BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF LAFARGE MIDWEST, INC.	)	AS 06-1
FOR BOILER DETERMINATION	)	
PURSUANT TO 35 Ill. Adm. Code 720.132 and	)	
720.133.	)	

NOTICE OF FILING

TO: Illinois Pollution Control Board
Attn: Dorothy M. Gunn, Clerk
100 West Randolph Street
James R. Thompson Center, Suite 11-500
Chicago, IL 60601-3218

James G. Richardson, Assistant Counsel
Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

PLEASE TAKE NOTICE that on this 2nd day of December 2005, a copy of the attached *Amended* ***Petition for Boiler Determination Through Adjusted Standard Proceedings*** was filed with the Office of the Clerk of the Illinois Pollution Control Board, a copy of which is herewith served on you.

Respectfully submitted,

Jon S. Faletto, as Attorney for
Petitioner Lafarge Midwest, Inc.

Howard & Howard Attorneys, P.C.
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THIS FILING SUBMITTED ON RECYCLED PAPER

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PETITION OF LAFARGE MIDWEST, INC.	)	AS 06 -1
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720.133.	)	

AMENDED PETITION FOR BOILER DETERMINATION THROUGH ADJUSTED STANDARD PROCEEDINGS

NOW COMES the Petitioner, LAFARGE MIDWEST, INC., by and through its attorneys, Howard & Howard Attorneys, P. C., and presents to the Illinois Pollution Control Board ("Board") its Petition for Adjusted Standard pursuant to 35 Ill. Adm. Code Sections 720.132 and 720.133 requesting a determination that a slag dryer operated at Petitioner's South Chicago Slag Grinding Plant may be considered a "boiler" as that term is defined in 35 Ill. Adm. Code 720.110.

The Board's determination that the slag dryer is a "boiler" pursuant to the criteria set forth in 35 Ill. Adm. Code 720.132 will allow it to be used for the combustion of off-specification used oil for energy recovery, in compliance with 35 Ill. Adm. Code 739.161. The Board regulations at 35 Ill. Adm. Code 720.133 provide that the Board will make such a boiler determination on a case-by-case basis utilizing the Adjusted Standard procedures of Subpart D of 35 Ill. Adm. Code 104.

In support of its Petition, the Petitioner states as follows:

I. Background and Procedural History

On September 12, 2005, the Petitioner filed a Petition with the Illinois Pollution Control Board seeking a determination that a slag dryer operated at its South Chicago Slag Grinding Plant may be considered a boiler for the purposes of reclaiming thermal energy from utilizing

off-specification used oil as a supplemental fuel. The Board regulations at 35 Ill. Adm. Code 720.132 provide that the Board will make such a determination on a case-by-case basis by evaluating the criteria specified at 35 Ill. Adm. Code 720.132 and by utilizing the Adjusted Standard procedures of Subpart D of 35 Ill. Adm. Code 104.

In accordance with the Board's procedural rules, specifically 35 Ill. Adm. Code 104.408(a), Petitioner arranged for publication of notice of its Petition in a newspaper of general circulation in the area likely to be affected by Petitioner's activity. On September 30, 2005, Petitioner timely filed with the Board a certificate of publication stating that the *Daily Southtown* had published notice of the Petition on September 15, 2005. Filing of the certificate complied with the Board's procedural rules at 35 Ill. Adm. Code 104.410.

On October 24, 2005, the Illinois Environmental Protection Agency, through its Assistant Counsel James G. Richardson, filed its Recommendation to the Board in accordance with 35 Ill. Adm. Code 104.416. The Agency recommended that the Board grant the Petitioner's requested relief.

On October 20, 2005, the Board issued an Order in this proceeding which directed the Petitioner to provide additional information in support of its Petition and request for relief. The Board's October 20th Order directed Petitioner to provide the requested additional information by filing an Amended Petition. This Amended Petition is filed in accordance with the Board's October 20th Order and provides the additional information requested by the Board.

II. Description of Petitioner and South Chicago Facility

The South Chicago Slag Grinding Plant ("Grinding Plant") is owned and operated by Lafarge Midwest, Inc. ("Lafarge" or "Petitioner"), a subsidiary of Lafarge North America, Inc. Together with its subsidiaries, Lafarge North America is the largest supplier of cement and a

leading ready-mixed concrete supplier in North America. The Company also is one of the top four producers of construction aggregate (crushed stone, sand and gravel) and a leading manufacturer of gypsum drywall. Lafarge North America has over 1,000 operations doing business in almost every State and throughout all provinces in Canada through its Lafarge Canada, Inc. subsidiary. Lafarge's products are used in the construction of such diverse projects as roads, office buildings, factories, hospitals, department stores, sports stadiums, banks, museums, high-rise apartments, amusement parks, swimming pools and bridges. In 2002, Lafarge North America shipped 117.1 million tons of aggregate, 11.1 million cubic yards of ready-mixed concrete, 13.8 million tons of cement and 2.0 billion square feet of gypsum drywall.

Lafarge developed the South Chicago Slag Grinding Plant in 2001 and 2002. The plant was developed on existing Lafarge property that had been used as a terminal for cement storage and distribution since approximately 1987. The Grinding Plant is located at the common address of 2150 East 130th Street, Cook County, Chicago, Illinois, adjacent to the Calumet River and the southernmost portion of Lake Calumet.

The Lake Calumet area is a heavily industrialized area of active and closed steel mills, oil refineries, railroad yards, coke ovens, heavy manufacturing and waste disposal facilities. Waste disposal facilities are a major feature of the landscape; five major facilities – Paxton I, Paxton II, Land & Lakes, CID No.1 and CID No. 2 – cover approximately 820 acres in the Lake Calumet area, with only Waste Management's CID No.2 landfill currently operating. An aerial photograph showing the Grinding Plant is attached hereto as Exhibit A. In addition, a map showing the location of the Grinding Plant and the low population density of the surrounding Lake Calumet area is attached hereto as Exhibit B.

The economy and communities in the Lake Calumet area are still recovering from the loss of several steel mills, including Wisconsin Steel (1980), U.S. Steel Company's South Works (1992), LTV and Acme Steel (2003), and the closing of the many area businesses that supported the steel industry. The Lake Calumet area has vast acres of vacant land available for industrial development; at least 1,000 acres of vacant property is identified as available for industrial uses in the City of Chicago's 2002 *Calumet Area Land Use Plan*. That Land Use Plan designates property in the Lake Calumet area for future industrial development and open space, but no property is designated for future residential development.

Sustainable development, using a byproduct from another industry, was one of the key factors in Lafarge's decision to construct the Grinding Plant at this location. The principal product produced by Lafarge's Grinding Plant is a slag cement product marketed under the trade name "**NewCem®**". NewCem is produced by drying and grinding a pelletized or granulated iron blast furnace slag to cement fineness. The blast furnace slag used by Lafarge in the production of NewCem is generated at the Ispat-Inland, Inc. integrated steel facility located in East Chicago, Indiana, approximately 20 miles away.

Blast furnaces, which produce iron from iron ore in the presence of limestone or dolomite fluxes, produce a molten slag. The molten slag is tapped off the furnace separately from the molten iron metal and quenched with water through a granulation or pelletizing process. Modern blast furnaces produce slag having a very low variability. Typically, the oxide forms of silicon, calcium, aluminum and magnesium make up 95% or more of the blast furnace slag.

Slag cement such as Lafarge's NewCem product can be used to replace a portion of the cement in a concrete mix. The advantages of slag cement are improved workability and pumpability in the plastic (unhardened) form of concrete. In hardened concrete, the use of slag

cement increases strength, reduces permeability and heat of hydration, increases sulfate resistance and controls the alkali/silica reaction.

The environmental benefits associated with production of NewCem slag cement include productive use of an industrial byproduct, i.e. blast furnace slag that otherwise would be landfilled, reduced use of virgin materials and substantially reduced energy consumption compared to the energy demands of Portland cement manufacturing. Lafarge's proposal to utilize off-specification used oil fuel in the slag drying process provides additional environmental benefits by recycling and reclaiming the thermal energy from the waste oils that are generated from motor vehicles, refineries and manufacturing processes using machining/cutting oils, heat transfer fluids, hydraulic fluids and general lubricants.

The U. S. Environmental Protection Agency ("USEPA") has actively promoted and approved the recycling of used oil for energy recovery since Congress passed the Used Oil Recycling Act in 1980. Consistent with the legislative mandate to adopt a hazardous and solid waste management program consistent with the federal program and to secure USEPA approval thereof, the Board has adopted "identical-in-substance" regulations designed to encourage used oil recycling and burning specification and off-specification used oil for energy recovery.

Utilization of off-specification used oil fuel in the slag drying system at the Lafarge Grinding Plant is not expected to change the current air emissions from the facility, other than a negligible increase in the emissions of sulfur dioxide emissions from the drying operation. The air emissions associated with the proposed use of off-specification used oil fuel will be subject to approval by the IEPA through modification of the Grinding Plant's existing Lifetime Operating Permit. The permit modification procedures will provide the opportunity to address any

questions related to emissions of air contaminants associated with the combustion of used oil fuels.

III. Petition Content Requirements of 35 Ill. Adm. Code 104.406

Set forth below is the information specified by 35 Ill. Adm. Code 104.406 to be included in a Petition for Adjusted Standard. Since 35 Ill. Adm. Code 720.132 and 720.133 mandate the use of the Board's adjusted standard procedures of Subpart D of 35 Ill. Adm. Code 104 for determining whether a particular enclosed flame combustion device is a "boiler," this Petition addresses the requirements of Subpart D and includes the information specified in Section 104.406. The information is organized under headings corresponding to the informational requirements of each subsection of Section 104.406, in compliance with that Section.

a) A statement describing the standard from which an adjusted standard is sought. This must include the Illinois Administrative Code citation to the regulation of general applicability imposing the standard as well as the effective date of that regulation;

Response: The Board has promulgated administrative regulations applicable to the management of used oil set forth at 35 Ill. Adm. Code Part 739. Section 739.161(a) of Subpart G of the Part 739 [35 Ill. Adm. Code 739.161(a)] allows the combustion of off-specification used oil for energy recovery in "industrial boilers located on the site of a facility engaged in a manufacturing process where substances are transformed into new products, including the component parts of products, by mechanical or chemical processes."

The Board has promulgated regulations at 35 Ill. Adm. Code 720.132 and 720.133 establishing criteria and procedures for making a determination that certain enclosed devices using controlled flame combustion are "boilers" that may be utilized for the burning of off-specification used oil, even though such devices do not otherwise meet the definition of "boiler" set forth at 35 Ill. Adm. Code 720.110. Section 720.132 establishes the criteria to be considered

by the Board in making a case-by-case boiler determination and Section 720.133 mandates use of the Adjusted Standard procedures of Subpart D of 35 Ill. Adm. Code 104 to determine whether a particular enclosed flame combustion device is a "boiler" that may be used to burn off-specification used oil.

Through this adjusted standard proceeding, Petitioner seeks a determination that its slag dryer may be considered a boiler, even though it may not otherwise meet the definition of "boiler" at 35 Ill. Adm. Code 720.110. Such a case-by-case determination may be made by the Board upon demonstrating compliance with the criteria set forth at 35 Ill. Adm. Code 720.132. The applicable Board regulations, specifically 35 Ill. Adm. Code 720.132 and 720.133 were both promulgated with an effective date of July 17, 2003 (27 *Ill. Reg.* 12713, effective July 17, 2003).

b) A statement that indicates whether the regulation of general applicability was promulgated to implement, in whole or in part, the requirements of the CWA (33 USC 1251 et seq.), Safe Drinking Water Act (42 USC 300(f) et seq.), Comprehensive Environmental Response, Compensation and Liability Act (42 USC 9601 et seq.), CAA (42 USC 7401 et seq.), or the State programs concerning RCRA, UIC, or NPDES [415 ILCS 5/28.1];

Response: The regulations applicable to case-by-case boiler determinations, specifically 35 Ill. Adm. Code 720.132 and 720.133, were promulgated to implement, in whole or in part, the requirements of the Illinois program for the management of solid and hazardous waste, the state analog to the federal regulatory program under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, 42 U.S.C. §6901, et seq. (hereafter "RCRA".)

c) The level of justification as well as other information or requirements necessary for an adjusted standard as specified by the regulation of general applicability or a statement that the regulation of general applicability does not specify a level of justification or other requirements [415 ILCS 5/28.1] (See Section 104.426);

Response: The Board's regulations at 35 Ill. Adm. Code 720.132 and 720.133 establish the criteria and procedures for obtaining a case-by-case boiler determination by the Board. Section 720.132 establishes the criteria to be considered by the Board for making a determination that certain enclosed devices using controlled flame combustion are "boilers" that may be utilized for burning off-specification used oil for energy recovery, even though such devices do not otherwise meet the definition of a "boiler" set forth at 35 Ill. Adm. Code §720.110. Section 720.133 mandates use of the Adjusted Standard procedures of Subpart D of 35 Ill. Adm. Code 104 to determine whether a particular enclosed flame combustion device is a "boiler" that may be used to burn off-specification used oil.

(Note: Sections 720.132 and 720.133 are virtually identical to the federal RCRA regulations at 40 CFR 260.32 and 260.33 which establish the criteria and variance procedures for "case-by-case" determinations that specific combustion devices can be considered "boilers.")

The criteria to be considered by the Board and the procedures to be followed in making a determination that certain enclosed devices using controlled flame combustion are "boilers" are set forth in Sections 720.132 and 720.133. Those regulations are set forth in full below:

Section 720.132 Boiler Determinations

In accordance with the standards and criteria in Section 720.110 (definition of "boiler"), and the procedures in 720.133, the Board will determine on a case-by-case basis that certain enclosed devices using controlled flame combustion are boilers, even though they do not otherwise meet the definition of boiler contained in Section 720.110, after considering the following criteria:

a) The extent to which the unit has provisions for recovering and exporting thermal energy in the form of Steam, heated fluids or heated gasses;

b) The extent to which the combustion chamber and energy recovery equipment are of integral design;

c) The efficiency of energy recovery, calculated in terms of the recovered energy compared with the thermal value of the fuel;

d) The extent to which exported energy is utilized;

e) The extent to which the device is in common and customary use as a "boiler" functioning primarily to produce steam, heated fluids or heated gases; and

f) Other relevant factors.

(Source: Amended at 27 Ill. Reg. §12713, effective July 17, 2003.)

Section 720.133 Procedures for Determinations

The Board will use the procedures of Subpart D of 35 Ill. Adm. Code 104 for determining whether a material is a solid waste or for determining whether a particular enclosed flame combustion device is a boiler.

(Source: Amended at 27 Ill. Reg. §12713, effective July 17, 2003.)

d) A description of the nature of the petitioner's activity that is the subject of the proposed adjusted standard. The description must include the location of, and area affected by, the petitioner's activity. This description must also include the number of persons employed by the petitioner's facility at issue, age of that facility, relevant pollution control equipment already in use, and the qualitative and quantitative description of the nature of emissions, discharges or releases currently generated by the petitioner's activity;

Response: The principal product produced by Lafarge at the South Chicago Slag Grinding Plant is a slag cement product marketed under the trade name "**NewCem®**". NewCem is a ground granulated blast furnace slag produced by grinding a pelletized or granulated blast furnace slag to cement fineness. The blast furnace slag used by Lafarge in the production of NewCem is generated at the Ispat-Inland, Inc. integrated steel mill located in East Chicago, Indiana, approximately 20 miles away.

Pelletized slag is delivered to the Grinding Plant via truck. The 10-12% moisture content of the slag guarantees a dust-free transfer of slag from the truck to the raw material storage hoppers at the Grinding Plant. From the storage hoppers, raw material is moved via conveyors and elevators through the Grinding Plant where any metallic compounds are removed via

magnets before the slag is introduced into the drying system. The slag dryer functions as a direct-fired process heater to reduce the moisture content of the blast furnace slag so that the slag can be ground into a fine powder and processed into slag cement. The dried slag discharges to a cyclone collector before being fed to a large ball mill to reduce the slag to a fine powder and achieve product specifications. NewCem is a Grade 120 slag cement that meets ASTM C-989 and ASHTO M-302 specifications.

The Grinding Plant has the capacity to grind over 500,000 metric tons of granulated slag. Sales of NewCem in 2002 were 120,000 metric tons and for 2003 were approximately 200,000 metric tons. NewCem product produced by the Lafarge Grinding Plant is distributed through a marine transportation system using the Great Lakes and major rivers through Lafarge distribution terminals located in Red Rock, Minnesota, Kansas City, Missouri and Cleveland, Ohio.

The slag cement manufacturing operations are continually monitored to ensure efficient operation of the Grinding Plant. There are currently sixteen (16) full-time employees at the Grinding Plant; fifteen salaried plant employees and one salaried distribution employee. The annual payroll is approximately $850,000. Annual tax payments made to the State of Illinois and Cook County are approximately $326,000. Through its payroll and tax payments, Lafarge supports the depressed economy in the Lake Calumet area and has an active community relations presence through its involvement with the Calumet Area Industrial Commission, Hegewisch Chamber of Commerce, East Side Chamber of Commerce and the Illinois Manufacturers Association.

NewCem is produced at the Lafarge Grinding Plant with state-of-the-art manufacturing technology ensuring consistent supply for customers, exacting quality control to guarantee excellent product quality and minimal environmental impact. The environmental benefits

associated with production of NewCem slag cement include productive use of an industrial byproduct, reduced use of virgin materials and reduced energy consumption.

Lafarge's proposal to utilize off-specification used oil fuel in the drying process provides additional environmental benefits by recycling used oils that are continuously generated from motor vehicles, refineries and manufacturing operations using machining/cutting oils, heat transfer fluids, hydraulic fluids and general lubricants. Burning used oil is an accepted and proven means of energy recovery in Illinois and throughout the United States. Utilizing off-specification used oil fuel would permit Lafarge to better manage its fuel costs to stay competitive in the market. It would provide additional security for operations at the Grinding Plant and reduce the Company's exposure to the volatility of price and supply of natural gas, a non-renewable source of energy.

Additional Information. The Board's October 20th Order included the following request for additional information to address 35 Ill. Adm. Code 104.406(d): *"The Board requests that Lafarge submit data regarding both controlled and uncontrolled emissions from the slag dryer if that data is collected as part of an emissions monitoring program at the plant. Also under 35 Ill. Adm. Code 104.406(d), the Board asks Lafarge to clarify whether operation of the plant results in any discharges other than air emissions."*

Reported Emissions. The federal Clean Air Act and the Illinois Environmental Protection Act require reporting of air pollutant emissions by regulated sources and tracking of reported emissions data by the State of Illinois. To implement the requirements of State and Federal law, the State of Illinois has implemented an Annual Emissions Reporting requirement which applies to all sources required to have an operating permit in accordance with 35 Ill. Adm.

Code 201.302. The requirements applicable to the Annual Emissions Reporting program are codified in 35 Ill. Adm. Code 254.

In accordance with applicable regulations, Petitioner submits an Annual Emissions Report to the Illinois Environmental Protection Agency to report on actual emissions from all emissions units and activities at the South Chicago Grinding Plant. The most recent Annual Emissions Report was due on or before May 1, 2005. Set forth below is a summary of the emissions reported by Petitioner in its most recent Annual Emissions Report which was submitted to the Agency on March 15, 2005. The first summary table identifies all reported emissions from the entire Grinding Plant and the second table identifies reported emissions from only the slag drying system. A complete copy of Petitioner's Annual Emissions Report is attached hereto as Exhibit E.

2004 REPORTED EMISSIONS FOR ENTIRE FACILITY	
Pollutant	***2004 Emissions (tons/year)***
CO	9.96
NO_x	7.68
PM	11.54
PM_{10}	6.01
SO_2	0.59
VOM	9.07

2004 REPORTED EMISSIONS FOR SLAG DRYING SYSTEM ONLY	
Pollutant	***2004 Emissions (tons/year)***
CO	9.96
NO_x	7.68
PM	10.08
PM_{10}	5.02
SO_2	0.59
VOM	9.07

Other Discharges. Other than the air emissions reported to the Illinois Environmental Protection Agency and summarized above, operation of the Grinding Plant results in no other discharges to the environment.

e) **A description of the efforts that would be necessary if the petitioner was to comply with the regulation of general applicability. All compliance alternatives, with the corresponding costs for each alternative, must be discussed. The discussion of costs must include the overall capital costs as well as the annualized capital and operating costs;**

Response: Through this proceeding, Petitioner seeks a determination by the Board that the slag dryer operated at its South Chicago Plant may be considered a "boiler" for purposes of using off-specification used oil as a supplemental dryer fuel. The slag dryer functions as a direct-fired process heater to reduce the moisture content of blast furnace slag so that the slag can be ground into a fine powder and processed into slag cement. The finished slag cement product is used as an architectural building material and in a number of construction and building applications.

In January 2004, the Petitioner requested confirmation from the Illinois Environmental Protection Agency ("IEPA") that the slag dryer could be considered a "boiler" as that term is defined at 35 Ill. Adm. Code 720.110, and was therefore authorized to burn off-specification used oil for energy recovery. By letter dated May 28, 2004, the IEPA through Ms. Joyce L. Munie, P.E., Manager-Permit Section, Bureau of Land, stated that the slag dryer ". . . would not meet the definition of industrial boiler in 35 Ill. Adm. Code 720.110."

Although Petitioner disagreed with the IEPA's decision and believed that the slag dryer meets the definition of "boiler" in 35 Ill. Adm. Code §720.110, Petitioner would not risk an enforcement action by proceeding to utilize off-specification used oil as a supplemental fuel in the slag dryer. As a result of IEPA's interpretation of Section 720.110, Petitioner is prohibited

from burning off-specification used oil for energy recovery in its slag dryer. There are no compliance alternatives, no capital improvements and no operational changes that would allow Petitioner to "comply with the regulation of general applicability."

Additional Information. The Board's October 20th Order included the following request for additional information to address 35 Ill. Adm. Code 104.406(e): *"The Board requests that Lafarge provide a comparison of the cost of using specification fuel under the regulation of general applicability and of using off-specification fuel under the requested relief."*

Comparison of Costs – Specification Used Oil vs. Off-Specification Used Oil. Petitioner is proposing to supplement the use of natural gas with off-specification used oil as a supplemental fuel for its slag drying system as a cost saving measure. Specification used oil could be used as supplemental fuel in the slag drying system, but the cost savings with this type of fuel do not justify the investment required to burn used oil in the slag dryer. Off-specification used oil, due to its lower cost, is required to make the project economically feasible.

Lafarge is proposing to use approximately 500,000 to 600,000 gallons of used oil fuel per year. Specification used oil is priced at an average of $0.90 per gallon while off-spec oil is averaging around $0.67 per gallon. Based on projected usage of 500,000 gallons per year and current market pricing, this translates to an annual cost of $450,000 for on-specification used oil and $335,000 for off-specification used oil. The additional cost savings of $115,000 gained by using off-specification used oil as supplemental dryer fuel is required to make the project cost effective.

Additionally, as the costs of natural gas and specification used oil fuel increase, the economic benefits associated with use of off-specification used oil as a supplemental fuel also increase. According to the Energy Information Administration of the U.S. Department of

Energy, natural gas prices in the United States have more than doubled in the past three years, primarily because development of new gas supplies has not kept pace with increasing demand. (see *Annual Energy Outlook 2005 – Market Trends: Natural Gas Demand and Supply*). Natural gas is increasingly popular for use in homes, businesses, industrial facilities and electric power-generation because it is efficient, clean and reliable. Over the last several years, increased demand was spurred by the electric power industry, which is opting for cleaner, gas-fired power plants rather than conventional coal-fired power generation. Power plants were consuming 24 percent more natural gas in July 2005 than in July 2004, according to the federal Energy Information Administration.

In addition to a lag in the development of new natural gas production supplies, catastrophic weather has further widened the gap between supply and demand. In 2005, hurricanes Katrina and Rita devastated more than 250 oil and natural gas platforms. Almost nine percent of the Gulf Coast's annual production of natural gas was lost between August 26th and October 19th, according to the U.S. Minerals Management Service.

Historically, the factors that led to rising oil prices, such as political instability or war in major production areas such as the Middle East, did not affect U.S. natural gas prices, because more than 90 percent of the natural gas used in this country was produced domestically. However, many large industrial facilities can switch between natural gas and oil with modest capital expenditures for fuel oil storage and distribution facilities. In the past, in times of rising natural gas prices, these industrial facilities would switch to lower-priced fuel oil and diesel, thus relieving demand and upward price pressure on the natural gas market. Today, however, with oil prices spiking at prices of upwards of $60 or $70 per barrel, many industrial facilities cannot afford to switch to virgin fuels and are utilizing large quantities of alternative fuels, including

recycled used oil. The rising prices for natural gas and refined petroleum products has further increased the demand for used oil fuels, and thus, the market prices for both specification and off-specification used oil are expected to continue to increase.

f) A narrative description of the proposed adjusted standard as well as proposed language for a Board order that would impose the standard. Efforts necessary to achieve this proposed standard and the corresponding costs must also be presented;

Response: Pursuant to the criteria set forth at 35 Ill. Adm. Code §720.132, the Board may determine that the slag dryer is a boiler, even though it may not otherwise meet the definition of the term "boiler" set forth at 35 Ill. Adm. Code §720.110. Once the Board determines that the Petitioner's slag dryer meets the criteria set forth at 35 Ill. Adm. Code §720.132, it will meet the regulatory definition of the term "Boiler by designation" at 35 Ill. Adm. Code 720.110, which states in relevant part:

> *Boiler by designation. The unit is one that the Board has determined, on a case-by-case basis, to be a boiler, after considering the standards in Section 720.132.*

An industrial boiler located on the site of a facility engaged in a manufacturing process is authorized under Subpart G of 35 Ill. Adm. Code Part 739 to utilize off-specification used oil for energy recovery. Upon determination by the Board that Petitioner's slag dryer should be classified as a "boiler," Petitioner will be allowed to burn off-specification used oil for energy recovery in its slag dryer because it will be considered a "Boiler by designation," provided all other elements of Subpart G of 35 Ill. Adm. Code Part 739 are satisfied

Set forth below is proposed language for a Board Order that would approve the requested case-by-case boiler determination and Adjusted Standard relief:

1. *Procedural History*

2. *Background*

3. *Agency Recommendation*

4. *Response to Recommendation*

5. *Discussion*

   - *Legal Framework*
   - *Availability of Relief Under Section 720.132*
   - *Section 720.132 Factors*
   - *Other Relevant Factors*

6. *Conclusion*

The Board finds that Lafarge Midwest, Inc. has established under Section 720.132 of the Board regulations (35 Ill. Adm. Code 720.132), that the slag dryer operated at the South Chicago facility satisfies the criteria set forth in Section 720.132 to be considered a "boiler." Accordingly, the Board finds and determines that the slag dryer is a "boiler" within the meaning of 35 Ill. Adm. Code 720.110.

The Board's determination that the slag dryer is a "boiler" will allow it to be used for the combustion of off-specification used oil for energy recovery, in compliance with Section 739.161 of the Board's regulations (35 Ill. Adm. Code 739.161). The Board emphasizes that use of off-specification used oil as fuel for the slag dryer must comply with all other applicable Illinois and federal environmental standards and requirements, including the terms and conditions of Lifetime Operating Permit No. 98010053, issued for operation of the Granulated

Blast Furnace Slag Grinding and Drying Operation and associated air pollution control equipment and any subsequent modifications thereto.

This opinion constitutes the Board's findings of fact and conclusions of law.

ORDER

1. *The Board finds that the slag dryer operated by Lafarge Midwest, Inc. at its South Chicago Cement Distribution Terminal/Slag Processing Facility meets the criteria set forth in 35 Ill. Adm. Code §720.132 to be considered a "boiler." The Board accordingly grants Lafarge Midwest, Inc. the regulatory relief available under 35 Ill. Adm. Code 720.132 and determines that the slag dryer is a "Boiler by designation" under 35 Ill. Adm. Code §720.110.*
2. *The Adjusted Standard will allow the slag dryer to combust off-specification used oil for energy recovery under 35 Ill. Adm. Code 739.161, subject to compliance with all other applicable Illinois and federal environmental standards and requirements.*

IT IS SO ORDERED.

Additional Information. The Board's October 20th Order included the following request for additional information to address 35 Ill. Adm. Code 104.406(f): *"The Board requests that Lafarge state whether any additional air pollution control devices or modifications of existing equipment would be necessary if it (sic) slag dryer uses off-specification used oil as fuel in its slag dryer. If additional or modified devices are necessary, the Board also requests that Lafarge provide information about any costs associated with the installation or modification of that equipment."*

Adequacy of Current Air Pollution Control Equipment. The slag dryer is equipped with a modern, high-efficiency fabric filter baghouse particulate control system to minimize the release of particulate matter and other air contaminants in the exhaust gases. The combined capture and removal efficiency of these baghouse systems typically achieve greater than 99.9% overall control efficiency. The dried product captured in the fabric filter baghouse is a valuable material that is returned to the production process. In addition to controlling particulate emissions, maximizing capture of the dried slag entrained in the exhaust gases increases plant productivity and profitability that is critical to the overall financial health and long-term viability of the Grinding Plant. Consequently, there exists a strong economic incentive to operate the fabric filter baghouse at maximum removal efficiency.

Petitioner has estimated the potential particulate emissions from utilizing up to 500,000 gallons of off-specification used oil as a supplemental fuel in the slag dryer. Based on those calculations, total particulate matter ("PM") emissions and emissions of PM10 resulting from the combustion of used oil supplemental fuel will orders of magnitude lower than the emissions allowed by the current Lifetime Operating Permit. Set forth in Exhibit F are the calculations of emissions of all regulated pollutants that would be associated with annual combustion of up to 500,000 gallons of off-specification fuel in the slag dryer.

Allowable emissions of PM under the Operating Permit are 6.70 tons/year; maximum potential PM emissions resulting from combustion of off-specification used oil are predicted at 0.03 tons/year. Similarly, allowable emissions of PM10 under the Operating Permit are 3.05 tons/year; maximum potential PM10 emissions resulting from combustion of off-specification used oil are predicted at 0.02 tons/year. Because predicted PM and PM10 emissions from the combustion of off-specification used oil are predicted to be well below the permitted allowable

emission limits, Petitioner believes that no modifications to the existing fabric filter baghouse control equipment will be required to further control PM or PM10 emissions. Additionally, Petitioner believes that no additional pollution control equipment will be required to control emissions from the combustion of off-specification used oil as supplemental fuel in the slag dryer.

Utilization of off-specification used oil fuel in the slag drying system would need to be reviewed and approved by the Illinois Environmental Protection Agency air permitting officials, with issuance of a Construction Permit and/or modifications to the existing Operating Permit. Currently, the Grinding Plant is permitted to utilize natural gas as fuel for the slag drying system. Under the provisions of 35 Ill. Adm. Code Section 201, the use of used oil as a supplemental fuel in the slag drying system is likely to be considered a change in the method of operation which would trigger construction and operating permit requirements. All questions about the air pollutant emissions associated with combustion of used oil fuel would be addressed and fully answered through the air permitting review process.

g) **The quantitative and qualitative description of the impact of the petitioner's activity on the environment if the petitioner were to comply with the regulation of general applicability as compared to the quantitative and qualitative impact on the environment if the petitioner were to comply only with the proposed adjusted standard. To the extent applicable, cross-media impacts must be discussed. Also, the petitioner must compare the qualitative and quantitative nature of emissions, discharges or releases that would be expected from compliance with the regulation of general applicability as opposed to that which would be expected from compliance with the proposed adjusted standard;**

Response: As noted above, IEPA questioned whether the slag dryer and drying system at the Lafarge Grinding Plant met the definition of a "boiler" in 35 Ill. Adm. Code 720.110. Although Lafarge believes that the slag dryer meets the boiler definition and therefore is allowed to combust off-specification used oil fuels, it is not utilizing off-specification used oil as a fuel in

the slag dryer. As a result, Lafarge is not able to secure the benefits of used oil recycling and the recovery of thermal energy contained in these materials.

Lafarge will continue to combust substantial quantities of natural gas and suffer the economic uncertainties associated with the volatility of natural gas supplies and costs. As the cost of natural gas increases and availability decreases, the economic success and viability of the slag cement production operation at the Grinding Plant becomes questionable; a production process that utilizes secondary materials from the steel industry that otherwise must be landfilled or otherwise disposed of.

If the Board grants the requested adjusted standard relief, Lafarge would purchase used oil fuel from regulated used oil marketers at a cost per Btu of thermal energy that is significantly less than the escalating cost of natural gas. The used oil fuels would be subject to strict specifications to ensure high Btu value, allow complete combustion and produce negligible change in the combustion exhaust gas composition.

The only consequence associated with the Board's approval of Lafarge's request to utilize used oil fuels in its slag drying system would be a change in the air pollutant emissions from the slag dryer. Currently, the drying system utilizes natural gas as the primary dryer fuel and air contaminants from the combustion process are authorized under Lifetime Operating Permit No. 98010053 issued by IEPA on June 25, 2004. The Operating Permit establishes emissions limitations for total particulate matter ("PM"), PM with an aerometric diameter less than 10 microns ("PM_{10}"), sulfur dioxide ("SO_2"), carbon monoxide ("CO"), volatile organic material ("VOM"), and nitrogen oxides ("NO_x"). Compliance with the permitted emissions limits is achieved by full and complete combustion of the fuel and operation of a high-efficiency fabric filter baghouse system to control emissions in the dryer exhaust.

Lafarge has investigated how combustion of off-specification used oil fuel would affect air pollutant emissions from the Grinding Plant drying system. As noted above, Exhibit F provides the supporting calculations of emissions of all regulated pollutants that would be associated with annual combustion of up to 500,000 gallons of representative off-specification used oil fuels that would be supplied by reputable, authorized used oil marketers. Lafarge estimates there will be no increases in any of the permitted emissions other than a slight increase in the emissions of sulfur dioxide (SO_2), as compared to current emissions from combustion of natural gas. Utilization of off-specification used oil fuel in the slag drying system would need to be reviewed and approved by the IEPA air permitting officials, with issuance of a Construction Permit and/or modifications to the existing Operating Permit. Any questions about the air pollutant emissions associated with combustion of used oil fuel would be addressed and fully answered through the air permitting review process.

Additional Information. The Board's October 20th Order included the following request for additional information to address 35 Ill. Adm. Code 104.406(g): *"With its responsibility to review the environmental impacts of Lafarge's proposed activity, the Board requests that Lafarge submit a copy of its lifetime operating permit issued by he(sic) Agency. Second, the Board requests that Lafarge provide emission levels, whether monitored or estimated, under both the rule of general applicability and the proposed relief for all contaminants of concern: PM, SO_2, CO, VOM, and NOx. Third, the Board requests that Lafarge describe the quantitative and qualitative impacts on the environment of using off-specification used oil as fuel instead of natural gas. Fourth, the Board requests that Lafarge describe the nature and source of the used oil that it intends to use as fuel in terms of its previous use, handling, and presence of contaminants. Finally, the Board requests that Lafarge address whether it intends to institute*

any quality control measures on the off-specification used oil it plans to use as fuel for its slag dryer."

Lifetime Operating Permit and Emissions Calculations. As requested, Petitioner has included as Exhibit G a true and complete copy of Lifetime Operating Permit No. 98010053 issued by IEPA on June 25, 2004 authorizing operation of the Grinding Plant. The Operating Permit establishes emissions limitations for PM, PM_{10}, SO_2, CO, VOM, and NO_x. Compliance with the permitted emissions limits is achieved by full and complete combustion of the fuel and operation of a high-efficiency fabric filter baghouse system to control PM and PM_{10} emissions entrained in the dryer exhaust.

In Exhibit F attached hereto, Petitioner has provided its calculations of the emissions of all contaminants of concern identified in the Board's October 20th Order, specifically PM, SO_2, CO, VOM, and NOx, that would result from the combustion of up to 500,000 gallons/year of off-specification used oil as supplemental dryer fuel. All values and parameters utilized in the emissions calculations are set forth in Exhibit F. In addition to the foregoing, Exhibit F also includes calculations of the emissions of the same contaminants PM, SO_2, CO, VOM, and NOx, that result from the combustion of natural gas in the slag dryer. Note that Exhibit E also provides the actual emissions data for PM, SO_2, CO, VOM, and NOx, emissions from the slag dryer for the 2004 calendar reporting year which are based on the current use of natural gas fuel.

Quantitative and Qualitative Impacts of Using Supplemental Used Oil Fuels. In preceding sections of this Petition, Lafarge has described the results of its investigations of air emissions associated with the combustion of off-specification used oil fuel as a supplemental dryer fuel compared to continuing use of 100 percent natural gas as the only dryer fuel. Exhibit F provides the supporting calculations of emissions of all regulated pollutants that would be

associated with annual combustion of up to 500,000 gallons of representative off-specification used oil fuels. Based on those calculations, there will be no significant increases in any of the permitted emissions with the largest increase in the emissions of SO_2 when compared to current emissions from the combustion of natural gas. Emissions of CO would actually decrease with the use of used oil fuel. Moreover, all emissions associated with combustion of off-specification used oil fuel would be less than the allowable emissions under the current Lifetime Operating Permit, with the exception of SO_2.

Utilization of off-specification used oil fuel in the slag drying system would need to be reviewed and approved by the IEPA air permitting officials, with issuance of a Construction Permit and/or modifications to the existing Operating Permit. The permitting process would ensure that all emissions associated with combustion of used oil fuel would be in full compliance with all applicable regulatory requirements and environmental standards.

On a qualitative basis, Lafarge's proposal to utilize off-specification used oil fuel in the slag drying process provides significant environmental benefits by recycling and reclaiming the thermal energy from the waste oils that are generated from motor vehicles, refineries and numerous industrial processes. Recycling used oil for reuse or energy recovery provides environmental and economic benefits. According to the USEPA's Office of Solid Waste, re-refining used oil takes only about one-third the energy of refining crude oil to lubricant quality; it takes 42 gallons of crude oil, but only one gallon of used oil, to produce two and a half quarts of new, high-quality lubricating oil; and one gallon of used oil processed for fuel contains about 140,000 British Thermal Units (BTUs) of energy.

Substituting off-specification used oil for natural gas also helps to conserve this non-renewable resource. As noted in preceding sections of this Petition, the demand for natural gas

has far outpaced current supplies and as a result, natural gas prices in the United States have more than doubled in the past three years. Lafarge's proposal to substitute used oil fuel in place of natural gas provides an environmental benefit by conserving a valuable natural resource.

Indirectly, the Board's approval of the relief requested by Lafarge would support the additional environmental benefits associated with the industrial byproduct recycling operations at the Grinding Plant. As noted earlier, Lafarge's production of NewCem slag cement at the Grinding Plant uses an industrial byproduct, i.e. blast furnace slag that otherwise would be landfilled. Production of cement from a byproduct of the steel manufacturing industry reduces the amount of virgin raw materials and energy that otherwise would be consumed in manufacturing Portland cement from natural raw materials. Controlling the operating costs of the Grinding Plant by approving use of lower cost used oil supplemental fuel would provide more stability to Lafarge's production operations and maintain the environmental benefits of recycling blast furnace slag into commercial cement products. It would provide reduce the Company's exposure to the volatility of price and supply of natural gas, a non-renewable source of energy.

Sources of Used Oil Supplies and Basic Quality Control Management Standards. Included in Exhibit G is a description of the nature and source of the used oil that is likely to be available for use as supplemental fuel for the slag dryer. In addition, Exhibit G summarizes the key procedures that would be instituted to control the quality of off-specification used oil to be used as fuel for the slag dryer. This summary document, entitled *"Potential Supply Sources and Basic Principles for Management of Used Oil Fuel for the South Chicago Slag Grinding Plant,"* was prepared for Lafarge by Systech Environmental Corporation, a wholly owned subsidiary of Lafarge. It is anticipated that Systech Environmental Corporation will serve as Lafarge's

principal contractor for identifying and qualifying used oil suppliers and making arrangements for delivery of used oil fuels to the Grinding Plant by pre-qualified suppliers.

h) A statement which explains how the petitioner seeks to justify, pursuant to the applicable level of justification, the proposed adjusted standard;

Response: Section 720.132 of the Board's regulations (35 Ill. Adm. Code §720.132), establishes the criteria to be considered by the Board in making a "case-by-case" determination that certain enclosed devices using controlled flame combustion are boilers, even though they do not otherwise meet the definition of a "boiler" contained in Section 720.110. The criteria for "case-by-case" boiler determination track closely the regulatory definition of "boiler" set forth at 35 Ill. Adm. Code 720.110. Consequently, when evaluating whether a particular combustion source, such as the slag dryer at the Lafarge Drying Plant, should be classified as a boiler, the regulatory definition of "boiler" provides the determining physical characteristics.

Set forth below is the regulatory definition of a "boiler" which identifies the key physical characteristics of a boiler to be considered in making a "case-by-case" boiler determination under 35 Ill. Adm. Code 720.132. The 35 Ill. Adm. Code 720.110 "boiler" definition states:

> **"Boiler"** means an enclosed device using controlled flame combustion and having the following characteristics:
>
> Boiler physical characteristics.
>
> The unit must have physical provisions for recovering and exporting thermal energy in the form of steam, heated fluids, or heated gases; and the unit's combustion chamber and primary energy recovery sections must be of integral design. To be of integral design, the combustion chamber and the primary energy recovery sections (such as waterwalls and superheaters) must be physically formed into one manufactured or assembled unit. A unit in which the combustion chamber and the primary energy recovery sections are joined only by ducts or connections carrying flue gas is not integrally designed; however, secondary energy recovery equipment (such as economizers or air preheaters) need not be physically formed into the same unit as the combustion chamber and the primary energy recovery section. The following units are not precluded from being boilers solely because they are not of integral design: process heaters (units that

transfer energy directly to a process stream) and fluidized bed combustion units; and

While in operation, the unit must maintain a thermal energy recovery efficiency of at least 60 percent, calculated in terms of the recovered energy compared with the thermal value of the fuel; and

The unit must export and utilize at least 75 percent of the recovered energy, calculated on an annual basis. In this calculation, no credit may be given for recovered heat used internally in the same unit. (Examples of internal use are the preheating of fuel or combustion air, and the driving of induced or forced draft fans or feedwater pumps); or

Boiler by designation. The unit is one that the Board has determined, on a case-by-case basis, to be a boiler, after considering the standards in Section 720.132.

The 35 Ill. Adm. Code 720.132(a) Criteria. Set forth below is a demonstration that Petitioner's slag dryer satisfies each of the criteria specified at 35 Ill. Adm. Code 720.132(a) to be considered a boiler.

Section 720.132(a) The extent to which the unit has provisions for recovering and exporting thermal energy in the form of steam, heated fluids or heated gases:

The process unit is a thermal dryer with its main objective being to recover the thermal energy in the fuel being burned in order to heat the slag and drive off moisture. The dryer functions as a direct-fired process heater, in which the process material, wet blast furnace slag, and additional air are brought into contact with the hot combustion product gases. The thermal energy released by the combustion of the fuel is transferred to the wet slag. Heating the slag vaporizes a portion of the moisture that is in the pores of the material. The heat is then exported in the form of heated slag, gases and water vapor. The slag, hot gases and water vapor are discharged from the dryer through a cyclonic separator, where the slag is removed from the exhaust gas stream, which is cleaned by a high-efficiency fabric filter baghouse system before

being discharged to the atmosphere. The dried slag captured in the cyclone separators is conveyed to a mill where it is ground to the desired particle size.

The dryer is fully enclosed with an outer shell of steel. The burning chamber is lined with a high temperature resistant refractory material and the transport shaft is lined with ceramic tile. This design is conducive to recovering as much energy as possible from the fuel.

Section 720.132(b). The extent to which the combustion chamber and energy recovery equipment are of integral design;

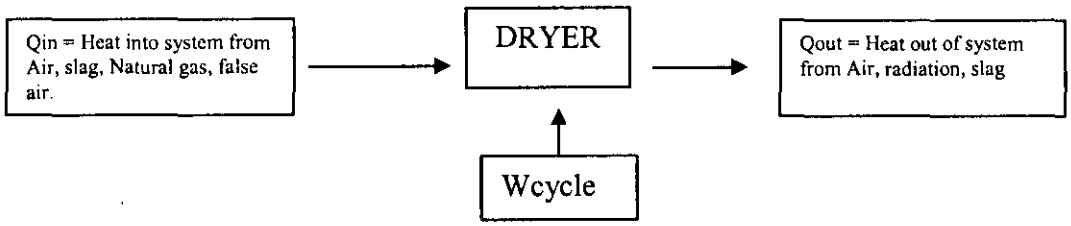
The dryer is fully enclosed and of integral design. The combustion chamber and vertical shaft were assembled to be one piece of equipment. The dryer is an inline portion of the slag cement manufacturing process, in which the slag is dried, ground and size-classified to produce a salable cement product. For a graphic depiction of the slag dryer, see the engineering drawing attached hereto as Exhibit C.

The regulatory definition of a "boiler" set forth in the Board's regulations at 35 Ill. Adm. Code 720.110 includes an express exemption from the "integral design" element for process heaters such as the slag dryer. The regulation states, *"The following units are not precluded from being boilers solely because they are not of integral design: process heaters (units that transfer energy directly to a process stream) and fluidized bed combustion units."*

Because the slag dryer is a direct-fired process heater where the thermal energy of the combusted fuel is transferred to the wet slag being processed, the element of "integral design" is not determinative in this proceeding. However, the slag dryer is fully enclosed and of integral design so compliance with this criterion is established even though the unit is subject to the process heater exemption.

Section 720.132(c) The efficiency of energy recovery, calculated in terms of the recovered energy compared with the thermal value of the fuel;

For purposes of calculating the efficiency of energy recovery, a detailed analysis of the South Chicago Drying System is necessary. The South Chicago Drying System can be graphically depicted and summarized with the following process flow diagram:



"Qin" = heat into the system
"Qout" = Energy out of the system
"Wcycle" = net amount of energy transfer by heat and work.

Systems undergoing the drying process as described above deliver a network transfer of energy to the surroundings. This is called a "power cycle."

Thermal efficiency is calculated in engineering thermodynamic reference materials as the following:
η = Wcycle/Qin eq#1

An alternative form based on the balance of the system described above can be:
η = (Qin-Qout)/Qin eq#2

Equation #2 translates into:
Efficiency = Energy Absorbed (Qin-Qout) divided by Qin (Heat into system)

The efficiency method described above is based on the principles of the First and Second Laws of Thermodynamics, hence a method uniformly used worldwide for the design, operation and evaluation of heat systems. (See *Fundamentals of Engineering Thermodynamics*, Michael J. Moran, Third Edition, 1996, pages 60-61; *Chemical and Process Thermodynamics*, B.G. Kyle, Second Edition, 1992, page 63

A heat balance has been calculated for the Slag Drying System to provide the input variables for the thermal efficiency calculations. All values and parameters used in the heat balance calculations are set forth in the following *"Table 1. Heat balance Calculations: Total Heat In"* and *"Table 2. Heat Balance Calculations: Total Heat Out."*

Table 1. Heat Balance Calculations: Total Heat In

Line	Feed	Definition	As Measured (kg/hr)	Moisture Calculation	As measured (dry basis)	Feed	Kg/ Kg_slag	T(C)	CP (kcal/kgC)	Heat (Kcal/Kg Slag)
1	DF	Dilution Fan	62,116		61,681	61,681	0.843	22.0	0.2421	4.4892
2	CF	Combustion Fan	10,800		10,724	10,724	0.147	24.0	0.2425	0.8531
3	FAD	Fresh Air Damper	17,717		17,593	17,593	0.240	27.0	0.2432	1.5789
4	Slag	Slag Feed	81,300		73,170	73,170	1.000	36.0	0.1779	6.4041
5	Slag_H20	Slag Water		8,130		8,130	0.111	36.0	0.4574	1.8296
6	DF_H2O	Dilution Fan Air Water		435		435	0.006	24.5	0.4527	0.0659
7	CF_H2O	Combustion Fan Air Water		76		76	0.001	27.0	0.4537	0.0127
8	FAD_H2O	Fresh Air Damper Air Water		124		124	0.002	22.3	0.4518	0.0171
9	FUEL_H2O	Fuel Gas Water		42.47		42.47	0.001	25.0	0.4529	0.0066
10	Fuel Latent Heat		425		382	382	0.005	25.0	0.2500	0.0326
11	False Air		10,118		10,118	10,118	0.138	23.0	0.2423	0.7706
12	FUEL Combustion Heat		22,245		1,013					77.6085
13									Total Heat In	93.6688
	Outlet					Outlet				

Table 2. Heat Balance Calculations: Total Heat Out

14	False Air in Stack Gas		10,118	Estimate 10%	10,118	10,118	0.138	72.0	0.2536	2.5244
15	Stack Gas		91,058		90,420	90,420	1.236	72.0	0.2536	22.5604
16	Stack Gas_H20	Stack Gas Water		637	7,437	7,437	0.102	72.0	0.4725	3.4582
17	Slag	Slag outlet	76,500		76,500	76,500	1.046	42.0	0.1791	7.8642
18	Slag H2O	Slag water		1,700	1,700	1,700	0.023	42.0	0.4599	0.4487
19	Radiation		Approximately 2.5% of total heat out							2.2294
20	Heat of vaporization					6,800	0.093		539	50.0916
21									Heat Out	89.1769
22	Other heat contained within the system									4.4920
23									Total Heat Out	93.6688
24									% Recovery	[redacted]

Notes: Slag feed is 85000 kg/hr @10% moisture.

The following parameters were used to calculate the heat balance for the Slag Drying System:

Inlet Parameters

*Heat input from dilution fan (DF) = (Dry Dilution Fan Airflow (kg/hour) / Dry Slag Feed Rate (Kg/hour)) * Temperature of Air stream (°C) * Specific Heat capacity of Air @ stream T*

*Heat input from combustion fan (CF) = (Dry combustion Fan Airflow (kg/hour) / Dry Slag Feed Rate (Kg/hour)) * Temperature of Air stream (°C) * Specific Heat capacity of Air @ stream T*

*Heat input from Fresh Air Damper (FAD) = (Dry Fresh Air Damper Airflow (kg/hour) / Dry Slag Feed Rate (Kg/hour)) * Temperature of Air stream (°C) * Specific Heat capacity of Air @ stream T*

*Heat input from Slag stream = (Dry Slag Feed Rate (kg/hour) / Dry Slag Feed Rate (Kg/hour)) * Temperature Slag Feed before dryer (°C) * Specific Heat capacity of Slag @ stream T ** The slag feed rate was used as the reference material (Kcal /Kg slag)*

*Heat input from water in slag = (Water mass flow in slag (kg/hour) * / Dry Slag Feed Rate (Kg/hour)) * Temperature water in slag (°C) * Specific Heat capacity of water @ stream T*

*Heat input from water in dilution fan air stream = (Water mass flow in dilution air stream from relative humidity (kg/hour) * / Dry Slag Feed Rate (Kg/hour)) * Temperature of water in dilution air stream (°C) * Specific Heat capacity of water @ stream T*

*Heat input from water in combustion fan air stream = (Water mass flow in combustion fan air stream from relative humidity (kg/hour) * / Dry Slag Feed Rate (Kg/hour)) * Temperature of water in combustion fan air stream (°C) * Specific Heat capacity of water @ stream T*

*Heat input from water in fresh air damper air stream = (Water mass flow in fresh air damper air stream from relative humidity (kg/hour) * / Dry Slag Feed Rate (Kg/hour)) * Temperature of water in fresh air damper air stream (°C) * Specific Heat capacity of water @ stream T*

*Heat input from water in Natural Gas stream = (Water mass flow in gas from moisture provided by gas company (kg/hour) * / Dry Slag Feed Rate (Kg/hour)) * Temperature of water in gas stream from gas company (°C) * Specific Heat capacity of water @ stream T*

*Heat input from latent heat of natural gas = (Dry natural gas flow rate (kg/hour) / Dry Slag Feed Rate (Kg/hour)) * Temperature of natural gas stream (°C) * Specific Heat capacity of natural gas @ stream T*

*Heat input from false air = (Dry false air Airflow (kg/hour) / Dry Slag Feed Rate (Kg/hour)) * Temperature of Air stream (°C) * Specific Heat capacity of Air @ stream T *** False air is the air as a result of in-leakage in the system. It is estimated to be about 10% of the stack's air flow rate*

*Heat input from natural gas stream = natural gas flow rate from gas meter (ft^3/hour) * Gas fuel value from gas company (BTU/ft^3) * conversion factor to Kcal / Dry Slag Feed Rate (Kg/hour)*

Total heat in = SUM Lines (1 to 12)

Outlet Parameters

*Heat output from false air = (Dry false air Airflow (kg/hour) / Dry Slag Feed Rate (Kg/hour)) * Temperature of Air stream (°C) * Specific Heat capacity of Air @ stream T *** False air is the air as a result of in-leakage in the system. It is estimated to be about 10% of the stack's air flow rate*

*Heat output from stack stream = (Dry stack stream Airflow (kg/hour) / Dry Slag Feed Rate (Kg/hour)) * Temperature of Air stream (°C) * Specific Heat capacity of Air @ stream T*

*Heat output from water in stack air stream = (Water mass flow in stack air stream from relative humidity (kg/hour) * / Dry Slag Feed Rate (Kg/hour)) * Temperature of water in stack air stream (°C) * Specific Heat capacity of water @ stream T*

*Heat output from Slag stream = (Slag mass flow rate after dryer (kg/hour) / Dry Slag Feed Rate (Kg/hour)) * Temperature Slag after dryer (°C) * Specific Heat capacity of Slag @ stream T*

*Heat output from water in slag stream after dryer = (Water mass flow in slag steam (kg/hour) / Dry Slag Feed Rate (Kg/hour)) * Temperature water in slag (°C) * Specific Heat capacity of water @ stream T*

*Heat output from heat loss thru the system walls = Total heat out (SUM lines 14 to 18 and line 20) * 0.025*

*Heat output released from the vaporization of water = Water mass flow rate (kg/hr) / Dry Slag Feed Rate (Kg/hour) * heat of vaporization of water*
Heat out = (SUM Lines (14 to 18) and Line 20) / 0.975 (stack factor)
*Other heat contained within the system = Line 13 - Line 21 ** This heat includes the radiation heat loss*
Total heat Out = SUM Lines (21 to 22)

Other Definitions

- CP = Specific Heat Capacity. At a given temperature, this is the heat input expected from each of the components named above.
- As measure sample: On actual conditions, without moisture adjustments
- Moisture calculation: In the case of the air, the relative humidity and temperature is used along with a Psychometric chart to determine the Kg of water/Kg or air ratios.
- As measured (Dry basis): Stream of water or material with the moisture removed
- Kg/Kg_slag : When performing heat balances it is important to select a reference variable. In this case, we selected the slag feed as a reference variable.
- T: The actual temperature of the material or gas stream.
- Heat: The heat consumption can be obtained by multiplying the Kg/Kg_slag times the temperature times the CP of the individual values.

Assumptions Used in Heat Balance Calculations. One of the primary tasks in designing combustion equipment or engineering a complex mineral drying process is the development of a heat balance. Development of a heat balance is essentially a detailed accounting of the distribution of heat input, heat output and system losses. The heat balance accounting relies on actual test data, mathematical derivations and generally accepted engineering assumptions. Two of those assumptions used by Petitioner in preparation of the heat balance calculations for the Slag Drying System were the amount of "false air" input to the system and the amount of heat loss due to "shell radiation."

For Lafarge cement manufacturing and mineral processing facilities and generally within the cement industry, an accepted assumption for average "false air" in newer combustion equipment and mineral drying systems is a 10 percent value. This value takes into account devices such as expansion joints, inspection doors/ports, normal equipment wear and any other

in-leakage inherent with the system. This value for the "false air" assumption has been used in the design of equipment and mineral drying systems for Lafarge's numerous cement manufacturing and mineral processing facilities. As noted in the heat balance calculations set forth above, Petitioner used the generally accepted 10 percent value for the "false air" assumption.

For Lafarge cement manufacturing and mineral processing facilities and generally within the cement industry, an accepted assumption for average heat losses due to "shell radiation" in newer combustion equipment and mineral drying systems is a 2.5 percent value. This assumption addresses the radiant heat lost to the surrounding structures of the dryer or combustion device. This value for the "shell radiation" heat loss assumption has been used in the design of equipment and mineral drying systems for Lafarge's numerous cement manufacturing and mineral processing facilities. As noted in the heat balance calculations set forth above, Petitioner used the generally accepted 2.5 percent value for the "shell radiation" heat loss assumption.

In connection with development of the heat balance set forth in this Petition, Lafarge engineers consulted with reputable vendors of cement kilns and mineral dryers. Through that consultation, Petitioner verified that a 10 percent value for the "false air" assumption and a 2.5 percent value for the "shell radiation" heat loss assumption are values used in designing equipment and mineral processes for other cement manufacturers and raw material processors.

Additional Information. The Board's October 20th Order included the following request for additional information to address 35 Ill. Adm. Code 104.406(h): *"While Lafarge has named a design engineer with which it verified these assumptions, the petition does not include any supporting documentation or affidavits. The Board requests that Lafarge submit documentation*

or affidavits supporting the assumptions made in calculating the energy recovery efficiency of the slag dryer system.

As requested by the Board, Petitioner has included the affidavit of Mr. David Ledesma which is attached hereto as Exhibit I. Mr. Ledesma currently holds the position of Engineering Manager of the Process Engineering Department with Lafarge Midwest, Inc. In that capacity, Mr. Ledesma provides engineering support for Lafarge's cement manufacturing and mineral processing facilities from the corporate engineering offices located at the Lafarge Alpena Portland Cement Plant located in Alpena, Michigan. In addition to the Lafarge Alpena Cement Plant, Mr. Ledesma's engineering duties include other Lafarge facilities, including the Lafarge South Chicago Slag Grinding Plant located in Chicago, Illinois. Mr. Ledesma prepared the heat balance calculations for the Slag Drying System that are set forth in this Petition.

The Affidavit of Mr. Ledesma provides the support requested by the Board's October 20th Order. Based on his project experience, engineering judgment, consultation with other engineering professionals and a reasonable degree of scientific certainty, Mr. Ledesma has verified that use of the 10 percent value for the "false air" assumption and the 2.5 percent value for the "shell radiation" heat loss assumption were appropriate in conducting the heat balance calculations for the South Chicago Slag Drying System.

Thermal Energy Recovery Efficiency Calculation. The definition of the term "boiler" at 35 Ill. Adm. Code 720.110 specifies a standard for thermal energy recovery efficiency for a boiler. The relevant portion of the definition (which is identical to the federal definition) states: "While in operation, the unit must maintain a thermal energy recovery efficiency of at least 60 percent, calculated in terms of the recovered energy compared with the thermal value of the fuel"

Calculations to demonstrate compliance with the 60% thermal energy recovery efficiency standard of Section 721.110 were performed as described below:

- Thermal value of the fuel from line# 12 "Table 1. Heat Balance Calculations: Total Heat In" = **77.6085 Kcal/Kg_Slag**
- Recovered Energy = Energy used by the system. This value is calculated as follows:
  - The total value of energy used (based on a one year production period) is calculated by subtracting the total energy consumed in a one year period minus the pre-heat portion of the system (1.5% of the total energy used). The total energy was calculated by multiplying the known energy consumption from the heat balance (93.6688 Kcal/Kg_Slag) with the total Kg of slag used in 2002 (111,991,000). To this number, subtract the 1.5% of energy used in the pre-heating process of the furnace.
  - In order to calculate the recovered energy (energy absorbed) from the system, to the total heat value calculated above, we will subtract all heats that leave the system (False air in stack gas, stack gas, stack gas H2O, and Radiation)
  - The value obtained from the step above is **61.69 Kcal/Kg slag**
- Finding the thermal energy recovery as per 40 CFR 260.10(1)(iii): The last step is to divide the recovered energy (energy absorbed) by the Thermal value of the fuel: **61.69/77.61 * 100 = 79.23%**

As demonstrated by the foregoing calculations (and supported by the heat balance calculations), the Slag Drying System achieves a thermal energy recovery efficiency of 79.23%. The thermal energy recovery efficiency clearly exceeds the Section 720.110 criteria of a minimum of 60% recovery.

Section 720.132(d) The extent to which exported energy is utilized;

The definition of the term "boiler" at 35 Ill. Adm. Code 720.110 specifies a standard for utilization of the recovered thermal energy for a boiler. The relevant portion of the definition (which is identical to the federal definition) states: "The unit must export and utilize at least 75

percent of the recovered energy, calculated on an annual basis. In this calculation, no credit may be given for recovered heat used internally in the same unit. (Examples of internal use are the preheating of fuel or combustion air, and the driving of induced or forced draft fans or feedwater pumps.)"

Internal use of the recovered heat only occurs during preheating every time the system is started. The preheating hours account for 1.5% of the total operating hours in a year. With the loss of 1.5 percent of the fuel heat input due to preheating the dryer, the annual energy recovery is estimated to be 79.23%.

Total Kcal used without heat of drying	Total Kg of slag from 2002	Kcal/hg slag	% Used in Pre-Heat	Kcal/kg slag used in pre-heat	%Recovery after subtracting preheat used
	111,991,000	93.67	1.50%	157,350,997	
10,332,715,500		92.26			79.23%

Section 720.132(e) The extent to which the device is in common and customary use as a "boiler" functioning primarily to produce steam, heated fluids or heated gases.

Direct-fired dryers and process heaters are widely used in the production of cement and other non-metallic mineral products. Cement kilns and the associated process heaters and dryers used in the production of Portland cement utilize a tremendous amount of fuel to dry the raw materials before being introduced into the pyroprocessing steps and to produce the extreme temperatures and long residence times needed to calcine limestone rock, shale, sand and other minerals to produce clinker and ultimately Portland cement. It is a matter of common knowledge that cement kilns utilize a variety of fuel types including coal, petroleum coke, specification and off-specification used oil, used vehicle tires and hazardous wastes in a safe and environmentally

sound manner under express authorization and approvals from state and federal environmental regulatory agencies.

Lafarge operates a large Portland cement manufacturing plant located near Alpena, Michigan. The Alpena Plant is Lafarge's largest Portland cement-producing facility and reputed to be the largest cement manufacturing facility in North America. The plant consists of five cement kilns that produce approximately 2.7 million tons of cement annually. At Alpena, cement is made from high quality limestone, silica, alumina and iron. The limestone is crushed into nuggets, which are transported by conveyor to the plant. There, the limestone and other raw materials are dried in the raw feed dryers and fed into raw grinding mills which grind and blend the raw feed mixture into a fine powdered kiln feed. This "raw grind" kiln feed is conveyed into rotary cement kilns where it is heated to over 2700^0 Fahrenheit becoming grayish-black nuggets called clinker. When the clinker emerges from the kiln, it is cooled, mixed with gypsum, and ground into the fine powder known as Portland cement.

Lafarge is committed to sustainable development and the Alpena Plant has served as a showcase for several environmentally beneficial recycling projects. For example, the Alpena Plant is one of the few North American cement plants to use waste heat from the cement kilns to generate steam which drives turbines that produce electricity to power the plant's internal electrical system. Additionally, through a program known as "industrial ecology" Lafarge has implemented projects to utilize the waste byproducts of two other manufacturing processes as raw materials used in the manufacture of Alpena cement. The projects result in a reduction in the total waste stream from the plant while maintaining the high-quality cement for which the plant is known.

Another recycling opportunity implemented by Lafarge at the Alpena Plant was the utilization of off-specification used oil as fuel in the raw grind dryers. The State of Michigan administers a used oil regulatory program that is virtually identical to the federal and Illinois used oil management programs. Consequently, Lafarge consulted with the Michigan Department of Environmental Quality ("DEQ") to secure approval to combust off-specification used oil fuel in the raw grind dryers. Under the DEQ-administered used oil/RCRA regulations, specifically Michigan DEQ rules R299.9814 and 299.9101, Lafarge was required to demonstrate that the Alpena raw grind dryers satisfied the physical boiler criteria established by USEPA (and adopted by both Illinois and Michigan), to demonstrate use of used oil fuel in the dryer constituted a legitimate use for energy recovery. As noted above, those physical criteria are set forth in the definition of "boiler" and rely upon the concepts of integral design, combustion efficiency and energy recovery.

The Michigan DEQ reviewed the design, combustion efficiency and energy recovery attributes of the raw grind dryers and determined that the "boiler" criteria were established for these process heaters. Because the DEQ officials determined that the physical criteria were met, Lafarge was given approval to proceed with the combustion of off-specification used oil fuel in the raw grind dryers. The Michigan DEQ approved the use of used oil fuel by a detailed analysis of the dryer information provided by Lafarge, and did not require Lafarge to seek a variance or adjusted standard through the "boiler by designation" process. A copy of the Michigan DEQ's April 2, 2004 determination is attached hereto as Exhibit D.

The raw slag dryer utilized at Lafarge's Grinding Plant is the same type of combustion source as the raw grind dryers at Lafarge's Alpena cement plant that were authorized by the Michigan DEQ to combust off-specification used oil. With respect to the physical criteria

established in the definition of "boiler," specifically integral design, combustion efficiency and energy recovery, the South Chicago slag dryer and the Alpena raw grind dryers are virtually identical combustion sources. The Michigan DEQ's determination that the Alpena dryers meet the boiler physical characteristics and therefore are authorized to combust off-specification used oil fuel is an excellent example that such dryers, including the slag dryer at the Grinding Plant, are combustion sources *"in common and customary use as a "boiler" functioning primarily to produce steam, heated fluids or heated gases."* Moreover, it demonstrates that the Board's approval to grant the adjusted standard relief requested in this proceeding would be consistent with the findings of other environmental regulatory authorities.

Section 720.132(f) Other relevant factors.

The federal used oil/RCRA regulations at 40 CFR 260.33 specify the procedures for making a case-by-case determination that a particular combustion device, such as the slag dryer operated at Lafarge's Grinding Plant, should be considered a "boiler" for purposes of utilizing off-specification used oil fuels. The federal regulations define the term "boiler" (40 CFR 260.10); allow the combustion of off-specification used oil in boilers (40 CFR 279.61); and specify the criteria to determine which combustion devices can be considered equivalent to a boiler and allowed to combust off-specification used oil (40 CFR 260.32.) As noted above, the Pollution Control Board has completed "identical-in-substance" rulemakings to adopt these federal RCRA regulations as the Illinois regulations applicable to the combustion of off-specification used oil in boilers and similar combustion devices.

In promulgating the referenced RCRA regulations, USEPA has explained the scope of the regulations and discussed application of the rules to specific fact patterns. Those explanations and interpretations are set forth in the preamble discussions that accompany the

rulemakings published in the Federal Register. In its legislative capacity, the Board has relied on the USEPA preamble discussion to support its own rulemaking efforts and at times, has actually adopted USEPA guidance as mandatory and not advisory. (See the Board's recent rulemaking in R03-18 and its determination in that rulemaking that USEPA's RCRA guidance for delisting hazardous wastes was mandatory and not solely advisory.)

Consequently, the justifications set forth by USEPA to explain and interpret the criteria for making "case-by-case" boiler determinations can and should be relied upon by the Board in reviewing Lafarge's request for adjusted standard relief. In its November 29, 1985 rulemaking for the used oil management standards (50 *Federal Register* 49164), USEPA explained why it was allowing combustion of off-specification of used oil in industrial boilers but not in "...nonindustrial boilers (e.g., located in apartment and office buildings, schools, hospitals.)" USEPA focused on the risks of burning off-specification used oil in such "nonindustrial" combustion sources due to proximity to highly populated areas. According to USEPA, due to a greater number of "nonindustrial" boilers and the location of such sources in populated areas, these combustion sources would potentially expose many more individuals to hazardous emissions from burning off-specification used oil fuels.

Combustion of off-specification of used oil in industrial (and utility) boilers was believed by USEPA as presenting a much lower risk because such boilers are not located in close proximity to populated areas and "...large boilers or industrial furnaces may be operated by trained operators and equipped with combustion controls sophisticated enough to maintain peak combustion efficiency when burning fuels the unit is not designed to burn. Further, many industrial furnaces and some boilers are equipped with particulate control equipment that may

adequately control emissions from metal-bearing waste fuels." (50 *Federal Register* 49164 at 49182),

As evidenced by USEPA's preamble discussion, the agency considered four basic criteria in permitting combustion of off-specification used oil in industrial but not "nonindustrial" combustion sources: (1) location away from populated areas; (2) operation by trained operators; (3) maintaining good combustion efficiency to destroy organics; and (4) pollution control equipment to control particulate matter emissions (including metal particulate emissions.) In addition, USEPA has defined certain physical characteristics of boilers to distinguish boilers used to reclaim thermal energy from used oil or waste from other devices designed primarily to dispose of wastes without legitimate thermal recovery.

As set forth above, the design, combustion efficiency and energy recovery attributes of the slag dryer satisfy the physical boiler criteria established by USEPA and the Board. In addition, the non-physical criteria that justify combustion in industrial boilers versus non-industrial boilers or other combustion sources are satisfied in this situation.

First, the Drying Plant is located in a heavily industrialized area of Cook County that is remote from any residential development. The Grinding Plant and the drying system, in particular, is operated by trained personnel. The slag dryer is equipped with of state-of-the-art, efficient combustors and operating controls to maximize complete combustion of the fuels. Good combustion controls are designed into the system to maximize the extraction of all Btu value from the fuels combusted. Since fuel costs are critical to the overall profitability of the Grinding Plant, maximizing fuel efficiency is always a top priority, even if Lafarge is allowed to use lower cost off-specification used oil fuels.

Finally, the slag dryer is equipped with a modern, high-efficiency fabric filter baghouse particulate control system to minimize the release of PM and other air contaminants in the exhaust gases. The combined capture and removal efficiency of these baghouse systems typically achieve greater than 99.9% overall control efficiency. Again, maximizing capture of the dried slag is another component of plant productivity and profitability that is critical to the overall financial health and long-term viability of the facility.

i) A statement with supporting reasons that the Board may grant the proposed adjusted standard consistent with federal law. The petitioner must also inform the Board of all procedural requirements applicable to the Board's decision on the petitioner that are imposed by federal law and not required by this Subpart. Relevant regulatory and statutory authorities must be cited;

Response: The Board may grant the adjusted standard relief requested by Lafarge consistent with federal law. Section 7.2 and 22.4(a) of the Illinois Environmental Protection Act [415 ILCS 5/7.2 and 22.4(a)] require the Pollution Control Board to adopt regulations that are "identical in substance" to the hazardous waste regulations adopted by the USEPA. The USEPA hazardous waste regulations implement Subtitle C of the federal Resource Conservation and Recovery Act of 1976 [RCRA Subtitle C, 42 U.S.C. 6921, et seq.].

The federal RCRA regulations contain identical provisions for making a determination that a particular combustion device, such as the slag dryer operated at Lafarge's Grinding Plant, should be considered a "boiler" for purposes of utilizing off-specification used oil fuels. That federal regulation is set forth at 40 CFR 260.32 "*Variance to be classified as a boiler.*" Although the Illinois analog uses the term "adjusted standard" rather than "variance" to describe the agency "case-by-case" boiler determination, the standards, criteria and procedures are identical.

In short, the Illinois hazardous waste management regulations are "identical in substance" to the federal RCRA regulations and both state and federal regulations provide a mechanism to determine "...on a case-by-case basis that certain enclosed devices using controlled flame combustion are boilers, even though they do not otherwise meet the definition of boiler contained in Section 260.10." The federal regulation is set forth at 40 CFR 260.32 and the "identical in substance" Illinois regulation is set forth at 35 IAC 720.132. Approval by the Board of Lafarge's Petition would be consistent with federal law and the implementing RCRA regulations.

j) A statement requesting or waiving a hearing on the petition (pursuant to Section 104.422(a)(4) of this Part a hearing will be held on all petitions for adjusted standards filed pursuant to 35 Ill. Adm. Code 212.126 (CAA));

Response: Petitioner waives its right to a hearing on the Petition.

k) The petition must cite to supporting documents or legal authorities whenever they are used as a basis for the petitioner's proof. Relevant portions of the documents and legal authorities other than Board's decisions, State regulations, statutes and reported cases must be appended to the petition;

Response: Relevant portions of all documents or other information sources that have been used to support this Petition are attached or have been cited in the foregoing text of the Petition.

l) Any additional information which may be required in the regulation of general applicability.

Response: The regulation of general applicability does not specify any additional information requirements that must be addressed in this Petition. However, Lafarge requests that the Board consider the determinations made by other regulatory authorities to allow the combustion of off-specification used oil in controlled flame combustion devices such as raw material dryers and process heaters. As noted previously, the Michigan DEQ has determined

that the raw grind dryer at Lafarge's Alpena cement plant meets the physical characteristics of a "boiler" that are specified in the used oil/RCRA regulations and approved Lafarge's request to utilize off-specification used oil as fuel in the dryer. The slag dryer in use at Lafarge's South Chicago Slag Grinding Plant is virtually identical to the raw grind dryer approved by the Michigan DEQ. The technical and regulatory analysis conducted by Michigan DEQ officials should be considered by the Board in evaluating Lafarge's request to utilize used oil fuel in the slag dryer at its South Chicago Slag Grinding Plant.

WHEREFORE, Petitioner requests a determination from the Illlinois Pollution Control Board that the slag dryer operated at the South Chicago Slag Grinding Plant satisfies the criteria set forth in Section 720.132; is a "Boiler by designation" within the meaning of 35 Ill. Adm. Code 720.110; and may utilize off-specification used oil for energy recovery, in compliance with Section 739.161 of the Board's regulations (35 Ill. Adm. Code 739.161).

Respectfully submitted,

LAFARGE MIDWEST, INC., Petitioner

By: _____
Jon S. Faletto, Attorney for Petitioner

Jon S. Faletto
Howard & Howard Attorneys, P.C.
One Technology Plaza, Suite 600
211 Fulton Street
Peoria, IL 61602
(309) 672-1483
(309) 672-1568 FAX
jsf@H2law.com

LIST OF EXHIBITS

Exhibit A: **Aerial Photograph of Grinding Plant**
(Source: *Google Earth*® Database)

Exhibit B: **Map Depicting Grinding Plant and South Lake Calumet Area**
(Source: USEPA *Enviromapper* Database)

Exhibit C: **Engineering Drawing of Slag Dryer**

Exhibit D: **Michigan DEQ Correspondence (April 2, 2004) - Approval for Off-Specification Used Oil Fuel in Alpena Raw Grind Dryer**

Exhibit E: **Annual Emissions Report for 2004 Calendar Year Reporting Period**

Exhibit F: **Emissions Calculations Comparing Natural Gas to Used Oil Fuel**

Exhibit G: **Lifetime Operating Permit No. 98010053 issued June 25, 2004**

Exhibit H: **Potential Supply Sources and Basic Principles for Management of Used Oil Fuel for the South Chicago Slag Grinding Plant**

Exhibit I: **Affidavit of David Ledesma, Manager of Process Engineering for Lafarge**

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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF LAFARGE MIDWEST, INC.	)	AS 06-1
FOR BOILER DETERMINATION	)	
PURSUANT TO 35 Ill. Adm. Code 720.132 and	)	
720.133.	)	

CERTIFICATE OF SERVICE

I, the undersigned, certify that I have served the attached ***Amended Petition for Boiler Determination Through Adjusted Standard Proceedings*** upon the person or agency to whom it is directed, by placing it in an envelope addressed to:

Illinois Pollution Control Board
Attn: Dorothy M. Gunn, Clerk
100 West Randolph Street
James R. Thompson Center, Suite 11-500
Chicago, IL 60601-3218

James G. Richardson, Asst. Counsel
Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

and mailing it via First Class U.S. Mail from Peoria, Illinois, on this 2nd day of December 2005, with sufficient postage affixed thereto.

Jon S. Faletto, as Attorney for
Petitioner Lafarge Midwest, Inc.

Jon S. Faletto
Howard & Howard Attorneys, P.C.
One Technology Plaza, Suite 600
211 Fulton Street
Peoria, IL 61602
(309) 672-1483

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THIS FILING SUBMITTED ON RECYCLED PAPER

EXHIBIT A

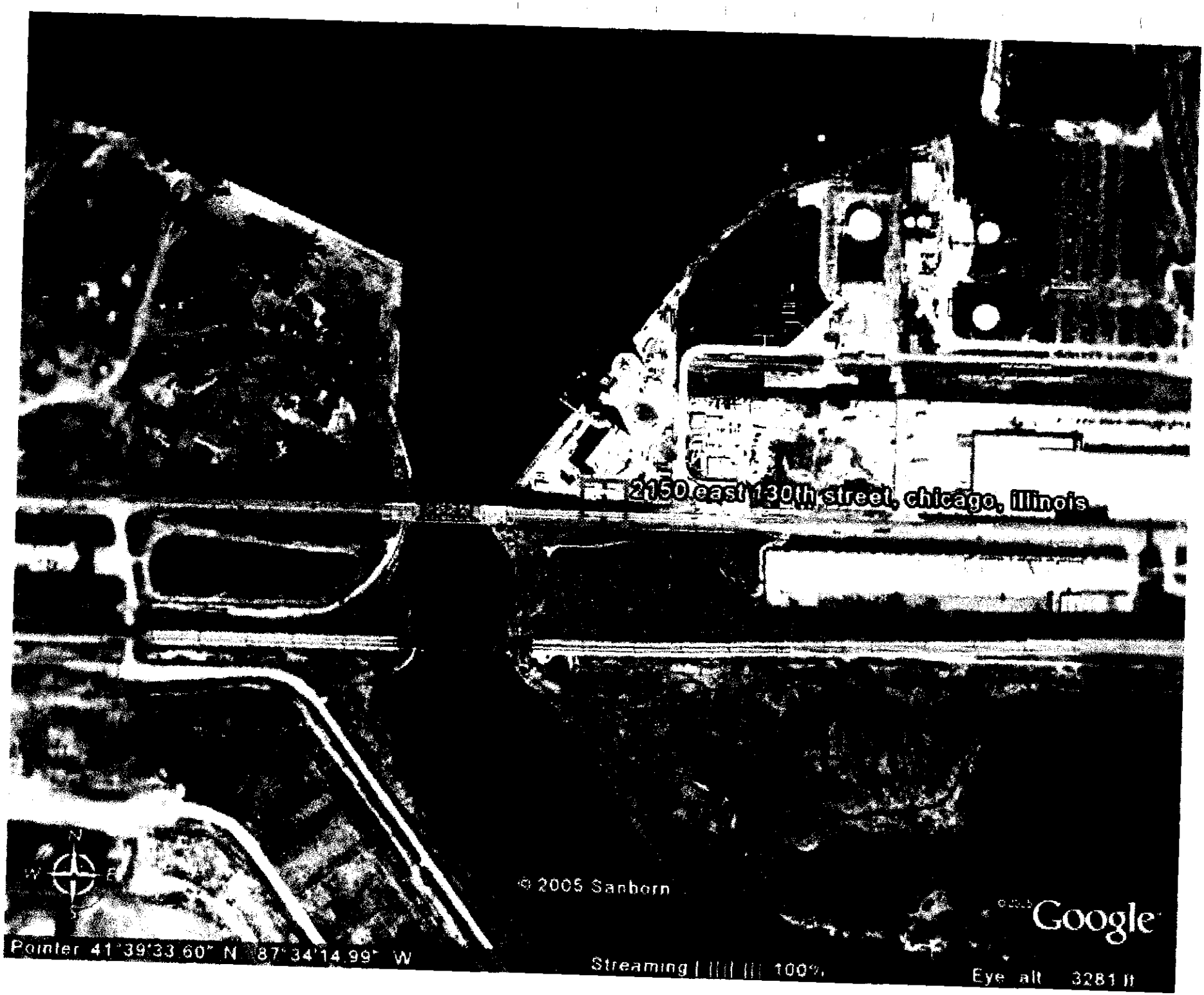
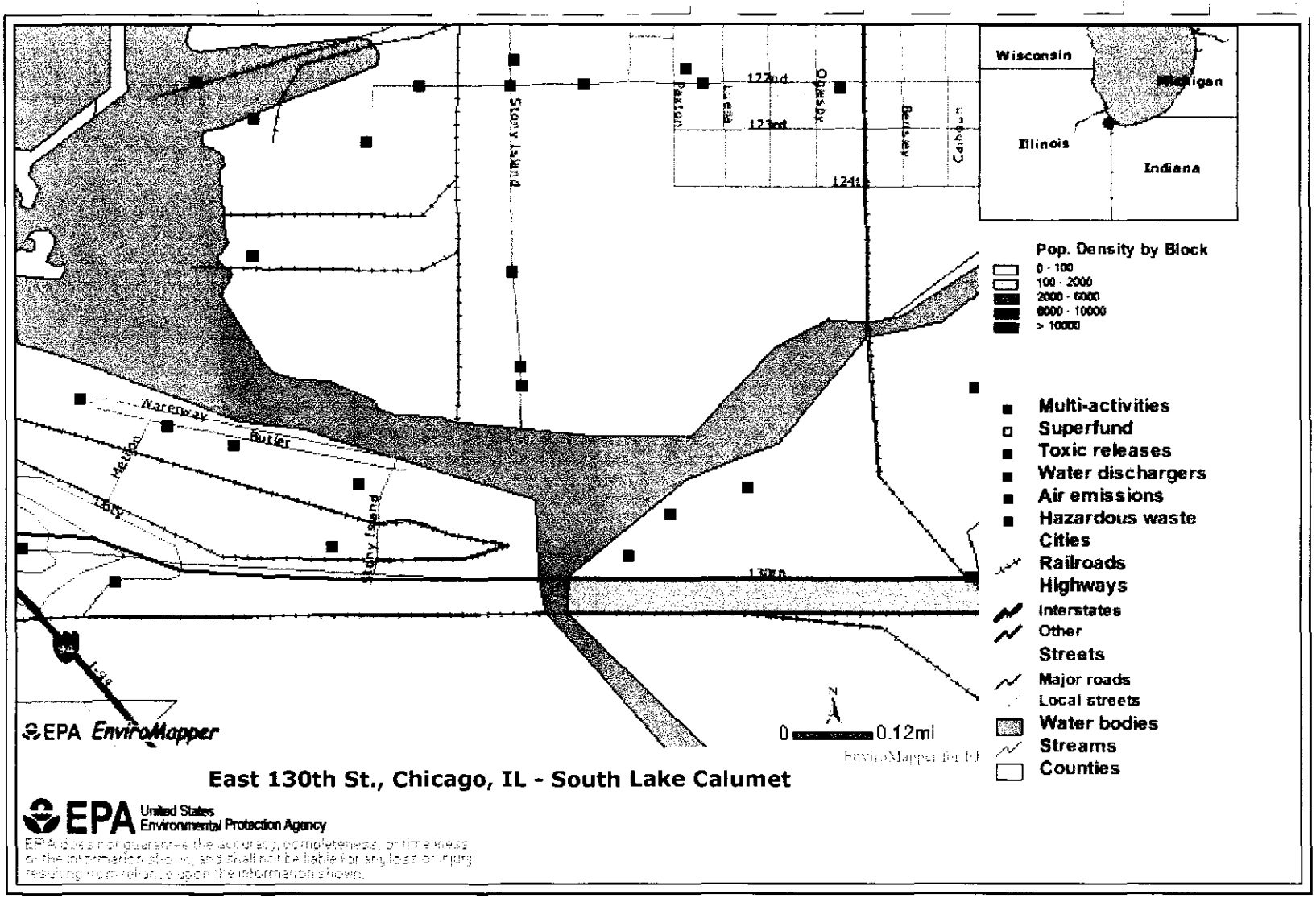

2150 east 130th street, chicago, illinois
© 2005 Sanborn
Google
Pointer 41°39'33.60" N 87°34'14.99" W
Streaming 100%
Eye alt 3281 ft

EXHIBIT B



400 x 300 600 x 450 800 x 600 Locator Map

Submit Cancel

EXHIBIT C

Lafarge Midwest, Inc. – South Chicago Slag Dryer

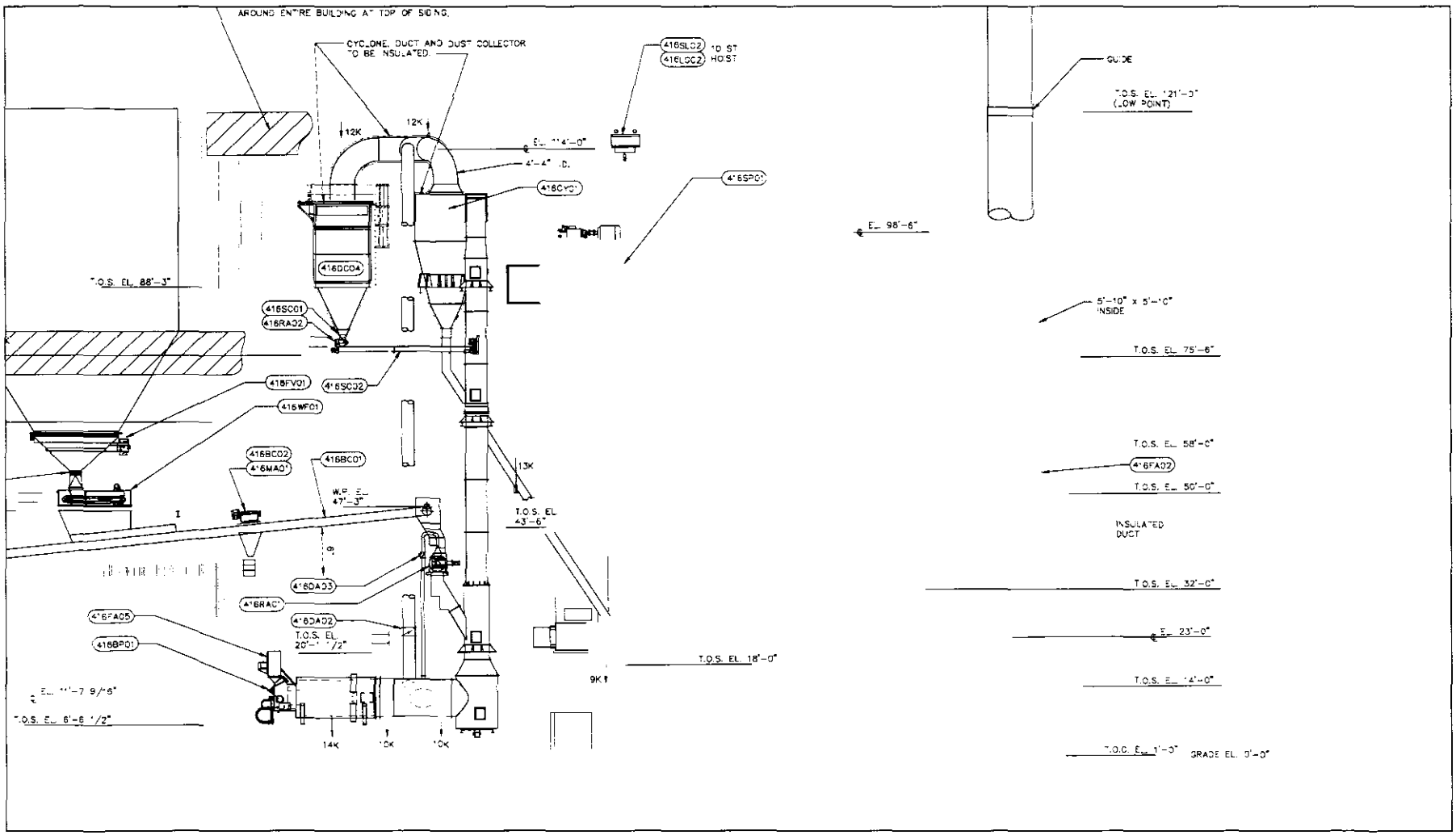


EXHIBIT D

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

STEVEN E. CHESTER
DIRECTOR

April 2, 2004

Mr. Bob Budnik
Environmental Manager
Lafarge North America
Great Lakes Region – Alpena Plant
P.O. Box 396
Alpena, Michigan 49707

Dear Mr. Budnik:

Thank you for your February 20, 2004, letter to Mr. G. Vinson Hellwig, Chief, Air Quality Division (AQD), Department of Environmental Quality (DEQ), regarding the proposed use of off-specification used oil fuel in the raw grind dryer. As your letter requests a determination that the dryer is an industrial boiler pursuant to the administrative rules promulgated under Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), the DEQ, Waste and Hazardous Materials Division (WHMD), is responding directly to your request.

As you know, off-specification used oil fuel can be burned for energy recovery only in certain types of units defined in R 299.9814(3)(a). One of the specified units is an industrial boiler that is located on the site of a facility that is engaged in a manufacturing process where substances are transformed into new products, including component parts of products, by mechanical or chemical processes. An industrial boiler must also be a boiler as defined in R 299.9101(w).

According to your letter, the raw grind dryer functions as a direct-fired process heater to produce heated gases that act directly upon the raw materials fed to the unit to drive off moisture. The dryer is fully enclosed within an outer shell of steel, and the burning chamber is lined with refractory material and ceramic tile to recover the energy of the fuel. Based upon this explanation, the WHMD agrees that the unit has physical provisions for recovering and exporting thermal energy in the form of heated gases and satisfies this requirement for classification as a boiler.

In order to be considered a boiler, the combustion chamber and primary energy recovery section of the unit shall be of integral design. However, process heaters are not required to meet the integral design criteria for classification as a boiler. The AQD district staff agrees that the raw grind dryer is a process heater and, therefore, is not required to meet this design requirement for classification as a boiler.

There is also an efficiency requirement for classification as a boiler. The information provided in your letter indicates that the raw grind dryer satisfies the efficiency criteria for both energy recovery and exportation of recovered energy.

Based on this analysis, the WHMD concurs that the raw grind dryer is a boiler and, specifically, an industrial boiler for purposes of implementing the used oil management standards of Part 111.

Be aware that the use of off-specification used oil fuel may impact any designations held by the company under Part 115, Solid Waste Management, of the NREPA, as a change in the materials and processes used may affect waste generation. Lafarge must take the actions necessary to maintain the validity of these designations.

If you have any questions regarding this letter, please contact Mr. Jack Schinderle, Hazardous Waste and Radiological Protection Section, WHMD, at 517-373-8410.

Sincerely,

George W. Bruchmann, Chief
Waste and Hazardous Materials Division
517-373-9523

cc: Mr. Bob Cooper, Lafarge North America
Mr. Brian Gasiorowski, Lafarge North America
Mr. G. Vinson Hellwig, DEQ
Mr. Phil Roycraft, DEQ
Mr. Duane Roskoskey, DEQ
Mr. Jack Schinderle, DEQ
Mr. Mark Stephens, DEQ

EXHIBIT E

DAPC - ANNUAL EMISSIONS REPORT - 2004

Lafarge Midwest Inc

- SOURCE DATA -

AIRS: 17-031-2259	IEPA USE ONLY	SIC 1: 5032		NAICS 1: 423320	
FINDS: ILD984795500	IEPA USE ONLY	SIC 2:		NAICS 2:	
FEIN: 58-1290226		SIC 3:		NAICS 3:	
D&B:		SIC 4:		NAICS 4:	
LATITUDE: 41:39:35.8560		SIC 5:		NAICS 5:	
LONGITUDE: 87:34:14.1600		SIC 6:		NAICS 6:	

Lafarge Midwest Inc

2150 E 130th St
Chicago, IL 60633
CONTACT: ~~Joe Ricker~~ Tony Turner
PHONE: 773-646-5228 EXT:
FAX: 773-646-1813
EMAIL:

Lafarge Midwest Inc

4000 Town Center Ste 2000
Southfield, MI 48075
CONTACT: ~~Gary Ostrander~~ Alan Van Sloten
PHONE: 248-354-9050 EXT:
FAX: 248-354-7649
E-MAIL:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete.

AUTHORIZED SIGNATURE — DATE: 3.15.05

DAVE DZIURINSKI / PLANT MANAGER — TYPED OR PRINTED NAME AND TITLE

989-358-3309 — TELEPHONE NUMBER

DAPC - ANNUAL EMISSIONS REPORT - 2004

Lafarge Midwest Inc

- ANNUAL SOURCE EMISSIONS -

POLLUTANT CODE	ALLOWABLE EMISSIONS (TONS/YEAR)	EMISSIONS REPORTED FOR 2003 (TONS/YEAR)	IEPA 2004 ESTIMATED EMISSIONS (TONS/YEAR)	SOURCE REPORTED EMISSIONS FOR 2004 (TONS/YEAR)
CO	20.835360	6.790000	20.835360	9.96
NOX	24.853920	4.050000	24.853920	7.68
PART	34.336276	7.140000	31.712376	11.54
PM10	29.195264	3.430000	27.671666	6.01
SO2	1.223040	0.400000	1.223040	0.59
VOM	19.000800	6.190000	19.000800	9.07

Estimated Maximum Annual Emissions for Slag Processing - S. Chicago - 2004

Operation	Estimated Annual Emissions (tons/yr)					
	PM	PM-10	SO_x	NO_x	CO	VOM
Cement Silo Loading	0.48	0.36				
Truck Loading Unloading	0.08	0.08				
Barge Unloading	0.13	0.09				
Wet Slag Processing	0.43	0.19				
Dry Slag Processing	10.08	5.02	0.59	7.68	9.96	9.07
Barge Loading	0.01	0.01				
Ship/Vessel Loading	0.33	0.26				
Total	11.54	6.01	0.59	7.68	9.96	9.07

Estimated Emissions from Dry Slag Processing
-Drying Operations-

2004

Pollutant	Emission Factor	Emission Factor/ Throughput Units	Maximum Hourly Throughput	Typical Hourly Throughput	Maximum Short-Term Emissions (lbs/hr)	Typical Short-Term Emissions (lb/hr)	Maximum Annual Throughput	Maximum Annual Emissions (tons/yr)
Emission Factor Source: AP-42 Section 11.1 Asphalt Rotary Dryer, except for NO_x which is performance guarantee.								
PM	0.018	tons	85	68	1.53	1.22	355,820	3.20
PM-10	0.0082	tons	85	68	0.70	0.56	355,820	1.46
SO_x	0.0033	tons	85	68	0.28	0.22	355,820	0.59
CO	0.056	tons	85	68	4.8	3.8	355,820	9.96
VOM	0.051	tons	85	68	4.34	3.47	355,820	9.07
NO_x	132	MM ft^3_{gas}	0.043	0.034	5.68	4.49	116.4	7.68

Estimated Particulate Emissions from Slag Processing - 2004

Emission Point	Description	Control Device	Maximum Throughput (tons/hr)	Maximum Throughput (lbs/hr)	Maximum Process Throughput Rate (tons/yr)	Controlled PM Emission Factor (lb/ton)	Controlled PM-10 Emission Factor (lb/ton)	Maximum Short-Term PM Emissions (lbs/hr)	Typical Short-Term PM Emissions (lbs/hr)	Maximum Annual PM Emissions (tons/yr)	Maximum Short-Term PM-10 Emissions (lbs/hr)	Typical Short-Term PM-10 Emissions (lbs/hr)	Maximum Annual PM-10 Emissions (tons/yr)
Wet Portion of Slag Process													
M 01	Unloading Hopper	None	300	600,000	365,086	0.00064	0.00031	0.1932	0.15456	0.12	0.09	0.072	0.06
M 02	Hopper Belt	None	300	600,000	365,086	0.000031	0.000015	0.01	0.01	0.01	0.005	0.004	0.00
M 03	Day Bin Feed Belt	None	300	600,000	365,086	0.00032	0.00015	0.1	0.08	0.06	0.05	0.04	0.03
N 01	Day Bin	None	300	600,000	365,086	0.00032	0.00015	0.1	0.08	0.06	0.05	0.04	0.03
N 02	Day Bin Weigh Belt	None	100	200,000	365,086	0.00032	0.00015	0.03	0.02	0.06	0.02	0.016	0.03
N 03	Dryer Feed Belt	None	100	200,000	365,086	0.00032	0.00015	0.03	0.02	0.06	0.02	0.016	0.03
N 06	Dryer Feeder	None	100	200,000	365,086	0.00032	0.00015	0.03	0.02	0.06	0.02	0.016	0.03
	Inbound Slag Trucks												0.18
	Outbound Product Trucks												0.20
Dry Portion of Slag Process													
N 07	Slag Dryer	DC10	85	170,000	355,820	0.018	0.0082	1.53	1.22	3.20	0.70	0.56	1.46
N 17	Ball Mill	DC11	85	170,000	355,820	0.008	0.004	0.68	0.54	1.42	0.34	0.27	0.71
N 24	HES Collector	DC12	85	170,000	355,820	0.028	0.014	2.38	1.90	4.98	1.19	0.95	2.49
ST10	Slag Storage Tank 10	DC9	85	170,000	355,820	0.0027	0.002	0.23	0.18	0.48	0.17	0.14	0.36
Silos and Loading Operations													
SL1	Silo Loading	DC1	600	1,200,000	355,820	0.0027	0.002	1.62	1.30	0.48	1.20	0.96	0.36
SB1	Intermediate Surge Bin	DC6	600	1,200,000	355,820	0.0002	0.0002	0.12	0.10	0.04	0.12	0.10	0.04
TL1/TUL1	Truck Loading/Unloading 1	DC3, DC4	880	1,760,000	368,478	0.0002	0.0002	0.18	0.14	0.04	0.18	0.14	0.04
BUL1	Barge Unloading	DC5	400	800,000	94,728	0.0027	0.002	1.08	0.86	0.13	0.8	0.64	0.09
BL1	Barge Loading	DC8	500	1,000,000	69,355	0.0002	0.0002	0.10	0.08	0.01	0.10	0.08	0.01
	Dist Silo Loading		600	1,200,000	368,478	0.0002	0.0002	0.12	0.096	0.04	0.12	0.10	0.04
VL1	Ship/Vessel Loading	DC7	600	1,200,000	217,685	0.0027	0.002	1.62	1.30	0.29	1.20	0.96	0.22
									Total Emissions from Terminal (tons/yr)		11.54		6.01

EXHIBIT F

Table 1. Input Values

Parameter	Value
Raw Grind	
Actual Gas Use - 2002-03 Avg. (10^6	61.300
Oil Use at 100% NG Replacement	468.309
Oil Use Target for Permit (1000	500.000
Oil Use at Burner Capacity, 8760	3,471.116
Raw Grind Heat Capacity (MMBtu/hr)	50
Raw Grind Gas Capacity (10^6	0.0519
Natural Gas Heat Content (Btu/scf)	964
Raw Grind Oil Capacity (10^3 gal/hr)	0.3962
Used Oil	
Heat Content (Btu/lb)	17,000
Density (g/ml)	0.89
Used Oil Heat Content (Btu/gal)	126,184
Oil Sulfur Content (%)	1

Table 2. Actual Emissions from Dryer Natural Gas Use

Pollutant	CAS No.	Uncontrolled Emission Factor (lb/10^6 scf)	Emission Factor Reference	Control Efficiency (%)	Actual Emissions (tpy)	Maximum Emissions (lb/hr)
NOx		100	AP-42, Table 1.4-1	0	3.07	5.19
CO		84	AP-42, Table 1.4-1	0	2.57	4.36
Pb		0.0005	AP-42, Table 1.4-2	99	1.53E-07	2.59E-07
PM total/PM_{10}		7.6	AP-42, Table 1.4-2	99	2.33E-03	3.94E-03
SO_2		0.6	AP-42, Table 1.4-2	0	1.84E-02	3.11E-02
VOC		5.5	AP-42, Table 1.4-2	0	1.69E-01	2.85E-01

Table 3. Potential Emissions from Dryer Oil Use

Pollutant	CAS No.	Uncontrolled Emission Factor (lb/10^3 gal)	Emission Factor Reference	Control Efficiency (%)	Potential Emissions (tpy)	Maximum Emissions (lb/hr)
NOx		55	AP-42, Table 1.3-1	0	13.75	21.79
CO		5	AP-42, Table 1.3-1	0	1.25	1.98
Pb		1.51E-03	Systech Qual. Analysis	0	3.78E-04	5.98E-04
PM total		11.5	AP-42, Table 1.3-1&2	99	0.03	0.05
PM_{10}		86% of PM	AP-42, Table 1.3-5	99	0.02	0.04
SO_2		148.5	Stochiometry (1% S, 7.4 lb/gal)	0	37.13	58.84
VOC		1.28	AP-42, Table 1.3-3	0	0.32	0.51

EXHIBIT G

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

P.O. BOX 19506, SPRINGFIELD, ILLINOIS 62794-9506

RENEE CIPRIANO, DIRECTOR

217/782-2113

LIFETIME OPERATING PERMIT - REVISED

PERMITTEE

Lafarge Midwest, Inc.
Attn: David Ledesma
4000 Town Center Suite 2000
Southfield, Michigan 48075

Application No.: 98010053 I.D. No.: 031600FHQ
Applicant's Designation: SOUTH CHICAGO Date Received: April 5, 2004
Subject: Cement Distribution Terminal/Slag Processing
Date Issued: June 25, 2004 Expiration Date: See Condition 1.
Location: South Chicago Facility, 2150 East 130th Street, Chicago 60633

This permit is hereby granted to the above-designated Permittee to OPERATE emission unit(s) and/or air pollution control equipment consisting of:

A Granulated Blast Furnace Slag Grinding and Drying Operation with Loadout Operation, Controlled by Baghouses
A Cement Distribution Terminal
Cement Silo Loading Process Controlled by a Dust Collector
Truck Loading/Unloading Process Controlled by Three Dust Collectors
Barge Unloader Controlled by a Filter

pursuant to the above-referenced application. This permit is subject to standard conditions attached hereto and the following special condition(s):

1a. This permit shall expire 180 days after the Illinois EPA receives a written request for the renewal of this permit.

b. This permit shall terminate if it is withdrawn or is superseded by a revised permit.

2. No person shall cause or allow any visible emissions of fugitive particulate matter from any process, including any material handling or storage activity beyond the property line of the emission source, pursuant to 35 Ill. Adm. Code 212.301.

3a. Particulate matter-10 emissions from vents or stacks shall not exceed 0.03 gr/dscf, pursuant to 35 Ill. Adm. Code 212.324(b).

b. At all times the Permittee shall also, to the extent practicable, maintain and operate these sources, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions.

4a. Fugitive emissions of particulate matter from the grinding mills, screens (except from truck dumping), roadways, parking areas and storage piles (at 4 feet from the pile surface), shall not exceed 10 percent opacity, pursuant to 35 Ill. Adm. Code 212.316(b), (c) and (d).

b. Fugitive emissions of particulate matter from all other emission units operations shall not exceed 20 percent opacity, pursuant to 35 Ill. Adm. Code 212.316(f).

5. Emissions and operation of the slag cement operations shall not exceed the following limits:

Item of Equipment	Material Usage (Ton/Hr)	Material Usage (Ton/Yr)	Particulate Matter Emissions (Lb/Mo.)	Particulate Matter Emissions (Ton/Yr)
Cement Silo Unloading	1,600	1,400,000	317	1.90
Truck Loading/Unloading	880	1,400,000	23	0.14
Barge Unloading	500	1,400,000	316	1.89
Wet Slag Processing	300	850,000	305	0.77
Dry Slag Processing	150	744,600	3,586	21.11
Barge Loading	1,000	1,400,000	24	0.14
Ship/Vessel Loading	600	1,400,000	338	2.03
		Total	4,908	27.98

These limits are based on standard emission factors, a minimum baghouse efficiency of 99.0%, maximum operation rates and continuous operation. Compliance with annual limits shall be determined from a running total of 12 months of data.

6. Emissions and operation of the dryer shall not exceed the following limits:

Pollutant	Emission Factor	Emission Factor/ Throughput Units	Maximum Hourly Throughput	Maximum Annual Throughput	Short-Term Emissions (Lbs/Hr)	Maximum Annual Emissions (T/Yr)
PM	0.018	Tons	150	744,600	2.70	5.70
PM_{10}	0.0082	Tons	150	744,600	1.23	3.05
SO_2	0.0033	Tons	150	744,600	0.50	1.23
CO	0.056	Tons	150	744,600	8.40	20.85
VOM	0.051	Tons	150	744,600	7.65	18.99
NO_x	132	$mmft^3$	0.043	376.7	5.68	24.86

These limits are based on the maximum firing rates, standard emission factors (Emission Factor AP-42 Section 11.1 Asphalt Rotary Dryer, except for NO_x which is performance guarantee) and continuous operation. Compliance with annual limits shall be determined from a running total of 12 months of data.

7. Within 45 days of a written request from the Illinois EPA, the Permittee shall measure particulate matter emissions from process emission sources/control equipment as specified by the Illinois EPA.

8a. The Permittee shall maintain and operate an alarm on each baghouse to indicate any malfunction of these baghouses.

b. The Permittee shall maintain records of the occurrence and duration of any malfunction of equipment which results in emissions in excess of applicable standards. These malfunctions shall be submitted to the Illinois EPA as required by the Standard Conditions attached to this permit.

9. Annual raw slag throughput shall not exceed 850,000 tons per year. Compliance with the annual limit shall be determined monthly from the preceding 12 months of data.

10a. The Permittee shall do the following:

i. Maintain total enclosure on any conveyors which are outside the slag processing building.

ii. Operate and maintain the material at the dump hopper such that it is sufficiently wet that no visible emissions occur.

iii. Maintain plant roads which go to the truck dump hopper and the product bins.

b. The Permittee shall sweep, flush, or clean in an equivalent manner, the paved plant roads and parking areas at least 2 times per week, or more often if requested by the Illinois EPA.

c. Any operations generating fugitive emissions shall be operated in a manner consistent with those in the current fugitive dust plan submitted to the Illinois EPA, or in a manner which results in less fugitive emissions.

11. Emissions of particulate matter (PM) and operation of the Portland cement terminal shall not exceed the following limits:

Item of Equipment	Material Usage (T/Hr)	(T/Yr)	PM Emissions (LB/HR)	(T/YR)
Cement Silo Loading	1,600	14,016,000	350	1.90
Truck Loading/Unloading	880	7,710,000	98	0.44
Barge Unloader	320	2,803,200	[illegible]	3.77
		Total:	[illegible]	6.11

These limits define the potential emissions of PM and are based on 8,760 hours/year, maximum output capacity and standard emission factors. Compliance with annual limits shall be determined from a running total of 12 months of data.

12. The Permittee shall maintain records of the following items, and such other items as may be appropriate to allow the Illinois EPA to review compliance with the limits in the Conditions of this permit.

    a. A log of the fugitive control measures performed, as specified in this permit.

    b. Slag throughput (ton/month).

    c. Baghouse Leak Detection Monitor data.

    d. Material usage for the cement terminal, including cement silo loading, truck loading/unloading process, and barge unloader (tons/month and tons/year).

13. The Permittee shall submit the following with the Annual Report:

    a. Throughputs (ton per month and ton per year).

    b. Natural gas usage ($mmft^3/yr$).

    c. Annual emissions with supporting calculations.

14a. The Permittee shall maintain a PM-10 contingency plan, pursuant to 35 Ill. Adm. Code 212, Subpart U.

  b. Within 90 days of receiving a notification from the Illinois EPA, the Permittee shall implement a PM-10 contingency plan which will result in a reduction of the total actual annual source-wide fugitive PM-10 emission by 15% for a Level I notice, and 25% for a Level II notice.

15. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least three years from the date of entry and shall be made available for inspection and copying by the Illinois EPA upon request. Any records retained in an electronic format (e.g., computer) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Illinois EPA request for records during the course of a source inspection.

16. If there is an exceedance of the requirements of this permit as determined by the records required by this permit, the Permittee shall submit a report to the Illinois EPA's Compliance Section in Springfield, Illinois within 30 days after the exceedance. The report shall include the emissions released in accordance with the recordkeeping requirements, a copy of the relevant records, and a description of the exceedance or violation and efforts to reduce emissions and future occurrences.

17. Two (2) copies of required reports and notifications concerning equipment operation or repairs, performance testing or a continuous monitoring system shall be sent to:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

and one (1) copy shall be sent to the Illinois EPA's regional office at the following address unless otherwise indicated:

Illinois Environmental Protection Agency
Division of Air Pollution Control
9511 West Harrison
Des Plaines, Illinois 60016

18. Persons with lifetime operating permits must obtain a revised permit for any of the following changes at the source:

a. An increase in emissions above the amount the emission unit or the source is permitted to emit;

b. A modification;

c. A change in operations that will result in the source's noncompliance with conditions in the existing permit;

d. A change in ownership, company name, or address, so that the application or existing permit is no longer accurate.

It should be noted that this permit has been revised to change the short term limits without any increase in annual emissions.

If you have any questions on this permit, please contact John P. Blanis at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:JPB:psj

cc: Region 1

EXHIBIT H

Exhibit H

Potential Supply Sources and Basic Principles for Management of Used Oil Fuel for the South Chicago Slag Grinding Plant

Introduction. This document describes the basic principles for management of used oil fuel at the Lafarge South Chicago Slag Grinding Plant. The information provided includes a brief description of some of the sources of used oil, how used oil is regulated, and how it will be managed to provide for the health and safety of Lafarge employees, the environment and to ensure compliance with applicable regulations.

Systech Environmental Corporation, a wholly owned subsidiary of Lafarge will source and qualify used oil suppliers and arrange for its delivery to the Grinding Plant. Upon arrival of used oil shipments, Lafarge will analyze the used oil prior to on-site acceptance. Once accepted, Lafarge will supervise the transfer of the used oil from the tanker trucks into the storage tanks prior to its use as a supplemental fuel in the slag dryer. The management of used oil is regulated pursuant to 40 CFR 279 and corresponding state regulations.

Used Oil Sources. The used oil delivered to the South Chicago Grinding Plant may come directly from generators or indirectly from processors, or marketers of used oil. Generators typically generate used lubricating oils, machine oils, and motor oils that are suitable for reclaiming or energy recovery. Examples of used oil generators are the automotive industry (Ford, General Motors, DaimlerChrysler, John Deere, etc.), steel mills, oil refineries (Exxon, Texaco, etc.), machine tool and die makers, automotive oil changers (Jiffy Lube, Grease Monkey, etc.), and companies with large transportation fleets (Roadway, U-Haul, etc.).

Used oil processors treat oil/water mixtures, produce lubrication products, and produce fuel blends suitable for industrial use. These fuels are appropriate for use in steel mills, asphalt plants, cement kilns, and other industrial boilers and furnaces. The used oil processors produce both on-specification and off-specification oil with various BTU values, water and solids content. These used oil processing facilities employ various processes to achieve fuel quality specifications such as distillation, filtration, decanting

and blending. By utilizing these processes, they can produce a fuel that meets the requirements of the South Chicago Grinding Plant.

In some instances, used oil marketers have access to used oils either directly from generators or from other intermediate entities like used oil processors. Used oils may be obtained from these types of entities in the used oil supply chain.

On-site Management of Used Oil. The management of used oil for the South Chicago Grinding Plant will involve a two step process: qualification of used oil streams and verification prior to acceptance at the plant. The first step begins prior to the receipt of used oil. Each customer will be required to complete a used oil profile form. This form will provide information about their used oil stream and include certifications stating that the used oil complies with applicable used oil regulations. Required information includes customer name and address, how the used oil stream was generated, the components of the used oil stream, and the estimated volume of used oil. Certifications will also provide that the used oil has not been mixed with hazardous waste or pesticides/herbicides. The customer may also be required to provide a representative sample that will be tested for heat value, chlorine content, water content, PCB, metals (As, Pb, Cd, and Cr), sulfur, and flash point. Each customer will have to re-qualify its used oil stream on a biennial basis.

Shipments will be received by tanker truck at the South Chicago plant. When a shipment arrives, the shipping papers will be reviewed to confirm the material has been previously qualified. After verification that the shipment has been pre-qualified, a representative sample will be taken. A portion of the representative sample will be analyzed for PCB prior to acceptance and off-loading into the storage tanks. The remainder of the representative sample will be retained (preserved according to the QA/QC requirements). On a periodic basis, a composite sample comprised of the individual samples will be analyzed for the same set of parameters as the qualification analysis.

The following table shows the analytical methods, and frequency of analysis for the parameters to be measured in the qualification, as-received, and annual composite samples:

Analytical Parameters, Methods, and Frequency

Parameter	Analytical Method	Frequency
PCB	GC/ECD SW-846-8080	1, 2, 3*
Metals**	ICP – SW-846-7100	1, 3
BTU content	Bomb calorimeter	1, 3
Sulfur		1, 3
Chlorine		1, 3
Moisture content	Karl Fischer titration	1, 3
Flash point		1, 3

* 1 – qualification sample, 2 – as-received sample, 3 – annual composite

** Suite of metals includes lead (Pb), cadmium (Cd), chromium (Cr), arsenic (As)

All analyses will be performed in accordance with established analytical methods. To ensure the validity of the results, a written QA/QC plan will be followed to ensure that all testing is accurate and compliant with applicable Federal and State regulations.

Any load of used oil that has been mixed with hazardous waste or is determined to be contaminated with TSCA-regulated PCB will be rejected and returned to the used oil customer.

All used oil handled at the South Chicago Grinding Plant will be stored in approved above ground storage tanks with secondary containment. Lafarge personnel will be assigned to oversee the proper off-loading of tanker trucks and to ensure that paperwork is complete and accurate. Appropriate safety procedures developed for handling flammable or combustible materials will be employed.

EXHIBIT I

Affidavit of David Ledesma

I, David Ledesma, being first duly sworn on oath, depose and state as follows:

1. I am 32 years old and under no legal disability, and if called and sworn as a witness would testify on the following facts which are within my own personal knowledge.

2. I received a degree in Chemical Engineering from the University of South Florida in 2000. I currently hold the position of Manager of the Process Engineering Department with Lafarge Midwest, Inc. and practice my profession at the Lafarge Alpena Portland Cement Plant located in Alpena, Michigan. In addition to the Lafarge Alpena Cement Plant, my engineering duties include other Lafarge facilities, including the Lafarge South Chicago Slag Grinding Plant located in Chicago, Illinois. As an engineer for Lafarge, I routinely consult with other professional engineers employed by consulting firms and equipment vendors, including Mr. Peter Paone who is a process design engineer with the F.L. Smidth Group, 2040 Avenue C, Bethlehem, Pennsylvania 18017.

3. In the course of my engineering career, I have been involved in projects involving the design, construction and operation of combustion equipment, including cement kilns, raw material dryers and other material processing equipment utilized in the cement manufacturing industry.

4. One of the principal design criteria for any piece of combustion equipment or combustion process is the development of a heat balance. Development of a heat balance is essentially a detailed accounting of the distribution of heat input, heat output and system losses. The heat balance accounting relies on actual test data, mathematical derivations and generally accepted engineering assumptions.

5. For projects within the cement industry, an accepted industry-wide standard average "false air" assumption in newer dryers and drying systems is estimated to be 10%. This assumption takes into account devices such as expansion joints, inspection doors/ports, normal equipment wear and any other in-leakage inherent with the system.

6. For equipment and processes within the cement industry, an accepted industry-wide standard for average "shell radiation" losses from newer dryers and drying systems is estimated to be at 2.5%. This estimate refers to the radiant heat lost to the surrounding structures of the dryer or combustion device.

7. It is my opinion, based on project experience, engineering judgment, consultation with other engineering professionals and a reasonable degree of scientific certainty, that use of a value of 10% for the "false air" assumption and a value of 2.5% for the "shell radiation" loss assumption are appropriate in conducting a heat balance calculation for a slag dryer used for the production of slag cement.

By: _____

David Ledesma, Manager

Process Engineering

Signed and sworn to before me this 2nd day of Dec, 2005.

Notary Public

NOTARY PUBLIC AUREN CO, MI
MY COMMISSION EXPIRES Dec 19, 2008

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