STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
GAYLORD FIELD OFFICE

RICK SNYDER
GOVERNOR

DAN WYANT
DIRECTOR

(19)

COPY

July 14, 2014

Mr. Bob Budnik
Area Environment and Public Affairs Manager
Lafarge Midwest, Inc.
1435 Ford Avenue
Alpena, MI 49707

SRN: B1477, Alpena County

Dear Mr. Budnik:

SUBJECT: Sampling Plan for Mass Balance Calculations for Mercury Emissions

The Department of Environmental Quality (DEQ), Air Quality Division (AQD), reviewed the Sampling Plan for Mass Balance Calculations for Mercury Emissions (plan) for the Lafarge Midwest, Inc. facility located in Alpena, Alpena County, Michigan. The plan was received by the AQD on June 9, 2014. This letter provides the AQD District Supervisor's approval of the subject plan which replaces any previous plan.

If you have any questions on this issue, please contact Gloria Torello, Environmental Quality Analyst, AQD at 989-705-3410.

Sincerely,

Gloria Torello for

Janis Ransom
Cadillac District Supervisor
Air Quality Division
231-499-9235

cc/via email: Mr. Joshua Strapec
cc: Ms. Gloria Torello, DEQ

![LAFARGE CEMENT logo]

June 9, 2014

Ms. Gloria Torello
Michigan DEQ, AQD
2100 W. M-32
Gaylord, MI 49735

RE: Sampling Plan for Mass Balance Calculations for Hg Emissions for PTI # 195-10B

Dear Ms. Torello:

Submitted for your review and approval, the Lafarge Alpena Plant is submitting this sampling plan in anticipation of commencing material sampling on July 9, 2014 for the purposes of determining emissions by mass balance per PTI # 195-10B. Lafarge will determine mercury emissions for FG Mercury on a monthly and 12-month rolling time period, as determined at the end of each calendar month, for the purpose of determining compliance with the mercury emission limit as listed in Section I (1) and approval of the sampling plan identified in Section V (2) in PTI # 195-10B. The following sampling procedure will be used:

1. Every two weeks samples of the kiln raw feed used, fuels used, wasted cement kiln dust (CKD), clinker, and synthetic gypsum will be collected during normal operating conditions.

2. Samples of each material will be composited and analyzed to determine the total monthly mercury concentration of the materials being processed.

3. All sampling and methods used to determine mercury concentrations will be in accordance with U.S. EPA sampling and analysis protocols.

4. The mass balance equation below will be used to calculate monthly mercury emissions based on the mercury concentrations determined from analysis of the samples collected as described above:

$$MCMI - MCMO = MCME$$

Where:

1

MCMI = The Monthly Calculated Mercury Input (pounds per month) – The mercury entering the process will be determined by the sum of the product of the mercury concentration of the kiln raw feed used and the mass of the kiln raw feed used and the product of the mercury concentration of each fuel used and the mass of each fuel used during the month and sampled every two weeks and composited monthly.

MCMO = The Monthly Calculated Mercury Output (pounds per month) – The mercury leaving the process will be the sum of the products of the mercury concentration of the clinker, permanently removed CKD, and synthetic gypsum for the month, and the respective mass of each material produced for the month and sampled every two weeks and composited monthly.

MCME = The Monthly Calculated Mercury Emissions (pounds per month) - The mass of mercury emitted from FG Mercury will be the Monthly Calculated Mercury Input minus the Monthly Calculated Mercury Output. The consecutive 12-month mercury emission rate will be the sum of the individual monthly records for the current month and the preceding eleven months (pounds of mercury per 12-month rolling time period) after 12 months of initial data has been collected commencing on July 9, 2014.

Production, sampling and testing records, including calculations and data, will be completed and maintained by the permittee for 5 years and shall be made available to the Department upon request.

Please find attached an example spreadsheet for the mass balance emission calculation as determined from material sampling.

If you have any questions or require further information please contact me at 989-358-3321.

Sincerely,

Lafarge Midwest Inc.

Bob Budnik
Area Environment and Public Affairs Manager

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Alpena Plant
Calculated Mercury Emissions

(COPY/PASTE VALUES INTO REPORT) [ ] enter values in these cells

	MCMI																		MCMO									MCME			
	Kiln Feed			Coal-Coke			Plastics			Shingles			Wood			Other (Broth)			Clinker			CKD waste			Syn Gyp			Hg	Hg	Hg	Hg emit
Mo	Tons	Hg PPB	Hg lbs	Tons	Hg PPB	Hg lbs	Tons	Hg PPB	Hg lbs	Tons	Hg PPB	Hg lbs	Tons	Hg PPB	Hg lbs	Tons	Hg PPB	Hg lbs	Tons	Hg PPB	Hg lbs	Tons	Hg PPB	Hg lbs	Tons	Hg PPB	Hg lbs	lbs in	lbs out	emit	12 months
2014 Jan	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Feb	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Mar	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Apr	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
May	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Jun	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Jul	306604	66.2608	40.63	29176.1	30	1.75	532	172.7	0.18			0.00			0.00	506.00	7.55	0.01	187134	1.91	0.72	138135	214.29	5.92			0.00	42.57	6.64	35.94	
Aug	338757	56.6346	38.37	30715.6	15.1	0.93	414.9	143	0.12			0.00			0.00	717.32	76.4	0.11	195019	2.00	0.78	173027	142.3	4.92			0.00	39.53	5.70	33.82	
Sep	309435	41.8077	25.87	27688.4	15.55	0.86	826.6	93.3	0.15			0.00			0.00	503.62	2.7	0.00	181268	1.75	0.63	17656.8	104.359	3.69			0.00	26.89	4.32	22.57	
Oct	361280	43.5843	31.49	33173.6	12.89	0.86	999.6	170.13	0.34			0.00			0.00	683.93	4.85	0.01	209299	2.43	1.02	18506	60.7925	2.25			0.00	32.69	3.27	29.43	
Nov	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Dec	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
2015 Jan	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Feb	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Mar	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Apr	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
May	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Jun	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Jul	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	121.76	
Aug	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	85.82	
Sep	0	0	52.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	52.00	
Oct	0	0	29.43			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	29.43	
Nov	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Dec	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
2016 Jan	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Feb	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Mar	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Apr	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
May	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Jun	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Jul	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Aug	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Sep	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	
Oct	0	0	0.00			0.00			0.00			0.00			0.00			0.00	0	0.00	0.00	0	0	0.00			0.00	0.00	0.00	0.00	

Kiln Feed

	KG5	KG6	KG5	KG6	KF total	KF avg
Mo	tonnes	tonnes	Hg ppb	Hg ppb	tons	Hg ppb
2013 Jan					0	0
Feb					0	0
Mar					0	0
Apr					0	0
May					0	0
Jun					0	0
Jul	126224.1	152506.9	76	58.2	306604.1	66.26078
Aug	177345.5	130615.8	61.3	50.3	338757.4	56.63456
Sep	161185.9	120118.8	43.9	39	309435.2	41.80767
Oct	161822	166614.3	41.2	45.9	361279.9	43.58429
Nov					0	0
Dec					0	0
2014 Jan					0	0
Feb					0	0
Mar					0	0
Apr					0	0
May					0	0
Jun					0	0
Jul					0	0
Aug					0	0
Sep					0	0
Oct					0	0
Nov					0	0
Dec					0	0
2015 Jan					0	0
Feb					0	0
Mar					0	0
Apr					0	0
May					0	0
Jun					0	0
Jul					0	0
Aug					0	0
Sep					0	0
Oct					0	0
Nov					0	0
Dec					0	0

CKD

KG5	KG6	KG5	KG6	CKD total	CKD avg
tonnes	tonnes	Hg ppb	Hg ppb	tons	Hg ppb
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
5107.32	7450.443	241.7	195.5	13813.54	214.2898
8096.816	7632.866	138.53	146.3	17302.65	142.3004
8086.639	7965.034	105.6	103.1	17656.84	104.3595
7466.178	9357.425	86.1	40.6	18505.96	60.79253
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
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				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0

Clinker

KG5	KG6	KG5	KG6	KK total	KK avg
tonnes	tonnes	Hg ppb	Hg ppb	tons	Hg ppb
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
69189.58	100932.2	1.2	2.4	187134	1.911953
91259.82	86030.6	1.9	2.1	195019.5	1.99705
83018.53	81770.11	1.6	1.9	181267.5	1.748864
84440.95	105830.6	2.85	2.1	209298.7	2.432844
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
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				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0
				0	0

147718.0

Broth Tool
Gallons 147718
Tons 683.9343

4.

Year	Month	Coal-Coke Tons K19	K20	K21	K22	K23	TOTAL	Clinker Tons K19	K20	K21	K22	K23	KG5 Tonnes	KG6 Tonnes	Kiln Feed Tonnes K19	K20	K21	K22	K23	KG5 Tonnes	KG6 Tonnes
2013	Jan																				
	Feb																				
	Mar																				
	Apr																				
	May																				
	Jun																				
	Jul	5367.5	2116	4782.4	7574.4	9335.8	29176.1	32048.83	13018.53	31201.5	53657.36	57601.88	69189.58	100932.2	49686.8	24602.39	53060.4	78695.72	75584.13	127349.6	154279.9
	Aug	5282.8	5384.7	5109.7	5470.1	9468.3	30715.6	32785.23	33560.37	34251.66	36471.63	58361.37	91259.82	86030.6	53385.08	66582.35	57377.78	51541.98	79073.82	177345.2	130615.8
	Sep	5317.4	4886.4	4887	4445.3	8152.3	27688.4	31964.48	29063.61	30484.65	31970.28	58166.31	83018.53	81770.11	53964.52	56387.32	50833.92	42177.17	77941.67	161185.8	120118.8
	Oct	4291.7	5458.3	5505.4	9194.2	8724	33173.6	25094.02	33926.6	34060.08	59101.8	57557.04	84440.95	105830.6	40851.2	63057.88	57912.87	86195.36	80418.94	161822	166614.3
	Nov																				
	Dec																				
2014	Jan																				
	Feb																				
	Mar																				
	Apr																				
	May																				
	Jun																				
	Jul																				
	Aug																				
	Sep																				
	Oct																				
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	Dec																				
2015	Jan																				
	Feb																				
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	Apr																				
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	Oct																				
	Nov																				
	Dec																				

5.