ACCUAIR ANALYSIS

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Air Quality Test Report

SMC-18-3

Particulate, OHAPs, & Dioxin/Furan
Testing Services for:

St Marys Cement

Charlevoix, MI

SVMain & SVBypass
EUClinkerCooler
and
SVCokeMill Stacks

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Prepared by:
AccuAir Analysis, LLC
219.765.3425
AccuAirAnalysis.com

PREPARED FOR
Mr. Cortney Schmidt
St. Marys Cement
16000 Bells Bay Road
Charlevoix, MI 49720

Phone: 231-237-1342

INTRODUCTION

On September 17th, 2018 AccuAir, LLC (ACCUAIR) was onsite at St. Marys Cement, Inc. to perform air testing at their facility in Charlevoix, Michigan. ACCUAIR was contracted to perform compliance emission testing on the SVMAIN (Main), SVBYPASS (Bypass), SVCOKEMILL (Coal Mill), and the EUCLINKERCOOLER (Clinker Cooler) Stacks. The test was conducted in accordance with all appropriate United States Environmental Protection Agency (USEPA) methodologies.

The objective of the program was to demonstrate the compliance status of the site according to the requirements of the facility's Permit to Install number 140-15 issued April 1, 2016 by the Michigan Department of Environmental Quality and the and the Federal standards of 40 CFR Part 63 subpart LLL.

Testing on the stacks was performed for the determination of concentrations and mass emission rates for Particulate Matter (PM),Matter less than 10 micron (PM10), Less than 2.5 micron (PM2.5), Organic Hazardous Air Pollutants (OHAPs), and Dioxins and Furans (DF).

Mr. Geoff Resney was the onsite project manager and was assisted by Mr. Mark Carlson and Mr. Brian Durkop. Mr. Robert Dickman and Jeremy Howe of the Michigan Department of Environmental Quality was onsite to observe during testing.

Testing and analysis procedures used for this project are presented in the United States Environmental Protection Agency (USEPA) document Title 40, Code of Federal Regulations, Part 60 (40 CFR 60), Appendix A; the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods, and on the USEPA website, Test Methods Section (https://www.epa.gov/emc). The methods are discussed in the Performance Test Procedures section of this report.

Included in this test report are sections detailing the Test Program, including Executive Summary, Introduction, Sampling Procedures, Source Information, Sample Calculation and Test Results Sections; with Appendices which include calibrations, field data, calculated data, and laboratory data.

The test procedures referenced in this report are in accordance with the Approved Test Plan for this project. Deviations from the Test Plan or published Reference Methods are documented in the Problems, Deviations and/or Exceptions section of this report. A copy of the Test Plan is provided in Appendix H of this report.

Provided in Table 1-1 are the results of the test program.

Source	emission	units	Results	Emission Limit, Permit	Emission Limit, Subpart LLL
Main & Bypass	Filterable PM	lbs/1000lbs exhaust	0.006	0.25	
		lbs/ton clinker	0.022		0.07
	OHAPs	ppm	12.62		12
Main, Mill On	Dioxins & Furans	ng/dscm	0.0003		0.2
Main, Mill Off	Dioxins & Furans	ng/dscm	0.005		0.2
Bypass	Dioxins & Furans	ng/dscm	0.002		0.2
Coal Mill	Filterable PM	grains/dscf	0.001	0.01	
Clinker Cooler	Filterable PM,	lbs/1000lbs exhaust	0.004	0.25	
		lbs/ton clinker	0.01		0.02

*OHAPs results for the bypass stack were below MDL; however, the MDL was used in calculating the results. If ½ the MDL was used, OHAPs would be less than LLL limit. During a retest, a method with a lower MDL will be used.

Table 1-1. Summary of Performance Test Results

SUMMARY OF RESULTS

Testing was performed using a heated Method 5 train for the determination of PM emitted from the Main and Bypass Process Stacks. Particulate testing consisted of one (1) 120-minute run and two (2) 60-min runs in accordance with USEPA Methods 5 and 202 and the approved test protocol. Both Main and Bypass Stacks testing runs were performed simultaneously. During testing the processes were operated at maximum normal rates with the Roller Mill on.

Testing was performed using a heated Method 5 train for the determination of PM emitted from the Coal Mill and the Clinker Cooler Stack. Particulate testing consisted of three (2) 60-min runs in accordance with USEPA Methods 5 and 202 the approved test protocol.

Testing was performed using a heated Method 23 train for the determination of Dioxins and Furans emitted from the Main and Bypass Process Stacks. DF testing consisted of three (3) 180-minute runs in accordance with USEPA Method 23 and the approved test protocol. Both Main and Bypass Stacks testing runs were performed simultaneously. During testing the processes were operated at maximum normal rates with the Roller Mill on. Three additional test 180-minute runs were run on the Main Process Stack with the roller mill off.

Airflow was determined using USEPA Methods 1 and 2. Molecular weight was determined in accordance with Method 3a and method 3. The moisture content of the stack gas was measured using Method 5 and 23. Testing procedures are discussed in more detail in the test methods section. All calculated reference method data is provided in Appendix E, and examples of all calculations are presented in the Sample Calculation section of this report.

Problems, Deviations and/or Exceptions

Kiln and Bypass Stack Sampling

Sources with acid gas emissions, especially those using ammonia for their control equipment, have trouble measuring condensable particulate matter due to salt formation in the collected water after sample collection. This is aggravated by sulfur dioxide and ammonia in the exhaust stream. Increased ammonia can be the result of the over use of ammonia in the SNCR system which became apparent during the main and bypass stack tests. Method 202 no longer allows for an adjustment because of this bias. Method 202 attempts to address this issue with a nitrogen purge which will not completely remove the bias and is most effective when started immediately following completion of the test run. In this case the technician delayed the purge until after delivery to the laboratory trailer and weighing the sample train, which contributed to higher bias. The combination of these factors indicates questionable test results for condensable particulate matter from the main and bypass stack and should be further investigated with a retest. Because of the questionable test results, we are presenting only the filterable particulate emission data for the main and bypass stack in this summary, however Appendices include all test data.

Clinker Cooler and Coal Mill Stack Sampling

Testing at the Clinker Cooler and Coal Mill showed the presence of both organic and inorganic condensable particulate matter. Neither was expected when testing these processes as there is not a source of condensable particulate from these processes[1]. in an ambient air process and are likely the product of glassware contamination either in the field or the laboratory and therefore an indication of an inconclusive test. Longer test runs would prove this theory.

Based on the above information we are presenting only the front half emission data for the Clinker Cooler and The Coal Mill in this summary, however Appendices include all test data.

[1] Requiring the use of Proposed Method 202 for sources such as material handling operations, crushers, and bagging operations results in unnecessary expenses. Proposed Method 202 should not be required for sources that clearly do not generate condensable vapors. In the cement industry, sources such as clinker coolers and finish mills operate at elevated temperature but have no possible source of condensable vapors. Method 5, "Determination of Particulate Matter Emissions from Stationary Sources," provides an adequate measurement of total particulate matter emissions for these types of sources."
https://www3.epa.gov/ttn/emc/methods/comments201a202.pdf

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Table 1-2. SVMAIN Summary of Test Results

St. Mary
Charlevoix
Unit Main
Determination of Particulate Emissions From Stationary Sources

Client:	*Charlevoix*		**Plant:**	*Main*
Date(s):	*9/18-19/2018*		**EPA Method(s):**	5,202
Run #:	Run 1	Run 2	Run 3	
Date:	9/18/2018	9/18/2018	9/19/2018	
Time:	12:32-14:45	16:59-18:16	9:43-10:51	Average
Process Conditions				
Clinker (ton/hr)	224.4	224.4	245.0	231.3
Stack Conditions				
Doc. Version	AB M5 Ver 1.10			
Nozzle (inches)	0.197	0.197	0.197	0.197
Delta P (inH20)	1.80	1.89	2.22	1.97
Delta H (inH20)	1.75	1.97	2.15	1.96
Stack Temp (°F)	255	260	263	259
Oxygen (%)	9.3	9.6	8.9	9.3
Carbon Dioxide (%)	21.0	21.0	20.8	20.9
Moisture (%)	11.81	12.30	11.87	11.99
Mol Weight, Dry	31.7	31.7	31.7	31.7
Mol Weight, Wet	30.1	30.1	30.1	30.1
Stack Press (inH20)	-0.72	-0.72	-0.73	-0.72
Stack Area (ft2)	92.18	92.18	92.18	92.18
Stack Vel (ft/sec)	86.71	89.40	96.92	91.01
Stack Flow (wacfm)	479,567	494,400	535,992	503,320
Stack Flow (wscfm)	346,277	354,407	383,984	361,556
Stack Flow (dscfm)	305,383	310,812	338,415	318,203
Stack Flow (lbs/hr)	1,013,600	1,032,336	1,121,906	1,055,947
Test Results - Total Particulate Matter				
Sample Gas Vol (dscf)	81.369	42.557	45.205	56.377
Isokinetics (%)	96.7	99.4	96.9	97.7
Filter (mg)	3.9	4.1	3.3	3.8
Probe Rinse (mg)	1.5	2.8	1.7	2.0
Filterable (lbs/hr)	2.680	6.665	4.951	4.765
lbs/1000 lbs exhaust gas (STATE limit 0.25)	**0.0026**	**0.0065**	**0.0044**	**0.0045**
lbs/ton Clinker (PCMACT Limit 0.07)	**0.012**	**0.030**	**0.020**	**0.0206**

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Table 1-3. SVBYPASS Summary of Test Results

St. Mary
Charlevoix
Unit Bypass
Determination of Particulate Emissions From Stationary Sources

Client:	*Charlevoix*		**Plant:**	*Bypass*
Date(s):	*9/18-19/2018*		**EPA Method(s):**	5,202
Run #:	Run 1	Run 2	Run 3	
Date:	9/18/2018	9/18/2018	9/19/2018	
Time:	12:46-15:09	16:52-18:37	9:43-10:56	Average
Process Conditions				
Clinker (ton/hr)	224.4	224.4	245.0	231.3
Stack Conditions				
Doc. Version	AB M5 Ver 1.10			
Nozzle (inches)	0.506	0.506	0.506	0.506
Delta P (inH20)	0.045	0.044	0.051	0.047
Delta H (inH20)	2.65	2.37	2.64	2.56
Stack Temp (°F)	194	248	253	232
Oxygen (%)	20.1	19.9	19.9	20.0
Carbon Dioxide (%)	0.8	0.8	0.9	0.9
Moisture (%)	1.83	1.81	1.56	1.73
Mol Weight, Dry	28.9	28.9	28.9	28.9
Mol Weight, Wet	28.7	28.7	28.8	28.7
Stack Press (inH20)	0.43	0.43	0.43	0.43
Stack Area (ft2)	132.73	132.73	132.73	132.73
Stack Vel (ft/sec)	13.41	13.79	14.89	14.03
Stack Flow (wacfm)	106,812	109,820	118,595	111,743
Stack Flow (wscfm)	84,558	80,304	86,440	83,767
Stack Flow (dscfm)	83,009	78,848	85,093	82,317
Stack Flow (lbs/hr)	251,325	238,675	257,723	249,241
Test Results - Total Particulate Matter				
Sample Gas Vol (dscf)	103.590	49.546	52.759	68.632
Isokinetics (%)	98.8	99.5	98.2	98.9
Filter (mg)	0.0	0.0	0.0	0.0
Probe Rinse (mg)	2.0	1.2	1.5	1.6
Filterable (lbs/hr)	0.212	0.253	0.320	0.262
lbs/1000 lbs exhaust gas (STATE limit 0.25)	**0.0008**	**0.0011**	**0.0012**	**0.0010**
lbs/ton Clinker (PCMACT Limit 0.07)	**0.001**	**0.001**	**0.001**	0.001

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Table 1-4. SVCOKEMILL Summary of Test Results
St. Marys Cement
Charlevoix
Unit Coal Mill
Determination of Particulate Emissions From Stationary Sources

Client: *Charlevoix*			**Plant:**	*Coal Mill*
Date(s):	*9/20/2018*		**EPA Method(s):**	5,202
Run #:	Run 1	Run 2	Run 3	
Date:	9/20/2018	9/20/2018	9/20/2018	
Time:	13:36-14:38	15:02-16:05	16:28-17:29	Average
Stack Conditions				
Doc. Version	AB M5 Ver 1.10	AB M5 Ver 1.10	AB M5 Ver 1.10	-
Nozzle (inches)	0.346	0.346	0.346	0.346
Delta P (inH20)	0.14	0.10	0.16	0.13
Delta H (inH20)	1.91	1.31	2.17	1.80
Stack Temp (°F)	126	127	139	131
Oxygen (%)	20.9	20.9	20.9	20.9
Carbon Dioxide (%)	0.3	0.3	0.3	0.3
Moisture (%)	7.99	7.18	5.58	6.92
Mol Weight, Dry	28.9	28.9	28.9	28.9
Mol Weight, Wet	28.0	28.1	28.3	28.1
Stack Press (inH20)	-0.13	-0.13	-0.13	-0.13
Stack Area (ft2)	14.19	14.19	14.19	14.19
Stack Vel (ft/sec)	22.77	18.70	24.76	22.08
Stack Flow (wacfm)	19,380	15,918	21,079	18,792
Stack Flow (wscfm)	17,164	14,068	18,245	16,492
Stack Flow (dscfm)	15,793	13,058	17,226	15,359
Test Results - Total Particulate Matter				
Sample Gas Vol (dscf)	43.971	35.855	47.437	42.421
Isokinetics (%)	100.8	99.4	99.7	100.0
Filter (mg)	0.0	0.0	0.0	0.0
Probe Rinse (mg)	1.3	1.3	1.7	1.4
Filterable gr/dscf (STATE Limit 0.010)	**0.0000**	**0.0005**	**0.0006**	**0.0003**

Table 1-5. EUCLIKERCOOLER Summary of Test Results
St. Marys Cement
Charlevoix
Unit Clinker Cooler
Determination of Particulate Emissions From Stationary Sources

Client: *Charlevoix*			**Plant:**	*Clinker Cooler*
Date(s):	*9/20/2018*		**EPA Method(s):**	5
Run #:	Run 1	Run 2	Run 3	
Date:	9/20/2018	9/20/2018	9/20/2018	
Time:	8:56-10:05	10:44-11:51	18:08-19:12	Average
Process Conditions				
Clinker (ton/hr)	212.6	212.6	200.8	208.7
Stack Conditions				
Doc. Version	AB M5 Ver 1.10	AB M5 Ver 1.10	AB M5 Ver 1.10	-
Nozzle (inches)	0.224	0.224	0.224	0.224
Delta P (inH20)	0.88	0.84	0.92	0.88
Delta H (inH20)	2.28	2.21	2.36	2.28
Stack Temp (°F)	180	178	185	181
Oxygen (%)	20.9	20.9	20.9	20.9
Carbon Dioxide (%)	0.3	0.3	0.3	0.3
Moisture (%)	1.98	2.04	1.76	1.93
Mol Weight, Dry	28.9	28.9	28.9	28.9
Mol Weight, Wet	28.7	28.7	28.7	28.7
Stack Press (inH20)	-0.52	-0.52	-0.52	-0.52
Stack Area (ft2)	80.52	80.52	80.52	80.52
Stack Vel (ft/sec)	58.75	57.33	60.43	58.83
Stack Flow (wacfm)	283,819	276,934	291,928	284,227
Stack Flow (wscfm)	229,773	224,833	234,522	229,709
Stack Flow (dscfm)	225,228	220,253	230,386	225,289
Stack Flow (lbs/hr)	680,677	665,641	696,266	680,861
Test Results - Total Particulate Matter				
Sample Gas Vol (dscf)	47.429	45.797	47.541	46.923
Isokinetics (%)	103.3	102.0	101.2	102.1
Filter (mg)	1.0	2.1	1.6	1.6
Probe Rinse (mg)	3.3	2.2	3.5	3.0
Aqueous (mg)	1.8	2.4	3.2	2.5
Organic (mg)	3.7	3.6	2.2	3.2
Filter/Organic (mg)	8.0	7.9	7.3	7.7
Total (mg)	9.8	10.3	10.5	10.2
Filterable (lbs/hr)	2.701	2.735	3.269	2.901
lbs/1000 lbs exhaust gas (STATE Limit 0.25)	**0.0040**	**0.0041**	**0.0047**	**0.0043**
lbs/ton Clinker (Limit 0.02)	**0.013**	**0.013**	**0.016**	**0.0139**

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Table 1-6. SVMAIN Mill On Summary of Test Results

EPA Reference Method 23

Determination of Dioxins/Furan Emissions From Stationary Sources

Client	**St. Marys**	**Date**	**9/18/2018**
Facility	**Charlevoix**	**Job Number**	**0**
Unit	**Main**	**Operator**	**BD**
Location	**Stack**	**Version**	**ST606-101-02**

AVERAGE TEST 1-3

Element	Detection Status	PG	ng/dscf	ng/dscm	lbs/hr	ng/dscm @7% O2	1989 TEF	1989 TEQ
2378-TCDD	ND							
12378-PeCDD	ND							
123478-HxCDD	ND							
123678-HxCDD	ND							
123789-HxCDD								
1234678-HpCDD		3.70	3.11E-05	1.10E-03	1.26E-06	1.28E-03	0.0100	0.00001
OCDD		11.87	9.92E-05	3.50E-03	4.05E-06	4.10E-03	0.00100	0.00000
Total TCDD		4.57	3.82E-05	1.35E-03	1.56E-06	1.58E-03		0.00000
Total PeCDD		0.83	7.15E-06	2.53E-04	2.84E-07	2.97E-04		0.00000
Total HxCDD								
Total HpCDD		5.27	4.45E-05	1.57E-03	1.80E-06	1.84E-03		0.00000
2378-TCDF		4.57	3.82E-05	1.35E-03	1.56E-06	1.58E-03	0.10	0.00000
12378-PeCDF								
23478-PeCDF		1.20	1.03E-05	3.64E-04	4.09E-07	4.27E-04	0.50	0.00021
123478-HxCDF		1.03	8.87E-06	3.13E-04	3.52E-07	3.68E-04	0.100	0.00004
123678-HxCDF								
234678-HxCDF								
123789-HxCDF		1.00	8.58E-06	3.03E-04	3.41E-07	3.56E-04	0.100	0.00004
1234678-HpCDF		1.87	1.59E-05	5.63E-04	6.36E-07	6.59E-04	0.0100	0.00001
1234789-HpCDF								
OCDF								
Total TCDF		32.83	2.75E-04	9.70E-03	1.12E-05	1.14E-02		
Total PeCDF		2.87	2.46E-05	8.69E-04	9.78E-07	1.02E-03		
Total HxCDF		2.03	1.75E-05	6.16E-04	6.93E-07	7.24E-04		
Total HpCDF		1.87	1.59E-05	5.63E-04	6.36E-07	6.59E-04		
Total TEQ								**0.00031**
Subpart LLL Limit								**0.2**

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Table 1-7. SVMAIN Mill Off Summary of Test Results

EPA Reference Method 23

Determination of Dioxins/Furan Emissions From Stationary Sources

Client	**St. Marys**	**Date**	**9/19/2018**
Facility	**Charlevoix**	**Job Number**	**E18043**
Unit	**Main**	**Operator**	**BD**
Location	**Stack**	**Version**	**ST606-101-02**

AVERAGE TEST 1-3

Element	Detection Status	ng	ng/dscf	ng/dscm	lbs/hr	ng/dscm @7% O2	2005 WHO TEF	2005 WHO TEQ
2378-TCDD								
12378-PeCDD		1.43	1.22E-05	4.32E-04	4.52E-07	4.94E-04	1.00	0.000
123478-HxCDD		1.20	1.02E-05	3.61E-04	3.79E-07	4.13E-04	0.100	0.000
123678-HxCDD		2.73	2.33E-05	8.23E-04	8.63E-07	9.41E-04	0.100	0.000
123789-HxCDD		1.67	1.42E-05	5.02E-04	5.26E-07	5.74E-04	0.100	0.000
1234678-HpCDD		19.27	1.64E-04	5.78E-03	6.13E-06	6.57E-03	0.0100	0.000
OCDD		71.53	6.05E-04	2.14E-02	2.29E-05	2.42E-02	0.00030	0.000
Total TCDD		40.07	3.41E-04	1.20E-02	1.27E-05	1.38E-02		
Total PeCDD		46.90	3.99E-04	1.41E-02	1.48E-05	1.61E-02		
Total HxCDD		42.77	3.64E-04	1.29E-02	1.35E-05	1.47E-02		
Total HpCDD		39.40	3.35E-04	1.18E-02	1.25E-05	1.35E-02		
2378-TCDF		28.07	2.38E-04	8.39E-03	8.89E-06	9.61E-03	0.10	0.001
12378-PeCDF		5.30	4.52E-05	1.60E-03	1.67E-06	1.82E-03	0.0300	0.000
23478-PeCDF		9.47	8.05E-05	2.84E-03	2.99E-06	3.25E-03	0.30	0.002
123478-HxCDF		23.80	2.03E-04	7.16E-03	7.53E-06	8.18E-03	0.100	0.001
123678-HxCDF		9.07	7.73E-05	2.73E-03	2.86E-06	3.12E-03	0.100	0.000
234678-HxCDF		8.33	7.11E-05	2.51E-03	2.63E-06	2.87E-03	0.100	0.000
123789-HxCDF		0.90	7.73E-06	2.73E-04	2.95E-07	2.97E-04	0.100	0.000
1234678-HpCDF		35.97	3.06E-04	1.08E-02	1.14E-05	1.24E-02	0.0100	0.000
1234789-HpCDF		3.33	2.84E-05	1.00E-03	1.05E-06	1.15E-03	0.0100	0.000
OCDF		15.57	1.32E-04	4.67E-03	4.95E-06	5.32E-03	0.00030	0.000
Total TCDF		154.30	1.31E-03	4.63E-02	4.88E-05	5.29E-02		
Total PeCDF		123.57	1.05E-03	3.72E-02	3.90E-05	4.25E-02		
Total HxCDF		92.07	7.85E-04	2.77E-02	2.91E-05	3.17E-02		
Total HpCDF		49.67	4.23E-04	1.49E-02	1.57E-05	1.71E-02		
Total TEQ								**0.00479**
Subpart LLL Limit								**0.2**

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Table 1-8. SVBYPASS Summary of Test Results

EPA Reference Method 23

Determination of Dioxins/Furan Emissions From Stationary Sources

Client	**St. Mary**	**Date**	**9/18/2018**
Facility	**Charlevoix**	**Job Number**	**0**
Unit	**Bypass**	**Operator**	**BD**
Location	**Stack**	**Version**	**ST606-101-02**

AVERAGE TEST 1-3

Element	Detection Status	PG	ng/dscf	ng/dscm	lbs/hr	ng/dscm @7% O2	1989 TEF	1989 TEQ
2378-TCDD		ND						
12378-PeCDD		1.43	9.47E-06	3.34E-04	1.03E-07	5.81E-03	0.500	9.47E-06
123478-HxCDD		1.20	7.93E-06	2.80E-04	8.63E-08	4.87E-03	0.100	7.93E-06
123678-HxCDD		2.73	1.81E-05	6.38E-04	1.97E-07	1.11E-02	0.100	1.81E-05
123789-HxCDD		1.67	1.10E-05	3.89E-04	1.20E-07	6.76E-03	0.100	1.10E-05
1234678-HpCDD		12.87	8.50E-05	3.00E-03	9.26E-07	5.22E-02	0.010	8.50E-05
OCDD		71.53	4.99E-04	1.76E-02	5.13E-06	3.06E-01	0.001	4.99E-04
Total TCDD		40.07	2.66E-04	9.41E-03	2.88E-06	1.63E-01		
Total PeCDD		46.90	3.12E-04	1.10E-02	3.37E-06	1.91E-01		
Total HxCDD		42.77	2.84E-04	1.00E-02	3.07E-06	1.74E-01		
Total HpCDD		17.67	1.21E-04	4.26E-03	1.27E-06	7.40E-02		
2378-TCDF		28.07	1.90E-04	6.72E-03	2.01E-06	1.17E-01	0.100	1.90E-04
12378-PeCDF		5.30	3.50E-05	1.24E-03	3.81E-07	2.15E-02	0.050	3.50E-05
23478-PeCDF		9.47	6.31E-05	2.23E-03	6.80E-07	3.87E-02	0.500	6.31E-05
123478-HxCDF		36.47	2.46E-04	8.69E-03	2.62E-06	1.51E-01	0.100	2.46E-04
123678-HxCDF		9.07	5.99E-05	2.12E-03	6.52E-07	3.68E-02	0.100	5.99E-05
234678-HxCDF		8.33	5.51E-05	1.94E-03	5.99E-07	3.38E-02	0.100	5.51E-05
123789-HxCDF		10.37	6.96E-05	2.46E-03	7.45E-07	4.27E-02	0.100	6.96E-05
1234678-HpCDF		23.87	1.59E-04	5.61E-03	1.72E-06	9.74E-02	0.010	1.59E-04
1234789-HpCDF		3.33	2.20E-05	7.78E-04	2.40E-07	1.35E-02	0.010	2.20E-05
OCDF		15.57	1.06E-04	3.73E-03	1.12E-06	6.47E-02	0.001	1.06E-04
Total TCDF		154.30	1.04E-03	3.66E-02	1.11E-05	6.36E-01		
Total PeCDF		123.57	8.17E-04	2.89E-02	8.89E-06	5.01E-01		
Total HxCDF		92.07	6.10E-04	2.16E-02	6.62E-06	3.75E-01		
Total HpCDF		49.67	3.30E-04	1.16E-02	3.57E-06	2.02E-01		
Total TEQ							0.0	**0.00164**
Subpart LLL Limit								**0.2**

ACCUAIR ANALYSIS

OHAPs Emissions Summary
St. Mary's Cement

Flow Weighting

Main Stack

Run	DSCFM
Particulate 1	305,383
Particulate 2	338,415
Particulate 3	318,203
Dioxin 1	300,362
Dioxin 2	303,463
Dioxin 3	326,880
Average	**315,451**

Bypass Stack

Run	DSCFM
Particulate 1	83,009
Particulate 2	78,848
Particulate 3	85,093
Dioxin 1	76,386
Dioxin 2	74,295
Dioxin 3	82,298
Average	**79,988**

Source	DSCFM	%
Main Stack	315,451	79.77
Bypass Stack	79,988	20.23
Total	395,439	100.00

Mill On Condition

Source	Total oHAP ppmvd @7%O2	% of Total Flow	Weighted Fraction
Alkali Bypass	8.27	20.23	1.67
Main Stack	12.66	79.77	10.10
TOTAL			11.77

Mill Off Condition

Source	Total oHAP ppmvd @7%O2	% of Total Flow	Weighted Fraction
Alkali Bypass	8.27	20.23	1.67
Main Stack	30.43	79.77	24.28
TOTAL			25.95

Time-Weighted Final Average

Condition	Total oHAP ppmvd @7%O2	% of Total Time	Weighted Fraction
Mill On	11.77	94.00	11.06
Mill Off	25.95	6.00	1.56
TOTAL			12.62