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GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



C. HEIDI GREYER
DIRECTOR

February 14, 2017

Mr. John Mooney
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard (AR-18J)
Chicago, Illinois 60604-3507

Dear Mr. Mooney:

The Michigan Department of Environmental Quality (MDEQ) is submitting an addendum to our recommended designations for the 1-hour sulfur dioxide (SO₂) National Ambient Air Quality Standard (NAAQS) as required by the Data Requirements Rule. This addendum contains revised dispersion modeling of the Lafarge Cement facility from that submitted to the United States Environmental Protection Agency (USEPA) in my letter dated January 13, 2016. This addendum supports our original recommendation of attainment for Alpena County.

Our attainment recommendation was determined using dispersion modeling, emissions-related data, and meteorology as outlined in the USEPA's guidance memorandum dated March 20, 2015. The initial attainment recommendation for the Lafarge Cement facility was based on two years and eleven months of data, not the required full three years of actual emissions. The analysis in this addendum covers the full three years of emissions data; 2014-2016.

A description of the MDEQ's analysis is provided in the enclosed Addendum - Support Documentation for Sulfur Dioxide Designation Recommendations for the 2010 SO₂ NAAQS.

If you have additional questions regarding this matter, please contact Mr. Robert Irvine, Air Quality Division, at 517-284-6749; irviner@michigan.gov; or MDEQ, P.O. Box 30260, Lansing, Michigan 48909-7760; or you may contact me.

Sincerely,

Lynn Fiedler, Division Director
Air Quality Division
517-284-6773

cc: Mr. Robert Irvine, MDEQ

Addendum

Support Documentation for Sulfur Dioxide Designation Recommendations for the 2010 SO₂ NAAQS



Michigan Department of Environmental Quality
Air Quality Division
P.O. Box 30260
Lansing, Michigan 48909-7760

February 14, 2017

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**Addendum - Support Documentation for
Sulfur Dioxide Designation Recommendations
for the 2010 SO₂ NAAQS**

Introduction

Per the provisions of the Data Requirement Rule, the Michigan Department of Environmental Quality (MDEQ) submitted designation recommendations for the 1-hour sulfur dioxide (SO₂) National Ambient Air Quality Standard (NAAQS) in a January 13, 2017, letter from Lynn Fiedler to the United States Environmental Protection Agency (USEPA). In that letter, the MDEQ recommended attainment for both Delta and Alpena Counties. However, since that submittal, the MDEQ has received updated emissions data for the Lafarge Cement facility in Alpena and revised the modeling analysis submitted on January 13, 2017, accordingly. Based upon the updated analysis, the MDEQ again recommends attainment for Alpena County. A description of the MDEQ's revised modeling analysis is provided in this document.

There have been no revisions in the modeling forming the basis of the MDEQ's attainment recommendation for Delta County. As such, the MDEQ's January 13, 2017, attainment recommendation for Delta County stands as submitted.

Lafarge Cement Stack and Emissions Information

Lafarge operates continuous emissions monitors (CEMS) on their kiln stacks. This actual CEMS emissions data was modeled for all sources at the facility, along with the actual hourly stack gas temperature, and gas flow rate. One of their kilns, KG6 (WGS) did not have controlled emissions until December 2013. For the January 13, 2017 submittal, the facility and the MDEQ decided to use actual emissions starting January 1, 2014 through November 30, 2016 to account for the current operation. On January 9, 2017, Lafarge provided the MDEQ with three full years of CEMS emissions data; 2014-2016. The modeled source parameters can be found in Table 1.

Table 1. Lafarge Cement Modeled Stack Parameters

Stack ID	Stack Height (meters)	Stack Diameter (meters)	Exit Velocity (meters/sec)	Exit Temperature (Kelvin)
K19	67.06	3.96	5.00	481.87
K20	67.06	3.96	5.40	467.98
K21	67.06	3.96	5.52	462.54
WGS	76.20	2.54	16.12	326.09

Summary of Lafarge Cement Modeling

The modeling for Lafarge Cement was performed by RTP Environmental Associates. The analysis submitted on January 13, 2017 was done using AERMOD version 15181 and hourly meteorological data from the National Weather Service station at the Alpena County Regional Airport (APN). The meteorological data was processed with AERMET version 14134 using the adjusted ustar non-default beta option.

An update to the AERMOD model, version 16216, was released December 20, 2016 and a revision to that model was released January 17, 2017; version 16216r. The updated modeling analysis for Lafarge Cement was done with AERMOD version 16216r using three years of hourly meteorological data from APN. The APN meteorological data was processed with the most recent version of AERMET, 16216, using the adjusted ustar regulatory option.

As with the initial submittal, no other SO₂ sources were found near the facility; therefore, the facility was modeled by itself. Background concentrations of SO₂ were input into the model as varying concentrations by hour of day and season. This is a less conservative, but allowed, approach for including background. The background concentrations were added to the modeled concentration within AERMOD; therefore, the end result is a combined impact of both facility emissions and background concentrations of SO₂. The total predicted impact is 74.3 ppb, which is below the NAAQS of 75 ppb.

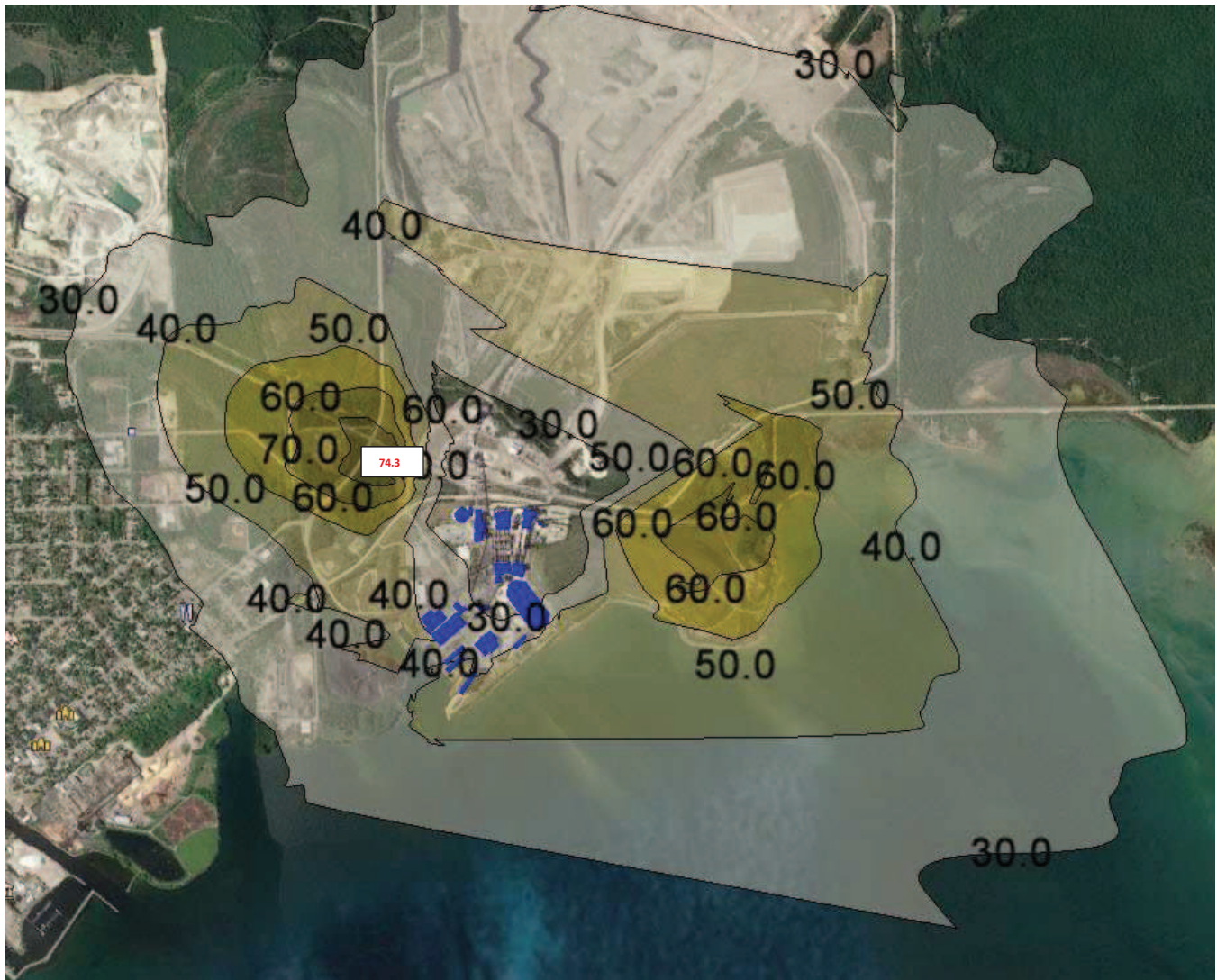
Table 2. Lafarge Modeling Impacts

County	Facility Name	3-year average of the 99% daily max. 1-hour (ppb)	Background Concentration (ppb) ¹	Combined SO ₂ Impact (ppb)
Alpena	Lafarge Portland Cement Manufacturing	74.3	-	74.3

¹ Contemporaneous SO₂ background concentrations were input into the model run; therefore, the 3-year average of the 99% daily max. 1-hour includes background.

Based on the modeling results displayed in Table 2, the Lafarge Cement facility meets the 1-hour SO₂ NAAQS. Figure 1 shows concentration isopleth plots and the maximum impact location for the demonstration. The following figure demonstrates areas in attainment.

Figure 1. Isopleth and Maximum Impact (ppb) for Lafarge Cement (including background)



Recommended Attainment Areas

Based on the source modeling described above, the MDEQ stands by its recommendation of attainment of the 2010 SO₂ 1-hour NAAQS for the areas surrounding the Lafarge Cement Facility. The MDEQ recommends attainment boundaries to include the entire county of Alpena. This follows the recommended approach for facilities modeling attainment as described in the March 20, 2015, USEPA guidance.