	11/14/23	07:22:40.172	0.035	-0.000	0.044	0.166	4584.91	1.43
SPC__000851.LAB	11/14/23	07:23:44.070	0.009	-0.002	-0.013	0.168	5909.94	1.43
SPC__000852.LAB	11/14/23	07:24:47.972	-0.067	-0.001	-0.038	0.134	5322.62	1.43
SPC__000853.LAB	11/14/23	07:25:51.884	-0.076	-0.001	0.026	0.133	5540.25	1.43
SPC__000854.LAB	11/14/23	07:26:55.782	-0.001	-0.001	-0.091	0.131	4881.68	1.44
SPC__000855.LAB	11/14/23	07:27:59.687	-0.132	-0.005	7.468	0.085	4631.16	1.44
SPC__000856.LAB	11/14/23	07:29:03.632	-0.142	-0.015	73.818	-0.003	2487.00	1.43
SPC__000857.LAB	11/14/23	07:30:07.496	-0.062	-0.018	74.279	0.001	5889.41	1.44
SPC__000858.LAB	11/14/23	07:31:11.532	0.002	-0.015	74.370	-0.008	4902.75	1.44
SPC__000859.LAB	11/14/23	07:32:15.429	-0.091	-0.016	74.324	-0.009	4849.05	1.44
Ethylene Calibration Transfer Standard (CC426155; 75.47 ppm)					**74.347**			
SPC__000860.LAB	11/14/23	07:33:19.559	31.836	1.437	60.617	-0.009	4168.31	1.44
SPC__000861.LAB	11/14/23	07:34:23.304	195.710	9.574	-0.380	-0.007	5189.57	1.44
SPC__000862.LAB	11/14/23	07:35:27.022	197.438	9.591	-0.600	-0.007	5751.27	1.44
SPC__000863.LAB	11/14/23	07:36:30.920	198.229	9.604	-0.593	-0.017	4465.20	1.44
SPC__000864.LAB	11/14/23	07:37:34.823	198.420	9.612	-0.633	-0.015	4680.81	1.44
SPC__000865.LAB	11/14/23	07:38:38.735	198.660	9.607	-0.658	-0.014	5762.01	1.44
SPC__000866.LAB	11/14/23	07:39:42.746	197.517	9.607	-0.716	-0.009	6188.63	1.44
HCN Standard (CC768233; 199.1 ppm HCN/10.0 ppm SF6)			**198.206**	**9.607**				
SPC__000867.LAB	11/14/23	07:40:46.540	196.505	9.583	-0.770	-0.010	6366.58	1.45
SPC__000868.LAB	11/14/23	07:41:50.451	195.447	9.568	-0.702	-0.017	5378.22	1.45
SPC__000869.LAB	11/14/23	07:42:54.353	194.795	9.553	-0.591	-0.019	4306.69	1.45
SPC__000870.LAB	11/14/23	07:43:58.396	94.284	6.180	0.480	-0.011	4883.53	1.45
SPC__000871.LAB	11/14/23	07:45:02.215	49.766	4.874	-0.443	-0.009	4772.89	1.45
SPC__000872.LAB	11/14/23	07:46:06.113	49.731	4.868	-0.442	-0.014	5065.20	1.46
SPC__000873.LAB	11/14/23	07:47:09.981	49.829	4.863	-0.380	-0.005	6907.94	1.46
SPC__000874.LAB	11/14/23	07:48:13.893	49.908	4.862	-0.391	-0.016	5781.74	1.46
SPC__000875.LAB	11/14/23	07:49:18.003	49.854	4.858	-0.423	-0.020	5412.05	1.46
SPC__000876.LAB	11/14/23	07:50:21.705	49.896	4.862	-0.380	-0.004	6539.68	1.46
HCN Standard (CC768222; 49.9 ppm HCN/5.0 ppm SF6)			**49.872**	**4.861**				

Analysis Validation Report

Sample Filename: F:\Midlothian on Rental\November 15\SPC__001501.LAB

Filename for noise: F:\Midlothian on Rental\November 14\SPC__000837.LAB
Interferences Filenames: C:\Midlothian on Rental\November 15\SPC__001463.LAB
C:\Midlothian on Rental\November 15\SPC__001464.LAB
C:\Midlothian on Rental\November 15\SPC__001465.LAB
C:\Midlothian on Rental\November 15\SPC__001466.LAB
C:\Midlothian on Rental\November 15\SPC__001467.LAB
C:\Midlothian on Rental\November 15\SPC__001468.LAB
C:\Midlothian on Rental\November 15\SPC__001469.LAB
C:\Midlothian on Rental\November 15\SPC__001470.LAB

Recipe path: C:\OLT\recipes\Cement Testing R3.MGRCP

Gas calibration Name	Conc	MDC3	MDC2	MDC1	MAU	FMU*R	OCU	~ DL	~ CL	~ Bias	Sigma	Range	Span	Comment
HCN (200) PCA 191C 191C	22.26	0.52	-	0.28	0.34	0.62	0.62	-	0.45	-	-	0-200	-	Good
SF6 (10) 191C	-0.01	0.01	-	0	0	0.02	0.02	-	0.01	-	-	0-10	-	Close to DL
HCL PPM (100) 191C	1.24	0.4	0.05	0.15	0.28	0.72	0.72	0.06	0.23	0.01	0.02	0-100	-	Check it!
SO2 (1000) 191C	40.76	0.88	0.37	0.14	0.27	1.67	1.67	0.79	1.13	0.42	0.12	0-1000	-	Good
NO (350,3000) 191C	57.62	4.92	0.22	0.26	0.35	6.69	6.69	0.45	3.19	0.23	0.07	0-3000	-	Good
NO2 (150) 191C (1OF2)	-0.64	0.42	0.04	0.02	0.03	0.45	0.45	0.05	0.38	0.01	0.01	0-150	-	Check it!
NO2 (2000) 191C (2OF2)	-0.41	4.22	2.03	0.88	1.12	5.37	5.37	3.81	3.81	1.78	0.68	0-2000	-	Close to DL
N2O (100,200,300) 191C	1.59	0.2	0.05	0.04	0.05	0.23	0.23	0.07	0.12	0.02	0.02	0-300	-	Good
NH3 (300) 191C (1OF2)	0.38	1.02	0.03	0.12	0.2	1.73	1.73	0.15	0.9	0.11	0.01	0-300	-	Check it!
NH3 (3000) 191C (2OF2)	3.13	14.22	0.35	1.19	2.25	26.82	26.82	0.44	13.16	0.09	0.12	0-3000	-	Close to DL
CO (500) 191C (1OF2)	492.07	15.9	-	0.2	0.43	30.18	30.18	-	9.89	-	-	0-500	-	Good
CO% (1) 191C (2OF2)	0.04	0	0	0	0	0	0	0	0	0	0	0-1	-	Good
H2O% (40) 191C	14.99	0.13	-	0.01	0.02	0.25	0.25	-	0.3	-	-	0-40	-	Good
CO2% (40) 191C	7.22	0.21	-	0.01	0.02	0.29	0.29	-	0.14	-	-	0-40	-	Good
CH4 (250) 191C (1OF2)	7.81	1.09	0.05	0.26	0.7	2.88	2.88	0.06	0.62	0.01	0.02	0-250	-	Good
CH4 (3000) 191C (2OF2)	8.5	6.62	0.34	1.1	1.81	10.91	10.91	0.61	5.32	0.27	0.11	0-3000	-	Check it!
FORMALDEHYDE (70) 191C	3.5	0.58	0.28	0.2	0.24	0.7	0.7	0.33	0.33	0.04	0.09	0-70	-	Good
ACETALDEHYDE (1000) 191C	2.81	1.41	0.23	0.35	0.38	1.53	1.53	0.59	0.98	0.35	0.08	0-1000	-	Check it!
ACETYLENE (1000) 191C	0.89	2.14	0.15	0.31	0.37	2.59	2.59	0.21	1.83	0.06	0.05	0-1000	-	Close to DL
PROPANE (100) 191C	2.84	0.82	0.42	0.12	0.14	0.98	0.98	0.72	0.72	0.3	0.14	0-100	-	Close to DL
PROPYLENE (200,1000) 191C	1.74	3.32	0.19	0.43	0.5	3.9	3.9	0.49	2.86	0.3	0.06	0-1000	-	Close to DL
ETHYLENE (100,3000) 191C	6.19	1.39	0.33	0.17	0.29	2.43	2.43	1.08	1.08	0.75	0.11	0-3000	-	Check it!
HF PPM (10) 191C	0.21	0.19	0.05	0.04	0.07	0.34	0.34	0.07	0.15	0.02	0.02	0-10	-	Close to DL
COS (100) 150C	2.21	0.19	0.02	0.02	0.02	0.26	0.26	0.02	0.12	0	0.01	0-100	-	Good
ETHANE (500) 191C	1.51	1.32	0.32	0.2	0.22	1.48	1.48	0.54	1.09	0.22	0.11	0-500	-	Close to DL
H2SO4 (50) 150C	-0.11	0.13	0.04	0.05	0.05	0.15	0.15	0.29	0.29	0.25	0.01	0-50	-	Close to DL
HBR (100) 180C	-0.33	3.96	0.17	0.68	1.39	8.05	8.05	0.19	3.3	0.02	0.06	0-100	-	Close to DL
MEOH (10) 191C	1.18	0.39	0.14	0.14	0.16	0.44	0.44	0.17	0.23	0.03	0.05	0-10	-	Close to DL
SO3 (150) 191C	2.18	0.31	0.7	0.03	0.04	0.34	0.34	1.14	1.14	0.44	0.23	0-150	-	Close to DL

Analysis Validation Report

Sample Filename: F:\Midlothian on Rental\November 15\SPC__001502.LAB

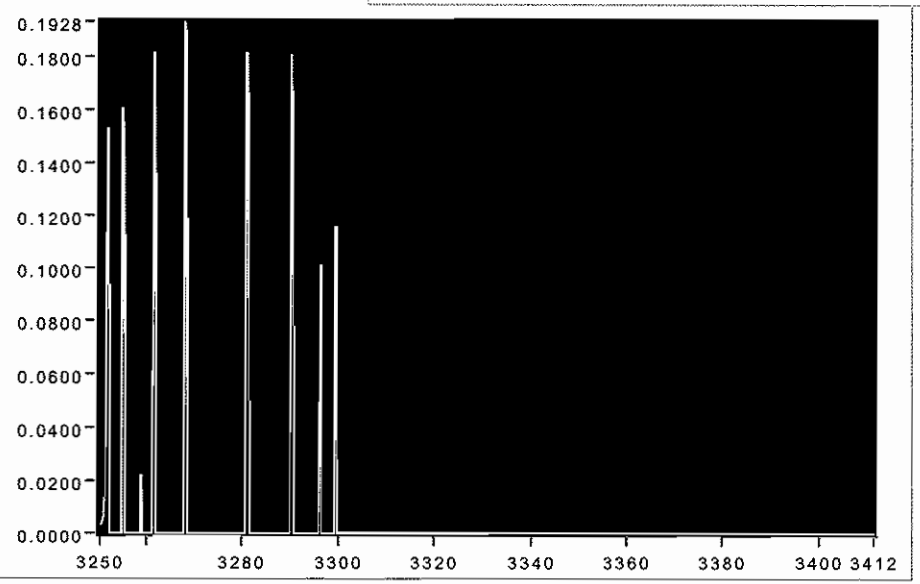
Filename for noise: F:\Midlothian on Rental\November 14\SPC__000837.LAB
Interferences Filenames: C:\Midlothian on Rental\November 15\SPC__001463.LAB
C:\Midlothian on Rental\November 15\SPC__001464.LAB
C:\Midlothian on Rental\November 15\SPC__001465.LAB
C:\Midlothian on Rental\November 15\SPC__001466.LAB
C:\Midlothian on Rental\November 15\SPC__001467.LAB
C:\Midlothian on Rental\November 15\SPC__001468.LAB
C:\Midlothian on Rental\November 15\SPC__001469.LAB
C:\Midlothian on Rental\November 15\SPC__001470.LAB

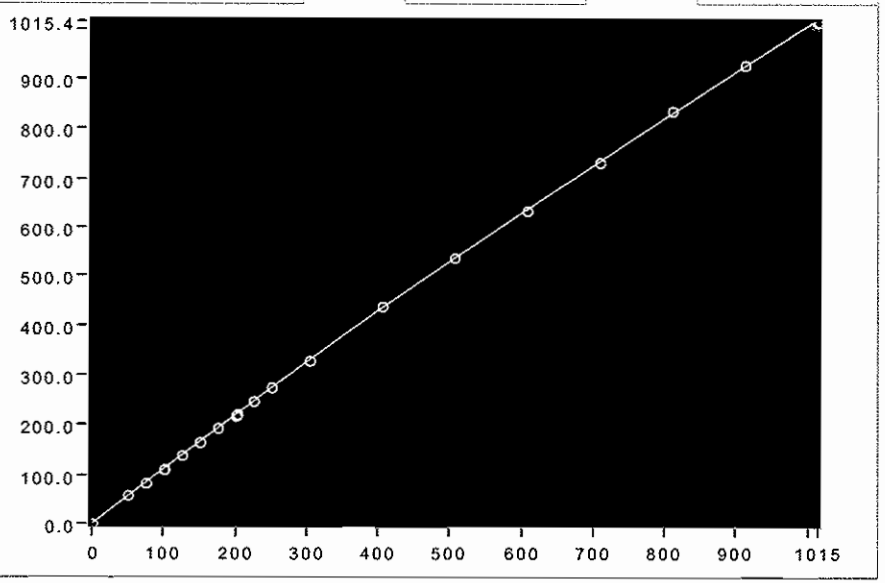
Recipe path: C:\OLT\recipes\Cement Testing R3.MGRCP

Gas calibration Name	Conc	MDC3	MDC2	MDC1	MAU	FMU*R	OCU	~ DL	~ CL	~ Bias	Sigma	Range	Span	Comment
HCN (200) PCA 191C 191C	21.12	0.45	-	0.28	0.34	0.54	0.54	-	0.42	-	-	0-200	-	Good
SF6 (10) 191C	0	0.01	-	0	0	0.02	0.02	-	0.01	-	-	0-10	-	Close to DL
HCL PPM (100) 191C	1.23	0.38	0.05	0.15	0.28	0.68	0.68	0.06	0.21	0.01	0.02	0-100	-	Check it!
SO2 (1000) 191C	39.23	0.88	0.37	0.14	0.27	1.68	1.68	0.79	1.11	0.42	0.12	0-1000	-	Good
NO (350,3000) 191C	54.66	5.45	0.22	0.26	0.35	7.41	7.41	0.45	3.76	0.23	0.07	0-3000	-	Good
NO2 (150) 191C (1OF2)	-0.76	0.46	0.04	0.02	0.03	0.49	0.49	0.05	0.42	0.01	0.01	0-150	-	Check it!
NO2 (2000) 191C (2OF2)	-0.89	4.25	2.03	0.88	1.12	5.41	5.41	3.81	3.81	1.78	0.68	0-2000	-	Close to DL
N2O (100,200,300) 191C	1.54	0.21	0.05	0.04	0.05	0.25	0.25	0.07	0.14	0.02	0.02	0-300	-	Good
NH3 (300) 191C (1OF2)	0.42	1.07	0.03	0.12	0.2	1.81	1.81	0.15	0.95	0.11	0.01	0-300	-	Check it!
NH3 (3000) 191C (2OF2)	3.83	15.77	0.35	1.19	2.25	29.74	29.74	0.44	14.68	0.09	0.12	0-3000	-	Check it!
CO (500) 191C (1OF2)	481.28	16.49	-	0.2	0.43	31.3	31.3	-	9.81	-	-	0-500	-	Good
CO% (1) 191C (2OF2)	0.04	0	0	0	0	0	0	0	0	0	0	0-1	-	Good
H2O% (40) 191C	16.95	0.15	-	0.01	0.02	0.28	0.28	-	0.34	-	-	0-40	-	Good
CO2% (40) 191C	7.16	0.2	-	0.01	0.02	0.28	0.28	-	0.14	-	-	0-40	-	Good
CH4 (250) 191C (1OF2)	7.83	1.13	0.05	0.26	0.7	3	3	0.06	0.67	0.01	0.02	0-250	-	Good
CH4 (3000) 191C (2OF2)	8.61	7.11	0.34	1.1	1.81	11.71	11.71	0.61	5.8	0.27	0.11	0-3000	-	Check it!
FORMALDEHYDE (70) 191C	3.32	0.59	0.28	0.2	0.24	0.72	0.72	0.33	0.33	0.04	0.09	0-70	-	Good
ACETALDEHYDE (1000) 191C	2.77	1.35	0.23	0.35	0.38	1.47	1.47	0.59	0.92	0.35	0.08	0-1000	-	Check it!
ACETYLENE (1000) 191C	0.85	2.21	0.15	0.31	0.37	2.67	2.67	0.21	1.89	0.06	0.05	0-1000	-	Close to DL
PROPANE (100) 191C	2.94	0.84	0.42	0.12	0.14	1.01	1.01	0.72	0.72	0.3	0.14	0-100	-	Close to DL
PROPYLENE (200,1000) 191C	1.67	3.48	0.19	0.43	0.5	4.08	4.08	0.49	3.02	0.3	0.06	0-1000	-	Close to DL
ETHYLENE (100,3000) 191C	6.05	1.49	0.33	0.17	0.29	2.59	2.59	1.08	1.16	0.75	0.11	0-3000	-	Check it!
HF PPM (10) 191C	0.23	0.17	0.05	0.04	0.07	0.31	0.31	0.07	0.14	0.02	0.02	0-10	-	Close to DL
COS (100) 150C	2.15	0.19	0.02	0.02	0.02	0.26	0.26	0.02	0.12	0	0.01	0-100	-	Good
ETHANE (500) 191C	1.57	1.37	0.32	0.2	0.22	1.53	1.53	0.54	1.13	0.22	0.11	0-500	-	Close to DL
H2SO4 (50) 150C	-0.11	0.13	0.04	0.05	0.05	0.14	0.14	0.29	0.29	0.25	0.01	0-50	-	Close to DL
HBR (100) 180C	-0.17	3.83	0.17	0.68	1.39	7.79	7.79	0.19	3.17	0.02	0.06	0-100	-	Close to DL
MEOH (10) 191C	1.24	0.41	0.14	0.14	0.16	0.47	0.47	0.17	0.25	0.03	0.05	0-10	-	Close to DL
SO3 (150) 191C	2.82	0.36	0.7	0.03	0.04	0.39	0.39	1.14	1.14	0.44	0.23	0-150	-	Close to DL

Calibration Generated	:08 PM 12/29/2023	Gas ID	HCN (200) PCA 191C 191c
		LRF Path	C:\OLT\Methods R3\Cement-coal-EGU method 191C\HCN (200) PCA 191C 191c_18.lrf

Lo Alarm	NaN	Span	Offse ,00000
Hi Alarm	NaN	Mutations	FALSE





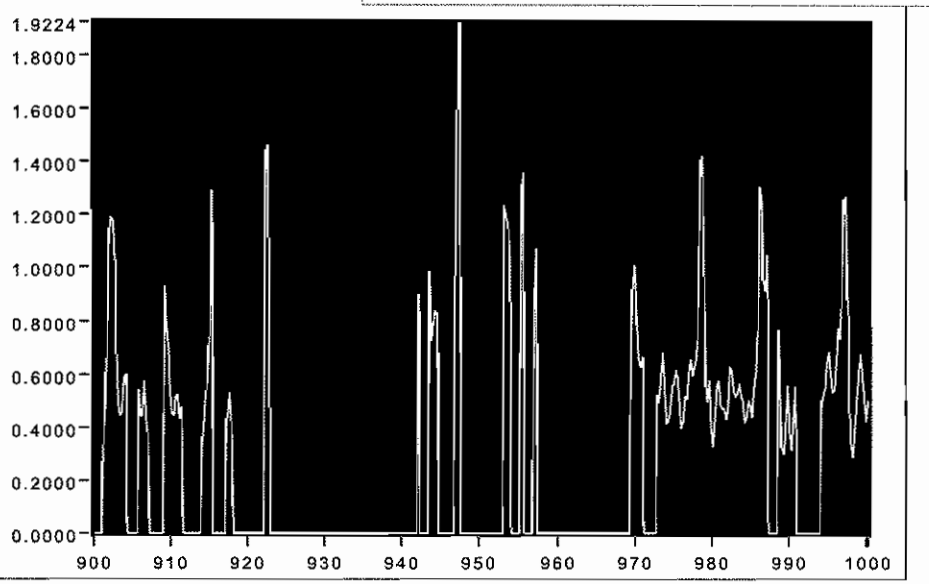
Cal Spectra	Temp (C)	Pres (atm)	Conc (ppm-m)	Actual	Calc'd
HCN (200) PCA 191C (9.86ppm, 5.11r	191.209	0.977	50.385	50.338	58.224
HCN (200) PCA 191C (14.79ppm, 5.11	191.194	0.977	75.577	75.505	82.698
HCN (200) PCA 191C (19.72ppm, 5.11	191.202	0.977	100.769	100.670	109.924
HCN (200) PCA 191C (19.87ppm, 5.11	191.196	0.978	101.536	101.566	110.865
HCN (200) PCA 191C (24.65ppm, 5.11	191.204	0.977	125.962	125.832	138.998
HCN (200) PCA 191C (29.58ppm, 5.11	191.209	0.977	151.154	150.999	165.056
HCN (200) PCA 191C (34.51ppm, 5.11	191.225	0.977	176.346	176.168	193.807
HCN (200) PCA 191C (39.44ppm, 5.11	191.217	0.977	201.538	201.349	218.561
HCN (200) PCA 191C (39.74ppm, 5.11	191.194	0.978	203.071	203.055	221.567
HCN (200) PCA 191C (44.37ppm, 5.11	191.203	0.977	226.731	226.500	246.999
HCN (200) PCA 191C (49.30ppm, 5.11	191.199	0.977	251.923	251.691	274.819
HCN (200) PCA 191C (59.61ppm, 5.11	191.221	0.978	304.607	304.577	328.275
HCN (200) PCA 191C (79.48ppm, 5.11	191.195	0.977	406.143	405.954	437.656
HCN (200) PCA 191C (99.35ppm, 5.11	191.258	0.977	507.679	507.181	537.974
HCN (200) PCA 191C (119.22ppm, 5.11	191.209	0.977	609.214	608.643	634.405
HCN (200) PCA 191C (139.09ppm, 5.11	191.246	0.977	710.750	709.953	733.320
HCN (200) PCA 191C (158.96ppm, 5.11	191.263	0.977	812.286	811.364	836.755
HCN (200) PCA 191C (178.83ppm, 5.11	191.221	0.977	913.821	913.339	928.309
HCN (200) PCA 191C (198.70ppm, 5.11	191.202	0.978	1015.357	1015.357	1015.357

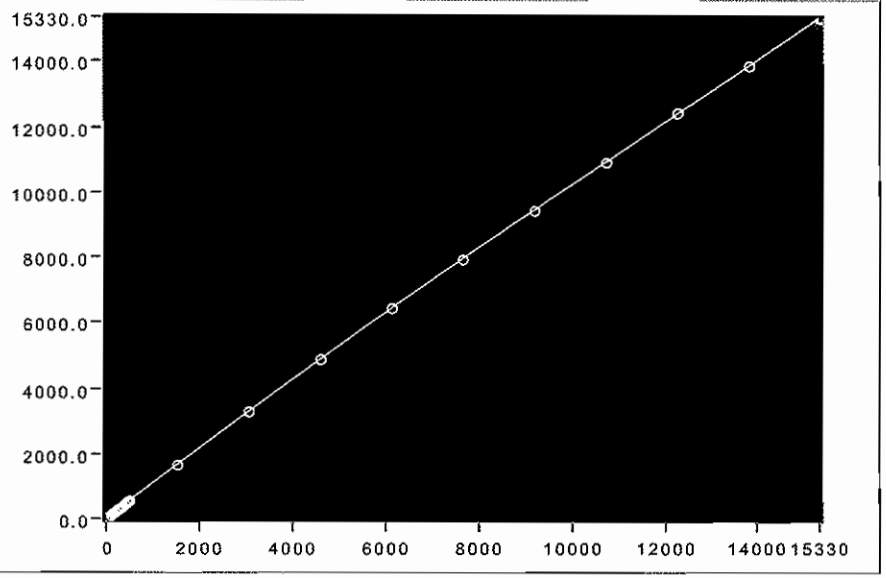
Interpolation: Quadratic — Force Through Zero: ☒

Min % Residuals: ☐ — Excl. Zero: ☐ — Quant w/ Highest: ☐

Spectral Regions
Region 00 - 3250.25 to 3411.52 cm-1
Region 01 - 593.01 to 840.34 cm-1
Region 02 - 1295.95 to 1518.21 cm-1
Region 03 - 2496.93 to 2901.43 cm-1
Region 04 - 3172.38 to 3250.01 cm-1
Region 05 - 3881.35 to 4113.97 cm-1

Calibration Generated	12:50 AM 11/30/2012	Gas ID	Ethylene (100,3000) 191C	Lo Alarm	NaN	Span	Offse. 000000
		LRF Path	C:\OLT\Methods R3\Cement-coal-EGU method 191C\Ethylene (100,3000) 191C_19.lrf	Hi Alarm	NaN	Mutations	FALSE





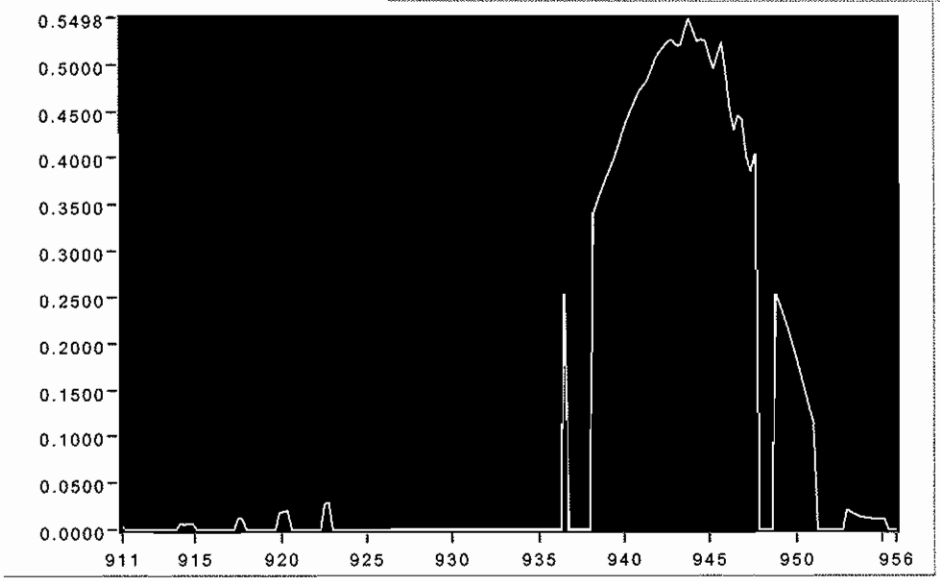
Cal Spectra	Temp (C)	Pres (atm)	Conc (ppm-m)	Actual	Calc'd
Ethylene (9.74ppm, 5.11m, 190C).lab	190.014	0.994	49.792	49.542	54.522
Ethylene (19.49ppm, 5.11m, 190C).lab	189.989	0.994	99.594	99.135	107.070
Ethylene (29.23ppm, 5.11m, 190C).lab	189.985	0.994	149.365	148.729	162.298
Ethylene (38.98ppm, 5.11m, 190C).lab	189.998	0.995	199.188	198.392	217.388
Ethylene (48.72ppm, 5.11m, 190C).lab	189.971	0.995	248.959	247.990	272.190
Ethylene (58.46ppm, 5.11m, 190C).lab	189.964	0.995	298.731	297.587	327.537
Ethylene (68.21ppm, 5.11m, 190C).lab	189.977	0.995	348.553	347.251	383.508
Ethylene (77.95ppm, 5.11m, 190C).lab	189.933	0.995	398.325	396.868	439.409
Ethylene (87.70ppm, 5.11m, 190C).lab	189.964	0.995	448.127	446.506	495.696
Ethylene (97.44ppm, 5.11m, 190C).lab	189.934	0.995	497.918	496.089	551.021
Ethylene (300.00ppm, 5.11m, 190C).la	189.942	0.997	1533.000	1531.357	1654.977
Ethylene (600.00ppm, 5.11m, 190C).la	189.991	0.998	3066.000	3063.066	3290.420
Ethylene (900.00ppm, 5.11m, 190C).la	189.934	0.998	4599.000	4597.015	4885.213
Ethylene (1200.00ppm, 5.11m, 190C).la	189.933	0.998	6132.000	6130.754	6446.341
Ethylene (1500.00ppm, 5.11m, 190C).la	189.960	0.998	7664.999	7658.046	7940.995
Ethylene (1800.00ppm, 5.11m, 190C).la	189.922	0.998	9197.999	9195.039	9445.204
Ethylene (2100.00ppm, 5.11m, 190C).la	189.971	0.998	10730.999	10728.462	10942.161
Ethylene (2400.00ppm, 5.11m, 190C).la	189.936	0.998	12263.999	12262.913	12444.229
Ethylene (2700.00ppm, 5.11m, 190C).la	189.914	0.998	13796.999	13797.629	13888.468

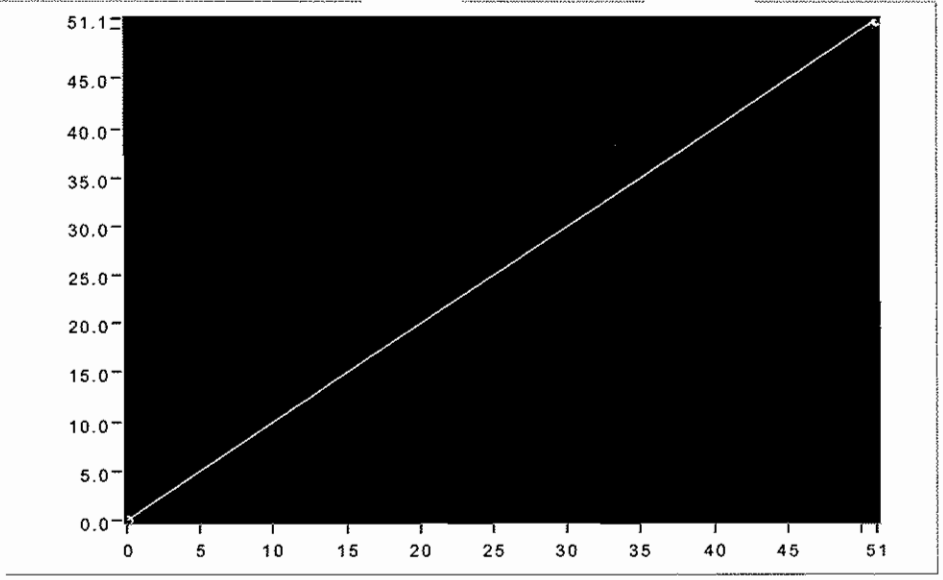
Interpolation: Quartic — Force Through Zero: ☒

Min % Residuals: ☒ Excl. Zero: ☐ Quant w/ Highest: ☐

Spectral Regions
Region 00 - 900.12 to 1000.16 cm-1
Region 01 - 615.91 to 899.88 cm-1
Region 02 - 1000.40 to 1211.33 cm-1
Region 03 - 1341.75 to 2117.96 cm-1
Region 04 - 2901.41 to 3286.87 cm-1

Calibration Generated	:34 PM 07/09/2012	Gas ID	SF6 (10) 191C	Lo Alarm	NaN	Span	Offse 00000
		LRF Path	C:\OLT\Methods R3\Cement-coal-EGU method 191C\SF6 (10) 191C_0.lrf	Hi Alarm	NaN	Mutations	FALSE





Cal Spectra	Temp (C)	Pres (atm)	Conc (ppm-m)	Actual	Calc'd
SF6 (10ppm, 5.11m, 191C) #1.LAB	191.504	1.008	51.100	51.100	51.100

Interpolation: Linear | Force Through Zero: ☒

Min % Residuals: ☒ | Excl. Zero: ☐ | Quant w/ Highest: ☐

Spectral Regions
Region 00 - 910.73 to 955.81 cm-1
Region 01 - 902.05 to 910.49 cm-1
Region 02 - 956.05 to 1004.99 cm-1

Appendix F

Test Participants

Scott Steinsberger	Project Manager and FTIR Operator
Lee Harris	Sample Recovery Technician
Gage Mayer	Sampling Technician
Michael Powell	Sampling Technician
Dan Carnes	Holcim Plant Contact

Appendix G

RTR Sampling and Analytical Protocol

DEECO Inc.
3404 Lake Woodard Road
Raleigh, NC 27604
(919) 250-0285 (ph); (919) 250-1835 (Fax) www.deeco.com

PROTOCOL TO PERFORM A SAMPLING AND ANALYTICAL TESTING PROGRAM AS PART OF THE US EPA RISK AND TECHNOLOGY REVIEW

at

Holcim Inc.
Midlothian Facility
1800 Dove Lane
Midlothian, TX 76065

Submitted By:
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Appendix A - Sampling and Analytical Methods

1.0 INTRODUCTION

1.1 SUMMARY OF TEST PROGRAM

The United States Environmental Protection Agency (US EPA) has directed the portland cement industry (SIC 3241) to conduct emissions testing as part of the US EPA Risk and Technology Review (RTR). This document provides the overall test program approach and specifies minimum sample collection procedures, data quality objectives, and quality assurance/quality control measures to be used by the source testing firms selected by the cement companies performing tests. The test program is designed to be a comprehensive and robust test of each facility. The quality assurance and quality control (QA/QC) measures are designed to produce standardized data having known precision and accuracy. Collection of accurate, representative, and standardized data for facilities with low emissions is necessary especially in view of MACT standard setting procedures.

Cement kiln pyro-processing systems located throughout the US will be included in this request. Individual facilities have a wide range of kiln system configurations and air pollution control (APC) trains. Site-specific considerations will be required to capture emissions profiles for the target analytes that represent the extent of control or possible emissions increases from these controls.

1.2 PLANT NAME, ADDRESS, AND CONTACT

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1800 Dove Lane
Midlothian, TX 76065

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1.3 PROCESS OF INTEREST

The processes to be tested at the Midlothian facility are two preheater/precalciner pyro-processing system, each with an inline raw mill, producing portland cement, referred to as Line 1 and Line 2.

1.4 AIR POLLUTION CONTROL EQUIPMENT

The air pollution control equipment for Line 1 consists of three control devices. A dry sorbent injection system utilizing lime is used to control acid gas emissions. Combined emissions from the clinker cooler and the kiln/raw mill and alkali bypass directed through respective fabric filters for particulate removal. The kiln/raw mill exiting the fabric filter is sent to a selective catalytic reduction (SCR) system for reducing organic emissions. Exhaust from the SCR and the alkali bypass are combined and sent to scrubber for final particulate removal and acid gas control before exhausting through the Line 1 Main Stack.

The air pollution control equipment for Line 2 consists of three control devices. A dry sorbent injection system utilizing lime is used to control acid gas emissions. Combined emissions from the clinker cooler and the kiln/raw mill and alkali bypass directed through respective fabric filters for

particulate removal. The kiln/raw mill exiting the fabric filter is sent to a regenerative thermal oxidizer (RTO) system for reducing organic emissions. Exhaust from the RTO and the alkali bypass are are combined and sent to scrubber for final particulate removal and acid gas control before exhausting through the Line 2 Main Stack.

1.5 EMISSION POINTS AND SAMPLING LOCATIONS

Sampling will be conducted on the Line 1 Main Stack and Line 2 Main Stack.

1.6 POLLUTANTS TO BE MEASURED

Emission testing will be conducted for hydrogen cyanide (HCN), hydrogen fluoride (HF), and diatomic chlorine (Cl_2). Concurrent measurements to determine volumetric flow rate will be made. The sampling and analytical procedures to be followed are discussed in detail in Section 4.

1.7 EXPECTED TEST DATES

Test dates are to be determined.

1.8 TEST PROGRAM ORGANIZATION

The test program organizational chart is presented in Figure 1.1.

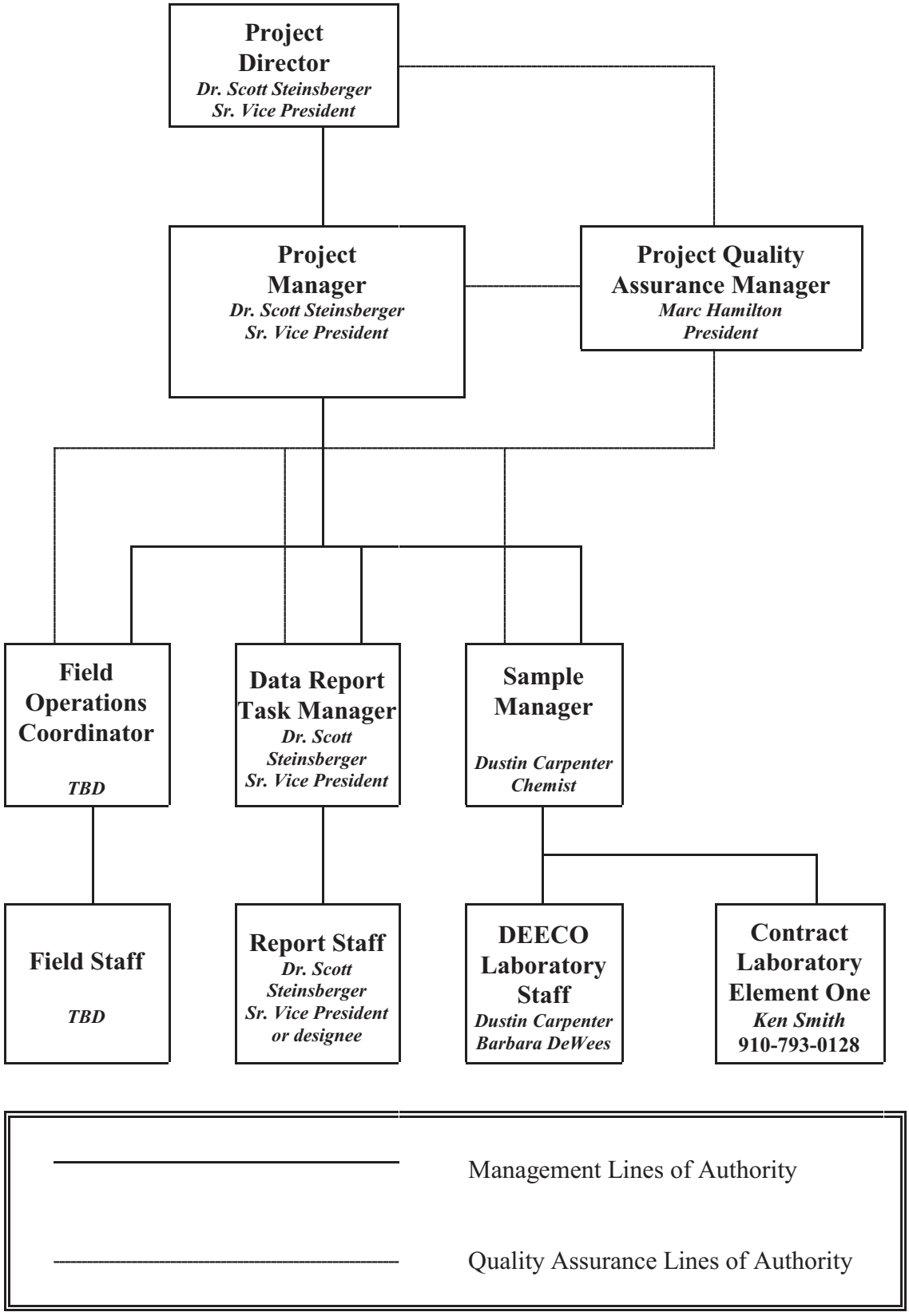


Figure 1.1 Organizational Chart

2.0 SOURCE DESCRIPTION

2.1 PROCESS DESCRIPTION

The Midlothian Plant's Portland cement manufacturing process involves raw materials acquisition and handling, kiln feed preparation, pyro-processing, and finished cement grinding and loading. The Midlothian Plant acquires calcareous raw material (i.e., limestone) by drilling and blasting in the quarry. The blasted material is fed to the primary and secondary crushers where it is processed down to three-inch or smaller product. Crushed raw materials are deposited into piles in the Raw Material Storage (RMS) building by an overhead multi-position tripper belt conveyor before entering the Raw Mill Feed Bins.

The Midlothian Plant processes shale brought on-site by delivery truck. The shale is unloaded and then moved to a stockpile inside the existing shale storage building. The shale is crushed, stored in the shale Storage Building No. 1 or 2, and then conveyed to the raw mill feed bins.

The roller mills (i.e., Line 1 and Line 2 Raw Mills) receive the crushed raw material and process it for the Midlothian Plant's pyro-processing systems. The raw mill product is carried by airstream into cyclones where over 90 percent of the material is separated from the airstream. The exhaust gases are vented through the main baghouse where the remainder of the product is captured. The product stream from the cyclones is transported to the blending silos. The product from the main baghouse may be sent to the blending silos or directly to a bin and metered to the kiln feed.

The blending silos, which operate in a continuous flow, serve both a mixing and storage function. The silos are discharged normally through flow control gates. The ground raw feed enters a calibration bin and discharged to the preheater feed or re-circulated back to the top of the silos.

Each of the Midlothian Plant's Line 1 and Line 2 pyro-processing systems consist of a four-stage preheated precalciner system (Emission Point Numbers [EPNs] 7 and 65). Both lines have a bypass system to control the quantity of alkali and sulfur since the nature of the raw materials requires that alkali and sulfur be removed to control the quality of the clinker. Water spray conditioning towers designed to cool gases are located in the duct between the presenters and the raw mills. When the mill systems are not operational, the spray towers protect the main bathhouses from high temperatures. The spray towers are not used when the mill systems are operational.

The presenters consist of four ”stages” (or cyclones) and a precalciner. The first three stages, or the preheating stage, heat the feed by mixing the cold feed with the hot kiln and precalciner exit gases. From the preheating stage, the preheated feed enters the precalciner where the calcium carbonate (limestone) is converted to lime and carbon dioxide gas. The calcined raw feed enters the kiln where raw materials are sintered and clinker produced. The clinker is cooled in reciprocating grate coolers (i.e. clinker coolers) by induced airflow. The air used to quench the clinker is hot and is reused in the kilns, precalciners, coal mills, raw mills, and partially re-circulated to various fans.

The Midlothian Plant receives coal by railcar. The coal is piled, sized, and then placed in silos. The coal then enters the coal mills where heat for drying is supplied by the hot vent air from the clinker cooler. From the coal mill, the coal is conveyed to the kilns for combustion.

Clinker from the clinker silos and acquired gypsum are fed to three finish mill systems. The finish mill systems grind the clinker and additive to produce finish cement. The mills cool the finish cement by mill venting and water spraying. The finish cement is discharged to O-Sepa separators

where properly sized product is transported by air stream to a dust collector. The tailings from the separator are reintroduced into the mills for further grinding. The dust collector product is conveyed to the cement silos. The cement is transported from the silos to various loading stations for transportation from the plant.

2.2 CONTROL EQUIPMENT DESCRIPTION

The air pollution control equipment for Line 1 consists of three control devices. A dry sorbent injection system utilizing lime is used to control acid gas emissions. Combined emissions from the clinker cooler and the kiln/raw mill and alkali bypass directed through respective fabric filters for particulate removal. The kiln/raw mill exiting the fabric filter is sent to a selective catalytic reduction (SCR) system for reducing organic emissions. Exhaust from the SCR and the alkali bypass are combined and sent to scrubber for final particulate removal and acid gas control before exhausting through the Line 1 Main Stack.

A schematic of the Line 1 process, including control equipment is shown below in Figure 2.1.

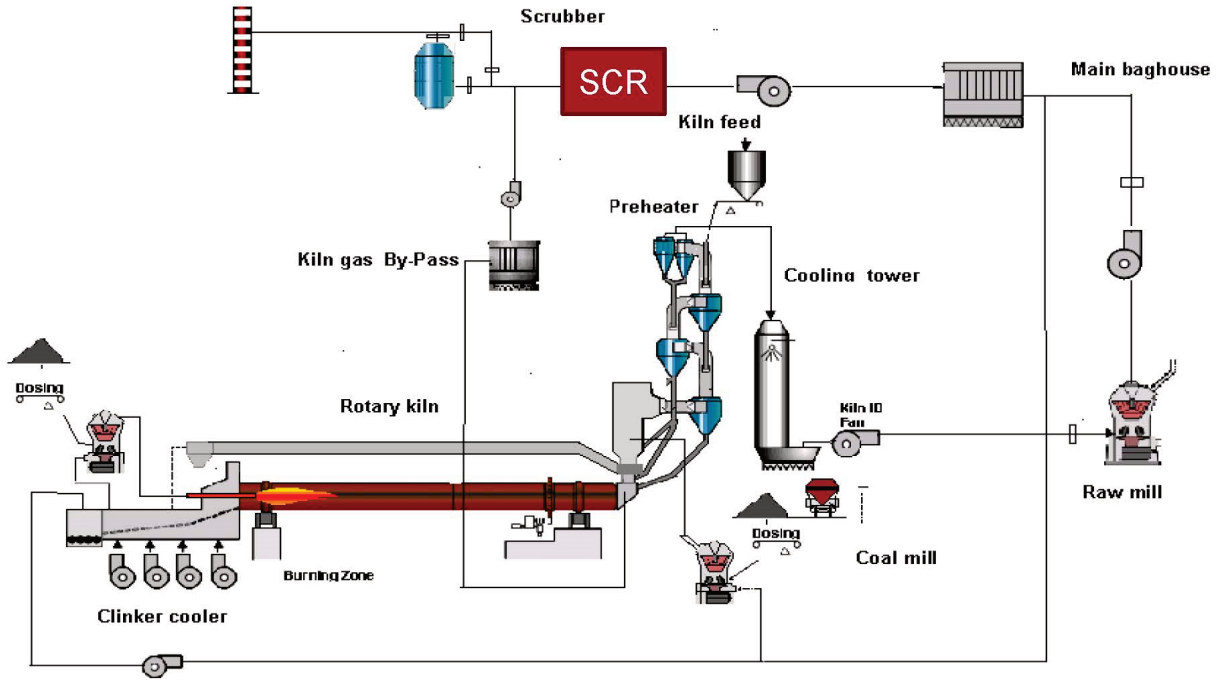


Figure 2.1 Midlothian Line 1 Detailed Process Schematic

The air pollution control equipment for Line 2 consists of three control devices. A dry sorbent injection system utilizing lime is used to control acid gas emissions. Combined emissions from the clinker cooler and the kiln/raw mill and alkali bypass directed through respective fabric filters for particulate removal. The kiln/raw mill exiting the fabric filter is sent to a regenerative thermal oxidizer (RTO) system for reducing organic emissions. Exhaust from the RTO and the alkali bypass are are combined and sent to scrubber for final particulate removal and acid gas control before exhausting through the Line 2 Main Stack.

A schematic of the Line 2 process, including control equipment is shown below in Figure 2.2.

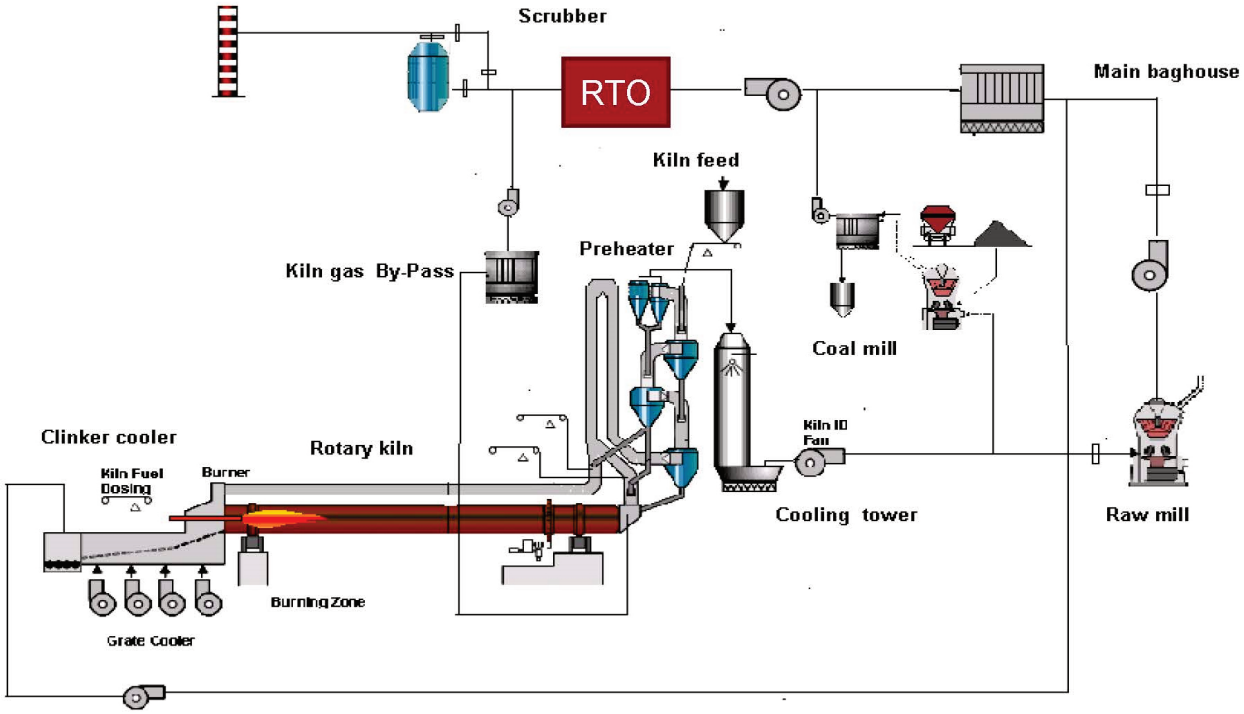


Figure 2.2 Midlothian Line 2 Detailed Process Schematic

3.0 TEST PROGRAM

3.1 OBJECTIVES

An air emissions sampling and analytical program will be conducted on the Line 1 Main stack and the Line 2 Main stack Midlothian cement facility located in Midlothian, TX. All testing will be performed following accepted EPA methodology. The test program is to provide a standardized data set to the EPA and the cement industry so that reliable facility inter-comparisons of emissions can be made.

All testing will be performed in strict accordance with "DRAFT GENERAL TEST PLAN Testing To Determine HCN, HF, and Cl2 Emissions From Cement Kilns" dated March 2, 2023" and the specifications stipulated in 40 CFR 60, Appendix A for flow rate following EPA Method 1, 2, 3A, and 4) and hydrogen fluoride (HF) and diatomic chlorine (Cl_2) following EPA Method 26A and in 40 CFR 63, Appendix A for hydrogen cyanide (HCN) and (HF) following EPA Method 320. All sampling runs will be one hour long.

The source emission test will be performed on a date to be determined. Testing will be conducted under representative process and control system operating conditions. For facilities with inline raw mills, testing will be performed while operating in the "Mill On" and "Mill Off" conditions.

3.2 TEST MATRIX

Table 3-1 presents the sampling and analytical matrix and proposed test schedule.

TABLE 3-1 PROGRAM OUTLINE AND TENTATIVE TEST SCHEDULE

Sampling Location	No. of runs	Sample/Type Pollutant	Sampling Method	Sample Run Times (min)	Analytical Method	Analytical Laboratory
Day 1						
Line 1	Arrive on-site and set up test equipment on Line 1 Stack					
Day 2						
Line 1 Stack; Raw Mill On	3	O_2/CO_2	EPA Method 3A	60	Paramagnetic (O_2) NDIR (CO_2)	DEECO
	3	HF and Cl_2	EPA Method 26A[1]	60	Ion Chromatograph	Element One
	3	HCN and HF	EPA Method 320	60	FTIR (Method 320)	DEECO
Day 3						
Line 1 Stack; Raw Mill Off	3	O_2/CO_2	EPA Method 3A	60	Paramagnetic (O_2) NDIR (CO_2)	DEECO
	3	HF and Cl_2	EPA Method 26A[1]	60	Ion Chromatograph	Element One
	3	HCN and HF	EPA Method 320	60	FTIR (Method 320)	DEECO
Day 4						
Line 2	Move and set up test equipment on Line 2					

TABLE 3-1 (Continued)

Sampling Location	No. of runs	Sample/Type Pollutant	Sampling Method	Sample Run Times (min)	Analytical Method	Analytical Laboratory
Day 5						
Line 2 Stack; Raw Mill On	3	O_2/CO_2	EPA Method 3A	60	Paramagnetic (O_2) NDIR (CO_2)	DEECO
	3	HF and Cl_2	EPA Method 26A[1]	60	Ion Chromatograph	Element One
	3	HCN and HF	EPA Method 320	60	FTIR (Method 320)	DEECO
Day 6						
Line 2 Stack; Raw Mill Off	3	O_2/CO_2	EPA Method 3A	60	Paramagnetic (O_2) NDIR (CO_2)	DEECO
	3	HF and Cl_2	EPA Method 26A[1]	60	Ion Chromatograph	Element One
	3	HCN and HF	EPA Method 320	60	FTIR (Method 320)	DEECO

[1] Stack gas flow rate and moisture measurement may be taken from concurrent Method 26A sampling trains.

3.3 TEST COORDINATION

Mr. Dan Carnes, the Midlothian facility contact, will serve as the test coordinator and will be responsible for:

1. Scheduling the start of all testing
2. Principal contact with the agency officials concerning the tests
3. Principal contact with DEECO concerning the tests
4. Recording the process data during the testing
5. Providing copies of any field test data to the agency

If there is a temporary equipment malfunction in the middle of a test, radio contact will be made with the test crew in order to delay the test. When problems have been corrected, the test will continue from the point where it was delayed. If the malfunction or upset condition results in an extended test delay, then the affected test run(s) may be aborted and a new run(s) conducted when the malfunction has been corrected or process upset cleared. Any samples or field data from aborted runs may be discarded.

4.0 SAMPLING LOCATION DESCRIPTIONS

4.1 SAMPLING LOCATION DESCRIPTION

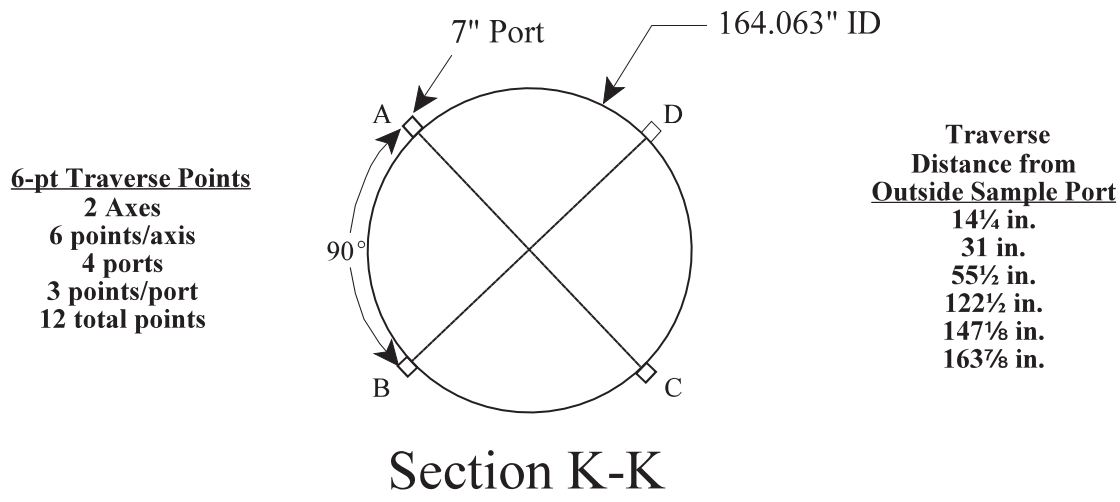
The Line 1 Main stack is a vertically-oriented circular stack with an inside diameter of 161.5" inside diameter. The stack gas sampling ports are located approximately 101' 7" (approximately 7.55 duct diameters) above the ID fan breaching and approximately 38' 6" (approximately 2.86 duct diameters) from the stack outlet.

The Line 2 Main stack is a vertically-oriented circular stack with an inside diameter of 164.063" inside diameter. The stack gas sampling ports are located approximately 102' 9" (approximately 7.52 duct diameters) above the ID fan breaching and approximately 83' 6" (approximately 6.11 duct diameters) from the stack outlet.

Both sampling locations meet the minimum specifications for selection of a measurement site as outlined in EPA Method 1. Cyclonic flow checks, as described in EPA Method 1 Section 2.4, using the Type-S pitot null procedure and angle measurements at the Common stack test location will be conducted.

A twelve (12) point sampling traverse will be made using 3 points in each of 4 sampling ports at the Line 1 Main stack and Line 2 Main stack. Each traverse will be made at each sampling location using a type-S pitot tube in accordance with EPA Methods 2 procedures. Gas temperatures are to be measured using calibrated Type K thermocouples and digital readout devices. All measurements are to be performed in accordance with the procedures in EPA Methods 2, and 26A.

Schematics of the Line 1 Main stack and Line 2 Main stack are provided in Figures 4-1 and 4-2, respectively.



6-pt Traverse Points
2 Axes
6 points/axis
4 ports
3 points/port
12 total points

Traverse Distance from Outside Sample Port
14¼ in.
31 in.
55½ in.
122½ in.
147⅞ in.
163⅞ in.

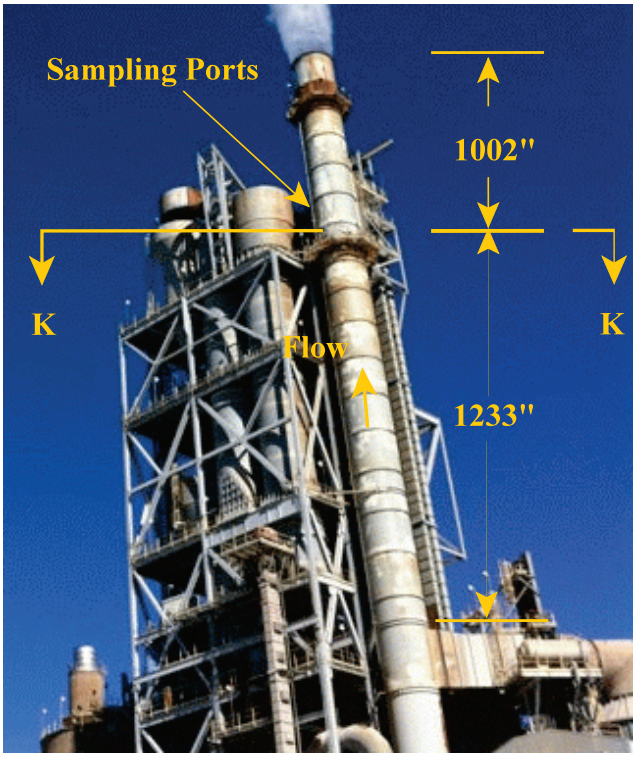
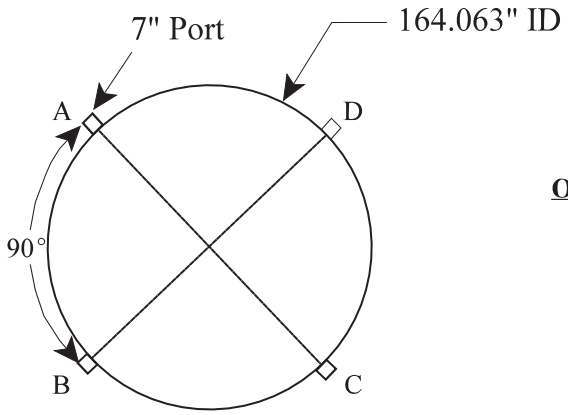


Figure 4.1 Schematic of the Line 1 Stack Sampling Location (not) Placeholder

6-pt Traverse Points
2 Axes
6 points/axis
4 ports
3 points/port
12 total points



Section K-K

Traverse Distance from Outside Sample Port
14¼ in.
31 in.
55½ in.
122½ in.
147⅞ in.
163⅞ in.

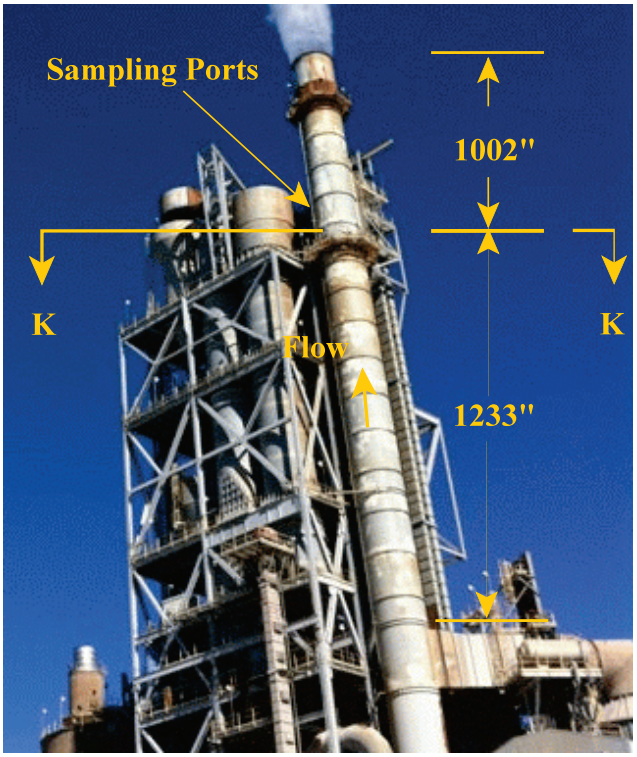


Figure 4.2 Schematic of the Line 2 Stack Sampling Location

5.0 SAMPLING AND ANALYTICAL PROCEDURES

This section contains a brief description of the sampling and analytical procedures for each method that will be employed during the test program. All equipment, procedures, and quality assurance measures necessary for completion of the test program will meet or exceed the specifications of the appropriate methods Any deviations from the methods to ensure quality representativeness of the results are also discussed.

5.1 TEST METHODS

The methods for the test program are described below, and apply to all process operating conditions (e.g. where there is an inline raw mill, testing will be performed while operating in the "Mill On" and "Mill Off" conditions). Table 3-1 outlines expected operating conditions for this test.

5.1.1 SAMPLING POINT DETERMINATION - EPA METHOD 1

The number and location of the sampling or traverse points will be determined according to the procedures outlined in EPA Method 1. The sample location will be inspected to insure EPA Method 1 criteria is met. All points will be at least 1.0 inches from the stack wall, per Method 1.

5.1.2 FLUE GAS VELOCITY AND VOLUMETRIC FLOW RATE - EPA METHOD 2

The flue gas velocity and volumetric flow rate will be determined according to the procedures outlined in EPA Method 2. Velocity measurements will be made using type S pitot tubes conforming to the calibration specifications outlined in EPA Method 2, Section 10.1. Each Type-S pitot tube, calibrated according to these standards, will have an assigned coefficient. Differential pressures will be measured with Magnehelic gauges of appropriate range or with fluid manometers. Effluent gas temperatures will be measured with chromel-alumel thermocouples equipped with digital readouts.

5.1.3 OUTLET FLUE GAS COMPOSITION - EPA METHOD 3A

Outlet flue gas analysis for oxygen (O_2) and carbon dioxide (CO_2) concentrations, and the calculation of percent excess air and flue gas dry molecular weight will be performed in accordance with EPA Method 3A.

To evaluate the sampling location and points for FTIR and O_2 sampling, a three-point O_2 concentration stratification test on a line passing through the centroidal area at 16.7, 50.0 and 83.3 percent of the measurement line (or for stacks is greater than 2.4 meters (7.8 ft) at 0.4, 1.2 and 2.0 meters from the stack or duct wall). The procedures in Section 8.1.2 of Method 7E will be followed, but oxygen will be used as parameter as allowed by fourth sentence in Section 8.1.2. The plant O_2 CEMS as a control. A criteria of <5% variation from combined mean for each point will be used as indication of non-stratification and allowing single point sampling at the point closest to the mean. Otherwise, sampling for equal periods at the three test points during test run will be conducted.

Per EPA Method 3A for determining molecular weight, integrated sampling will be obtain using the Method 320 sampling system described in Section 5.1.6.

A portion of the hot , wet gas sample will be sent through a condensing system to remove the stack moisture, A portion of the moisture-free gas sample will be snt to a CAI Model 200 O_2 (or

equivalent) analyzer measures using the paramagnetic technique. An oxygen molecule, because of its sp3 electron orbital distribution, has an unpaired electron and hence displays a magnetic orientation. Since other elements that display this magnetic phenomenon are not common gasses at normal temperatures, the paramagnetic measurement technique is virtually specific for oxygen. The sample gas flows through a detection cell located in a very strong magnetic field. The concentration of O_2 gas present induces a pressure differential in the detector cell. The amount of differential pressure is proportional to the concentration of O_2 gas present.

Calibration procedures will be performed in accordance with EPA methodology. Analyzers will be calibrated before and after each test and a calibration check between each test run.

The pretest calibrations will consist of the following steps:

- Internal (direct) calibration of each analyzer to adjust calibration and check linearity.
- External (through the entire sampling system) calibration to check the system bias on zero and span gases.

The post test calibration will consist of an external system bias calibration check.

The analyzer will be as calibrated using a certified zero and span (mid or high range) gas. Zero and span gases were directed to each analyzer through the appropriate plumbing, the calibration gas flow rates will be adjusted to the correct flow rate and the analyzer will be adjusted with the appropriate span pot.

After the analyzer is properly adjusted the linearity will be checked using a low and high range calibration gas. The maximum allowable limit for linearity is 2% of the analyzer range. All analyzers will be shown to be linear within these limits before proceding..

The external calibration bias check will be performed by placing the CEM system in sampling mode and injecting a zero and span gas into the sample line at the probe exit. This check shows if there is any sampling system related bias, and also checks the integrity of the sample line.

5.1.3.1 Calibration Gases-DEECO will use EPA Protocol and/or ±2% NIST Traceable gases for calibration as required by the various reference methods employed in this test program. Calibration gases will be selected from previous experience with similar sources and/or from information obtained from the facility engineer prior to sampling. In some cases if the gases that are selected are out of the optimum range of operation then no significant impact of data quality is expected due to the linear nature of the analyzers that were used.

Audit gases, if available from a federal or a state agency, will be analyzed.

5.1.3.2 Sampling Procedures-At the completion of the pretest calibration routine, the CEM system will be ready for operation. No further adjustments of sample flow rates, analyzer zero or span adjustments, or other critical CEM operating parameters will be made until testing and post test calibration were complete.

Each sampling run will be one hour. At the completion for each test run, calibration gases will be used to check between test runs. A zero and the upscale calibration gas closest to the actual emission concentrations will be used for the pretest and post test calibrations.

5.1.4 FLUE GAS MOISTURE CONTENT - EPA METHOD 4

The flue gas moisture content will be determined in conjunction with the EPA Method 26A trains according to the sampling and analytical procedures outlined in EPA Method 4. (**NOTE:** In order to maintain isokinetic sampling, the sampling rate used may be required to temporarily exceed the EPA Method 4-specified maximum sampling rate of 0.75 CFM, based on observed stack gas pitot readings.) The impingers will be connected in series and will contain reagents as described below. The impingers will be contained in an ice bath in order to assure condensation of the moisture in the flue gas stream. Any moisture that is not condensed in the impingers is captured in the silica gel, therefore all moisture can be weighed and entered into moisture content calculations.

5.1.5 HYDROGEN FLUORIDE AND DIATOMIC CHLORINE - EPA METHOD 26A

Sampling and analytical procedures will be similar to those outlined in EPA Method 26A to determine primarily diatomic chlorine (Cl_2) emissions and hydrogen fluoride (HF) emissions at main stack outlet sampling locations. Duplicate simultaneous trains (a.k.a "paired trains") for each test run will be used to determine precision.

Sample is collected through a heated glass probe, followed by a heated quartz fiber filter, where stack gas HF and Cl_2 are collected in a series of chilled impingers. The sampling train impingers will contain 50 ml of 0.1N sulfuric acid in the first impinger (optional should high moisture warrant a modified short stem), 100 ml of 0.1N sulfuric acid in the second and third, an optional fourth empty impinger, 100 ml of 0.1N NaOH in the fifth and sixth and 200 grams of silica gel in the last impinger. (**NOTE**: For plants with scrubbers, the optional cyclone may be used since the gas stream may be saturated with moisture.)

Sampling will be conducted isokinetically (±10%) with readings of flue gas parameters recorded at traverse points selected according to EPA Method 1. Leak-checks on the Method 26A sampling train will be are performed before and after each sampling run and optionally for any port change. In the event that any portion of the train needed to be disassembled and reassembled (i.e., due to filter or resin changes), leak-checks are performed. The sampling train leak-checks and leakage rate (where applicable) are documented on the field test data sheet for each respective run. All leak checks will be acceptable.

The glass button hook nozzle and probe liner will be constructed of borosilicate glass or quartz. The filter holder will be constructed of borosilicate glass with a Teflon frit filter support and a sealing gasket. A heated quartz fiber filter, for sources above 210°C, or PTFE-bonded glass fiber filter will be used. The probe and filter housing will heated to above 248°F and not exceed an upper boundary of 273°F. Probe liners and filter holders will be cleaned thoroughly prior to testing.

The Method 26A trains will be operated isokinetically for a minimum of 60 minutes and collect a minimum of 1 dry, standard cubic meter (DSCM). Pretest preparations, preliminary determinations, and leak check procedures will be those outlined in EPA Method 5.

After completion of sampling the train will be leak checked and transferred to the sample recovery trailer. All leak checks will be acceptable. The impingers will be weighed to determine moisture gain in accordance with EPA Method 4.

Sample recovery will involve quantitative recovery of the sulfuric acid impinger contents and the NaOH impinger contents into separate tare-weighed, precleaned polyethylene sample containers.

The nozzle, probe, filter and filter housing will not be recovered.

The contents of sulfuric acid impingers, including the contents if any of the empty (2nd knockout or fourth) impinger will be quantitatively transferred to the tare-weighed, precleaned polyethylene sample container, followed by three rinses with deionized (DI) water of the impingers and all connecting glassware (including the connecting glassware to the first impinger) placed in the same H_2SO_4 container. The container will be labeled and weighed to determine the final sample volume. The liquid level will be marked on the sample container.

The contents NaOH impingers will be quantitatively transferred to a second tare-weighed, precleaned polyethylene sample container, followed by three rinses with DI water of the impingers and all connecting glassware placed in the same NaOH container. The container will be labeled and weighed to determine the final sample volume. The liquid level will be marked on the sample container

Sample recovery from each train will include:

1. Container No. 1 - Contents 1st knockout, H_2SO_4 impingers, and 2nd knockout and, and DI rinse of impingers and connecting glassware; and
2. Container No. 2 - Contents NaOH impingers, and DI rinse of impingers and connecting glassware.

Additional quality control consists of collecting and analyzing a field blank train for every three test runs. The blank train is to be assembled from a used train, leak checked and sit for a period equal to the sampling time (i.e, 1-hr). The blank train data will be used to determine the method detection limit for the test program target analytes (ie. The lowest number that could be detected), and compared to stack emissions.

Reagent blanks of 0.1 N H_2SO_4, 0.1N NaOH, and DI water will be collected and archived for later analysis should there be any issues with the field blank train samples

The H_2SO_4 impinger solutions will be analyzed using ion chromatography techniques for fluoride ions (F^-) (EPA SW-9057). Duplicate analyses will be performed on the samples and a reagent blank. Precision will be demonstrated by duplicate injection of each sample, the results of each individual analysis must be within 5% of their mean to be acceptable. If the precision criteria is not met, analysis of the sample is repeated until consecutive injections meet the criteria.

The NaOH impinger solutions will be treated with sodium thiosulfate to ensure complete conversion of hypochlorous acid (HClO) to chloride ions (Cl^-). The resulting solution will be analyzed using ion chromatography techniques for chloride ions (EPA SW-9057). Duplicate analyses will be performed on the samples and a reagent blank. Precision will be demonstrated by duplicate injection of each sample, the results of each individual analysis must be within 5% of their mean to be acceptable. If the precision criteria is not met, analysis of the sample is repeated until consecutive injections meet the criteria.

All EPA Method 26A HF/Cl_2 samples will be analyzed by Element One of Wilmington NC. Refer to Section 1, Figure 1.1 for contact information.

The relative deviation (RD)will be calculated as described in EPA Method 30B between the Cl_2 concentrations measured with the paired trains.

5.1.6 HYDROGEN CYANIDE AND HYDROGEN FLUORIDE - EPA METHOD 320

EPA Method 320 will be performed to determine emissions of concentrations of HCN and HF. Three, 1-hour sampling runs will be conducted under representative process and control system operating conditions.

The gas sample will be extracted from the stack through a glass-lined probe and filter heated to 375° F. For external calibration checks and analyte spikes, the gases will be introduced in front of the heated filter. Any excess calibration gas will be diverted through the sample probes into the source. Outflow of gas from the heated filter enclosure was transported through a Teflon sample line heated to 375° F. For this source approximately 100' of sample line will be required. The heated sample line will be connected directly to the FTIR sample cell. Using heat-traced Teflon tubing the exit of the FTIR cell will be connected to a sample pump with a heated stainless steel pump head. The pump discharge will be directed to a proprietary chiller-type gas conditioner to remove moisture prior to delivery sample gas to the O_2/CO_2 monitors.

The distribution of the gas sample to the monitors will be accomplished using a panel equipped with valves and rotometers. The gas sample was then divided and directed to the analyzers.

FTIR sample cell will be maintained at 191°C and connected to a MKS Instruments Multigas 2030 Fourier Transform Infrared Spectrometer and Detector.

The FTIR spectrometer will measure vapor phase organic or inorganic compounds which absorb energy in the mid-infrared spectral region, about 400 to 4000 cm^{-1} (25 to 2.5 μm). Continuous measurement will be made by matching sample absorbance bands with bands in reference spectra, and comparing sample band intensities with reference band intensities.

The principle limitation to FTIR spectroscopy are the presence of interfering compounds that also absorb energy in the mid-infrared spectral region. In a cement kiln stack gas matrix, water vapor (H_2O) and carbon dioxide (CO_2) are the primary interferents that must be incorporated into the identification and quantitation method.

The FTIR software performs the computation for a single compound by subtracting all the other compounds (interferants and target) from the absorbance spectra and quantifies the single compound based on the remain absorbance. The FTIR software provides a Standard Error Calculation (SEC) value that is an indication of how well the identification and quantitation has been performed. A high SEC indicates that other interferants have not been accounted for in the analysis method, and a low SEC is indicative of greater confidence measurement.

The instrument is operated with a resolution of 0.5 cm^{-1} with 4x zero filling. Beer-Norton Medium apodization is used with amplitude phase correction.

For this RTR test program, following specific QA/QC activities for EPA Method 320 will be performed and criterium met.

5.1.6.1 Laboratory QA/QC Activities Before Field Test Program- Before field testing occurs, the following QA/QC activities will be conducted;

1) Seven consecutive samples of dry nitrogen through the sampling system will be acquired and used to calculate the standard deviation for each of the test program target analytes multiplied

by a factor of 3. These data will be considered representative of detection limits for this test program and are to be compared to the 0.5 ppm required DL;

2) From these seven dry nitrogen samples, the results for the Signal-to-Noise Ratio (SNR) @ 2500 cm^{-1} should be >2500, at 64 scans and the results for single beam intensity @ 2500 cm^{-1} should be >0.9; and

3 Upon receipt of HCN calibration gases a direct analysis will be performed to verify FTIR response agrees with tag value within 5%. Analysis results will be reported to PCA to assess need for modified reference spectra and/or change to direct analysis criterion:

5.1.6.2 QA/QCActivities During Field Test Program- During the field test program, following QA/QC activities will be performed and criterium met;

1) On each test day prior to any testing , an instrument background will be collected using dry nitrogen directed to the gas cell. The background will be collected with at least 128 scans;
2) The probe, filter, sample line and all sample system components in contact with effluent will be maintained at or above 375ºF or 191ºC (consistent with FTIR calibration temperature) to avoid any possible "cold spots;"
3) Heated sample lines will be ≤100 feet wherever possible, and not longer than 200 feet, without prior approval for unusual test circumstances;
4) A system zero with all sampling system components at operating temperature will be performed by injecting nitrogen at the sample probe and through sample filter and entire measurement system. After zero equilibration has been achieved, all measurement components will be quantified for at least 128 scans;
5) Ambient air will be sampled until equilibration of the measurement system has been achieved and all measurement components will be quantify for at least 128 scans;
6) The sample probe will be position at effluent measurement point and sampling will continue until equilibration of the measurement system has been achieved. At this point, the effluent concentrations will be quantified with two consecutive 64-scan samples as the initial native concentration for the dynamic spike;
7) Analyte spiking will be conducted for HCN before the first test run, and after each successive test run for a minimum of 4 spikes per test condition. (Additional spikes would be required before and after corrective action for the sampling or analysis system and/or before and after removing the sampling system from the stack.) These results will determine accuracy;
8) The spike gas injections will be maintained at 10% or less of total sample volume. The spike gas concentration and flow rate will be selected to approximately double the native effluent concentration, or the spike will be conducted to add 3-4 ppm to native concentration, whichever results in greater spiked concentration. Spike recovery results will be within ±20% of the expected value or ±0.5 ppm, whichever is least restrictive. (Specific HCN gases will be manufactured for this test program in the range of 50-100 ppm to provide spikes in the 5-10 ppm range, or lower. An SF_6 or appropriate tracer will be used to calculate the exact spike gas dilution ratio of 10% or less;)
9) After the dynamic spike, nitrogen will be sent through the sampling system until all traces of spike gas are removed and lines are proven below DL for target analytes;
10) The nitrogen purge will be discontinued and the sampling system will be allowed to equilibrate with stack gas before starting a test run. The first two consecutive 64-scan samples of a sample run will be used for the final native concentration. Residual results for HCN and HF will be verified to be less than 0.2-0.3 ppm for data acceptance, or less than 5% of the measured value, whichever is least restrictive. Calculate the standard deviation for each of the test program target analytes for seven consecutive sample spectra from Run 1,

multiplied by a factor of 3. These data will be compared to the pre-test system nitrogen standard deviation results and also included in the facility test report;

11) The SNR @ 2500 cm^{-1}, at 64 scans, and the results for single beam intensity @ 2500 cm^{-1} will be verified to met the >2500 and >0.9 criterium; respectively. The analyte spiking for HCN and subsequent system nitrogen injection will be conducted after each test run. Continue sequence until at least three valid runs per test condition are completed.

6.0 QUALITY ASSURANCE/QUALITY CONTROL ACTIVITIES

6.1 QA/QC PROCEDURES

The QA/QC procedures for this RTR test program are summarized in Table 6-1.

TABLE 6-1 QA/QC PROCEDURES AND REQUIREMENTS

Target Analyte	Test Method	Detection Limit	QA/QC
HCN	EPA Method 320	0.5 ppm	Increase scans if needed to achieve detection limits. Increasing to 400 from relative 64 (gives a 2.5 S/N advantage). HCN spiking before and after each run by adding 10% or less spike to approximately double the native effluent concentration, or conduct spike to add 3-4 ppm to native concentration, whichever results in greater spiked concentration. Spike recovery results shall be within ±20% of the expected value or ±0.5 ppm, whichever is least restrictive 5% pre-to-post run calibration transfer standard (CTS) requirement
HF		0.2-0.3 ppm	Rely on CTS (5%), HCN and tracer gas responses to validate HF FTIR data
Cl_2	EPA Method 26A	~ 0.07 mg/m^3 (~0.2 ppm)	Duplicate Simultaneous Trains; Collect minimum of 1 dscm for each sample train. Acceptance criteria for paired samples: 10% Relative Deviation or 0.2 ppm absolute difference, whichever is least restrictive. Insert dry impinger between acid and base impingers
Effluent Flow Rate	EPA Methods 1-4	Not Applicable	As per M26A isokinetic testing or separately by Methods 1-3. FTIR measurements for H_2O. **Wind Tunnel calibrated pitot tube having a Cp of 0.84 or less is required for all flow measurements**. Compare preliminary velocity traverse measurements and sample run flow rate measurements to installed certified flow rate monitor. Investigate and resolve differences greater than 10% of average flow rate.
O_2	EPA Method 3A	Not Applicable	Analyte concentrations corrected @ 7% O_2 Span is 10%, 15%, or 20% (for co-mingled stacks only) Acceptance criteria are 0.2% O_2 difference for analyzer calibration error, and 0.3% O_2 for system bias checks, and zero and upscale drift checks.

6.2 SAMPLE IDENTIFICATION AND CUSTODY

Sample custody procedures for this program are based on EPA recommended procedures. Since samples will be analyzed by one or more laboratories as well as in the field, the custody procedures emphasize careful documentation of sample collection and field analytical data and the use of chain of custody records for samples being transported. The procedures which will be used are discussed below.

The project manager will be responsible for ensuring that proper custody and documentation procedures are followed for the field sampling and field analytical efforts. He will be assisted in this effort by key sampling personnel involved in sampling recovery.

Samples will be collected, transported, and stored in clean containers which are constructed of materials inert to the analytical matrix such as glass jars. Only containers which allow air tight seals will be used. Amber glass jars will be employed when containers are needed to inhibit photochemical reactions.

All sampling data, including information regarding sampling times, locations, and any specific considerations associated with sample acquisition will be recorded on preformatted data sheets. All samples will be given unique, identifying alphanumeric sample codes which will serve to track samples from the field to the laboratory.

Samples will be stored for transport from the lab to the field to the lab in storage boxes constructed in a fashion which minimizes movement and thus prevents breakage of containers. For example, boxes used for transporting glass containers will have foam inserts with form-fitting cutouts. Sample transport boxes will be locked except when in use. Vans containing equipment and samples will be locked whenever they are left unattended.

A daily activity log will be maintained by the project supervisor. This will be an informal log used to record various types of information, such as minor problems which arise, sketches of sampling locations, names and phone numbers of plant contacts. daily activity summaries, etc.

This section provides information regarding the organization of the sampling and analytical program. The following details the key positions and their responsibilities. Once personnel have been assigned to these positions, their qualifications will be provided as an addendum.

The organization of the project team, including QA functions, is shown in the project organization chart (see Figure 1.1).

7.0 SAMPLE CUSTODY

Sample custody procedures for this program are based on EPA recommended procedures. Since samples will be analyzed by one or more laboratories as well as in the field, the custody procedures emphasize careful documentation of sample collection and field analytical data and the use of chain of custody records for samples being transported. The procedures which will be used are discussed below.

7.1 FIELD SAMPLING OPERATIONS

The project manager will be responsible for ensuring that proper custody and documentation procedures are followed for the field sampling and field analytical efforts. He will be assisted in this effort by key sampling personnel involved in sampling recovery.

Samples will be collected, transported, and stored in clean containers which are constructed of materials inert to the analytical matrix such as glass jars. Only containers which allow air tight seals will be used. Amber glass jars will be employed when containers are needed to inhibit photochemical reactions.

All sampling data, including information regarding sampling times, locations, and any specific considerations associated with sample acquisition will be recorded on preformatted data sheets. All samples will be given unique, identifying alphanumeric sample codes which will serve to track samples from the field to the laboratory.

Samples will be stored for transport from the lab to the field to the lab in storage boxes constructed in a fashion which minimizes movement and thus prevents breakage of containers. For example, boxes used for transporting glass containers will have foam inserts with form-fitting cutouts. Sample transport boxes will be locked except when in use. Vans containing equipment and samples will be locked whenever they are left unattended.

A daily activity log will be maintained by the project supervisor. This will be an informal log used to record various types of information, such as minor problems which arise, sketches of sampling locations, names and phone numbers of plant contacts. daily activity summaries, etc.

7.2 ANALYTICAL OPERATIONS

Analytical operations will be performed on-site in the laboratory as well as in the remote laboratories. Samples analyzed by outside laboratories are transported with a Change of Custody form. This form will list sample identifications, analytical parameters, sample matrices, anticipated date of results, and other relevant information necessary to ensure the appropriate analyses are performed and to document the progress of the samples.

8.0 INTERNAL QUALITY CONTROL CHECKS

Specific quality control (QC) procedures will be followed to ensure the continuous production of useful and valid data throughout the course of this test program. The QC checks and procedures described in this section represent an integral part of the overall sampling and analytical scheme. Strict adherence to prescribed procedures is quite often the most applicable QC check. A discussion of both the sampling and analytical QC checks that will be utilized during this program is presented below.

8.1 EQUIPMENT INSPECTION AND MAINTENANCE

Each item of field test equipment will be assigned a unique, permanent identification number. An effective preventative maintenance program is necessary to ensure data quality. Each item of equipment returning from the field will be inspected before it is returned to storage. During the course of these inspections, items are cleaned, repaired, reconditioned, and recalibrated where necessary.

Each item of equipment transported to the field for this test program will be inspected again before being packed to detect equipment problems which may originate during periods of storage. This minimizes lost time on the job site due to equipment failure.

Occasional equipment failure in the field is unavoidable despite the most rigorous inspection and maintenance procedures. For this reason, replacement equipment for all critical sampling train components will be transported to the job site.

8.2 EQUIPMENT CALIBRATION

New items for which calibration is required will be calibrated before initial field use. Equipment whose calibration status may change with use or time will be inspected in the field before testing begins and again upon return form each field use. When an item of equipment is found to be out of calibration, it will be repaired and recalibrated or retired from service. All equipment will be periodically recalibrated in full, regardless of the outcome of these regular inspections.

Calibrations will be conducted in a manner, and at a frequency, which meets or exceeds U.S. EPA specifications. The calibration procedures outlined in the EPA Methods will be followed. When these methods are inapplicable, methods such as those prescribed by the American Society for Testing Materials (ASTM) will be used.

Data obtained during calibrations will be recorded on standardized forms, which will be checked for completeness and accuracy by the quality assurance manager. Data reduction and subsequent calculations will be performed using computer facilities. Calculations will be checked at least twice for accuracy. Copies of calibration forms will be included in the test or projects reports.

Emissions sampling equipment requiring calibration includes pitot tubes, pressure gauges, thermometers, dry gas meters and barometers. The following sections elaborate on the calibration procedures to be followed for these items of equipment.

A: Pitot Tubes. All Type S pitot tubes used, whether separate or attached to a sampling probe, will be constructed in-house or by a third-party vendor. Each new pitot will

be calibrated in accordance with Section 10.1 of EPA Method 2. Each Type-S pitot tube, calibrated according to these standards, will have an assigned coefficient. This coefficient should not change as long as the pitot tube is not damaged.

Each pitot tube will be inspected visually upon return from the field. If a cursory inspection indicates damage or raises doubt that the pitot remains in accordance with the EPA geometry standards, the pitot tube will be refurbished as needed and recalibrated.

B: **Differential Pressure Gauge.** All meter consoles used are equipped with 10-inch water column (W.C.) inclined-vertical manometers. Fluid manometers do not require calibration other than leak checks. Manometers will be leak checked in the field prior to each test series, and again upon return from the field.

C: **Impinger Thermometer.** Prior to the start of testing, the thermometer used to monitor the temperature of the gas leaving the last impinger will be compared with a mercury-in-glass thermometer which meets ASTM E-1 No. 63F specifications. The impinger thermometer is adjusted if necessary until is agrees within 2°F of the reference thermometer. If the thermometer is not adjustable, it is labeled with a correction factor.

D: **Dry Gas Meter Thermometer.** The thermometer used to measure the temperature of the metered gas sample will be checked prior to each field trip against an ASTM mercury-in-glass thermometer. The dry gas meter thermometer is acceptable if the values agree within ± 5.4°F. Thermometers not meeting this requirements will be adjusted or labeled with a correction factor.

E: **Flue Gas Temperature Sensor.** All thermocouples employed for the measurement of flue gas temperature are calibrated upon receipt. Initial calibrations will be performed at three points (ice bath, boiling water, and hot oil). An ASTM mercury-in-glass thermometer will be used as a reference. The thermocouple is acceptable if the agreement is within 1.5 percent (absolute) at each of the three calibration points.

Before and after each field use, the reading from the flue gas thermocouple-potentiometer combination will be compared with an ASTM mercury-in-glass reference thermometer at ambient conditions. If the two agree within ± 1.5 percent (absolute), the thermocouple and potentiometer are considered to be in proper working order.

F: **Dry Gas Meter and Orifice.** Two procedures will be used to calibrate the dry gas meter and orifice simultaneously. The full calibration will be a complete laboratory procedure used to obtain the calibration factor of the dry gas meter. Full calibrations will be performed over a wide range of orifice settings. A simpler procedure, the post-test calibration, will be designed to check whether the calibration factor has changed.

A dry gas meter that is calibrated annually against a spirometer or a set of calibrated critical orifices will be used as a transfer standard. During the annual calibration, triplicate calibration runs will be performed at seven flow rates ranging from 0.25 to 1.40 cfm.

G: **Dry Gas Meter.** Each metering system receives a full calibration at the time of purchase and a post-test calibration after each field use. If the calibration factor, γ, deviates by less than five percent from the initial value, the test data are acceptable. If γ deviates by more than 5 percent, the meter is recalibrated and the meter coefficient (initial or recalibrated) that yields the lowest sample volume for the test runs is used.

EPA Method 5 requires another full calibration anytime the post-test calibration check indicates that γ changed by more than 5 percent. Standard practice is to adjust and recalibrate the dry gas meter anytime γ is found to be outside the range of 0.96 to 1.04. Post-test calibrations will be performed after each field test series per EPA Method 5, section 16.3 procedures.

H: **Orifice.** An orifice calibration factor will be calculated for each flow setting during a full calibration. If the range of values does not vary by more than 0.20 in H_2O over a range of 0.4 to 4.0 in H_2O, the arithmetic average of the values obtained during the calibration is used.

I: **Barometer.** Each field barometer will be adjusted before each test series to agree within ± 0.1 inches of a reference aneroid barometer. The reference barometer will be checked against the station pressure value (corrected for elevation difference) reported by the National Weather Service.

8.3 SAMPLING QUALITY CONTROL PROCEDURES

The following pretest QC checks will be conducted:

- All sampling equipment will be thoroughly checked to ensure clean and operable components.
- Equipment will be inspected for possible damage from shipment.
- The oil manometer or Magnehelic gauge used to measure pressure across the Type S pitot tube will be leveled and zeroed.
- The number and location of the sampling traverse points will be checked before taking measurements.
- The temperature measurement system will be visually checked for damage and operability by measuring the ambient temperature prior to each traverse.

In addition to the general QC procedures listed above, QC procedures specific to each sampling method will also be incorporated into the sampling scheme. These methods and specific procedures are discussed below.

A: Sampling Train QC checks. The following QC procedures will be emphasized:

Prior to Start of Tests

- Keep all cleaned glassware and sample train components sealed until train assembly.
- Assemble the sampling trains in an environment free from uncontrolled dust.
- Visually inspect each sampling train for proper assembly.
- Perform pretest calculations to determine the proper sampling nozzle size.

Prior to Each Test Run

- Visually inspect the sampling nozzle.
- Visually inspect the Type S pitot tube.
- Leak check each leg of the Type S pitot tube.
- Leak check the entire sampling train.

During Each Test Run

- Readings of temperature and differential pressure will be taken at each transverse point.
- All sampling data and calculations will be recorded on preformatted data sheets.
- All calibration data forms will be reviewed for completeness and accuracy.
- Any unusual occurrences will be noted during each run on the appropriate data form.
- The project supervisor will review sampling data sheets daily during testing.
- Properly maintain the roll and pitch axis of the Type S pitot tube and the sampling nozzle.
- Leak check the train before and after any move from one sampling port to another during a run (at DEECO's option) or if a filter change takes place.
- Conduct additional leak checks if the sampling time exceeds 4 hours.
- Maintain the probe, filter, and impingers at the proper temperatures.
- Maintain ice in the ice bath at all times.
- Make proper readings of the dry gas meter, delta P and delta H, temperature, and pump vacuum during sampling at each traverse point.
- Maintain isokinetic sampling within ± 10% of 100%.

After Each Test Run

- Visually inspect the sampling nozzle.
- Visually inspect the Type S pitot tube.
- Leak check each leg of the Type S pitot tube.
- Leak check the entire sampling train.

B: QC for Volumetric air flow rate determinations

Flue Gas Velocity. Data required to determine the flue gas velocity will be collected using the methodology specified in EPA Method 2. Quality control procedures are as follows.

- Visually inspect the Type S pitot tube before and after sampling.
- Leak check both legs of the pitot tube before and after sampling.
- Check the number and location of the sampling traverse points before taking measurements.

Flue Gas Molecular Weight. In the event that that integrated bag samples are to be used for determination of flue gas molecular weight, EPA Method 3 will be the sampling technique specified. Quality control will focus on the following procedures:

- The sampling train will be leak checked before and after each run.
- A constant sampling rate will be used in withdrawing a sample.
- The sampling train will be purged prior to sample collection.
- The sampling port will be properly sealed to prevent air in-leakage.

Moisture Content. The moisture content of the gas stream will be determined using the technique specified in EPA Method 4. The following QC checks will be performed:

- The sampling train will be leak checked before and after each run.
- Ice will be maintained in the ice bath throughout each run to insure an exit temperature (after the silica gel impinger) of $\leq 67^{\circ}$F.

8.4 ANALYTICAL QUALITY CONTROL PROCEDURES

All analyses for this program will be performed using accepted laboratory procedures in accordance with the specified analytical protocols. Adherence to prescribed QC procedures will ensure data of consistent and measurable quality. Analytical QC will focus upon the use of control standards to provide a measure of analytical precision and accuracy. Also, specific acceptance criteria are defined for various analytical operations including calibrations, control standard analyses, drift checks, blanks, etc. The following general QC procedures will be incorporated into the analytical effort:

- The on-site project manager will review all analytical data and QC data on a daily basis for completeness and acceptability.
- Analytical QC data will be tabulated using the appropriate charts and forms on a daily basis
- Copies of the QC data tabulation will be submitted to the quality assurance manager following the completion of the test program.
- All hard copy raw data (i.e., chromatograms, computer printouts, etc.) will be maintained in organized files.

Specific analytical QC procedures for the Orsat analyzer (if used) are listed below.

- The analyzer will be leveled and the fluid levels zeroed prior to use.
- The analyzer will be leak checked prior to use.
- The analyzer will be thoroughly purged with sample prior to use.
- The analyzer will be checked by analyzing an ambient air sample.

EPA Method 26A Sample Analysis QC Checks are listed below.

- Calibration curve consisting of 4 calibration levels that bracket the expected sample range. Dilute samples as necessary to reach the calibration range;
- Duplicate analysis of calibration standards, before and after sample analysis, with duplicate injections being within 5% of their mean;
- Duplicate analysis of reagent blanks, quality control samples and field samples with duplicate injections being within 5% of their mean;
- Matrix spike samples may be prepared and analyzed. Matrix spike recoveries should be 90-110%
- A field blank will be carried through the procedure and analyzed with the field samples.
- An audit sample will be analyzed for if available from two or more independent, Approved Audit Sample Providers no less than 60 days prior to the test effort.

9.0 REPORTING AND DATA REDUCTION REQUIREMENTS

9.1 DATA REPORTING

The reporting units for HCN, HF, and Cl_2 will be in parts-per-million by volume, wet basis ($ppm_{v,d}$), parts-per-million by volume, dry corrected to 7% oxygen ($ppm_{v,d}@7\%O_2$), pounds-per-hour (lbs/hr), and pounds-per-ton of clinker (lbs/ton). Additional supporting data for CO_2, O_2, and H_2O concentrations and volumetric flow rates (actual cubic feet-per-minute, wet,standard cubic feet-per-minute, and dry,standard cubic feet-per-minute) will be reported. The clinker production, in short tons-per-hour (TPH) will be reported.

Any data that is not acceptable because of technical difficulties will be indicated, and an explanation of the technical problem will be given. All related QC and calibration data will be in the final report.

9.2 REPORT CONTENTS

Copies of the test report will be submitted after the test series has been completed. Results reported will include, but not be limited to emission rates and concentrations of gaseous pollutants, and process sample determinations, any liquid stream constituents determinations, and any other type of data requested. This report will also include a list of all personnel present during testing, summary results, descriptions of test procedures used, a description of the source and its operation during testing, test locations drawings, example calculations, raw field data, and equipment calibrations.

9.3 DATA REDUCTION

Care will be exercised to ensure hand recorded data is written accurately and legibly. Additionally, the use of prepared data recording forms, conveniently formatted, is an important aid to verify that all necessary data items are recorded. The collected field and laboratory data will be reviewed by the analyst and the Project Manager.

The Project Manager will reduce and validate all of the sampling and analytical data that is collected. The sampling data will include flow measurements, calibrations, etc. Each laboratory will reduce all analytical results prior to their submission to the Project Manager. The analytical data will be used to determine concentrations and emission rates of the compounds of interest.

Data reduction follows guidelines published in EPA Reference Methods, where applicable, and by guideline documents where EPA Reference Methods are not available. Validated computer programs will be used to calculate all reported values.

9.4 DATA VALIDATION

A second technical review of the data will be performed and documented by a qualified scientist other than the one who performed the actual analyses. The second reviewer will include evidence (e.g., check marks, recalculations, etc.) that show which data points were checked. Finally, the second reviewer will sign and date the cover page of the data packet or the record that was reviewed.

In-situ measurements will be validated by demonstrated acceptable post-test leak checks and calibration verifications according to the referenced method used.

Analysis data may be validated according to defined criteria by a secondary reviewer or by the analyst. At a minimum and if applicable, analysis data will be validated according to the following criteria (additional method-specific criteria or project requirements may apply):

- Sampling records complete and traceable
- All appropriate QC samples included with the analytical batch and reported with the sample results
- Routine tuning, calibration and inspection of analytical instrumentation documented and performed prior to analyses
- Initial and continuing calibration criteria met
- Method/reagent blanks confirm no background contamination
- Surrogate recoveries within criteria
- Qualitative sample results (e.g., retention times, mass spectra, isotopic ratios) consistent with standard data
- Sample data within the calibrated range of the instrument
- Chromatograms or other raw data consistent with computer-generated quantitation reports
- Accuracy of intermediate data manipulations, transcribed numbers and/or final reported results verified
- Reference standards, instrumentation, sample identification, analysts, methodology, and sequence of processing clearly identified and traceable in the project records
- Lost data or corrective actions documented (e.g., loss of sample, reanalysis, redilutions, additional cleanup steps, alternative calculations etc.)
- Data that does not meet the validation requirements flagged accordingly
- Data reported in the correct units (e.g., "ppm" should not be used without specifying volume or mass units; "ug/g" are preferred units for data reporting)

10.0 PLANT ENTRY AND SAFETY

10.1 SAFETY RESPONSIBILITIES

The Project Manager is responsible for ensuring compliance with plant entry, health, and safety requirements. The Facility Contact (refer to Section 1.2) as the authority to impose or waive facility restrictions. The Project Manager has the authority to negotiate with facility person any deviations from the facility restrictions.

10.2 SAFETY PROGRAM

DEECO has a comprehensive health and safety program that satisfies Federal OSHA and MSHA requirements. The basic elements include: (1) written policies and procedures, (2) routine training of employees and supervisors, (3) medical monitoring, (4) use of personal protection equipment, (5) hazard communication, (6) pre-mobilization meetings with Holcim personnel and DEECO test team personnel, and (7) routine surveillance of the on-going test work.

10.3 SAFETY REQUIREMENTS

All test personnel will adhere to the following standard safety and precautionary measures as follows:

1) Confine activities to test area only;
2) Wear hard hats at all times on-site, except inside sample recovery trailers and mobile CEM laboratory;
3) Wear protective shoes or boots in test area:
4) Wear protective glasses or goggles at the outlet test sites, and other areas as designated;
5) Have readily available first aid equipment and fire extinguishers.

Before or on the first day on-site, the Project Manager will fill out the Emergency Response Procedure form and provide copies to be posted at each test site.

Appendix A

Sampling and Analytical Methods

The sampling and analytical methods for this sampling effort can be found at the following website:

Promulgated EPA test methods, 40 CFR 60 (Methods 1-4, 26A, and 320)

https://www.epa.gov/emc/emc-promulgated-test-methods