Comments of Olson, Bzdok & Howard, P.C. on behalf of the People of Alpena Regarding a Proposed Consent Order and Air Quality Permitting at the Lafarge Corporation Cement Plant and Coal Combustion Fly Ash Disposal Operation at Alpena, Michigan

Presented to

Air Quality Division
Michigan Department of Environmental Quality

&

U.S. Environmental Protection Agency, Region V,
Air & Radiation Division

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1 Introduction

At the request of counsel (Olson, Bzdok & Howard, P.C., in Traverse City Michigan), these comments are submitted on behalf of residents of Alpena regarding the proposed consent order and operating permits for the Lafarge Plant. We understand that the proposed consent order and operating permits are offered as a settlement of the lawsuit filed by Lafarge against the Michigan Department of Environmental Quality (DEQ), and that the DEQ noticed the proposed order and permits for public comment prior to their being finalized. The proposed order and permits violate the statutes, regulations, and policies intended to protect human health and environment, as described in detail below.

In sum, (1) rather than deny, revoke, or sanction Lafarge for errors and omission related to its historic mercury emissions, MDEQ-AQD proposes to issue new permits that would essentially condone those prior problems; (2) MDEQ-AQD has failed to apply adequate control technology review to the proposed processes, particularly with respect to mercury emissions; and (3) there has been no valid, complete, or adequate assessment of the potential human health and ecological impacts resulting from the proposed mercury emissions. For these reasons, we respectfully request that you withdraw any preliminary approval of the proposed order and permits and amend them to satisfy the concerns cited below.

2 MDEQ Air Quality Division Claims They Are Without Authority to Require Emission Controls and More Stringent Regulation of Lafarge Corporation's Mercury Emissions is Erroneous on Multiple Counts

MDEQ Air Quality Division (MDEQ-AQD) has repeatedly claimed they are without authority to require more stringent mercury emission control and emission limitations at the Lafarge Alpena facility. MDEQ's claims represent abdications from clear MDEQ requirements and duties on both permitting and enforcement proceeding in which MDEQ and Lafarge are parties.

An example of MDEQ-AQD abdication of their responsibilities is noted in the June 20, 2005 responsiveness summary on the issuance of Permit No. 15-05:

> "....we currently do not have any rules or regulations requiring cement plants to limit mercury or to require them to control mercury. The only two rules that generally apply to health and welfare and compounds that are harmful from routes other than inhalation that could affect the environment are Rules R336.1901 and R336.1228, respectively."....

> "It has been preliminarily determined that the proposed installation of the facility will not violate any of the department's rules nor the national ambient air quality standards."....
>
> "The AQD must have a regulatory basis (either a state rule or a federal regulation) for developing the conditions of a permit."

MDEQ-AQD did not actually render a judgment or finding under Rules R336.1901 and R336.1228; the agency never considered that it had both broadly applicable residual authority and a firm regulatory basis to act under its rules and the statute as set forth in subsequent sections of this comment. With its failure to make findings and to avail itself of available authority, MDEQ-AQD failed to impose effective conditions and limitations on Lafarge as outlined below through the application of its permit to install authority, which provides, in part:

> "A permit to install may be approved subject to any condition, specified in writing, that is reasonably necessary to assure compliance with all applicable requirements." (Michigan Rule 336.1201(3))

By failing to render a condition to require emission limitations that reflect a robust level of emission control for mercury at the Lafarge facility, MDEQ-AQD has abused its discretion under this rule.

2.1 The MDEQ-AQD's Proposed Consent Order and Underlying Permit Decisions Fail to Comply with the "Michigan Environmental Protection Act" MCL §324.1705 Provisions of the Michigan Natural Resources and Environmental Protection Act (NREPA)

Notwithstanding these assertions of limits on the ability of MDEQ-AQD to insist on additional mercury control and limitations, the MDEQ-AQD proposed administrative order, the 2005 version of Permit No. 15-05 and the proposed Permit No. 15-05A all fail to comply with the "Michigan Environmental Protection Act"[1] provisions of NREPA. This statute provides:

> "(2) In administrative, licensing, or other proceedings, and in any judicial review of such a proceeding, the alleged pollution, impairment, or destruction of the air, water, or other natural resources, or the public trust in these resources, shall be

[1] The Michigan Environmental Protection Act was formerly a stand-alone Michigan statute that was re-codified in the mid-1990's into Article I, Part 17 of the Michigan Natural Resources and Environmental Act.

> determined, and conduct shall not be authorized or approved that has or is likely to have such an effect if there is a feasible and prudent alternative consistent with the reasonable requirements of the public health, safety, and welfare." (MCL §324.1705(2))

In enacting this section of law, the Michigan Legislature was enacting both a standard and a process for decision-making by MDEQ intended to articulate the requirements of the Michigan Constitution:

> "The conservation and development of the natural resources of the state are hereby declared to be of paramount public concern in the interest of the health, safety and general welfare of the people. The legislature shall provide for the protection of the air, water and other natural resources of the state from pollution, impairment and destruction."[2]

MDEQ-AQD's proceedings to adopt the proposed consent order, the proposed permit amendment as Permit No. 15-05A and the original year 2005 adoption of the present Permit No. 15-05 must undeniably be considered as "administrative, licensing, or other proceedings." Further, the proceedings of the Alpena County Circuit Court in litigation filed by Lafarge against MDEQ involving Lafarge's challenge to Permit No. 15-05 must also be considered as covered by MCL §324.1705(2).

As such, MDEQ-AQD must make clear findings on all "pollution, impairment and destruction" and further, to consider "feasible and prudent alternative consistent with the reasonable requirements of the public health, safety, and welfare..." MDEQ-AQD proposed decisions on the administrative order and the subject air quality permitting fails on both counts.

First, MDEQ-AQD has failed to carry out a comprehensive multi-path risk assessment for both human health and ecological risk associated with both the final target emission level of 390 lbs/year of mercury under Permits No. 15-05 and 15-05A, and the interim mercury limit of 567 lbs/year under the proposed administrative consent order. (See section _____of this document for additional information on the inadequacy of the MDEQ risk assessment effort.)

Second, MDEQ-AQD has placed no information on the record which establishes the reliability and validity of the 33% "best engineering judgment" system removal efficiency factor used to derive an emission estimation of 390 lbs/year of mercury or otherwise shown how such a factor is justified for the particular configuration and process equipment at the Lafarge site. Nothing in Permits No. 15-05 and 15-05A provide a method to ensure that the mercury content of each shipment of all raw materials, fuels,

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[2] Michigan Constitution 1963, Art. IV, § 52, Eff. Jan. 1, 1964

alternate raw materials and alternate fuels is properly analyzed, monitored and considered for determination of the mercury inputs to the multiple kiln systems and other process equipment at the Lafarge site. The failure to provide for measures to require that Lafarge complies with mercury emission limitations and emission projections at times other than when a stack test is being conducted exacerbates the failure to justify its assumptions and to properly quantify mercury inputs at the site.

Third, MDEQ-AQD never considered any "feasible and prudent" alternative techniques and measures for reducing the mercury emissions from Lafarge. One obvious measure that would cut mercury emissions by over 50% would be to cease the use of coal combustion fly ash containing as much as 0.5 mg/kg of mercury. The primary purpose of the fly ash is to provide aluminum oxides and silicon oxides which can be provided by more traditional cement-making materials, such as aluminum ore and other materials. However, instead of making protection of the public trust in Michigan's environment and natural resources its paramount concern, MDEQ-AQD made Lafarge's contract obligations and Lafarge's collection of tipping fees for disposal of fly ash its primary concern:

> "The interim stack testing requirements appear to be tied to process modifications. What is the basis of the December 31, 2009 as concluding the interim period?
>
> The Company utilizes flyash in their material inputs used for manufacturing cement product. It has entered a binding contract which expires December 31, 2009 with a supplier of flyash. The Company has discovered that a significant source of their mercury emissions comes from the flyash they use. In addition to the process modifications which allow for production increases of up to 20%, the Company has represented that after the modifications have been implemented or by the time this contract expires they will be able to reduce their mercury emissions to 390 pounds of mercury per year, in part presuming that the Company will be able to obtain flyash with lower mercury content after the contract expires."[3]

In particular, the Lafarge facility receives power plant fly ash from the Nanticoke power plant in Canada, which is a facility having a high carbon content in its fly ash that presently allows up to 60% collection efficiency of mercury generated from coal burning in that facility. Ceasing use of the Nanticoke fly ash in favor of other fly ash sources that do not contain as much mercury must also be considered a feasible and prudent option. There is no reason that Nanticoke fly ash must be disposed at the Lafarge facility. It can also be landfilled just as much other fly ash from other power plants is managed.

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[3] MDEQ-AQD question and answer document 15-05a&72-03q&a.pdf, September 7, 2006, p 5 of 9.

Other alternative control measures which MDEQ-AQD failed to consider include the potential for disposing a greater proportion of the cement kiln dust rather than insufflating it back to the kiln and thus increasing equilibrium mercury concentrations in the kiln systems, selective mining of the Lafarge quarry to achieve lower mercury content in limestone, limitations/standards on the maximum mercury content of coal fly ash utilized, use of lower mercury fuels, provision for thermal treatment of either fly ash received and/or collected cement kiln dust (CKD) to desorb mercury for separation and collection from the CDK prior to kiln insufflation for recycling, potential alteration of the process to allow use of carbon injection and/or the addition of sorbents and a polishing emission control system on the final flue gas exhaust.

In administrative proceedings in which MDEQ-AQD failed to properly consider the potential magnitude and effects of potential emissions and failed to consider potential alternatives for emission control, the agency violates the requirements of MCL §324.1705(2).

2.2 MDEQ-AQD Never Enforced Part 2 - Air Use Approval Rules Regarding Erroneous Emission Characterizations and Fly Ash-Related Process Changes Regarding Lafarge's Raw Material Test Project and Commencement of Permanent Coal Fly Ash Utilization Operations

2.2.1 MDEQ-AQD's Erroneous Insistence That Lafarge's Mercury Emissions Were Never Previously Stack Tested Leading MDEQ-AQD to be Blind-sided on Review of Mercury Issues, Enforcement of Part 2 Requirements and the Defense of MDEQ Against Lafarge's Litigation

MDEQ-AQD staff managing the present applications and consent order proceedings apparently believed that mercury emissions from Lafarge kiln processes had never been stack tested for mercury.

> "Comment: Is 570 pounds per year supposed to be a close estimate of how much is actually released?
>
> AQD Response: The 570 pounds is an estimate of what could be the worst scenario of mercury emissions. Both Lafarge and the AQD do not know what emissions of mercury are currently being emitted since the company has never been required to do stack testing."[4]

This MDEQ-AQD staff belief was seriously in error. Stack emissions from Lafarge were tested at least twice for mercury in the 1990s, including BIF compliance tests in 1992 for

[4]June 20, 2005 Response to Comments Document, Page 5

metals. MDEQ field staff should have known this fact from prior experience. Attachment #1 shows one of the stack tests on Kiln 23 in September, 1990. The results indicate a three-test average of 2.69 dry normal cubic meters. The prior PM test had a three test average of 5936 dry normal cubic meters per minute. The mass rate mercury emissions from Kiln 23 would thus be about 0.0021 lbs/hr or about 18 lbs of mercury in a 8760 hour year. This stack test indicated that Lafarge would not be considered an unusually large source of emissions. Such emissions would be a small fraction of the present mercury emissions from Kiln 23.

2.2.2 Lafarge's Subsequent Applications for Alternate Raw Materials

The testing mentioned in the prior subsection and any testing done in 1992 represent emissions during operations by Lafarge with their traditional kiln raw meal mix using limestone, shale, sand and other materials and not the use of coal fly as a component of the raw kiln meal.

In early 1992, Lafarge attempted to gain permission to use Abitibi-Price fly ash without success in the form of approval from MDEQ.

Subsequently, in October, 1992, Lafarge shifted its attention to using coal combustion fly from the Nanticoke power plant in Ontario and iron ore tailings from Michigan U.P. iron ore mines on a test basis. See Attachment #2. Lafarge asserted:

> **"Due to the nature of the raw materials, <u>we are expecting no increase in air contaminants</u> as compared to using our traditional raw materials."**[5] (emphasis added)

Lafarge subsequently told U.S. EPA:

> "These alternate raw materials will be replacing our current raw material, shale. This material will be used in our kilns which are now regulated by BIF. These alternative raw materials are **not chemically different from our shale**.....Lafarge is **anticipating no increased impact on emissions from the kiln system**.....We intend to sample the raw materials and CKD to **demonstrate the metal inputs out [sic] outputs have not changed or increased** with the alternate raw materials." (emphasis added) (See Attachment #4)

Attachment #2 contains a laboratory analytical report showing total mercury for the fly ash at 0.03 mg/kg, which is presumed as the valid mercury concentration of the Nanticoke

[5] See October 23, 1992 cover page letter from Thomas A. Johns, Lafarge Environmental Engineer to Dave Ferrier, MDEQ-AQD; 1st page of Attachment #2.

fly ash at the time. Table 1 of the submittal showed the fly ash at 0.4 mg/kg, but did not indicate the supporting basis of that number. Because the 0.03 mg/kg test result appeared on a laboratory report and the 0.4 mg/kg result appeared unsupported in a spreadsheet, Commentors ascribe more weight to the 0.03 mg/kg coal combustion fly ash mercury content characterization as of the time of the ash testing demonstration in late 1992 and at the beginnings of the permanent usage program.

At the same time, Lafarge submitted a mercury analytical sample of the shale that the fly ash would replace showing that the shale has < 0.3 mg/kg of mercury.

Table 3 assumed a total kiln mercury input of 55.7 grams per hour and that 20.5% of that input would partition to kiln discharge gas as an estimated uncontrolled emission. Lafarge's calculation then assumed the air pollution control equipment would have a 90% mercury control efficiency for an expected stack total stack emission rate from all of the kilns of only 1.14 grams per hour (about 21.9 lbs of mercury per year).

Given the prior low stack test results from 1990 on Kiln 23 for mercury and the projected low emission rate from the Lafarge submittal, MDEQ-AQD had no reason to doubt the submittal and the overriding assertion that use of Nanticoke fly ash as a substitute aluminum oxide source for shale would not increase any emissions, notably of mercury.

Subsequently, Lafarge submitted permit application #166-93 for fly ash and iron ore handling equipment which was subsequently approved after a May 2, 1994 MDEQ-AQD staff report (See Attachment #3). This MDEQ-AQD report contained no mention of mercury or any other kiln stack emissions change/increase and instead focused exclusively on the material handling-related emissions. In doing so, MDEQ-AQD continued to accept Lafarge's characterization as to mercury emissions from the use of the coal fly ash.

2.2.3 Lafarge Changed their Process Within the Meaning of the Part 2 Air Use Rules by Taking More Heavily Mercury Contaminated Fly Ash and by Failing to Inform MDEQ of Such Changes and Failing to Correct the 1992 Erroneous Emissions Characterization

Sometime during the multiple year period from 1995 to 2005, Lafarge either knew or should have known that more mercury was contained in fly ash they were receiving. Attachment #5 shows the mercury content of fly ash at 0.5 mg/kg as of 2005. In 1992, Lafarge was showing fly ash analytical work as shown previously at 0.03 mg/kg, or about 17 times less mercury.

Attachment #6 is a January, 2006 stack test report on a stack test conducted in December 2005 as an alleged "baseline" test; the test report shows Lafarge was emitting about 26-27 times the amount of mercury – about 581 lb in a 8760 hour year -- as they previously estimated they were emitting in 1992 (1.14 grams/hour or 0.0025 lb/hr).

The use of significantly more contaminated coal combustion fly ash together with the existence of a past unsupportable emission characterization and the occurrence of a stack test with dramatically larger mercury emissions in 2005 compared to what was occurring in a baseline period in the early 1990s is all unmistakable evidence of a process change that led to increased emissions.

The Nanticoke plant has installed selective catalytic reduction and has engaged in coal blending to increase coal-related chlorine in order to increase the collection efficiency of mercury in their air pollution control system. Lafarge should have exercised continuing due diligence concerning the mercury contaminants contained in fly ash they disposed in their cement making process by testing for mercury in such materials. In 2000 and years prior, Lafarge should have known about all metal inputs from all materials and fuels to their kiln system as part of their responsibilities for Boiler and Industrial Furnace rules compliance as part of their hazardous waste combustion activities. Lafarge either knew, or should have known, about the amount of mercury in their kiln systems. As of 1996, Lafarge was required to certify compliance in a Clean Air Act Title V application concerning their emissions and compliance with new source review/Part 2 rules in Michigan.

In addition, Lafarge either knew, or should have known, that their fabric filter emission control systems with no spray drying would be unlikely to achieve a 90% control efficiency for mercury emissions. In addition, assumptions that only 20.5% of the mercury would partition to the flue gas and failure to consider the equilibrium effects of CKD recycling would render any emission characterization that relied on these assumptions as highly suspect. All of these assumptions were made in their 1992 emissions characterization on the matter of using alternative raw materials.

Notwithstanding the process change associated with receiving and using coal fly ash that had over an order of magnitude increase in mercury content and an emission characterization that could not be assumed as correct with the development of additional expertise and experience with mercury emission control, Lafarge nevertheless failed to inform MDEQ of these problems with mercury at their facility until they sought to increase their production rate in mid-2005.

While Commentors do not have a complete history of what went in the interim period between the early 1990s and year 2005, it is clear that Lafarge had low mercury emissions at the beginning of the interval and high mercury emissions at the end of the interval.

2.2.4 Notwithstanding Lafarge's Past Process Change and Failure to Correct an Unsupportable Emission Characterization, MDEQ-AQD Failed to Enforce its Part 2 Rules Requiring Both Permits for Process Changes and Accurate Permit Applications and Submittals

The air pollution control section of the Michigan Natural Resource and Environmental Protection Act provides the following grounds for revocation or denial of a permit:

> "(c) The person applying for the permit makes a false representation or provides false information during the permit review process.
>
> (d) The source has not been installed, constructed, reconstructed, relocated, altered, or operated in a manner consistent with the application for a permit or as specified in a permit." (MCL §324.5510(c) & (d))

Lafarge had a duty to inform MDEQ that replacement of shale with coal combustion fly ash could not be done as years went by without significantly increased mercury emissions once it was clear to the company that they were operating and emitting mercury in a manner that was not supported by their previous characterizations to MDEQ.

The company failed to correct an erroneous emission calculation in prior information submitted to MDEQ. We have not reviewed Lafarge's Title V application, but any breach in the duty to disclose the above failures in a certification of compliance would also violate Title V rules as well. Finally, the evidence of actual emissions being significantly larger is also *prima facia* evidence of a process change that would have required a permit to install such a process change.

Lafarge failed to submit an application for a process change to accommodate the increased mercury content of coal combustion fly ash it received when Michigan Part 2 air pollution rules require a permit in such a circumstance.

Once that MDEQ-AQD learned of these facts, the agency should have commenced an enforcement action against Lafarge over such past violations. The failure to commence such an enforcement action is an inappropriate failure to carry out environmental enforcement involving an entity with an extensive past history of environmental violations.

Further, even absent an enforcement action, the MDEQ-AQD should not be responding to the past error by Lafarge by permitting such conduct essentially after the fact through issuance of permit revisions designed accommodate the high facility mercury emissions.

2.3 MDEQ-AQD Has Failed to Enforce Rule Requirements Governing Collected Air Contaminants

Michigan air pollution control rules provide:

> "Rule 370. (1) Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. **The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air.**" (Michigan Rule 336.1370(1)) (emphasis added)

In the present case of Rule 370, the applicability of the rule goes beyond just the control of particulate matter and reaches all collected "air contaminants," which are defined under the Michigan rules as follows:

> "(f) "Air contaminant" means a dust, fume, gas, mist, odor, smoke, vapor, or any combination thereof." (Michigan Rule 336.1101(f))

Similar requirements are contained in general conditions of air quality permits to install and operate issued throughout Michigan. All entities generating or handling collected air contaminants for disposal must comply with requirements involving collected air contaminates generated by coal fired electric power plants. Appendix A of proposed Permit No. 72-03 indicates that Lafarge is receiving the following materials for disposal:

> Coal combustion residue (ash) - OPG Nanticoke
> Coal combustion residue (ash) - Bay City, Michigan Karn Station
> Coal combustion residue (ash) - Marquette, Michigan Presque Isle Station
> Coal combustion residue (ash) - Decorative Panels Inc. (approved but not yet used)

As ash generators, each of the listed entities must comply with Rule 370. In addition, Lafarge Corporation must also comply with Rule 370 when acting as a waste disposal contractor for the named facilities. As such both the ash generating entities and Lafarge have a joint responsibility to comply with Rule 370 and limit the emission of air contaminants from the disposal of coal combustion fly ash.

However, management of coal combustion fly ash in a manner that allows at least two thirds (or perhaps virtually all) of its mercury content to be emitted uncontrolled to the air by disposal operations cannot be considered as minimizing the introduction of collected air contaminants (specifically mercury) into the outdoor air. In a state which has allegedly determined its goal is the virtual elimination of mercury emissions, such a practice cannot be considered as emissions minimization. Other means of managing coal combustion fly ash, such as landfilling and its use as a cement blending component and admixture (rather than clinker production raw meal), must be considered as the required

practices for minimizing the introduction of mercury as a collected air contaminant from coal combustion fly ash disposal and for meeting the requirements of Michigan rule 370.

In a situation where the Lafarge facility with its high, uncontrolled mercury emissions is used for fly ash as raw kiln meal, such a practice must be considered in violation of Rule 370 for both the ash generating facilities and Lafarge as the ash disposal contractor.

2.4 Michigan's Rule 224(2)(a) Exemption from the Requirements for Best Available Control Technology Standards for Toxics (T-BACT) is Not Triggered by an Inchoate Federal MACT Standard for Portland Cement Plants; As Such, MDEQ-AQD's Failure to Require Implementation of T-BACT at the Lafarge Facility with its Dramatically Increased Emissions of Mercury Constitutes Error

MDEQ-AQD requires that new or modified processes subject to the permit to install requirement incorporate Best Available Control Technology for Toxics:

> "(1) A person who is responsible for any proposed new or modified emission unit or units for which an application for a permit to install is required by part 2 of these rules and which emits a toxic air contaminant shall not cause or allow the emission of the toxic air contaminant from the proposed new or modified emission unit or units in excess of the maximum allowable emission rate based on the application of best available control technology for toxics (T-BACT), except as provided in subrule (2) of this rule." (Michigan Rule 336.1224(1))

In the present case, MDEQ-AQD did not require Lafarge to submit a T-BACT demonstrations concerning the increased mercury emissions from the facility compared to what was previously emitted during stack testing in the 1990s. Instead, MDEQ-AQD considered that the publication of the final regulations of the present Portland Cement MACT standard[6] triggered the following T-BACT exemption:

> "(2) The requirement for T-BACT in subrule (1) of this rule shall not apply to any of the following:
>
> > (a) An emission unit or units for which standards have been promulgated under section 112(d) of the clean air act or for which a control technology determination has been made under section 112(g) or 112(j) of the clean air act for any of the following:

[6] See 40 C.F.R. 63, Subpart LLL at 40 C.F.R. 63.1340, *et seq.*

> (i) The hazardous pollutants listed in section 112(b) of the clean air act.
>
> (ii) Other toxic air contaminants that are volatile organic compounds, if the standard promulgated under section 112(d) of the clean air act or the determination made under section 112(g) or 112(j) of the clean air act controls similar compounds that are also volatile organic compounds.
>
> (iii) Other toxic air contaminants that are particulate matter, if the standard promulgated under section 112(d) of the clean air act or the determination made under section 112(g) or 112(j) of the clean air act controls similar compounds that are also particulate matter." (Michigan Rule 336.1224(2)(a))

However, as published the final 40 C.F.R. Part 63, Subpart LLL Portland Cement Maximum Achievable Control Technology Standard are inchoate and cannot be considered to have triggered the T-BACT exemption of Michigan Rule 336.1224(2)(a). In *National Lime Association v. U.S. Environmental Protection Agency*,[7] the United States Circuit Court for the District of Columbia remanded the 40 C.F.R. Part 63, Subpart LLL Portland Cement MACT standard back to U.S. EPA. The Court found (in part):

> *"B. Failure to Set Floors for HCl, Mercury, and Total Hydrocarbons*
>
> EPA established emission floors of "no control" for HCl, mercury, and total hydrocarbons (a surrogate for organic HAPs other than dioxin/furan) because the Agency found no cement plants using control technologies for these pollutants. The Sierra Club argues that EPA's failure to set emission limits for these HAPs violates the statute's requirement that the Agency establish emission standards for each of "the hazardous air pollutants listed for regulation." 42 U.S.C. § 7412(d)(1). Defending its decision, EPA points to *Sierra*'s suggestion that the worst foreseeable performance of the best performing unit might be predictable from the performance of the worst performing unit using the same technology. *See* 64 Fed.Reg. at 31,915 (citing *Sierra*, 167 F.3d at 665). According to EPA, if no control technology exists, then the worst foreseeable performance "could vary day by day" and the standard must be no control. *See* EPA Response to Comments (May 7, 1999), at 190.
>
> On this issue, we agree with the Sierra Club. Nothing in the statute even suggests that EPA may set emission levels only for those listed HAPs controlled with technology. To the contrary, the statute lists over one hundred specific HAPs, 42 U.S.C. § 7412(b)(1), and requires EPA to "promulgate regulations establishing

[7] 233 F.3d 625, (D.C. App. 2000)

emission standards for each category or subcategory of major sources ... of hazardous air pollutants listed for regulation." *Id.* § 7412(d)(1). The statute directs the ***634 **106** Agency to promulgate these emission standards by November 15, 2000. *Id.* § 7412(e)(1) (E). Congress added the list of pollutants to be regulated, regulation deadlines, and minimum stringency requirements to the Clean Air Act precisely because it believed EPA had failed to regulate enough HAPs under previous air toxics provisions. "The [air toxics] law has worked poorly. In 18 years, EPA has regulated only some sources of only seven chemicals.... The legislation reported by the Committee would entirely restructure the existing law, so that toxics might be adequately regulated by the Federal Government." S. rep. No. 101-228, at 128 (1989); *see also* H.R. rep. No. 101-490, pt. 1, at 322 (1990) ("Since 1970, EPA has listed only eight substances as hazardous air pollutants ... and has promulgated emissions standards for seven of them.").

Contrary to EPA's argument, nothing in *Sierra* relieves it of the clear statutory obligation to set emission standards for each listed HAP. Although *Sierra* permits the Agency to look at technological controls to set emission standards, *see* 167 F.3d at 665, it does not say that EPA may avoid setting standards for HAPs not controlled with technology.

Although we thus believe that section 7412(d)(1)'s language disposes of this issue, we add that our reading of that section is reinforced by the Clean Air Act's legislative history. A report by the Senate Committee on Environment and Public Works states:

> The technologies, practices or strategies which are to be considered in setting emission standards under this subsection go beyond the traditional end-of-the-stack treatment or abatement system. The Administrator is to give priority to technologies or strategies which reduce the amount of pollution generated through process changes or the substitution of materials less hazardous. Pollution prevention is to be the preferred strategy wherever possible. S. rep. No. 101-228, at 168.

For all of these reasons, the absence of technology-based pollution control devices for HCl, mercury, and total hydrocarbons did not excuse EPA from setting emission standards for those pollutants. We thus will remand for EPA to do so."

Because EPA's Portland Cement MACT standard is under remand and because EPA has not yet published a final standard in response to the D.C. Circuit Court remand order, the current final MACT regulation is inchoate and cannot be considered as finally "promulgated" within the meaning of the Michigan Rule 224(2) T-BACT exemption.

Further, the T-BACT exemption is clearly contaminant-specific (Rule 224(2)(a)(1)), and the *National Lime Association* opinion makes clear that there is no mercury-specific federal standard.

Notably, the federal standard is not complete on the very important matter of the failure to incorporate a floor and emission limitation for mercury – the very subject of the present MDEQ-AQD proceeding. The Michigan Rule T-BACT exemption was never intended to allow toxic air contaminant sources to escape all control technology review for important contaminants such as mercury. It was intended to allow federally promulgated hazardous air pollutant emission limitations to supercede Michigan T-BACT requirements.

When the Federal standards are not complete, under remand and fail to regulate the subject air contaminants, such a circumstance does not validly invoke the Rule 224 exemption from T-BACT. Because T-BACT is nevertheless required as part of Lafarge's air permit application (and with MDEQ-AQD's consideration of it), Lafarge's permit application 15-05A and the proposed consent order should be denied and the existing Permit No. 15-05 should be revoked.

3 Matters of Environmental Risk Assessment Concerning Lafarge Mercury Emissions

3.1 No Comprehensive Human Health and Ecological Risk Assessment Has Been Performed to Address the Consequences of High Mercury Emissions from Lafarge

MDEQ-AQD admits that only a "screening" review of risks of mercury emissions from Lafarge has been conducted:

> "The tall stacks at Lafarge promote the dispersion and dilution of emitted mercury. Air dispersion modeling takes this into account, as well at the local weather patterns. **As a screening analysis air dispersion modeling was used to estimate the dispersion of emitted mercury and also the deposition rates to the surface of land and lakes around Alpena. These deposition rates were compared to the deposition rates from a full scale mercury impact analysis done previously in another area of the state.** This screening comparison indicated that the modeled deposition rates from Lafarge did not appear likely to significantly increase mercury bioaccumulation in fish tissue, and the resultant health hazards associated with eating these fish. However, there is some uncertainty associated with this screening analysis as it does not take into account several site specific parameters that can impact the findings. It is possible to perform more detailed and complex site specific modeling to derive estimates of the fate of the emitted mercury in the watersheds and lakes surrounding Alpena. The required stack test data will provide actual speciated mercury emissions data that would be important

for this analysis. Any needed further assessments regarding impacts of mercury would be based on this data."[8] (emphasis added)

As such, there has been no complete and comprehensive multipathway risk assessment analysis of both human health and ecological risk and effects associated with Lafarge's heavy mercury emissions. The failure to provide such an analysis rises to a violation of the requirement for MDEQ-AQD to determine the amount of "pollution, impairment and destruction"within the meaning of MCL §324.1705(2) duties of the MDEQ Air Quality Division. MDEQ-AQD must also pursue a Rule 228 determination with a formal multipathway human health and ecological risk assessment to deal with mercury emission consequences. Under the circumstances, MDEQ-AQD should have deemed the permit application incomplete without such further additional risk assessment analysis.

3.2 Lafarge Discharges Mercury Predominately in an Oxidized Form That Has the Highest Susceptibility for Local Dry and Wet Deposition and Which Increases the Potential Biological/Toxicological Availability of Mercury as Emitted

In May, 2006, Lafarge conducted a stack test featuring mercury form speciation to determine amounts of elemental mercury, particle bound mercury and oxidized mercury discharged by the facility. Attachment #7 shows two spreadsheets adapted from the spreadsheets in the report of the May 2006 testing to show additional summarizing information on the relative proportions of each of the forms of mercury emissions. One spreadsheet considers stack monitoring results below the detection limit to be at the detection limit and the other considers such results as zero mercury emissions.

Both spreadsheets generally show that oxidized mercury emissions from Lafarge constitute the predominate form of mercury emissions. In general, the proportion of emissions that is oxidized mercury constitutes about 90% of the mercury emitted.

The MDEQ-AQD "screening" approach to risk assessment did not consider this general factor of 90% of Lafarge mercury emissions to be oxidized. MDEQ-AQD assessment on Lafarge was patterned after a steel plant with less than 100 lbs of annual mercury emissions. The "screening" risk assessment was not memorialized in writing in the file and considered that reactive divalent mercury emissions from Lafarge only constituted 30% of the total mercury emitted.[9] Oxidized forms of mercury pose the greatest likelihood of wet and dry deposition near the plant (unlike very long range transport of elemental mercury vapor). Oxidized forms, such as ionic divalent mercury chloride

[8] June 20, 2005 Response to Comments Document, Page 4

[9] Personal telephone conversation with Robert Sills, MDEQ-AQD Toxicologist on September 25, 2006.

compounds, are water soluble and are immediately biologically available to exert a toxic effect.

3.3 The City of Alpena, Alpena County and Lake Huron Contain Designated Waterbodies Considered To Be In Violation of Michigan Water Quality Standards Because of Pre-existing Mercury Fish Tissue Problems That Will Only Be Exacerbated by Dry and Wet Deposition of Mercury from Lafarge's Emissions

Review of Michigan's Year 2006 final listing integrated report pursuant to the Federal Clean Water Act Sections 303(d), 305(b) and 314 shows that the Lafarge mercury discharge is in close proximity to presently impaired water bodies having pre-existing problems with excessive mercury fish tissue concentrations.

Under the CWA 303(d) designations, the following water bodies are designated as "Category 5" impaired waters considered to be in violation of water quality standards because of excessive mercury fish tissue concentrations:

Category 5 Designated and Impaired Water Bodies Considered in Violation of Michigan Water Quality Standards Because of Excessive Fish Tissue Mercury Concentrations	**Size of Water Body**
Lake Besser – Vicinity of the City of Alpena upstream from the Ninth Street Dam	392 acres
Lake Winyah (aka Seven Mile Pond of Thunder Bay River)	1530 acres
Beaver Lake	665 acres
Waters of Lake Huron (considered as nonattaining when fish consumption advisories are in effect and/or average mercury fish tissue concentrations are greater than 0.35 mg/kg)	

In addition to these formally designated CWA 303(d) Category 5 listed, mercury-impaired water bodies, Michigan's year 2004 Fish Contamination guide indicates that all inland lakes, reservoirs and impoundments in the Lake Huron Watershed have meal per week consumption restrictions for all but the smallest Crappie, Rock Bass and Yellow Perch and for large bass (largemouth and smallmouth), Muskellunge, Northern Pike and Walleye.

The presence of mercury-impaired water bodies in the Alpena area represents a pre-existing threat to public health from human exposure to mercury contaminated fish. This public health problem can only be exacerbated by continued high mercury emissions in an

immediately biologically available form from the Lafarge facility with the resulting nearby watershed dry and wet deposition of oxidized mercury released by this fly ash disposal facility.

4 By Allowing Lafarge to Discharge Virtually Uncontrolled Mercury Emissions, MDEQ-AQD Has Failed to Carry Out Its Great Lakes Protection Duties Under International and Great Lakes Basin Agreements Covering Control of Persistent and Bioaccumulative Airborne Toxicants

4.1 MDEQ-AQD Approval of the Proposed Consent Order and Associated Air Quality Permits With Such High Projected Emissions of Mercury and the Failure to Provide Emission Limitation Controls Constitute an Abrogation of United States Duties Under the Great Lakes Water Quality Agreement

Annex 12 of the Great Lakes Water Quality Agreement between the United States and Canada provides:

> "Regulatory strategies for controlling or preventing the input of persistent toxic substances to the Great Lakes System shall be adopted in accordance with the following principles:
>
> The intent of programs specified in this Annex is to virtually eliminate the input of persistent toxic substances in order to protect human health and to ensure the continued health and productivity of living aquatic resources and human use thereof;
>
> The philosophy adopted for control of inputs of persistent toxic substances shall be zero discharge; and
>
> The reduction in the generation of contaminants, particularly persistent toxic substances, either through the reduction of the total volume or quantity of waste or through the reduction of the toxicity of waste, or both, shall, wherever possible, be encouraged.
>
> The Parties shall take all reasonable and practical measures to rehabilitate those portions of the Great Lakes System adversely affected by persistent toxic substances."[10]

[10] See http://www.epa.gov/glnpo/glwqa/ for the full text.

Issuance of the proposed consent order and air quality permit for Lafarge and its coal combustion fly ash disposal activities with the high projected emissions, no review of mercury emission controls and insufficient screening-only evaluation of the environmental consequences of the expected emission is not a United States action reflecting "...virtual elimination..." of mercury as a persistent bioaccumulative toxicant.

A more specific provision found at Annex 15 of the Great Lakes Water Quality Agreement on "Airborne Toxic Substances" provides:

> "Pollution Control Measures.
>
> The Parties, in cooperation with State and Provincial Governments, shall develop, adopt and implement measures for the control of the sources of emissions of toxic substances and the elimination of the sources of emissions of persistent toxic substances in cases where atmospheric deposition of these substances, singly or in synergistic or additive combination with other substances, significantly contributes to pollution of the Great Lakes System. Where such contributions arise from sources beyond the jurisdiction of the Parties, the Parties shall notify the responsible jurisdiction and the Commission of the problem and seek a suitable response.
>
> The Parties shall also assess and encourage the development of pollution control technologies and alternative products to reduce the effect of airborne toxic substances on the Great Lakes System."

Issuance of a proposed Lafarge consent order and air quality permits with no mercury control technology review or complete impact assessment for this persistent and bioaccumulative toxicant at a site on the shores of Lake Huron can hardly be considered as meeting either the letter or spirit of this international agreement to which the United States is a signatory.

4.2 With Issuance of the Proposed Permit and Approval of the Facility as Proposed, MDEQ-AQD Would Abrogate the Great Lakes Governors' Toxic Substance Control Agreement Adopted in 1986 and Great Lakes Air Permitting Agreement Adopted by the Great Lakes Environmental Administrators in 1988

In 1986, the Great Lakes Governors adopted the Great Lakes Toxic Substance Control Agreement[11] which called for controlling Great Lakes toxic substances through the environmental permitting process. This agreement called for:

---

[11] For text of this agreement, see http://www.cglg.org/pub/toxics/index.html

> "The signatory States agree to consider the effects of airborne pollutants on human health and aquatic life when setting air emission standards and granting air emission permits, and to better integrate their respective air and water programs to address atmospheric deposition affecting the lakes."

To further the goals, objectives and achievements of the Agreement by the Great Lakes Governors, the Great Lakes environmental administrators entered the "Great Lakes States Air Permitting Agreement." The agreement is provided as Attachment #8. This agreement, which was signed by MDEQ and remains effective today, provides (in part):

> "For the pollutants listed on Table A [which includes mercury], each permitting authority shall utilize all applicable air pollution regulations to insure that BACT is being installed on any new or modified source which is subject to the state's New Source Review Program, an on existing sources, considering a diminimis cutoff, which are required to obtain an operating permit. States which do not have the current legal authority to assure that BACT is installed on new and existing sources of the pollutants in Table A shall pursue through their appropriate regulatory process authority to implement the governors' and environmental administrators' agreements."
>
> "For purposes of this agreement, BACT means emission limits, operating stipulations, and/or technology requirements based on the maximum degree of reduction which each Great Lakes state determinates is achievable through application of processes or available methods, systems, and techniques for the control of each of the pollutants listed in Table A, taking into account energy, environmental, and economic impacts, and other costs."
>
> "Emission limits, operating stipulations, and/or technology requirements shall be established as permit conditions for each of the pollutants listed in Table A. Whenever warranted, sources will also be required to conduct an emission verification test to assure compliance with the allowed emission limits during the initial verification test as well as during periodic verification tests."

MDEQ-AQD issuance of the proposed consent order and permit, and approval of Lafarge's operations as presently constituted with no review of mercury control technology and a less than complete human health and ecological risk assessment abrogates both of the above cited Great Lakes agreements.[12]

---

[12] Michigan DEQ is fully aware of these obligations under international and Great Lakes Basin agreements. Attachment 9 is a comment by MDEQ-AQD to Ohio EPA concerning the proposed permitting of a coke oven projected with 680 lbs/year of mercury emissions on the shores of Lake Erie. MDEQ-AQD urged Ohio EPA to comply with the Great Lakes Permitting Agreement to address the proposed mercury emission.

5 Alternate Raw Materials and Fuels Under Proposed Permit No. 72-03

5.1 The Screening Methods Contained in Appendix A Do Not Consider Reactive Conditions and Dynamic Kiln Chemistry in the Formation of Airborne Toxicants

The Lafarge cement kilns feature significant flue gas exposure to highly reactive materials. Flue gas chemistry in the Lafarge kilns feature significant hydrogen chloride and chlorine availability. Given the high temperatures and occasional low oxygen conditions expected, chlorination chemistry, incomplete oxidation and other chemical reaction dynamics can be expected to produce new compounds from precursor materials found in alternate raw materials.

Nothing in alternate raw materials provisions in Appendix A, the alternate fuels provisions of Appendix B, the compliance monitoring plans of Appendix C and D assess, account for, characterize or address the chemical products of kiln flue gas chemistry.

The introduction of halogens in alternate materials/fuels can be expected to increase the halogen-related reactions of halogen free radicals and acids with hydrocarbon precursors. Introduction of spent foundry sand contaminated with phenol-formaldehyde resins or contaminated soils with petroleum hydrocarbons can be expected to generate significant airborne toxicants in the raw grind dryers and at the cool end of the kiln from flash off, incomplete oxidation and chlorination reactions. The procedures and protocols do not contain sufficient methods and information on where and how alternate fuels and raw materials are introduced into physical kiln environments. Such details may well be determinative of the combustion and transformation fate of such materials.

For example, the simultaneous presence of chlorine and formaldehyde can form bis-(2)chloromethylether, an important carcinogen. Petroleum hydrocarbons introduced to dryers will flash off and produce hydrocarbons which can be converted to aldehyde compounds. The presence of phenol, chlorine and lignins from wood chips can provide the precursor compounds for the formation of chlorinated dibenzo-dioxins/furans.

No alternate fuel or raw materials should ever be considered without also determining the chemical fate in emissions of introduced compounds and precursors. Nothing like this has been provided in the proposed permit.

6 Neither the Proposed Consent Order, Nor the Proposed Permit, Contain Effective Monitoring, Recordkeeping and Reporting Measures to Sufficient to Ensure Compliance with Mercury Emission Limitations

No mandatory provisions of the proposed consent order will ensure sufficient compliance monitoring measures that ensure Lafarge's facility will maintain continuous compliance with mercury emission limitations.

Given the several sources of mercury input to the kiln process and the potential effects of process chemistry, process variability and kiln physical conditions on mercury emissions, the Lafarge facility should be subjected to additional requirements for compliance monitoring to ensure that facility emissions comply with the order. Simply requiring an annual emission test for three years following the interim period and then determining mercury emissions based on the clinker production rate cannot ensure compliance with mercury emission limitations at times when stack tests are not conducted.

Lafarge should be required to install continuous mercury emission monitors on all kiln and raw grind heater combustion stacks. Continuous mercury emission monitors are a proven technology that is presently being employed on the Nanticoke power plant, the source of some of the fly ash sent to the Lafarge plant. Lafarge should be required to perform mercury content monitoring on each load of fly ash received at the facility. Both continuous mercury emission monitoring and fly ash mercury content monitoring should be subjected to recordkeeping and quarterly reporting requirements.

Condition 9(C) providing for 15 days of delay before reporting emission exceedances of the mercury emission limitation undermines MDEQ-AQD's current rule at 336.1912(4) requiring reporting of malfunctions and excessive emissions promptly or within 2 days of discovery.

Attachment #1

TEST REPORT FOR AIR EMISSIONS AND DESTRUCTION AND REMOVAL EFFICIENCY EVALUATION OF KILN NO. 23, LAFARGE CORPORATION, ALPENA PLANT, GREAT LAKES DIVISION ALPENA, MICHIGAN

Prepared for:

Lafarge Corporation
Great Lakes Region
P.O. Box 396, Ford Avenue
Alpena, Michigan 49707

May 1, 1991
L:\4242

Pacific Environmental Services, Inc.
3708 Mayfair St., Suite 202
Durham, NC 27707
(919) 493-3536
Fax: (919) 493-7779

PARTICULATE MATTER EMISSIONS

The particulate emissions are summarized in Table 2.8. The kiln feed rates were 147.0, 147.9 and 153.7 ton/hr, respectively, for the three runs. The particulate emission data for run 1 was 0.1116, run 2 was 0.1961, and run 3 was 0.1606 lb/ton. The average of the three runs was 0.1561 lb/ton.

HYDROCHLORIC ACID EMISSIONS RESULTS

As shown in Table 2.9, the HCl emission concentrations were 8.6, 11.2, and 9.1 mg/dNm^3; to realize a average of 9.6 mg/dNm^3. All Cl^- detected is assumed to have been in HCl form.

METALS EMISSIONS RESULTS

The metals emissions results are presented in Table 2.10. The metals that were measured included antimony, arsenic, barium, beryllium, cadmium, lead, mercury, silver, thallium, total chromium, nickel, selenium and hexavalent chromium. The chromium and nickel results were very inconsistent and unreliable and thus, are excluded from this report.

TABLE 2.8

LAFARGE CORPORATION
TRIAL BURN TEST; KILN 23
PARTICULATE EMISSION RESULTS

Parameter	Units	Run 2	Run 3	Run 4
Date		9-16-90	9-16-90	9-17-90
Sample Time	mins.	72	72	72
Sample Volume	cu. m	1.126	1.102	1.139
Stack Gas Velocity	m/s	3.261	3.292	3.383
Stack Gas Volumetric Flowrate	acm/min.	9,020	9,096	9,357
Stack Gas Volumetric Flowrate	dncm/min	5,851	5,864	6,094
Stack Gas Temperature	deg. C.	141.1	146.1	149.4
Stack Gas Moisture	% vol.	6.4	5.95	5.53
Oxygen Conc.	%	14.1	14.1	12.2
Carbon Dioxide Conc.	%	9.2	9.2	11.3
Percent Isokinetic	%	100.8	98.3	99.3
Particulate Collected	mg	24.70	42.60	36.60
Particulate Conc.	g/dncm[a]	0.0213	0.0373	0.0307
Particulate Emission	kg/hr	7.438	13.15	11.19
Kiln Feed Rate	ton/hr	147.0	147.9	153.7
Particulate Conc.	lb/ton	0.111582	0.196059	0.160563

[a] Grams per dry normal cubic meter

TABLE 2.10

LAFARGE CORPORATION
TRIAL BURN
MULTI-METAL
EMISSION CONCENTRATIONS

Metals	Emission Concentrations, ($\mu g/dNm^3$)		
	Run 1	Run 2	Run 3
Silver (Ag)	0.86	0.61	4.83
Arsenic (As)	ND	5.40	3.82
Barium (Ba)	4.64	10.76	8.36
Beryllium (Be)	ND	ND	ND
Cadmium (Cd)	1.89	1.72	0.34
Mercury (Hg)	2.82	0.61	4.64
Lead (Pb)	5.07	4.38	3.33
Antimony (Sb)	ND	ND	5.51
Selenium (Se)	ND	ND	ND
Thallium (Tl)	ND	ND	ND
Hexavalent Chromium (Cr^{+6})	ND	0.44	1.25

Attachment #2

Lafarge Corporation
Great Lakes Region

P.O. Box 396
Ford Avenue
Alpena, MI 49707
(517) 354-4171

October 23, 1992

Mr. Dave Ferrier
Michigan Department of Natural Resources
Air Quality Division, Permit Section
PO Box 30028
Lansing, MI 48909

Dear Dave:

Enclosed you will find additional information that will assist you in the evaluation of our request to conduct a trial using alternate raw materials. Due to the nature of the raw materials, we are expecting no increase in air contaminants as compared to using our traditional raw materials. We are anticipating a reduction for some air contaminants.

I trust this additional information will be sufficient for your evaluation. If you require additional information, please feel free to contact me at (517) 354-4171.

Sincerely,

Thomas A. Johns
Environmental Engineer

cc: R. Alexander
T. Polasek
M. Black
L. Fiedler

Lafarge Corporation
Great Lakes Region
Alpena, Michigan

Alternate Raw Material Test

October, 1992

1. Introduction:

The cement manufacturing facility is located at Ford Avenue in Alpena, Michigan. Currently limestone and shale are quarried locally as ingredients for the manufacture of our product, cement. Lafarge Corporation is interested in conducting a test using alternate raw materials (Iron Ore Tailings and Flyash) in place of shale. We are expecting improvements in several emission parameters. We also are expecting that Cement Kiln Dust (CKD) wasting will decrease and at the same time make a quality product, cement.

The alternate raw material test is expected to run for three weeks. The new raw material mixture will consist of:
80% limestone
09% flyash
11% iron ore tailings

The traditional raw material mixture is limestone and shale. By permit the shale to stone ratio can not exceed 0.25 to 1, shale to stone ratio.

The total tons of material to be used during the test is 12,000 tons of flyash and 6,000 tons of iron ore tailings.

Chemical Analysis (Oxide analysis):

The four main compounds that make up our final product are as follows:

1. Tricalcium Silicate
2. Dicalcium Silicate
3. Tricalcium Aluminate
4. Tetracalcium Aluminoferrite

To make this product, clinker, it is essential that we have the necessary elements to create the four main compounds in our process. The following is the oxide analysis comparing shale to its substitutes, flyash and iron ore tailings.

Oxide Analysis

Compound	Shale	Flyash	Iron Ore Tailings
	%	%	%
SiO2	53.38	50.5	67.6
Al2O3	13.3	22.3	3.1
Fe2O3	6.08	4.8	27.5
CaO	5.7	3.9	0.9
MgO	1.94	1.3	0.4
Na2O	0.32	1.1	0.3
SO3	5.85	1.2	0.15

Impact on Emissions from the Raw Grind/Drying System

Currently the raw grind is regulated by Air Permit No. 622-89. This permit has special operating conditions which include emission limitations. The following is a summary of the permit emission limitations.

Particulate:

0.03#/1000# of exhaust gas
or
27.51#/hr

Sulfur dioxide:

0.0147#/ton of raw material
or
9.4#/hr

Carbon monoxide:

0.0036#/ton of raw material
or
2.3#/hr

Nitrogen oxide:

0.0342#/ton of raw material
or 21.9#/hr

VOC's:

56#/hr

During this testing period we do not expect to exceed the permit limitations for the emissions as stated in our Air Permit No. 622-89. We will be monitoring these parameter to assure compliance with our air permit. Lafarge Corporation has a Continuous Emission Monitor (CEM) for nitrogen oxide. In addition to the CEM, we will be analyzing the raw grind emissions for particulate, sulfur dioxide, nitrogen dioxide, carbon monoxide, ammonia and VOC's.

Particulate matter:

We are expecting no impact on particulate emissions due to the change in raw material. The efficiency of the bag house is static, thus we expect to meet permit limitations.

Nitrogen oxide:

The shale contains comparatively more nitrogen as compared to the alternate raw materials. Shale is composed of 0.22% nitrogen as compared to 0.06% for the alternate materials. We are expecting no increase in nitrogen oxide emissions with the new raw mix. We have demonstrated that we can comply with the NO permit conditions with our existing raw materials.

Sulfur dioxide:

The shale contains the bulk of the sulfur in the raw mix. Shale contains approximately 3.2% sulfur. The fly ash and iron ore tailings contain <0.5% sulfur. During the drying conditions we expect no increase in sulfur emissions. The drying temperatures are not near the volatilization of sulfur temperature within the system.

Carbon monoxide:

This compound is more of a function of combustion efficiency in the drying process. Since we are not changing the combustion efficiency of the dryer we do not expect any change in CO emissions.

Volatile Organic Compounds (VOC's):

Our shale contains naturally occurring Kerogens. These kerogens are released when subject to heat, such as in the drying process. The kerogens are released in the form of VOC's. The average organic content of our shale is 126,800ppm. The iron ore tailing and fly ash do not contain this high amount of organic matter due to their process of formation. This means that we should expect a decrease in total VOC emissions from the raw grind system.

Kiln System
Air Permit No. 126-86A

During the alternate raw material test we are intending to test for particulate, sulfur dioxide, nitrogen oxide, carbon monoxide, ammonia, VOC's and multiple metals. In addition, all of the parameters established by the Boiler and Industrial Furnace (BIF) regulations will be abided. This includes limitations on opacity for particulate removal efficiency, VOC's, oxygen, and carbon monoxide.

Emissions

VOC's:

As previously stated, the shale contains a large amount of organic matter. The organics are released in the form of VOC's when entering the kiln system. Since we will be replacing the shale with low organic matter content materials, we are expecting to reduce the total VOC emissions from the kiln system.

Sulfur dioxide:

Again, the shale contains sulfur in larger proportions as compared to the alternate raw materials. Since the kiln material temperature ranges from 1500F to 2700F, sulfur will be liberated. However the alternate raw material contains less sulfur, less will end up being exhausted from the stack. In addition, the new raw materials have the ability to trap more of the sulfur in the product clinker as compared to the traditional mix. This again equates to lower SO2 emissions.

Nitrogen Oxide, Oxygen, Carbon monoxide:

We are expecting no significant change in emissions from any one of the above parameters.

Particulate Matter:

We are expecting no increase in PM with the alternate raw materials. We are expecting a significant reduction in the production of our waste material, Cement Kiln Dust (CKD). This CKD will be characterized by analysis using both Total and TCLP metal analysis.

Metal Emissions:

A compliance test was conducted in June 1992 on Kiln 22 and 23 stack emissions. This test was required by BIF. This test set limits on metal inputs from all feed streams. Simply, stated a fixed metal input will yield a certain amount of emission. The BIF testing did set limitations on inputs and at the same time demonstrated that emissions were within EPA Safe Emission levels at that input level.

Table one shows the total metal inputs into the kiln system from the raw material mixture only.

Table two represents the metal inputs into the kiln system from the fuels, both the coal/coke and WDF.

Table three represents the theoretical stack emissions using the new raw mix. This table clearly demonstrates that there will be no increase in metal emissions resulting from the change in raw materials. All values are within the USEPA Safe Emissions levels.

Table four is a summary of the BIF operating feed rate limitations compared to those of the new raw mixture. This again points out that metal emissions will not increase as compared to those during the BIF compliance test. Lafarge will demonstrate that emissions have remained below the BIF limitations, by sampling and analyzing all metal feed streams and outputs.

Material Testing:

Daily samples will be taken and analyzed to assure compliance with BIF.
Samples will be taken for analysis of:

1. Waste-Derived-Fuel
2. Coal/Coke
3. Raw Material Mix
4. CKD

Summary:

This test will evaluate the use of materials that can be reused as a source separated raw material. These raw materials are of benefit to the production of our product, cement. The use of these source separated materials also lends itself to the possibility of reducing emissions from the raw grind and kiln system. These alternate raw materials will reduce the amount of our by-product significantly. In summary, this will be a good demonstration that recycling is possible amongst industries. One industry's by-product is other's resource and should not be wasted.

Expected Stack Emissions using proposed Flyash & Iron Tailings

Kiln Feed Metal Inputs

Metal	Limestone (in mg/kg)	Flyash (in mg/kg)	Fly Ash @ 9% (in mg/kg)	Iron Tailing (in mg/kg)	Iron Tail @11% (in mg/kg)	Total KF (in mg/kg)	Metal Rate (in g/hr)
Arsenic	1.6	30.3	2.727	4	0.44	4.767	627
Mercury	0.3	0.4	0.036	0.3	0.033	0.369	49
Selenium	0.5	20.5	1.845	100	11	13.345	1,755
Thallium	3.3	100	9	40	4.4	16.7	2,197
Antimony	2.2	40	3.6	20	2.2	8	1,052
Barium	20	950	85.5	1	0.11	105.61	13,892
Beryllium	1.8	6	0.54	4	0.44	2.78	366
Cadmium	2	4	0.36	8	0.88	3.24	426
Chromium	16	51	4.59	8	0.88	21.47	2,824
Copper	64	63	5.67	20	2.2	71.87	9,454
Lead	21	40	3.6	10	1.1	25.7	3,381
Nickel	100	30	2.7	4	0.44	103.14	13,567
Silver	0.7	4	0.36	67	7.37	8.43	1,109
Titanium	20	989	89.01	40	4.4	113.41	14,918
Zinc	45	60	5.4	0.5	0.055	50.455	6,637

Input Rates:		***%composition:***	
Kiln Feed	145 short tons/hr	Limestone	80%
Coal	12 short tons/hr	fly ash	9%
WDF	950 gal/hr	iron tails	11%

Expected Stack Emissions using proposed Flyash & Iron Tailings

Fuel Metal Inputs

Metal	Coal (mg/kg)	Coal (g/hr)	WDF (mg/kg)	WDF (g/hr)	Total Fuel (g/hr)
Arsenic	10.5	114	16.2	56	170
Mercury	0.5	5	0.5	2	7
Selenium	2.8	30	0.9	3	34
Thallium	0.5	5	0.5	2	7
Antimony	0.5	5	18.7	64	70
Barium	143	1557	545	1879	3436
Beryllium	0.9	10	0.5	2	12
Cadmium	0.5	5	5	17	23
Chromium	27	294	91	314	608
Copper	10	109	0	0	109
Lead	4	44	363	1251	1295
Nickel	71.5	778	8.1	28	806
Silver	0.39	4	1.14	4	8
Titanium	0	0	0	0	0
Zinc	16	174	0	0	174

Expected Stack Emissions using proposed Flyash & Iron Tailings

Theoretical Stack Emissions

Metal	Total kiln inputs (g/hr)	Partitioning Factor	Est. uncontrolled emissions (g/hr)	APCS %	Stack Emissions (g/hr)	EPA Total Allowable Emission Rate	%of EPA Allowable
Arsenic	7.97E+02	0.0148	11.80	0.99	0.12	175	0.07%
Mercury	5.57E+01	0.205	11.42	0.90	1.14	10,400	0.01%
Selenium	1.79E+03	0.0148	26.48	0.99	0.26		
Thallium	2.20E+03	0.259	570.82	0.99	5.71	62,000	0.01%
Antimony	1.12E+03	0.0148	16.61	0.99	0.17	36,100	0.00%
Barium	1.73E+04	0.0278	481.72	0.99	4.82	6,200,000	0.00%
Beryllium	3.77E+02	0.0148	5.58	0.99	0.06	320	0.02%
Cadmium	4.49E+02	0.0132	1.80	0.90	0.18	419	0.04%
Chromium	3.43E+03	0.00401	3431.89	0.99	34.32	63	54.30%
Copper	9.56E+03	1	2476.80	0.99	24.77		
Lead	4.68E+03	0.259	4675.62	0.99	46.76	6,852	0.68%
Nickel	1.44E+04	1	14373.75	0.99	143.74		
Silver	1.12E+03	1	1117.09	0.99	11.17	372,000	0.00%
Titanium	1.49E+04	1	14918.41	0.99	149.18		
Zinc	6.81E+03	1	6811.23	0.99	68.11		

Summary of Operating Feed Rates with New Raw Materials

Metal	Maximum metal feed rates under BIF (g/hr)	Expected metal feed rates with new raw material (g/hr)	% of BIF maximum
Arsenic	2.20E+04	7.97E+02	3.62%
Mercury	6.08E+03	5.57E+01	0.92%
Selenium		1.79E+03	
Thallium	2.29E+04	2.20E+03	9.62%
Antimony	2.28E+04	1.12E+03	4.92%
Barium	3.81E+06	1.73E+04	0.45%
Beryllium	1.19E+03	3.77E+02	31.70%
Cadmium	2.37E+03	4.49E+02	18.94%
Chromium	3.95E+03	3.43E+03	86.88%
Copper		9.56E+03	
Lead	1.13E+04	4.68E+03	41.38%
Nickel		1.44E+04	
Silver	2.28E+05	1.12E+03	0.49%
Titanium		1.49E+04	
Zinc		6.81E+03	

***** Lancaster Laboratories, Inc. Analytical Report *****
2425 New Holland Pike, Lancaster, PA 17601

Sample Number: SW 1881521 Account: 07050 Lafarge Corporation
Date Submitted: 10/15/92 Date Reported: NOT REP
Date Collected: 10/14/92

Shale (sh) Grab Solid Sample

Analysis Name	As Received	Dry Weight	Units
0111 Moisture	2.4		% by wt.

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

==========

0145 Arsenic	8.	9.	mg/kg
0159 Mercury	< 0.3	< 0.3	mg/kg
0164 Selenium	< 0.5	< 0.5	mg/kg
1625 Thallium	< 100.	< 100.	mg/kg
1644 Antimony	< 40.	< 40.	mg/kg
1646 Barium	< 20.	< 20.	mg/kg
1647 Beryllium	< 1.	< 1.	mg/kg
1649 Cadmium	< 4.	< 4.	mg/kg
1651 Chromium	19.	19.	mg/kg
1653 Copper	50.	52.	mg/kg
1655 Lead	< 20.	< 20.	mg/kg
1661 Nickel	60.	60.	mg/kg
1666 Silver	5.	5.	mg/kg
1670 Titanium	40.	41.	mg/kg
1672 Zinc	90.	100.	mg/kg

Due to the nature of the sample matrix, the requested detection limits could not be met.

==========

Lancaster Laboratories, Inc. Analytical Report
2425 New Holland Pike, Lancaster, PA 17601

Sample Number: SW 1881520 Account: 07050 Lafarge Corporation
Date Submitted: 10/15/92 Date Reported: NOT REP
Date Collected: 10/14/92

Limestone (<S) Grab Solid Sample

Analysis Name	As Received	Dry Weight	Units
0111 Moisture	4.4		% by wt.

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

==========

0145 Arsenic	2.	2.	mg/kg
0159 Mercury	< 0.3	< 0.3	mg/kg
0164 Selenium	< 0.5	< 0.5	mg/kg
1625 Thallium	< 1,000.	< 1,000.	mg/kg
1644 Antimony (Sb)	< 400.	< 400.	mg/kg
1646 Barium	20.	20.	mg/kg
1647 Beryllium	< 10.	< 10.	mg/kg
1649 Cadmium	< 40.	< 40.	mg/kg
1651 Chromium	< 80.	< 80.	mg/kg
1653 Copper	< 80.	< 80.	mg/kg
1655 Lead	< 200.	< 200.	mg/kg
1661 Nickel	< 100.	< 100.	mg/kg
1666 Silver	< 40.	< 40.	mg/kg
1670 Titanium	< 20.	< 20.	mg/kg
1672 Zinc	< 400.	< 400.	mg/kg

Due to the nature of the sample matrix, the requested detection limits could not be met.

==========

LAFARGE CORPORATION
CAL REPORT# 13761

AMPLE RECEIVED 06/26/91

AB# 1061189 001 TAILINGS

	ANALYTICAL RESULTS mg/kg
ntimony, Total	< 1.5
rsenic, Total	1.6
arium, Total	6.2
eryllium, Total	0.78
admium, Total	0.98
hromium, Total	8.6
ead, Total	11
ercury, Total	< 0.03
hallium, Total	< 18
pper, Total	2.6
inc, Total	2.8
ilver, Total	< 1.5

Canton Analytical Laboratory, Inc.
(313) 483-7430 FAX (313) 545-1541

LAFARGE CORPORATION
CAL REPORT# 13761

AMPLE RECEIVED 06/26/91

AB# 1061190 002 FLYASH

	ANALYTICAL RESULTS mg/kg
ntimony, Total	< 1.5
rsenic, Total	8.6
Barium, Total	440
Beryllium, Total	7.1
Cadmium, Total	1.7
Chromium, Total	41
Lead, Total	44
Mercury, Total	0.03
Thallium, Total	< 18
pper, Total	54
Zinc, Total	45
Silver, Total	1.6

459-8787

Canton Analytical Laboratory, Inc.
(313) 483-7430 FAX (313) 545-1541

COMM
GENERAL OFFI
SINCE 1908

INEERING CO.
D, ILLINOIS 60148 • (312) 953-9300

PLEASE ADDRESS ALL CORRESPONDENCE T
2979 E. CENTER ST., CONNEAUT, OH 440
TELEPHONE: (216) 224-22
TELEX: 985-606 CT&E COL
FAX: (216) 224-28

May 22, 1991

LAFARGE CORPORATION
P.O. Box 396
Alpena MI 49707

Sample identification by
LAFARGE CORPORATION

IDENT: #20 Kiln Feed
April 16

Kind of sample reported to us: Kiln Feed

Sample taken at: -----

Sample taken by: Submitted

Date sampled: ------

Date received: May 16, 1991

P.O. NO: 01-17764

Analysis Report No. 87-23430

PROXIMATE ANALYSIS	As Received	Dry Basis
% Moisture	0.18	xxxxx
% Ash	65.78	65.90
% Volatile	30.00	30.05
% Fixed Carbon	4.04	4.05
	100.00	100.00
Btu/lb	40	40
% Sulfur	0.03	0.03
MAF Btu		117

ULTIMATE ANALYSIS	As Received	Dry Basis
% Moisture	0.18	xxxxx
% Carbon	10.85	10.87
% Hydrogen	0.20	0.20
% Nitrogen	0.01	0.01
% Sulfur	0.03	0.03
% Ash	65.78	65.90
% Oxygen(diff)	22.95	22.99
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

K.D. Meier

Manager, Conneaut Laboratory

Attachment #3

DNR

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
AIR QUALITY DIVISION
STAFF ACTIVITY REPORT

May 2, 1994

Applicant

Lafarge Corporation
Ford Avenue
Alpena, Michigan

Permit to Install Application No. 166-93

SUMMARY

Lafarge Corporation is proposing to install new equipment to handle and store two new raw materials for their cement manufacturing process. These new raw materials are flyash from coal combustion and iron ore tailings from iron ore mining. These materials have the basic chemical properties needed for making cement.

The applicant has run a test of these alternative raw materials pursuant to a rule allowing an exemption from the air use approval process. This test run did not involve the installation of permanent equipment. The test run was determined to be exempt by the applicant with concurrence by the Air Quality Division District Office in Gaylord. Although the test run was exempt, it has been determined by the applicant that the permanent use of these alternative raw materials is not. Therefore, an application for a Permit to Install, No. 166-93, was submitted and is reviewed in this report.

Staff's review indicates that all of the pertinent air pollution control regulations can be met.

Because of the controversial nature of the applicant's cement manufacturing plant, and that they have elected to accept restrictions on the permit to limit their potential to emit to less than significant as defined in the Federal Prevention of Significant Deterioration (PSD) rules, a public comment period is being provided with a hearing, if requested, providing all interested persons the opportunity to comment on the proposed new equipment, and modifications, necessary for using the new alternative raw materials.

A recommendation to issue the Permit to Install, subject to the attached draft conditions, will be made to the decision maker if no new significant issues regarding air quality are brought up during the comment period and hearing, if held.

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SITE LOCATION AND PRESENT AIR QUALITY

The applicant's cement manufacturing process is located to the northeast of the City of Alpena, on the shore of Lake Huron, as shown in Exhibit I. The total area of the applicant's property is over 2500 acres. The area is considered to be in compliance with the primary and secondary National Ambient Air Quality Standards (NAAQS) for all criteria pollutants, with the exception of particulate matter less than 10 microns in diameter (PM10), for which it is considered attainment/unclassifiable. An attainment/unclassifiable designation means it is treated as attainment.

EXISTING FACILITY DESCRIPTION

The applicant owns and operates a complete portland cement manufacturing facility. A complete facility means that the raw materials, shale and clay, are mined on their property, and processed into portland cement.

The process involves mining the raw materials, drying and grinding these raw materials, exposing the raw materials to high heat in large kilns forming clinker, grinding the clinker into fine cement, storage of the cement and shipping the finished cement to distribution centers. Distribution is accomplished by rail, ship and truck, but primarily by ship.

PROPOSED PROCESS EQUIPMENT

The new equipment and modifications to process the new raw materials - iron ore tailings and flyash - consist of the following:

1. An iron ore tailings conveyor with bagfilter control;
2. Two flyash gravity conveyors each with bagfilter control;
3. A flyash unloading hopper with bagfilter control;
4. A flyash dome with bagfilter control;
5. A flyash bin with bagfilter control;
6. Flyash railcar unloading with bagfilter control; and
7. The Kiln Group 5 and Kiln Group 6 kiln dust return systems will be modified. These systems are each controlled by bagfilters.

APPLICABLE REGULATIONS

The new material handling equipment and modified kiln dust equipment are regulated by the Department's Rules for Air Pollution Control pursuant to Act 348, P.A. 1965, as amended. The applicable rules are listed below.

1. Rule 201 requires new or modified sources to obtain an approved Permit to Install prior to the installation of the new or modified source equipment and/or control equipment. Rule 202 allows a facility to request a waiver from this requirement so they may begin installation prior to the issuance of the Permit to Install. The applicant must demonstrate that the delay

in construction of the equipment will cause an undue hardship. If a waiver is issued, it allows construction to commence, at the applicant's risk. Operation of the equipment is not allowed until the Permit to Install is issued, if it is issued. A waiver was issued to the applicant in October, 1993.

2. Rule 230 regulates the emission of toxic air contaminants. The process must utilize best available control technology for toxics, and further, for each toxic air contaminant emitted, the ground level impact requirements specified by its respective initial threshold screening level for noncarcinogens and risk screening levels for carcinogens must be met.

3. Rule 301 limits visible emissions from equipment to less than 20 percent, or a level specified in a Permit to Install. The applicant will be limited to 10 percent as proposed in the attached draft conditions; see condition no. 23.

4. Rule 331 limits the emission of particulate matter to a level which is restricted by Table 31, or a limit stipulated in the Permit to Install. The applicant agrees to meet a limit which is more stringent than that specified in Table 31. See condition nos. 15 through 22.

5. Rule 371 regulates fugitive dust emissions from sources which are not in an area designated as nonattainment for particulate. As stated above, the applicant's process is located in an area that is in compliance with the total suspended particulate, and attainment/unclassifiable for PM10. A fugitive dust control program, as required by condition no. 29 in the draft permit conditions, is attached to this staff report.

6. Rule 372 stipulates the specific requirements for a fugitive dust control program pursuant to Rule 371.

7. Rule 901 does not allow the emission of an air contaminant from the proposed process which may cause injurious effects to human health and welfare, or prevent the comfortable enjoyment of life and property. See condition no. 5.

8. Rule 910 requires an air cleaning device to be installed, operated and maintained satisfactorily. See condition no. 30.

9. Rule 911 requires the submittal of a malfunction abatement plan for a source and related air cleaning devices to prevent the emission of an air contaminant that would exceed the allowable emissions required by the rules and Permit to Install. A malfunction abatement plan is attached to this staff report. See condition no. 29.

10. Rule 912 requires a source to notify the Department if an abnormal condition arises which causes the emission of an air contaminant that

exceeds the allowable emission rate in a rule and Permit to Install. See condition no. 8.

11. Part 10 requires the testing of emissions of air contaminants from a source if requested by the Department, and the protocol to be used for these tests. See condition no. 24.

CONTROL TECHNOLOGY REVIEW

The applicant has proposed the use of bagfilters to control the emissions from the sources listed previously. Bagfilters are considered to be the best means of control for particulate and toxic air contaminants that are solid at the exhaust conditions.

Furthermore, the applicant has proposed fugitive dust control techniques that will comply with the requirements of Rules 371 and 372. Fugitive dust will be controlled by water spray, a chemical dust suppressant, covered conveyors, adequate capture velocity at the hoods, three-sided wind barriers and covered storage containers. The proposed fugitive dust control program as required by condition no. 29 is included in Attachment B to this staff report.

The preventive maintenance program proposed by the applicant for the sources and the bagfilters comply with Rule 911. The proposed program as required by condition no. 29 is included in Attachment B to this staff report.

AIR QUALITY IMPACT ANALYSIS

The proposed allowed PM10 emissions are 12.16 pounds per hour and 28.6 tons per year for all of the proposed equipment and modifications. This results in a net increase of 9.95 pounds per hour and 13.2 tons per year. The difference between these emission rates is due to the displacement of emissions from existing equipment. The equipment involved are the two kiln group dust handling systems. A credit is given to the existing actual emissions from these kiln group dust handling systems versus the new allowed emissions. This results in the difference between the total allowed emissions and the increase in emissions as described above.

This net increase is less than the significance level as defined in the PSD regulations. Therefore the proposed changes are not subject to review for BACT and the other requirements for PSD. Since the emissions are less than the significance level, dispersion modeling was not done. Experience indicates that the particulate and PM10 air quality standards and increments should be complied with.

Dispersion modeling was performed for the expected metal emissions from the new and modified equipment. Attached to this staff report is Table I which shows the results of the modeling for these toxic air contaminants. The toxic air contaminants are either in a particulate form or attached on the particulate, and

will be regulated through the PM10 emission limits specified in the attached draft condition nos. 15 through 22.

No asbestos fibers have been detected in the iron ore tailings that will be supplied to the applicant. A condition, no. 39, requires the applicant to notify the District Supervisor, Air Quality Division, if there is a change in the source of the raw materials. The District Supervisor has the option of taking a sample of the new raw materials and testing it for asbestos.

PUBLIC COMMENTS

At the time of the writing of this staff report, we have received twenty letters from citizens and commercial enterprises supporting the work that the applicant has been doing, and in opposition to the position taken by some environmental action groups on the applicant's operations.

We have received one comment from a citizen in Alpena asking that the request to allow the use of the alternative raw materials be denied. Their reason is that the iron ore tailings probably contain asbestos fibers, and it would be unacceptable to allow additional hazardous emissions while the applicant is allowed to burn hazardous waste derived fuels. See the above discussion regarding asbestos fibers for an answer to their concern.

A 30-day public comment period and hearing, if requested, is being provided to allow additional public comment on the proposed use of the iron ore tailings and flyash to determine if there are any additional air quality issues that may need to be addressed.

ADDITIONAL DEPARTMENT APPROVALS

No other Department approvals are necessary for the new and modified equipment.

FINDINGS

Staff finds that the proposed equipment and modifications will result in impacts that will comply with all of the air pollution control regulations specified above. This finding may change if new significant information regarding air quality impacts is received during the comment period and hearing, if requested, which indicates otherwise

Submitted by: D. Ferrier
May 2, 1994
DAF:slj

Attachment #4

B 1 F

Lafarge Corporation
Great Lakes Region

P.O. Box 396
Ford Avenue
Alpena, MI 49707
(517) 354-4171

September 24, 1992

Mr. Gary Victorine
U.S. EPA Region V
Waste Management Branch
77 West Jackson
Chicago, ILL 60604

Dear Gary:

Lafarge Corporation intends on conducting a single test October 5, 1992 through October 25, 1992 using alternative raw materials, Iron Ore Tailings and Fly Ash, for the production of our product, cement. These alternative raw materials will be replacing our current raw material, shale. This material will be used in our kilns which are now regulated by BIF. These alternative raw materials are not chemically different from our shale. If this test is considered a success, Lafarge will seek approval from MDNR to permanently use this material. We are anticipating 2 years at a minimum before this project would be considered permanent. At that time Lafarge will conduct a full compliance test. This one time test was discussed in a meeting on September 16, 1992 with US EPA Region V. In attendance was Lorna Jereza, Julianne Socha, Nataline Warkenthien and Jae Lee.

Lafarge is anticipating no increased impact on emissions from the kiln system. Lafarge is expecting that Hydrocarbon emissions will decrease due to our shale containing naturally occurring kerogens and the alternate raw materials do not. Cement Kiln dust production will decrease by 50 percent at a minimum. Cement kiln dust at this plant is largely produced due to the large amount of sulfur in our shale, the alternative raw materials do not. We intend to sample the raw materials and CKD to demonstrate that metal inputs out outputs have not changed or increased with the alternate raw materials. Lafarge corporation intends to operate the kilns with the limits set by BIF. This will include the automatic waste feed cut-offs.

Process Department
FAX (517) 354-6794

Attachment #5

Total Facility Mercury Emissions

Material	2002 Throughput (ton/yr)	2003 Throughput (ton/yr)	Hg Concentration (mg/Kg)	Hg Concentration Reference	Actual Hg Mass (lb/yr)	Future Actual Hg Mass (lb/yr)
Input						
Limestone	3,947,633	3,773,810	0.02	5/9/03 SGS Report	154.43	185.31
Iron	26,377	20,819	0.019	5/9/03 SGS Report	0.90	1.08
Flyash	255,976	245,272	0.50	Max 1/05 Huron Valley Report	250.62	300.75
Gypsum	155,045	144,303	0.019	9/20/04 Huron Valley Report	5.69	6.83
Sand	173,967	179,969	0.02	5/9/03 SGS Report	7.08	8.49
Coal	221,918	221,262	0.093	5/9/03 SGS Report	41.22	41.22
Coke	221,920	221,104	0.058	5/9/03 SGS Report	25.70	25.70
Total Hg Input					485.63	569.37
Retained						
Cement	2,654,632	2,694,937	0		0.00	0.00
CKD Shipped	231,247	222,804	0		0.00	0.00
Total Hg Retained					0.00	0.00
Actual Emissions (Input mass - retained mass)					**485.63**	
Future Actual Emissions (Input mass - retained mass)						**569.37**
Air Emissions Change					**83.74**	

ND - detection limit used

Emissions of mercury were calculated based upon a mass balance approach given knowledge of Hg concentrations in feed materials, fuels, clinker and CKD. All material throughput, except for coal and coke, was assumed to increase linearly with production.

Attachment #6

5.0 TEST RESULTS AND DISCUSSION

5.1 Emission Testing Results

Table 5-1 summarizes the results of the emission testing, and presents both individual run data and source averages. Appendix E presents a set of example calculations from Kiln 19, Run 1. Mass emission rates are also presented in Table 5-1. The mass emission rates for Hg were calculated by dividing the collected mass of Hg collected in the sample trains by the sample gas volume, and then multiplying by the measured stack flue gas volumetric flow rates.

Table 5-1. Baseline Mercury Emission Test Results, December 2005

Source	Run	Hg Emission Concentration (gr/dscf)	Hg Emission Rate (lb/hr)	
Kiln 19	1	7.69E-06	6.03E-03	
	2	7.29E-06	5.60E-03	
	3	6.45E-06	4.97E-03	
	Avg	**7.15E-06**	**5.54E-03**	48.53
Kiln 20	1	7.84E-06	6.69E-03	
	2	6.58E-06	5.56E-03	
	3	8.47E-06	7.33E-03	
	Avg	**7.63E-06**	**6.53E-03**	57.20
Kiln 21	1	7.31E-06	6.42E-03	
	2	6.78E-06	6.01E-03	
	4	6.88E-06	6.18E-03	
	Avg	**6.99E-06**	**6.20E-03**	54.31
Kiln 22	1	1.63E-05	2.19E-02	
	2	1.41E-05	1.89E-02	
	3	1.39E-05	2.07E-02	
	Avg	**1.48E-05**	**2.05E-02**	179.58
Kiln 23	1	1.78E-05	2.77E-02	
	2	1.71E-05	2.69E-02	
	3	1.68E-05	2.65E-02	
	Avg	**1.72E-05**	**2.70E-02**	236.52
RG14	1	6.46E-07	3.11E-04	
	2	6.58E-07	3.11E-04	
	3	6.53E-07	3.17E-04	
	Avg	**6.52E-07**	**3.13E-04**	2.74
RG15	1	7.59E-07	2.77E-04	
	2	7.49E-07	2.97E-04	
	3	7.54E-07	2.83E-04	
	Avg	**7.54E-07**	**2.86E-04**	2.50

TOTAL 581.38 LBS

Attachment #7

Mercury Emissions At Lafarge, May 2006; Non-Detects at Detection Limit								
Source	**Run #**	**Particle-Bound Hg Emissions (lb/hr)**	**Oxidized Hg Emissions (lb/hr)**	**Elemental Hg Emissions (lb/hr)**	**Total Hg Emissions (lb/hr)**	**Bound Hg Emissions %**	**Oxidized Hg Emissions %**	**Elemental Hg Emissions %**
Kiln 19	1	7.92E-05	4.81E-03	2.22E-04	5.12E-03			
	2	6.30E-05	5.00E-03	3.31E-04	5.39E-03			
	3	9.45E-05	3.12E-03	9.29E-04	4.14E-03			
	Average	**7.89E-05**	**4.31E-03**	**4.94E-04**	**4.88E-03**	1.62%	88.32%	10.12%
Kiln 20	1	1.06E-04	3.55E-03	5.45E-04	4.20E-03			
	2	6.24E-05	3.73E-03	3.74E-04	4.17E-03			
	3	7.90E-05	5.45E-03	5.37E-04	6.07E-03			
	Average	**8.25E-05**	**4.24E-03**	**4.86E-04**	**4.81E-03**	1.72%	88.15%	10.10%
Kiln 21	1	7.88E-05	5.36E-03	2.21E-04	5.66E-03			
	2	9.43E-05	5.72E-03	1.96E-04	6.01E-03			
	3	6.22E-05	3.53E-03	4.51E-04	4.04E-03			
	Average	**7.84E-05**	**4.87E-03**	**2.89E-04**	**5.24E-03**	1.50%	92.94%	5.52%
Kiln 22	1	5.83E-04	1.63E-02	5.55E-04	1.74E-02			
	2	1.38E-04	1.66E-02	5.25E-04	1.72E-02			
	3	1.11E-04	1.95E-02	7.49E-04	2.04E-02			
	Average	**2.77E-04**	**1.75E-02**	**6.10E-04**	**1.84E-02**	1.51%	95.11%	3.32%
Kiln 23	1	2.04E-04	1.20E-02	6.70E-04	1.29E-02			
	2	1.17E-04	1.22E-02	2.37E-03	1.47E-02			
	3	1.18E-04	1.68E-02	8.27E-04	1.77E-02			
	Average	**1.46E-04**	**1.37E-02**	**1.29E-03**	**1.51E-02**	0.97%	90.73%	8.54%
Raw Grind 14	1	3.44E-05	6.19E-05	8.26E-05	1.79E-04			
	2	4.15E-05	6.22E-05	8.29E-05	1.87E-04			
	3	3.43E-05	6.86E-05	8.92E-05	1.92E-04			
	Average	**3.67E-05**	**6.43E-05**	**8.49E-05**	**1.86E-04**	19.73%	34.57%	45.65%
Raw Grind 15	1	2.70E-05	1.28E-04	9.44E-05	2.49E-04			
	2	2.66E-05	6.65E-05	7.98E-05	1.73E-04			
	3	3.26E-05	5.21E-05	8.46E-05	1.69E-04			
	Average	**2.87E-05**	**8.22E-05**	**8.63E-05**	**1.97E-04**	14.57%	41.73%	43.81%
				Total Hourly Emission Rate	4.88E-02			
				Annual Emission at 8760 Hours	4.28E+02			

Mercury Emissions At Lafarge - Alpena, May 2006; Non-Detects at 0.0								
Source	**Run #**	**Particle-Bound Hg Emissions (lb/hr)**	**Oxidized Hg Emissions (lb/hr)**	**Elemental Hg Emissions (lb/hr)**	**Total Hg Emissions (lb/hr)**	**Particle-Bound Hg Emissions %**	**Oxidized Hg Emissions %**	**Elemental Hg Emissions %**
Kiln 19	1	0.00E+00	4.81E-03	1.27E-04	4.94E-03			
	2	0.00E+00	5.00E-03	2.36E-04	5.23E-03			
	3	0.00E+00	3.12E-03	9.29E-04	4.05E-03			
	Average	**0.00E+00**	**4.31E-03**	**4.31E-04**	**4.74E-03**	0.00%	90.93%	9.09%
Kiln 20	1	0.00E+00	3.55E-03	4.39E-04	3.99E-03			
	2	0.00E+00	3.73E-03	2.65E-04	3.99E-03			
	3	0.00E+00	5.45E-03	5.37E-04	5.99E-03			
	Average	**0.00E+00**	**4.24E-03**	**4.14E-04**	**4.66E-03**	0.00%	90.99%	8.88%
Kiln 21	1	0.00E+00	5.36E-03	1.10E-04	5.47E-03			
	2	4.71E-05	5.72E-03	9.43E-05	5.86E-03			
	3	0.00E+00	3.53E-03	3.42E-04	3.87E-03			
	Average	**1.57E-05**	**4.87E-03**	**1.82E-04**	**5.07E-03**	0.31%	96.06%	3.59%
Kiln 22	1	5.83E-04	1.63E-02	3.61E-04	1.72E-02			
	2	0.00E+00	1.66E-02	3.59E-04	1.69E-02			
	3	0.00E+00	1.95E-02	5.82E-04	2.01E-02			
	Average	**1.94E-04**	**1.75E-02**	**4.34E-04**	**1.81E-02**	1.07%	96.69%	2.40%
Kiln 23	1	1.46E-04	1.20E-02	0.00E+00	1.22E-02			
	2	0.00E+00	1.22E-02	2.37E-03	1.46E-02			
	3	0.00E+00	1.68E-02	8.27E-04	1.76E-02			
	Average	**4.85E-05**	**1.37E-02**	**1.06E-03**	**1.48E-02**	0.33%	92.57%	7.16%
Raw Grind 14	1	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
	3	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
	Average	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**			
Raw Grind 15	1	0.00E+00	1.28E-04	5.39E-05	1.82E-04			
	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
	3	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
	Average	**0.00E+00**	**4.27E-05**	**1.80E-05**	**6.07E-05**	0.00%	70.35%	29.65%
				Total Hourly Emission Rate	4.74E-02			
				Annual Emission at 8760 Hours	4.15E+02			

Attachment #8

GREAT LAKES STATES AIR PERMITTING AGREEMENT

I. INTRODUCTION

In 1986, the Great Lakes states' environmental administrators entered into an agreement, "Toxic Substances Management in the Great Lakes Basin Through the Permitting Process," requiring that Best Available Control Technology be installed wherever possible on all new and existing sources of persistent air toxic pollutants which impact on the Great Lakes, pursuant to implementing the governors' "Great Lakes Toxic Substances Control Agreement." In 1987, permitting staff representatives from the Great Lakes states attended a workshop in Ann Arbor, Michigan, where the latest research was presented, documenting the need to reduce the air impacts on the Great Lakes. At this workshop, the Great Lakes states' air permitting representatives investigated and made several recommendations on how the governors and environmental administrators directives can best be implemented. One of the recommendations was to have a follow-up meeting of the air permitting staff representatives in July of 1988 to insure consistency in the type of information which will be considered in permit reviews, and in the implementation of Best Available Control Technology, clear communications and informational exchange between Great Lakes states, and clarification of issues which EPA needs to take the lead on in order to assure effective implementation of the air provisions of the governors' and environmental administrators' agreements.

II. PERMITTING INFORMATION

A. All permit applicants in the state will be required to identify and quantify potential emissions of the pollutants identified in Table A as a part of a routine New Source Review permit application. Table A consists of the seven pollutants identified by the IJC as having adverse impacts on the Great Lakes and which have the potential of being emitted by air pollution point sources. Other pollutants may be added to Table A by unanimous agreement of the environmental administrators of the Great Lakes states.

B. Each state permitting authority shall conduct its own technical review in order to assure accurate identification and quantification of these pollutants.

C. Environmental Impact Statements, for potential sources of pollutants in Table A which are required under current state and federal regulations, should consider potential adverse impacts on the Great Lakes in order to be considered complete.

III. IMPLEMENTATION OF BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

A. For the pollutants listed on Table A, each permitting authority shall utilize all applicable air pollution regulations to insure that BACT is being installed on any new or modified source which is subject to the state's New Source Review Program, and on existing sources, considering a de minimus cutoff, which are required to obtain an operating permit. States which do not have the current legal authority to assure that BACT is installed on new and existing sources of the pollutants in Table A shall pursue through their appropriate regulatory process authority to implement the governors' and environmental administrators' agreements.

B. For purposes of this agreement, BACT means emission limits, operating stipulations, and/or technology requirements based on the maximum degree of reduction which each Great Lakes state determines is achievable through application of processes or available methods, systems, and techniques for the control of each of the pollutants listed in Table A, taking into account energy, environmental, and economic impacts, and other costs.

C. Emission limits, operating stipulations, and/or technology requirements shall be established as permit conditions for each of the pollutants listed in Table A. Whenever warranted, sources will also be required to conduct an emission verification test to assure compliance with the allowed emission limits during the initial verification test as well as during periodic verification tests.

IV. INTERAGENCY COMMUNICATIONS

A. Subject to restrictions on disclosure of trade secrets under federal and state law, each state shall enter into the BACT/LAER Clearinghouse and the Air Toxic Information Clearinghouse all permitting information relating to sources of the pollutants identified in Table A. This information shall include, as a minimum, the following information: all BACT and/or LAER determinations; all useful air toxics permitting information; and all air toxics emission verification data.

B. Additionally, each state shall send to all of the other Great Lakes air permitting programs a copy of public notice and a summary of the permitting information for any source which has the potential to emit any of the pollutants in Table A and which is subject to the federal public comment period requirements.

C. Each state shall participate in a standing technical steering committee to maintain consistency to the extent practicable in state determinations made pursuant to this agreement.

Signed and entered into November 3, 1988.

Illinois

New York

Indiana

Ohio

Michigan

Pennsylvania

Minnesota

Wisconsin

TABLE A

Mercury

Alkylated Lead Compounds

Total Polychlorinated Biphenyl

Hexachlorobenzene

Benzo-a-pyrene

2,3,7,8-Tetrachlorodibenzo-p-dioxin

2,3,7,8-Tetrachlorodibenzofuran

Attachment #9

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

STEVEN E. CHESTER
DIRECTOR

June 3, 2004

Mr. Matt Stanfield, Environmental Engineer
City of Toledo
Division of Environmental Services
348 South Erie Street
Toledo, Ohio 43602-1633

Mr. Robert Hodanbosi
Division of Air Pollution Control
Ohio EPA
P.O. Box 1049
Columbus, Ohio 43266-0149

Dear Sirs:

SUBJECT: Draft Permit to Install, FDS Coke Plant, L.L.C., Lucas County, Application No. 04-01360

The Michigan Department of Environmental Quality (MDEQ), Air Quality Division (AQD), is submitting the enclosed comments for the proposed Prevention of Significant Deterioration permit for the FDS Coke Plant, L.L.C. The purpose of these comments is to assure that the emission impacts from the proposed coke ovens has minimum impact on Monroe County, Michigan, and other areas of Michigan.

According to the Great Lakes States Air Permitting Agreement that was signed by Michigan and Ohio on November 3, 1988, we have reviewed the proposed project. The AQD is submitting the enclosed comments within the spirit of this agreement.

If you have any questions regarding the enclosed comments, please contact Mr. Randal S. Telesz, AQD, at 517-373-7089, or you may contact me.

Sincerely,

G. Vinson Hellwig, Chief
Air Quality Division
517-373-7069

Enclosure
cc/enc: Ms. Pamela Blakley, U.S. Environmental Protection Agency, Region V
Mr. Mike Ahern, Ohio EPA
Mr. Jim Sygo, Deputy Director, MDEQ
Ms. Carrie Monosmith, MDEQ
Mr. Randal S. Telesz, MDEQ

Comments for Preliminary Determination on the Draft Permit to Install Application of FDS Coke Plant, L.L.C. Oregon, Ohio

Draft Permit No. 04-01360

Proposed Coke Plant

Michigan Department of Environmental Quality
Air Quality Division
June 3, 2004

1. Based on the information included in the preliminary determination, it does not appear that the Best Available Control Technology (BACT) was conducted appropriately with regards to maintenance operations of the heat-recovery steam generators (HRSGs) downstream of the coke ovens. BACT determinations typically do not separated maintenance from normal operations because maintenance is part of the normal operation of any process. This means that uncontrolled emissions would not be allowed during maintenance. In the federal regulations there are BACT provisions for startup, shutdown and malfunction; however, there are no provisions for maintenance as a separate determination. Normally, all operations would be shutdown during most maintenance. Therefore, a separate BACT analysis should not be conducted for uncontrolled emissions during maintenance operations. If uncontrolled emissions from maintenance operations can be separated for a BACT analysis for coke operations, then almost all maintenance operations for other sources can easily be justified based on limited uncontrolled emissions on a $/ton.

   We are requesting that the Ohio EPA reconsider separating maintenance from normal operations, and consider what options exist for emission controls or other means of reducing the uncontrolled emissions during bypassing of the HRSGs.

2. There is a fundamental flaw in this design when the maintenance operation is separate from the normal operation. What will be the contingency plan when one of the HRSGs is down for more than 14 days or if there are too many green pushes? Will one of the four coke batteries or one of the six process modules be shutdown temporarily during maintenance operations of the HRSGs?

   Each of the six process modules (40 coke ovens) will have their waste gas exhausted through the afterburner tunnel routed to a HRSG followed by a dry scrubber/baghouse for sulfur dioxide and particulate control. The air pollution controls for the coke ovens have been undersized due to the coke oven exhaust gases bypassing their air pollution controls during servicing of the HRSGs. Since the control equipment is undersized, it is possible that one of the four coke batteries or one of the six process modules could be shutdown temporarily during maintenance operations of the HRSGs. Since maintenance operations should not be separated from normal operations, a BACT analysis is not necessary for the temporary shutdown of one of the four coke batteries or coke ovens.

   Uncontrolled emissions of particulate matter (PM), PM with an aerodynamic diameter less than 10 microns in diameter (PM-10), (PM with an aerodynamic diameter less than 2.5 microns in diameter (PM-2.5) to be regulated in the near future) and sulfur dioxide (SO_2) could be eliminated during maintenance operations of the HRSGs. This would also eliminate uncontrolled toxic emissions, such as the metals (arsenic, cadmium, lead, manganese, mercury, nickel, etc.) from the coke ovens.

   We are requesting that Ohio EPA consider revising the permit conditions to require shutdown of one of the four coke batteries or 40 coke ovens when coke oven gases are bypassing the HRSGs.

3. On November 3, 1988, the representatives of the Council of Great Lakes Governors, including Ohio, entered into the Great Lakes States Air Permitting Agreement. This agreement addresses the control of toxic emissions, including mercury, in the Great

Lakes Basin to minimize the impact of toxics on the Great Lakes. It was agreed that "Toxic Substance Management in the Great Lakes Basin Through the Permitting Process," requiring that Best Available Control Technology be installed whenever possible on all new and existing sources of persistent air toxic pollutants that have an impact on the Great Lakes' "Great Lakes Toxic Substances Control Agreement.". All permit applicants in the state will be required to identify and quantify potential emissions of the pollutants identified in Table A as a part of a routine New Source Review permit application.

TABLE A

Mercury
Alkylated Lead Compounds
Total Polychlorinated Biphenyl
Hexachlorobenzene
Benzo-a-pyrene
2,3,7,8-Tetrachlorodibenzo-p-dioxin
2,3,7,8-Tetrachlorodibenzofuran

Furthermore, it was agreed "to insure consistency in the type of information which will be considered in permit reviews, and in the implementation of Best Available Control Technology, clear communications and informational exchange between Great Lakes states, and clarification of issues which EPA needs to take the lead on in order to assure effective implementation of the air provisions of the governors' and environmental administrators' agreements."

We are requesting that Ohio EPA apply the Great Lakes States Air Permitting Agreement.

4. The estimated mercury emission rate is 0.34 tons/yr, or 680 lbs/yr. Considering the mercury emission rates from various facilities, this emission rate of mercury is relatively high. The potential impact to ambient air has been estimated by the applicant, but there does not appear to be any assessment of the mercury impact via deposition in the local region, or any discussion about concerns for adding this load to mercury cycling over larger regions. Although these concerns may not be amenable to quantitation and risk assessment, they do raise the issue of what emission controls are proposed or could be considered. The MDEQ has concerns about elevated levels of mercury in the environment and are interested in pursuing available options for reducing anthropogenic emissions.

   We are requesting that Ohio EPA describe any assessment or judgment on the concerns for this mercury emission rate, and what options exist for pursuing emission controls, such as carbon injection during normal operations and shutdown of one of the four coke batteries or 40 coke ovens during maintenance operations, or other means of reducing this source of emissions.

5. The air quality impact assessment for the coke ovens during bypass should address the PM-10 and SO_2 impacts on Monroe County, Michigan and other areas of Michigan.

Based on Ohio EPA modeling parameters, the MDEQ has modeled the maximum short-term emission rates for PM-10 and SO_2. The results of the modeling indicates that the 24 hour ambient impacts are 3.2 and 17.8 micrograms per cubic meter (ug/m^3) for PM-10 and SO_2, respectively, at the Michigan and Ohio borders. It is the MDEQ policy for facilities in Michigan to limit the federal Prevention of Significant Deterioration (PSD) increments at 80 percent, namely, 29.6 and 72.8 ug/m^3 for PM-10 and SO_2, respectively. The coke ovens will consume 10.8 and 24.5 percent of the 80 percent PSD increment for PM-10 and SO_2, respectively. However, the MDEQ has additional concerns. These concerns include the reduction in available PSD increments for SO_2 and the future PM-2.5 nonattainment status in Monroe County.

We are requesting that Ohio EPA review the 24-hour air quality impacts on Monroe County, Michigan and other areas of Michigan for uncontrolled PM-10 and SO_2 emissions during bypassing of the HRSGs.