

**CONSTRUCTION PERMIT
OFFICE OF AIR MANAGEMENT**

**Lone Star Industries, Inc.
3301 South County Road 150 West
Greencastle, Indiana 46135**

(herein known as the Permittee) is hereby authorized to construct the facilities listed in Section A (Source Summary) of this permit.

This permit is issued to the above mentioned company (herein known as the Permittee) under the provisions of 326 IAC 2-1, 326 IAC 2-2, 40 CFR 52.780 and 40 CFR 124, with conditions listed on the attached pages.

Construction Permit No.: CP-133-5886-00002	
Issued by: Paul Dubenetzky, Branch Chief Office of Air Management	Issuance Date:

SECTION A

SOURCE SUMMARY

This construction permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Management (OAM) and presented in the permit application.

A.1 General Information [326 IAC 2-7-4(c)]

The Permittee owns and operates a portland cement manufacturing plant.

Responsible Official: Dave Puzan
Source Address: 3301 South County Road 150 West, Greencastle, Indiana 46135
Mailing Address: P.O. Box 482, Greencastle, Indiana 46135
SIC Code: 3241
County Location: Putnam
County Status: Attainment for all criteria pollutants

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)]

This source modification for Lone Star Industries, Inc., relates to the construction and operation of a wet process cement kiln and associated operations.

- (a) The following facilities shall be constructed:
- (1) one (1) 380 million British thermal units (MMBtu) per hour coal-fired, wet process cement kiln, identified as Kiln No. 2. Whole, chopped, shredded, or crumbed waste tires, herein known as waste tires, may be utilized as an alternate fuel source to supplement up to 15 percent of the heat input to the kiln. The kiln has a maximum production capacity of 75 tons of clinker per hour. The particulate matter emissions from the kiln are controlled by one (1) electrostatic precipitator unit that exhausts to Stack 3-0.1;
 - (2) one (1) clinker cooler unit for Kiln No. 2, with a maximum throughput capacity of 75 tons of clinker per hour. The particulate matter emissions from the clinker cooler are controlled by one (1) baghouse unit that exhausts to Stack 3-0.7;
 - (3) one (1) enclosed conveyor that transfers the clinker to the existing clinker transfer line at a maximum rate of 75 tons per hour.
- (b) The following permitted facilities shall be incorporated as part of the equipment associated with the Kiln No. 2 operations:
- (1) two (2) existing pneumatically loaded raw material storage silos equipped with one (1) common baghouse unit that exhausts to Stack 1-30. The combined maximum throughput capacity is 150,000 tons per year (Exemption Letter CP-133-4864);
 - (2) one (1) cement grinding mill equipped with one (1) baghouse unit that exhausts to Stack 4-10, and one (1) cement transfer pump (Registration Letter CP-133-4537); and

- (3) six (6) pneumatically loaded cement storage silos equipped with one (1) common baghouse unit that exhausts to Stack 5-24. The combined maximum throughput capacity is 200,000 tons per year (Exemption Letter CP-133-4914).

The fly ash silos will also support the proposed Kiln No. 2 operations, and therefore shall be incorporated into this construction permit. The cement grinding mill and cement storage silos will be constructed to support the proposed Kiln No. 2 operations, and therefore shall be incorporated into this construction permit. This construction permit supersedes CP-133-4537, CP-133-4864, and CP-133-4919.

- (c) The following existing facilities shall be modified to support both Kiln No. 1 and Kiln No. 2 operations:
 - (1) the quarry activities shall increase the maximum volume of limestone rock removed from the quarry from 600 tons per hour to 1,100 tons per hour via additional equipment and work hours. The particulate matter emissions from the quarry roads shall be controlled by a water spray;
 - (2) the drive mechanism of the existing primary gyratory rock crusher, identified as Unit 1-8, shall be upgraded to increase the maximum crushing capacity from 600 tons per hour to 1,100 tons per hour. The crusher is equipped with a water mist spray system to control particulate matter emissions; and
 - (3) the existing secondary raw material crusher, identified as Unit 1-14A, shall be rebuilt or replaced to increase the maximum crushing capacity from 450 tons per hour to 1,200 tons per hour. The particulate matter emissions from this operation shall be controlled by one (1) baghouse unit.

These facilities will be modified to support both Kiln No. 1 and Kiln No. 2 operations, and therefore shall be incorporated into this construction permit. This construction permit supersedes those conditions relating to the quarry activities and the primary gyratory rock crusher in Operation Permit No. 3520-0002-0133 and those conditions relating to the secondary raw material crusher in Operation Permit No. 3520-0002-0134.

- (d) The following existing facilities shall support both Kiln No. 1 and Kiln No. 2 operations:
 - (1) coal handling and storage facilities (Operation Permit No. 3520-0002-0134);
 - (2) raw material handling, grinding and storage facilities (Operation Permit No. 3520-0002-0134);
 - (3) clinker handling and storage facilities (Operation Permit No. 3520-0002-0136); and
 - (4) cement grinding, storage and handling facilities (Operation Permit No. 3520-0002-0136 and Operation Permit No. 3520-0002-0138).

Details concerning these emission points are contained in the Part 70 permit application submitted October 15, 1996. The particulate matter emissions from these facilities shall be operated in accordance with their existing Operation Permits and shall also be controlled in accordance with the *Fugitive Dust Control Plan* submitted on September 19, 1997.

Section B Construction Conditions

B.1 General Construction Conditions

- (a) The data and information supplied with the application shall be considered part of this permit. Prior to any proposed change in construction which may result in an increase in allowable emissions, the change must be approved by IDEM, OAM.
- (b) This permit to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.
- (c) Notwithstanding Construction Condition B.4, all requirements and conditions of this construction permit shall remain in effect unless modified in a manner consistent with procedures established for modifications of construction permits pursuant to 326 IAC 2 (Permit Review Rules).
- (d) When the facility is constructed and placed into operation, the operation conditions required by Section B and Section C shall be met.

B.2 Effective Date of the Permit

Pursuant to 40 CFR Parts 124.15 124.19 and 124.20, the effective date of this permit will be thirty-three (33) days from its issuance.

B.3 Permit Revocation

Pursuant to 326 IAC 2-1-9(b)(Revocation of Permits), the Commissioner may revoke this permit if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.

B.4 First Time Operation Permit

This document shall also become a first-time operation permit pursuant to 326 IAC 2-1-4 (Operating Permits) when, prior to start of operation, the following requirements are met:

- (a) The attached affidavit of construction shall be submitted to:

Indiana Department of Environmental Management
Permit Administration & Development Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, IN 46206-6015

verifying that the facilities were constructed as proposed in the application. The facilities covered in the Construction Permit may begin operating on the date the Affidavit of Construction is postmarked or hand delivered to IDEM, OAM.

- (b) If construction is completed in phases; i.e., the entire construction is not done continuously, a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for New Source Performance Standards (NSPS) shall be applicable to each individual phase.

- (c) The Permittee shall receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section and attach it to this document.
- (d) The operation permit will be subject to annual operating permit fees pursuant to 326 IAC 2-1-7.1(Fees).
- (e) The Permittee has submitted their Part 70 permit application on October 15, 1996 for the existing source. The equipment being reviewed under this permit shall be incorporated in the submitted Part 70 application.

B.5 NSPS Reporting Requirement

Pursuant to the New Source Performance Standards (NSPS), Part 60.7, the source owner/operator is hereby advised of the requirement to report the following at the appropriate times:

- (a) Commencement of construction date (no later than 30 days after such date);
- (b) Anticipated start-up date (not more than 60 days or less than 30 days prior to such date);
- (c) Actual start-up date (within 15 days after such date); and
- (d) Date of performance testing (at least 30 days prior to such date), when required by a condition elsewhere in this permit.

Reports are to be sent to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, IN 46206-6015

The application and enforcement of these standards have been delegated to IDEM, OAM. The requirements of 40 CFR Part 60 are also federally enforceable.

SECTION C SOURCE OPERATION CONDITIONS

Entire Source

C.1 General Operation Conditions

- (a) The data and information supplied in the application shall be considered part of this permit. Prior to any change in the operation which may result in an increase in allowable emissions exceeding those specified in 326 IAC 2-1-1 (Construction and Operating Permit Requirements), the change must be approved by IDEM, OAM.
- (b) The Permittee shall comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder.

C.2 Transfer of Permit

Pursuant to 326 IAC 2-1-6 (Transfer of Permits), the following requirements shall apply:

- (a) In the event that ownership of this cement manufacturing facility is changed, the Permittee shall notify:

Indiana Department of Environmental Management
Permits Branch, Office of Air Management
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

within thirty (30) days of the change. Notification shall include the date or proposed date of said change.

- (b) A written notification shall be sufficient to transfer the permit from the current owner to the new owner.
- (c) IDEM, OAM shall reserve the right to issue a new permit.

C.3 Permit Revocation

Pursuant to 326 IAC 2-1-9(a)(Revocation of Permits), this permit to construct and operate may be revoked for any of the following causes:

- (a) violation of any conditions of this permit;
- (b) failure to disclose all the relevant facts, or misrepresentation in obtaining this permit;
- (c) changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this permit shall not require revocation of this permit;
- (d) noncompliance with orders issued pursuant to 326 IAC 1-5 (Episode Alert Levels) to reduce emissions during an air pollution episode; or
- (e) for any cause which establishes in the judgment of IDEM, OAM, the fact that continuance of this permit is not consistent with purposes of 326 IAC 2-1 (Permit Review Rules).

C.4 Availability of Permit

Pursuant to 326 IAC 2-1-3(l), the Permittee shall maintain the applicable permit on the premises of this source and shall make this permit available for inspection by IDEM, OAM, or other public official having jurisdiction.

C.5 Open Burning

The Permittee shall not open burn any material except as provided in 326 IAC 4-1-3, 326 IAC 4-1-4 or 326 IAC 4-1-6.

C.6 Emergency Reduction Plans

Pursuant to 326 IAC 1-5-2 (Emergency Reduction Plans; Submission):

- (a) The Permittee shall prepare written Emergency Reduction Plans (ERPs) consistent with safe operating procedures.
- (b) These ERPs shall be submitted for approval to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Management
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

within ninety (90) calendar days from the date on which this source commences operation.
- (c) If the ERP is disapproved by IDEM, OAM the Permittee shall have an additional thirty (30) days to resolve the differences and submit an approvable ERP. If after this time, the Permittee does not submit an approvable ERP, IDEM, OAM shall supply such a plan.
- (d) These ERPs shall state those actions that will be taken, when each episode level is declared, to reduce or eliminate emissions of the appropriate air pollutants.
- (e) Said ERPs shall also identify the sources of air pollutants, the approximate amount of reduction of the pollutants, and a brief description of the manner in which the reduction will be achieved.
- (f) Upon direct notification by IDEM, OAM that a specific air pollution episode level is in effect, the Permittee shall immediately put into effect the actions stipulated in the approved ERP for the appropriate level. [326 IAC 1-5-3]

C.7 Preventive Maintenance Plan

Pursuant to 326 IAC 1-6-3 (Preventive Maintenance Plans), the Permittee shall prepare and maintain a Preventive Maintenance Plan, including the following information:

- (a) identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;
- (b) a description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and
- (c) identification of the replacement parts which will be maintained in inventory for quick replacement.

The Preventive Maintenance Plan shall be submitted to IDEM, OAM upon request and shall be subject to review and approval.

C.8 Malfunction Condition

Pursuant to 326 IAC 1-6-2 (Records; Notice of Malfunction):

- (a) A record of all malfunctions, including startups or shutdowns of any facility or emission control equipment, which result in violations of applicable air pollution control regulations or applicable emission limitations shall be kept and retained for a period of three (3) years and shall be made available to IDEM, OAM or appointed representative upon request.
- (b) When a malfunction of any facility or emission control equipment occurs which lasts more than one (1) hour, said condition shall be reported to IDEM, OAM, using the Malfunction Report Forms (2 pages). Notification shall be made by telephone or facsimile, as soon as practicable, but in no event later than four (4) daytime business hours after the beginning of said occurrence.
- (c) Failure to report a malfunction of any emission control equipment shall constitute a violation of 326 IAC 1-6, and any other applicable rules. Information of the scope and expected duration of the malfunction shall be provided, including the items specified in 326 IAC 1-6-2(a)(1) through (6).
- (d) Malfunction is defined as any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. [326 IAC 1-2-39]

C.9 Fugitive Dust Emissions

Pursuant to 326 IAC 6-4 (Fugitive Dust Emissions), the Permittee shall be in violation of 326 IAC 6-4 (Fugitive Dust Emissions) if any of the criteria specified in 326 IAC 6-4-2(1) through (4) are violated. Observations of visible emissions crossing the property line of the source at or near ground level must be made by a qualified representative of IDEM, OAM. [326 IAC 6-4-5(c)]

C.10 Visible Emission Determination

Pursuant to 326 IAC 5, 326 IAC 6, and 326 IAC 12, visible emissions from the source shall be measured using one or both of the following procedures to demonstrate compliance with the opacity limitations:

- (a) visible emissions observations performed in accordance with the applicable procedures under 326 IAC 5-1-4 and 40 CFR 60, Appendix A, Method 9; or
- (b) continuous opacity monitoring data recorded in accordance with the applicable procedures under 40 CFR 60, Appendix B, Performance Specification 1 and 326 IAC 3-1.1.

A violation determined by one of the above methods shall not be refuted by the other method.

C.11 Solid Waste Permit

The Permittee shall not accumulate waste tires at a single outdoor location over the amount specified in 329 IAC 12 without receiving the proper approval from the Indiana Department of Environmental Management, Office of Solid and Hazardous Waste Management. All other waste tires on-site shall be stored in covered trucks that are permitted to transport waste tires. The storage of waste tires at Lone Star Industries shall not exceed 203 tons of waste tires or 16,224 passenger tire equivalents (PTEs) at any time.

C.12 Waste Tire Storage Monitoring

Pursuant to 326 IAC 2-1-3(i)(8) and 329 IAC 2, the Permittee shall maintain daily records of the following information on waste tire storage to demonstrate compliance with the limitations required by Operation Condition C.11:

- (a) daily records on the weight of waste tires delivered to the site; and
- (b) daily records on the total weight of waste tires stored on the site.

C.13 Ambient Monitoring

That pursuant to 326 IAC 2-2-4, the Permittee shall establish ambient monitoring sites for PM₁₀ and SO₂ as described in (a) through (e). These sites shall begin collecting valid data prior to the commencement of operation of Kiln No. 2. The monitoring shall be conducted for a minimum of 36 months after the commencement of operation of Kiln No. 2.

- (a) The monitoring must be performed using U.S. EPA approved methods, procedures, and quality assurance programs. A Quality Assurance Plan and Protocol shall be submitted to:

Indiana Department of Environmental Management
Ambient Monitoring Section, Office of Air Management
2525 North Shadeland Avenue
Indianapolis, Indiana 46219

within 90 calendar days prior to commencement of monitoring. The Quality Assurance Plan and Protocol must be approved by IDEM, OAM prior to commencement of monitoring.

- (b) The two (2) monitoring sites shall be established at a downwind location and an upwind location to be approved by IDEM, OAM. All monitors shall meet the operating and maintenance criteria outlined in IDEM, OAM Quality Assurance Manual.
- (c) The ambient data for PM₁₀ and SO₂ shall be collected for a minimum period of 36 months following the initial compliance demonstration. IDEM, OAM reserves the authority to require the Permittee to monitor for compliance with the National Ambient Air Quality Standards (NAAQS) for PM_{2.5} in the event that such information is necessary to demonstrate compliance with the standard.
- (d) A quarterly summary of the monitoring data shall be submitted to:

Indiana Department of Environmental Management
Ambient Monitoring Section, Office of Air Management
2525 North Shadeland Avenue
Indianapolis, Indiana 46219

within ninety (90) calendar days after the end of the quarter being reported.

- (e) After the 36 month period of monitoring, the Permittee may petition IDEM, OAM for the removal of the monitoring site if it has been established that the PM and SO₂ levels will continue to comply with the NAAQS with an adequate margin of safety. The monitoring requirements may be continued beyond the minimum 36 month period if there exists a threat to the NAAQS or if determined to be warranted by IDEM, OAM.

C.14 Emission Reporting Requirement

Pursuant to 326 IAC 2-6 (Emission Reporting), the Permittee shall annually submit an emission statement of the source. This statement must be received by July 1 of each year and must comply with the minimum requirements specified in 326 IAC 2-6-4. The submittal should cover the period defined in 326 IAC 2-6-2(8) (Emission Statement Operating Year). The annual statement must be submitted to:

Indiana Department of Environmental Management
Office of Air Management - Technical Support and Modeling
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015.

The annual emission statement required by this permit shall be considered timely if:

- (a) delivered by U.S. mail and postmarked on or before the date it is due; or
(b) delivered by any other method if it is received and stamped by IDEM, OAM on or before the date it is due.

SECTION D.1 FACILITY OPERATION CONDITIONS FOR THE WET PROCESS KILN

One (1) 380 million British thermal units (MMBtu) per hour coal-fired, wet process cement kiln, identified as Kiln No. 2. Whole, chopped, shredded, or crumbed waste tires, herein known as waste tires, may be utilized as an alternate fuel source to supplement up to 15 percent of the heat input to the kiln. The kiln has a maximum production capacity of 75 tons of clinker per hour. Particulate matter emissions from the kiln are controlled by one (1) electrostatic precipitator unit that exhausts to Stack 3-0.1.

Emission Limitations and Standards:

D.1.1 Particulate Matter Emissions Limitation

Pursuant to 326 IAC 2-2-3(a)(3) (Prevention of Significant Deterioration (PSD) Rules), Kiln No. 2 shall comply with the following limitations:

- (a) particulate matter (PM) emissions shall not exceed 40.5 pounds per hour which satisfies the requirements of 326 IAC 6-3-2 (Process Operations). This emissions limitation is equivalent to 0.30 pounds per ton of feed (dry basis) which satisfies the requirements of 326 IAC 12 and 40 CFR 60.62 (New Source Performance Standards (NSPS) for Portland Cement Plants);

- (b) particulate matter emissions less than 10 microns (PM_{10}) shall not exceed 37.3 pounds per hour; and
- (c) opacity shall not exceed an average of 20 percent in any 24 consecutive observations recorded at 15 second intervals in accordance with the applicable procedures under 326 IAC 5-1-4 and 40 CFR 60, Appendix A, Method 9. This limitation satisfies the requirements of 326 IAC 12 (40 CFR 60.62) and 326 IAC 5-1-2 (Opacity Limitations).

D.1.2 Sulfur Dioxide Emissions Limitation

Pursuant to 326 IAC 2-2-3(a)(3), the sulfur dioxide (SO_2) emissions from Stack 3-0.1 of Kiln No. 2 shall not exceed 543 pounds per hour and 4.03 pounds per ton of feed. This emissions limitation is equivalent to 1.43 pounds of SO_2 per MMBtu which satisfies the requirements of 326 IAC 7-1.1-2 (Sulfur Dioxide Emission Limitations).

D.1.3 Nitrogen Oxide Emission Limitation

Pursuant to 326 IAC 2-2-3(a)(3), the nitrogen oxide (NO_x) emissions from Stack 3-0.1 of Kiln No. 2 shall be controlled by low- NO_x burners and good combustion practices and shall not exceed 471 pounds per hour which is equivalent to 1.24 pounds per MMBtu.

D.1.4 Emission Limitations from Tire Combustion

To demonstrate the PSD rules do not apply pursuant to 326 IAC 2-2, the emissions from Stack 3-0.1 of Kiln No. 2 shall not exceed 9.13 pounds of VOC per hour or 22.8 pounds of CO per hour.

D.1.5 Dioxin/Furan Emission Limitation

(a) Pursuant to 326 IAC 2-1-3(i)(8), the dioxin/furan emissions, during the combustion of waste tires as a supplemental fuel, shall not exceed 8.7×10^{-11} grains of 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalents per dry standard cubic feet (gr TEQ/dscf) corrected at 7 percent oxygen unless:

- (1) the dioxin/furan stack test shows a higher result; and
- (2) the stack test, or subsequent test shows that the temperature at the inlet of the control device is less than 400 degrees Fahrenheit and does not exceed 1.7×10^{-10} gr TEQ/dscf corrected at 7 percent oxygen.

The compliance stack tests required by Operation Condition D.1.7 shall establish which of these limits is appropriate.

(b) The Permittee shall comply with the dioxin/furan emission limitation required by the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Portland Cement Manufacturing Plants (40 CFR 63 and 326 IAC 20) upon promulgation. This rule shall supersede the dioxin/furan emission limitation required by (a) above.

D.1.6 Operation Standards

Pursuant to 326 IAC 2-2-3(a)(3), the Permittee shall comply with the following throughput limitations:

- (a) raw material feed rate shall not exceed 135 tons per hour;
- (b) clinker throughput shall not exceed 75 tons per hour;

- (c) sulfur content of the coal shall not exceed 3 percent sulfur;
- (d) maintain a minimum temperature of 1800⁰ F in the burning zone of Kiln No. 2 under normal operation conditions until a minimum temperature is determined from a compliant stack test;
- (e) maintain the kiln back end oxygen concentration within a range of 0.75 percent to 3 percent under normal operating conditions;
- (f) the input of waste tires as a fuel source shall only be conducted in a kiln that is manufacturing product;
- (g) the weight of waste tires as a fuel source for Kiln No. 2 shall be limited to 50.7 tons per day;
- (h) the number of waste tires, measured as passenger tire equivalents (PTEs), injected into Kiln No. 2 shall be limited to 4056 PTEs per day; and
- (i) the heat input, in MMBtu, derived from the combustion of waste tires in Kiln No. 2 shall not exceed 15 percent.

Compliance Determination and Monitoring:

D.1.7 Initial Performance Testing

Pursuant to 326 IAC 2-1-3 (Construction and Operating Permit Requirements), initial compliance tests from Stack 3-0.1 of Kiln No. 2 shall be performed.

- (a) Compliance tests shall be conducted when the kiln is utilizing 100 percent coal. The compliance tests shall be performed for the pollutants stated in (a)(1) of this condition to demonstrate compliance with the limitations required by Operation Conditions D.1.1, D.1.2, and D.1.3, and to obtain information to ensure public health is protected.
 - (1) Opacity, PM, PM₁₀, and NOx.
- (b) In the event the Permittee adds the capability to burn waste tires as a supplemental fuel in Kiln No. 2, compliance tests shall be conducted when the kiln is utilizing a fuel combination of coal and whole waste tires. Whole waste tires, as opposed to chopped, shredded, or crumbed waste tires, represent the worst case emissions, and therefore shall be used during the performance testing. The compliance tests shall be performed for the pollutants stated in (b)(1) of this condition to demonstrate compliance with the limitations required by Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, and D.1.5 and to obtain information to ensure public health is protected. The tests shall be performed for the pollutants stated in (b)(2) of this condition to obtain information to ensure public health is protected.
 - (1) Opacity, PM, PM₁₀, NOx, VOC, CO, and dioxin/furan.
 - (2) Benzene, toluene, ethylbenzene, xylenes, styrene, methylene chloride, total hydrocarbons, antimony, arsenic, beryllium, cadmium, hexavalent chromium, cobalt, manganese, mercury, nickel, selenium, and zinc.
- (c) In addition to the compliance tests required by (a) and (b), the following observations and recordkeeping requirements shall be performed:

- (1) either EPA Method 9 opacity tests or certified continuous opacity monitoring (COM) data shall be performed concurrently with the particulate matter compliance tests for Kiln No. 2 unless meteorological conditions require rescheduling the opacity tests to another date;
 - (2) the kiln temperature and oxygen concentration shall be measured and recorded during each performance testing session;
 - (3) the clinker production rate shall be measured and recorded during each performance testing session. Kiln No. 2 must be operating at 95 percent of its maximum production capacity or more during the performance testing session to be considered a valid test;
 - (4) the weight of whole waste tires added to the kiln during the performance testing session for the combustion of coal and whole waste tires stated in (b) above shall be measured and recorded. The weight of the whole waste tires shall be used to calculate the heat input from the whole waste tires. The heat input from the whole waste tires during this performance testing session must be at least 95 percent of the maximum capacity allowed by Operation Condition D.1.6(i); and
 - (5) the temperature at the inlet of the electrostatic precipitator unit shall be measured and recorded during the dioxin/furan compliance tests for combustion of coal and whole waste tires stated in (b) above.
- (d) The Kiln No. 2 compliance tests for the utilization of 100 percent coal shall be performed within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up. Upon utilization of waste tires in Kiln No. 2, the compliance tests shall be performed no later than the 30th day that the kiln actually burns waste tires or no later than 180 days after the 1st use of waste tires as a supplemental fuel, whichever is earlier.
- (e) All compliance tests shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this permit, utilizing methods approved by IDEM, OAM.

- (1) A test protocol shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

at least thirty-five (35) days before the intended test date. The Permittee shall develop and submit with the protocol for approval by IDEM, OAM, standard operating procedures to be followed during sampling, handling, analysis, quality control, quality assurance, and data reporting.

- (2) The Compliance Data Section shall be notified of the actual test date at least two (2) weeks prior to the date. [326 IAC 3-2.1-2]
- (3) All test reports must be received by the Compliance Data Section within 45 days of completion of the testing. [326 IAC 3-2.1-4]

- (4) When the results of a compliance test performed exceed the level specified in any condition of this permit, the Permittee shall take appropriate corrective actions. Corrective actions may include cessation of waste tire burning within seven (7) days. The Permittee shall submit a description of these corrective actions to IDEM, OAM within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize emissions from the affected facility while the corrective actions are being implemented. IDEM, OAM shall notify the Permittee within thirty (30) days if the corrective actions taken are deficient. The Permittee shall submit a description of additional corrective actions taken to IDEM, OAM within thirty (30) days of receipt of the notice of deficiency. IDEM, OAM reserves the authority to use enforcement activities to resolve noncompliant tests.
 - (5) Whenever the results of a compliance test performed exceed the level specified in any condition of this permit, a second test to demonstrate compliance shall be performed within 120 days. Failure of the second test to demonstrate compliance may be grounds for immediate revocation of this permit to operate the affected facility.
- (f) IDEM, OAM retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.1.8 Performance Testing

Pursuant to 326 IAC 2-1-3 (Construction and Operating Permit Requirements), the following compliance tests from Stack 3-0.1 of Kiln No. 2 shall be performed in addition to the initial compliance tests required by Operation Condition D.1.7:

- (a) Compliance tests shall be performed every 2 ½ years when the kiln is utilizing 100 percent coal. The compliance tests shall be performed for the pollutants stated in (a)(1) of this condition to demonstrate compliance with the limitations required by Operation Conditions D.1.1, D.1.2, and D.1.3, and to obtain information to ensure public health is protected.
 - (1) Opacity, PM, PM₁₀, and NO_x.
- (b) In the event that the Permittee is burning tires, a compliance test shall be conducted every 2 ½ years for those pollutants that increased when the kiln is utilizing a fuel combination of coal and waste tires. Performance tests are also required every 2 ½ years for dioxin/furan emissions regardless of any increase in this pollutant when the kiln is utilizing a fuel combination of coal and whole waste tires.
- (c) In addition to the compliance tests, the following observations and recordkeeping requirements shall be performed:
 - (1) either EPA Method 9 opacity tests or certified continuous opacity monitoring (COM) data shall be performed concurrently with the particulate matter compliance tests for Kiln No. 2 unless meteorological conditions require rescheduling the opacity tests to another date;
 - (2) sulfur dioxide data collected from the certified continuous emissions monitoring system on from Stack 3-0.1 of Kiln No. 2 shall be acceptable in lieu of stack testing as long as the data is measured concurrently with the stack tests;

- (3) the kiln temperature and oxygen concentration shall be measured and recorded during each performance testing session;
 - (4) the clinker production rate shall be measured and recorded during each performance testing session. Kiln No. 2 must be operating at 95 percent of its maximum production capacity or more during the performance testing session to be considered a valid test;
 - (5) the weight of whole waste tires added to the kiln during the performance testing session for the combustion of coal and whole waste tires stated in (b) above shall be measured and recorded. The weight of the whole waste tires shall be used to calculate the heat input from the whole waste tires. The heat input from the whole waste tires during this performance testing session must be at least 95 percent of the maximum capacity allowed by Operation Condition D.1.6(i); and
 - (6) the temperature at the inlet of the electrostatic precipitator unit shall be measured and recorded during the dioxin/furan compliance tests.
- (d) The compliance tests shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this permit, utilizing methods approved by IDEM, OAM.
- (1) A test protocol shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

at least thirty-five (35) days before the intended test date. The Permittee shall develop and submit with the protocol for approval by IDEM, OAM, standard operating procedures to be followed during sampling, handling, analysis, quality control, quality assurance, and data reporting.
 - (2) The Compliance Data Section shall be notified of the actual test date at least two (2) weeks prior to the date. [326 IAC 3-2.1-2]
 - (3) All test reports must be received by the Compliance Data Section within 45 days of completion of the testing. [326 IAC 3-2.1-4]
 - (4) When the results of a compliance test performed exceed the level specified in any condition of this permit, the Permittee shall take appropriate corrective actions. Corrective actions may include cessation of tire burning within seven (7) days. The Permittee shall submit a description of these corrective actions to OAM within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize emissions from the affected facility while the corrective actions are being implemented. OAM shall notify the Permittee within thirty (30) days if the corrective actions taken are deficient. The Permittee shall submit a description of additional corrective actions taken to OAM within thirty (30) days of receipt of the notice of deficiency. OAM reserves the authority to use enforcement activities to resolve noncompliant tests.

- (5) Whenever the results of the stack test performed exceed the level specified in this permit, a second test to demonstrate compliance shall be performed within 120 days. Failure of the second test to demonstrate compliance may be grounds for immediate revocation of this permit to operate the affected facility.
- (e) The OAM retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.1.9 NSPS Compliance

Pursuant to 326 IAC 12 and 40 CFR 60, Subpart F, the Permittee shall maintain daily records of the following parameters for Kiln No. 2 to demonstrate compliance with the PM and opacity limitations required by Operation Conditions D.1.1(a), D.1.1(c), D.1.6(a), and D.1.6(b):

- (a) clinker production rate; and
- (b) kiln feed rates.

D.1.10 Electrostatic (ESP) Operating Condition

The electrostatic precipitator (ESP) of Kiln No. 2 shall be operated at all times when the kiln is in operation.

- (a) The Permittee shall maintain, monitor and record the primary and secondary amperage and T-R set voltage of each ESP at a level demonstrated by a compliant performance test, at least once per day. If the voltage of the T-R set drops five (5) direct current (DC) kilovolts or thirty (30) alternating current (AC) volts below this pre-determined baseline or if less than 90% of the total T-R sets are functioning, corrective action shall be taken in accordance with the Permittee's Preventive Maintenance Plan. The company shall document the cause of the out-of-range reading and take immediate action to correct any problem. Failure or partial failure of the control device shall be reported to IDEM, OAM according to the procedure specified for malfunctions in 326 IAC 1-6-2, in which case the provisions of 326 IAC 1-6-5 may apply at the discretion of IDEM, OAM.
- (b) The instrument used for determining the T-R set voltage shall be subject to approval by IDEM, OAM, and shall be calibrated at least once every six (6) months.
- (c) An inspection of the ESP shall be performed a minimum of two (2) times per 12 month period. The inspection will normally be conducted during scheduled kiln downtimes. A record shall be kept of the results of the inspection and the number of ESP part(s) replaced.
- (d) In the event that an ESP failure has been observed:
 - (1) The affected process will be shut down immediately until the failed unit has been repaired or replaced; or
 - (2) The airstream shall be routed to the second ESP compartment, as long as the second compartment is functioning properly. If both ESP compartments are malfunctioning, corrective actions will be devised within eight (8) hours of discovery and will include a timetable for completion.

D.1.11 Continuous Emissions Monitoring

Pursuant to 326 IAC 2-2, 326 IAC 3, and 326 IAC 12, the Permittee shall continuously monitor and record the following parameters from Kiln No. 2 to demonstrate compliance with the limitations and operation standards required by Operation Conditions D.1.1(c), D.1.2, D.1.6(d), and D.1.6(e):

- (a) opacity;
- (b) sulfur dioxide emission rates;
- (c) temperature in the burning zone of Kiln No. 2; and
- (d) oxygen concentration at the back end of Kiln No. 2.

The continuous monitoring systems shall be installed and operational prior to conducting the performance tests. A monitoring protocol shall be performed in accordance with the applicable procedures under 40 CFR 60, Appendix B, Performance Specification 1 and 326 IAC 3-1.1 and shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

within 60 days after achieving the maximum production rate at which the affected facility will be operated, but no later than 180 days after initial startup. Verification of operational status shall, as a minimum, include completion of the manufacturer written requirements or recommendations for installation, operation, and calibration of the device.

D.1.12 Fuel Consumption Monitoring

Pursuant to 326 IAC 2-2, the Permittee shall maintain daily records of the following fuel information for Kiln No. 2 to demonstrate compliance with the limitations required by Operation Conditions D.1.6(g), D.1.6(h), and D.1.6(i):

- (a) weight of each fuel combusted;
- (b) number of whole waste tires combusted; and
- (c) percentage of heat input attributable to each fuel combusted.

Recordkeeping and Reporting Requirements:

D.1.13 Recordkeeping Requirement

The Permittee shall maintain a log of information necessary to document compliance with Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, and D.1.6 as follows:

- (a) The Permittee shall meet the following time lines for recordkeeping requirements:

- (1) records of the performance test results and the continuous monitoring system data required by Operation Conditions D.1.7, D.1.8, and D.1.13 shall be maintained for a minimum of 24 months to show compliance with the emission limitations and operation standards required by Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, D.1.5, D.1.6(d) and D.1.6(e);
- (2) daily logs of the parameters established in Operation Condition D.1.9 shall be maintained for a minimum of 24 months to show compliance with the limitations required by Operation Conditions D.1.1, D.1.6(a), and D.1.6(b);
- (3) daily logs of the parameters established in Operation Condition D.1.10(a), semi-annual logs of the parameters established in Operation Condition D.1.10(b) and quarterly logs of the parameters established in Operation Condition D.1.10(c) shall be maintained for a minimum of 36 months to show compliance with the PM and opacity limitations required by Operation Condition D.1.1;
- (4) daily logs of the of the visible emission notations required by Operation Condition D.1.11 shall be maintained for a minimum of 24 months to show compliance with the emission limitations established in Operation Condition D.1.1; and
- (5) monthly logs of the parameters established in Operation Condition D.1.12 shall be maintained for a minimum of 36 months to show compliance with SO₂ limitations required by Operation Conditions D.1.2 and D.1.6(c); and
- (6) daily rolling average logs of the parameters established in Operation Condition D.1.14 shall be maintained for a minimum of 36 months to show compliance with the limitations required by Operation Conditions D.1.6(g), D.1.6(h), and D.1.6(i).

These records shall be kept at the source location and available within one (1) hour upon verbal request of an IDEM, OAM representative.

- (b) Records of required monitoring information shall include, where applicable:
 - (1) the date, place, and time of sampling or measurements;
 - (2) the dates analyses were performed;
 - (3) the company or entity performing the analyses;
 - (4) the analytic techniques or methods used;
 - (5) the results of such analyses; and
 - (6) the operating conditions existing at the time of sampling or measurement.
- (c) Support information shall include, where applicable:
 - (1) copies of all reports required by this permit;
 - (2) all original strip chart recordings for continuous monitoring instrumentation;

- (3) all calibration and maintenance records; and
- (4) records of any required preventive maintenance and corrective actions that were implemented. Such records shall briefly describe what was done and indicate who did it. Such records may include, but are not limited to work orders, quality assurance procedures, quality control procedures, operator's standard operating procedures, manufacturer's specifications or their equivalent, and equipment "troubleshooting" guidance.

D.1.14 Reporting Requirement

- (a) The Permittee shall submit records of excess emissions (defined in 326 IAC 3-1.1-3) from the continuous emissions monitoring system for each parameter described in Operation Condition D.1.12 to show compliance with Operation Conditions D.1.1(c), D.1.2, D.1.6(d), and D.1.6(e) to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

within thirty (30) days following the end of each calendar quarter.

- (b) The Permittee shall also submit semiannual reports of excess opacity emissions from the continuous emissions monitoring system to show compliance with Operation Condition D.1.1(c) and all malfunctions to:

U.S. Environmental Protection Agency (EPA), Regional Administrator, Region V
Air and Radiation Division, Regulation Development Branch-Indiana (AR-18J)
77 West Jackson Boulevard, Chicago, Illinois 60604-3590

within thirty (30) days following the end of each calendar half.

SECTION D.2

FACILITY OPERATION CONDITIONS FOR THE CLINKER COOLER UNIT

One (1) clinker cooler unit for Kiln No. 2, with a maximum throughput capacity of 75 tons of clinker per hour. The particulate matter emissions from the clinker cooler are controlled by one (1) baghouse unit that exhausts to Stack 3-0.7.

Emission Limitations and Standards:

D.2.1. Particulate Matter Emission Limitation

Pursuant to 326 IAC 2-2-3(a)(3) (Prevention of Significant Deterioration (PSD) Rules), Stack 3-0.7 of the Kiln No. 2 clinker cooler shall comply with the following limitations:

- (a) particulate matter (PM) emissions shall not exceed 13.5 pounds per hour which satisfy the requirements of 326 IAC 6-3-2 (Process Operations). This emissions limitation is equivalent to 0.082 pounds per ton of feed which satisfies the requirements of 326 IAC 12 and 40 CFR 60.62 (New Source Performance Standards (NSPS) for Portland Cement Plants);
- (b) particulate matter emissions less than 10 microns (PM_{10}) shall not exceed 12.4 pounds per hour; and
- (c) opacity shall not exceed an average of 10 percent in any 24 consecutive observations recorded at 15 second intervals in accordance with the applicable procedures under 326 IAC 5-1-4 and 40 CFR 60, Appendix A, Method 9. This limitation satisfies the requirements of 326 IAC 12 and 40 CFR 60.62 and 326 IAC 5-1-2 (Opacity Limitations).

Compliance Determination and Monitoring:

D.2.2 Performance Testing

Pursuant to 326 IAC 2-1-3 (Construction and Operating Permit Requirements), the Permittee shall perform compliance tests for opacity, PM, and PM_{10} on Stack 3-0.7 of the Kiln No. 2 clinker cooler to demonstrate compliance with the limitations required by Operation Conditions D.2.1.

- (a) Either EPA Method 9 opacity tests or certified continuous opacity monitoring (COM) data shall be performed concurrently with the PM and PM_{10} compliance tests for the Kiln No. 2 clinker cooler.
- (b) The compliance tests shall be performed within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up and shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this permit, utilizing methods approved by IDEM, OAM.

- (1) A test protocol shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

at least thirty-five (35) days before the intended test date. The Permittee shall develop and submit with the protocol for approval by IDEM, OAM, standard operating procedures to be followed during sampling, handling, analysis, quality control, quality assurance, and data reporting.

- (2) The Compliance Data Section shall be notified of the actual test date at least two (2) weeks prior to the date. [326 IAC 3-2.1-2]
- (3) All test reports must be received by the Compliance Data Section within 45 days of completion of the testing. [326 IAC 3-2.1-4]
- (4) When the results of a compliance test performed exceed the level specified in any condition of this permit, the Permittee shall take appropriate corrective actions. The Permittee shall submit a description of these corrective actions to IDEM, OAM within thirty (30) days of receipt of the test results. The Permittee shall take appropriate

action to minimize emissions from the affected facility while the corrective actions are being implemented. IDEM, OAM shall notify the Permittee within thirty (30) days if the corrective actions taken are deficient. The Permittee shall submit a description of additional corrective actions taken to IDEM, OAM within thirty (30) days of receipt of the notice of deficiency. IDEM, OAM reserves the authority to use enforcement activities to resolve noncompliant tests.

- (5) Whenever the results of a compliance test performed exceed the level specified in any condition of this permit, a second test to demonstrate compliance shall be performed within 120 days. Failure of the second test to demonstrate compliance may be grounds for immediate revocation of this permit to operate the affected facility.
- (c) IDEM, OAM retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.2.3 Continuous Opacity Monitoring

Pursuant to 326 IAC 2-2, 326 IAC 3 and 326 IAC 12, the Permittee shall continuously monitor and record the opacity from the Kiln No. 2 clinker cooler to demonstrate compliance with the opacity limitation required by Operation Condition D.2.1(c).

The continuous opacity monitoring system shall be installed and operational prior to conducting the performance tests. A monitoring protocol shall be performed in accordance with the applicable procedures under 40 CFR 60, Appendix B, Performance Specification 1 and 326 IAC 3-1.1 and shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

within 60 days after achieving the maximum production rate at which the affected facility will be operated, but no later than 180 days after initial startup. Verification of operational status shall, as a minimum, include completion of the manufacturer written requirements or recommendations for installation, operation, and calibration of the device.

D.2.4 Baghouse Operating Condition

The Kiln No. 2 clinker cooler baghouse shall be operated at all times when the Kiln No. 2 clinker cooler is in operation.

- (a) The Permittee shall take readings of the total static pressure drop across the baghouse, at least once per day. The pressure drop across the baghouse shall be maintained within a pressure drop range of 2.5 and 7.0 inches of water as determined from the manufacturer specifications. The pressure drop range may be adjusted to incorporate the pressure drop determined by a compliant stack test. If the water pressure falls outside of the determined range, corrective action shall be taken in accordance with the Permittee's Preventive Maintenance Plan. The company shall document the cause of the out-of-range reading and take immediate action to correct any problem. Failure or partial failure of the control device shall be reported to IDEM, OAM according to the procedure specified for malfunctions in

326 IAC 1-6-2, in which case the provisions of 326 IAC 1-6-5 may apply at the discretion of IDEM, OAM.

- (b) The instrument used for determining the pressure shall be subject to approval by IDEM, OAM and shall be calibrated at least once every six (6) months.
- (c) The gauge employed to take the pressure drop across the baghouse or any part of the facility shall have a scale such that the expected normal reading shall be no less than 20 percent of full scale and be accurate within ± 2 percent of full scale reading. The instrument shall be quality assured and maintained as specified by the vendor.
- (d) An inspection of the baghouse shall be performed during each major plant outage or at a minimum of two (2) times per year. Defective bags shall be replaced. A record shall be kept of the results of the inspection and the number of bags replaced.
- (e) In the event that a bag's failure has been observed:
 - (1) The affected compartments will be shut down immediately until the failed units have been replaced.
 - (2) Based upon the findings of the inspection, any additional corrective actions will be devised within eight (8) hours of discovery and will include a timetable for completion.

D.2.5 NSPS Compliance

Pursuant to 326 IAC 12 and 40 CFR 60, Subpart F, the Permittee shall maintain daily records of the following parameters for the Kiln No. 2 clinker cooler to demonstrate compliance with the PM limitations required by Operation Condition D.2.1:

- (a) clinker production rate; and
- (b) kiln feed rates.

Recordkeeping and Reporting Requirements:

D.2.6 Recordkeeping Requirement

The Permittee shall maintain a log of information necessary to document compliance with Operation Condition D.2.1 as follows:

- (a) The Permittee shall meet the following time lines for recordkeeping requirements:
 - (1) records of the performance test results and the continuous monitoring system data required by Operation Conditions D.2.2 and D.2.3 shall be maintained for a minimum of 24 months to show compliance with the emission limitations required by Operation Condition D.2.1;
 - (2) daily logs of the of the visible emission notations required by Operation Condition D.2.4 shall be maintained for a minimum of 24 months to show compliance with the emission limitations established in Operation Condition D.2.1;

- (3) daily logs of the parameters established in Operation Condition D.2.6(a), semi-annual logs of the parameters established in Operation Condition D.2.6(b) and quarterly logs of the parameters established in Operation Condition D.2.6(d) shall be maintained for a minimum of 36 months to show compliance with the PM and opacity limitations required by Operation Condition D.2.1; and
- (4) daily logs of the parameters established in Operation Condition D.2.6 shall be maintained for a minimum of 24 months to show compliance with the limitations required by Operation Condition D.2.1.

These records shall be kept at the source location and available within one (1) hour upon verbal request of an IDEM, OAM representative.

- (b) Records of required monitoring information shall include, where applicable:
 - (1) the date, place, and time of sampling or measurements;
 - (2) the dates analyses were performed;
 - (3) the company or entity performing the analyses;
 - (4) the analytic techniques or methods used;
 - (5) the results of such analyses; and
 - (6) the operating conditions existing at the time of sampling or measurement.
- (c) Support information shall include, where applicable:
 - (1) copies of all reports required by this permit;
 - (2) all original strip chart recordings for continuous monitoring instrumentation;
 - (3) all calibration and maintenance records; and
 - (4) records of any required preventive maintenance and corrective actions that were implemented. Such records shall briefly describe what was done and indicate who did it. Such records may include, but are not limited to work orders, quality assurance procedures, quality control procedures, operator's standard operating procedures, manufacturer's specifications or their equivalent, and equipment "troubleshooting" guidance.

D.2.7 Reporting Requirement

- (a) The Permittee shall submit quarterly summary reports of the excess emissions (defined in 326 IAC 3-1.1-3) of opacity from the continuous emissions monitoring system described in Operation Condition D.2.3 to show compliance with Operation Condition D.2.1(c) to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

within thirty (30) days following the end of each calendar quarter.

- (b) The Permittee shall also submit semiannual reports of excess opacity emissions from the continuous emissions monitoring system to show compliance with D.2.1(c) and all malfunctions to:

U.S. Environmental Protection Agency (EPA), Regional Administrator, Region V
Air and Radiation Division, Regulation Development Branch-Indiana (AR-18J)
77 West Jackson Boulevard, Chicago, Illinois 60604-3590

within thirty (30) days following the end of each calendar half.

**SECTION D.3 FACILITY OPERATION CONDITIONS
FOR STORAGE, HANDLING AND CRUSHING ACTIVITIES**

One (1) enclosed conveyor that transfers the clinker to the existing clinker transfer line at a maximum rate of 75 tons per hour;

Two (2) existing pneumatically loaded raw material storage silos equipped with one (1) common baghouse unit that exhausts to Stack 1-30. The combined maximum throughput capacity is 150,000 tons per year (Exemption Letter CP-133-4864);

One (1) cement grinding mill equipped with one (1) baghouse unit that exhausts to Stack 4-10, and one (1) cement transfer pump (Registration Letter CP-133-4537);

Six (6) pneumatically loaded cement storage silos equipped with one (1) common baghouse unit that exhausts to Stack 5-24. The combined maximum throughput capacity is 200,000 tons per year (Exemption Letter CP-133-4914);

The drive mechanism of the existing primary gyratory rock crusher, identified as Unit 1-8, shall be upgraded to increase the maximum crushing capacity from 600 tons per hour to 1,100 tons per hour. The crusher is equipped with a water mist spray system to control particulate matter emissions; and

The existing secondary raw material crusher, identified as Unit 1-14A, shall be rebuilt or replaced to increase the maximum crushing capacity from 450 tons per hour to 1,200 tons per hour. The crusher is equipped with one (1) baghouse unit to control the particulate matter emissions.

Emission Limitations and Standards:

D.3.1 Particulate Matter Emission Limitation

Pursuant to 326 IAC 2-2-3(a)(3) (Prevention of Significant Deterioration (PSD) Rules), from the storage, handling and crushing facilities stated above shall comply with the following limitations:

- (a) opacity shall not exceed an average of 10 percent in any 24 consecutive observations recorded at 15 second intervals in accordance with the applicable procedures under 326 IAC 5-1-4 and 40 CFR 60, Appendix A, Method 9. This limitation satisfies the requirements of 326 IAC 12 and 40 CFR 60.62 and 326 IAC 5-1-2 (Opacity Limitations).

Compliance Determination and Monitoring:

D.3.2 Visible Emission Notations

Visible emission notations of all exhaust to the atmosphere from each baghouse associated with the raw material silos, grinding mill, cement silos, and secondary raw material crusher shall be performed once per working shift (during daylight hours). A trained employee will record whether emissions are normal or abnormal.

- (a) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, 80% of the time the process is in operation, not counting start up or shut down time.
- (b) In the case of batch or discontinuous operation, readings shall be taken during that part of the operation specified in the facility's specific condition prescribing visible emissions.
- (c) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal and abnormal visible emissions for that specific process.
- (d) The Preventive Maintenance Plan for this facility shall contain troubleshooting contingency and corrective actions for when an abnormal emission is observed.

D.3.3 Baghouse Operating Condition

The baghouses associated with the raw material silos, grinding mill, cement silos, and secondary raw material crusher shall be operated at all times when its associated process is in operation.

- (a) The Permittee shall take readings of the total static pressure drop across each of the baghouses, at least once per day. The pressure drop across each of the baghouses shall be maintained within the pressure drop range reported by the manufacturer specifications as stated in the following table:

Baghouse Unit	Pressure Drop Range, inches H ₂ O
Two Raw Material Silos Baghouse, Unit 1-30	2.5 - 7.0
Grinding Mill No. 3 Baghouse, Unit 4-10	2.5 - 7.0
Six Cement Silos Baghouse, Unit 5-24	2.5 - 7.0
Secondary Crusher Baghouse, Unit 1-14A	2.5 - 7.0

The pressure drop range may be adjusted to incorporate the pressure drop determined by a compliant stack test. If the water pressure falls outside of the determined range, corrective action shall be taken in accordance with the Permittee's Preventive Maintenance Plan. The company shall document the cause of the out-of-range reading and take immediate action to correct any problem. Failure or partial failure of the control device shall be reported to IDEM, OAM according to the procedure specified for malfunctions in 326 IAC 1-6-2, in which case the provisions of 326 IAC 1-6-5 may apply at the discretion of IDEM, OAM.

- (b) The instrument used for determining the pressure shall be subject to approval by IDEM, OAM and shall be calibrated at least once every six (6) months.
- (c) The gauge employed to take the pressure drop across the baghouse or any part of the facility shall have a scale such that the expected normal reading shall be no less than 20 percent of full scale and be accurate within ± 2 percent of full scale reading. The instrument shall be quality assured and maintained as specified by the vendor.
- (d) An inspection shall be performed each calendar quarter of the baghouse. Defective bags shall be replaced. A record shall be kept of the results of the inspection and the number of bags replaced.
- (e) In the event that a bag's failure has been observed:
 - (1) The affected compartments will be shut down immediately until the failed units have been replaced.
 - (2) Based upon the findings of the inspection, any additional corrective actions will be devised within eight (8) hours of discovery and will include a timetable for completion.

D.3.4 Water Spray Operating Condition

The water mist spray systems for the unpaved roads or plant paved roads during periods of excessive dust conditions, limestone piles, and the primary gyratory rock crusher shall be operated on a continuous basis while its associated equipment is in operation and the temperature is above 35 degrees Fahrenheit.

Recordkeeping and Reporting Requirements:

D.3.5 Recordkeeping Requirement

The Permittee shall maintain a log of information necessary to document compliance with Operation Condition D.3.1 as follows:

- (a) The Permittee shall meet the following time lines for recordkeeping requirements:
 - (1) daily logs of the of the visible emission notations required by Operation Condition D.3.2 shall be maintained for a minimum of 24 months to show compliance with the emission limitations established in Operation Condition D.3.1;

- (2) daily logs of the parameters established in Operation Condition D.3.3(a), semi-annual logs of the parameters established in Operation Condition D.3.3(b) and quarterly logs of the parameters established in Operation Condition D.3.3(d) shall be maintained for a minimum of 36 months to show compliance with the PM and opacity limitations required by Operation Condition D.3.1; and

These records shall be kept at the source location and available within one (1) hour upon verbal request of an IDEM, OAM representative.

- (b) Records of required monitoring information shall include, where applicable:
 - (1) the date, place, and time of sampling or measurements;
 - (2) the dates analyses were performed;
 - (3) the company or entity performing the analyses;
 - (4) the analytic techniques or methods used;
 - (5) the results of such analyses; and
 - (6) the operating conditions existing at the time of sampling or measurement.
- (c) Support information shall include, where applicable:
 - (1) copies of all reports required by this permit;
 - (2) all original strip chart recordings for continuous monitoring instrumentation;
 - (3) all calibration and maintenance records; and
 - (4) records of any required preventive maintenance and corrective actions that were implemented. Such records shall briefly describe what was done and indicate who did it. Such records may include, but are not limited to work orders, quality assurance procedures, quality control procedures, operator's standard operating procedures, manufacturer's specifications or their equivalent, and equipment "troubleshooting" guidance.

SECTION D.4

FACILITY OPERATION CONDITIONS FOR QUARRY ACTIVITIES

The quarry activities shall require additional equipment and work hours to increase the maximum volume of limestone rock removed from the quarry from 600 tons per hour to 1,100 tons per hour. The fugitive dust emissions from the quarry activities including overburden removal, drilling, blasting, and quarry truck loading shall be controlled by a water spray.

Compliance Determination and Monitoring:

D.4.1 Fugitive Particulate Matter Emissions

Pursuant to 326 IAC 6-5 (Fugitive Particulate Matter Emissions Limitations), the fugitive particulate matter emissions shall be controlled according to the *Fugitive Dust Control Plan* (copy attached to permit) submitted on September 19, 1997. This plan consists of:

- (a) observing posted speed limits. The quarry truck traffic shall be limited to a mean speed of 9.6 miles per hour during periods with high blowing road dust potential;
- (b) applying a water spray to all of the unpaved surfaces associated with the quarry vehicle traffic on a daily basis during periods when there is an elevated blowing road dust potential; and
- (c) rescheduling work or arranging for additional water spray application to the quarry roads during periods of high blowing dust potential.

MALFUNCTION REPORT

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR MANAGEMENT
FAX NUMBER - 317 233-5967**

**This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6
and to qualify for the exemption under 326 IAC 1-6-4.**

THIS FACILITY MEETS THE APPLICABILITY REQUIREMENTS BECAUSE: IT HAS POTENTIAL TO EMIT 25 LBS/HR PARTICULATES ?____, 100 LBS/HR VOC ?____, 100 LBS/HR SULFUR DIOXIDE ?____ OR 2000 LBS/HR OF ANY OTHER POLLUTANT ?____ EMISSIONS FROM MALFUNCTIONING CONTROL EQUIPMENT OR PROCESS EQUIPMENT CAUSED EMISSIONS IN EXCESS OF APPLICABLE LIMITATION _____.

THIS MALFUNCTION RESULTED IN A VIOLATION OF: 326 IAC _____ OR, PERMIT CONDITION # _____ AND/OR PERMIT LIMIT OF _____

THIS INCIDENT MEETS THE DEFINITION OF 'MALFUNCTION' AS LISTED ON REVERSE SIDE ? Y N

THIS MALFUNCTION IS OR WILL BE LONGER THAN THE ONE (1) HOUR REPORTING REQUIREMENT ? Y N

COMPANY: _____ PHONE NO. () _____
LOCATION: (CITY AND COUNTY) _____
PERMIT NO. _____ AFS PLANT ID: _____ AFS POINT ID: _____ INSP: _____
CONTROL/PROCESS DEVICE WHICH MALFUNCTIONED AND REASON: _____

DATE/TIME MALFUNCTION STARTED: ____/____/ 19____ _____ AM / PM

ESTIMATED HOURS OF OPERATION WITH MALFUNCTION CONDITION: _____

DATE/TIME CONTROL EQUIPMENT BACK-IN SERVICE ____/____/ 19____ _____ AM/PM

TYPE OF POLLUTANTS EMITTED: TSP, PM-10, SO2, VOC, OTHER: _____

ESTIMATED AMOUNT OF POLLUTANT EMITTED DURING MALFUNCTION: _____

MEASURES TAKEN TO MINIMIZE EMISSIONS: _____

REASONS WHY FACILITY CANNOT BE SHUTDOWN DURING REPAIRS:

CONTINUED OPERATION REQUIRED TO PROVIDE ESSENTIAL*SERVICES: _____

CONTINUED OPERATION NECESSARY TO PREVENT INJURY TO PERSONS: _____

CONTINUED OPERATION NECESSARY TO PREVENT SEVERE DAMAGE TO EQUIPMENT: _____

INTERIM CONTROL MEASURES: (IF APPLICABLE) _____

MALFUNCTION REPORTED BY: _____ TITLE: _____

(SIGNATURE IF FAXED)

MALFUNCTION RECORDED BY: _____ DATE: _____ TIME: _____

**Please note - This form should only be used to report malfunctions
applicable to Rule 326 IAC 1-6 and to qualify for
the exemption under 326 IAC 1-6-4.**

326 IAC 1-6-1 Applicability of rule

Sec. 1. The requirements of this rule (326 IAC 1-6) shall apply to the owner or operator of any facility which has the potential to emit twenty-five (25) pounds per hour of particulates, one hundred (100) pounds per hour of volatile organic compounds or SO₂, or two thousand (2,000) pounds per hour of any other pollutant; or to the owner or operator of any facility with emission control equipment which suffers a malfunction that causes emissions in excess of the applicable limitation.

326 IAC 1-2-39 “Malfunction” definition

Sec. 39. Any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. (Air Pollution Control Board; 326 IAC 1-2-39; filed Mar 10, 1988, 1:20 p.m. : 11 IR 2373)

***Essential services** are interpreted to mean those operations, such as, the providing of electricity by power plants. Continued operation solely for the economic benefit of the owner or operator shall not be sufficient reason why a facility cannot be shutdown during a control equipment shutdown.

If this item is checked on the front, please explain rationale:

Indiana Department of Environmental Management Office of Air Management

Technical Support Document (TSD) for New Construction and Operation

Source Background and Description

Source Name:	Lone Star Industries, Inc.
Source Location:	Limedale Road, Greencastle, Indiana 46135
County:	Putnam
Construction Permit No.:	CP-133-5886-00002
SIC Code:	3241
Permit Reviewer:	Michele Williams

The Office of Air Management (OAM) has reviewed an application from Lone Star Industries, Inc., relating to the construction and operation of a wet process cement kiln and associated operations.

- (a) The following facilities shall be constructed:
- (1) one (1) 380 million British thermal units (MMBtu) per hour coal-fired, wet process cement kiln, identified as Kiln No. 2. Whole, chopped, shredded, or crumbed waste tires, herein known as waste tires, may be utilized as an alternate fuel source to supplement up to 15 percent of the heat input to the kiln. The kiln has a maximum production capacity of 75 tons of clinker per hour. The particulate matter emissions from the kiln are controlled by one (1) electrostatic precipitator unit that exhausts to Stack 3-0.1;
 - (2) one (1) clinker cooler unit for Kiln No. 2, with a maximum throughput capacity of 75 tons of clinker per hour. The particulate matter emissions from the clinker cooler are controlled by one (1) baghouse unit that exhausts to Stack 3-0.7;
 - (3) one (1) enclosed conveyor that transfers the clinker to the existing clinker transfer line at a maximum rate of 75 tons per hour.
- (b) The following permitted facilities shall be incorporated as part of the equipment associated with the Kiln No. 2 operations:
- (1) two (2) existing pneumatically loaded raw material storage silos equipped with one (1) common baghouse unit that exhausts to Stack 1-30. The combined maximum throughput capacity is 150,000 tons per year (Exemption Letter CP-133-4864);
 - (2) one (1) cement grinding mill equipped with one (1) baghouse unit that exhausts to Stack 4-10, and one (1) cement transfer pump (Registration Letter CP-133-4537); and

- (3) six (6) pneumatically loaded cement storage silos equipped with one (1) common baghouse unit that exhausts to Stack 5-24. The combined maximum throughput capacity is 200,000 tons per year (Exemption Letter CP-133-4914).

The fly ash silos will also support the proposed Kiln No. 2 operations, and therefore shall be incorporated into this construction permit. The cement grinding mill and cement storage silos will be constructed to support the proposed Kiln No. 2 operations, and therefore shall be incorporated into this construction permit. This construction permit supersedes CP-133-4537, CP-133-4864, and CP-133-4919.

- (c) The following existing facilities shall be modified to support both Kiln No. 1 and Kiln No. 2 operations:
 - (1) the quarry activities shall increase the maximum volume of limestone rock removed from the quarry from 600 tons per hour to 1,100 tons per hour via additional equipment and work hours. The particulate matter emissions from the quarry roads shall be controlled by a water spray;
 - (2) the drive mechanism of the existing primary gyratory rock crusher, identified as Unit 1-8, shall be upgraded to increase the maximum crushing capacity from 600 tons per hour to 1,100 tons per hour. The crusher is equipped with a water mist spray system to control particulate matter emissions; and
 - (3) the existing secondary raw material crusher, identified as Unit 1-14A, shall be rebuilt or replaced to increase the maximum crushing capacity from 450 tons per hour to 1,200 tons per hour. The particulate matter emissions from this operation shall be controlled by one (1) baghouse unit.

These facilities will be modified to support both Kiln No. 1 and Kiln No. 2 operations, and therefore shall be incorporated into this construction permit. This construction permit supersedes those conditions relating to the quarry activities and the primary gyratory rock crusher in Operation Permit No. 3520-0002-0133 and those conditions relating to the secondary raw material crusher in Operation Permit No. 3520-0002-0134.

- (d) The following existing facilities shall support both Kiln No. 1 and Kiln No. 2 operations:
 - (1) coal handling and storage facilities (Operation Permit No. 3520-0002-0134);
 - (2) raw material handling, grinding and storage facilities (Operation Permit No. 3520-0002-0134);
 - (3) clinker handling and storage facilities (Operation Permit No. 3520-0002-0136); and
 - (4) cement grinding, storage and handling facilities (Operation Permit No. 3520-0002-0136 and Operation Permit No. 3520-0002-0138).

Details concerning these emission points are contained in the Part 70 permit application submitted October 15, 1996. The particulate matter emissions from these facilities shall be operated in accordance with their existing Operation Permits and shall also be controlled in accordance with the *Fugitive Dust Control Plan* submitted on September 19, 1997.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
3-0.1	Kiln No. 2	225	11	525,000	200
3-0.7	Clinker Cooler	100	7.5	158,600	160
1-30	Raw Material Silos	140	1.5	625	ambient
4-10	Grinding Mill 3	100	7.5	150,000	200
5-24	Cement Silos	190	3	10,500	ambient
1-14A	Secondary Crusher	54.2	1.8	8,500	77

Recommendation

The staff recommends to the Commissioner that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Information, unless otherwise stated, used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on May 16, 1996, with additional information received on numerous dates from September 17, 1996 to December 8, 1997.

Emissions Calculations

The emissions calculations are provided in Appendix A. The January 1995 Edition or the 1988 Edition of the EPA AP-42 Emission Factors were used to calculate the potential emissions from the source. EPA AP-42 does not provide information on PM10. Therefore, PM10 emissions were calculated using recent industry data which shows 92 percent of the PM is PM10.

Total Potential and Allowable Emissions

The following table represents the Indiana Permit Allowable Emissions Definition. These emissions are determined after compliance with applicable rules (326 IAC 2-2 and 326 IAC 12), based on 8,760 hours of operation per year at rated capacity.

Pollutant	Allowable Emissions (tons/year)	Potential Emissions (tons/year)
Particulate Matter (PM)	265	95,530
Particulate Matter (PM10)	229	86,598
Sulfur Dioxide (SO ₂)	2,380	2,380
Volatile Organic Compounds (VOC)	0	0
Carbon Monoxide (CO)	42.8	42.8
Nitrogen Oxides (NO _x)	2,066	2,431
Single Hazardous Air Pollutant (HAP)	0.361	0.361
Combination of HAPs	0.686	0.686

- (a) Allowable emissions are determined from the applicability of rule 326 IAC 2-2, which are calculated in the Emissions Calculations included in Appendix A.
- (b) The allowable emissions based on the rules cited are less than the potential emissions, therefore, the allowable emissions are used for the permitting determination.
- (c) Allowable emissions (as defined in the Indiana Rule) of at least one criteria pollutant are greater than 25 tons per year. Therefore, pursuant to 326 IAC 2-1, Sections 1 and 3, a construction permit is required.

County Attainment Status

- (a) Volatile organic compounds (VOC) and oxides of nitrogen (NO_x) are precursors for the formation of ozone. Therefore, VOC and NO_x emissions are considered when evaluating the rule applicability relating to the ozone standards. Putnam County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NO_x emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (b) Putnam County has been classified as attainment or unclassifiable for all criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

Source Status

The following emissions summary table represents the existing source PSD definition. These emissions are based on emissions after controls, based on 8,760 hours of operation per year at rated capacity.

Pollutant	Emissions (ton/yr)
PM	402
PM10	177
SO ₂	3278
VOC	24.4
CO	2831
NO _x	4389

- (a) This existing source is a major stationary source because it is in one of the 28 listed source categories and at least one regulated pollutant is emitted at a rate of 100 tons per year or more.
- (b) These emissions were based on the Facility Quick Look Report, dated September 18, 1996.

Proposed Modification

PTE from the proposed modification (based on 8,760 hours of operation per year at rated capacity including enforceable emission control and production limit, where applicable):

Pollutant	PM (ton/yr)	PM10 (ton/yr)	SO ₂ (ton/yr)	VOC (ton/yr)	CO (ton/yr)	NO _x (ton/yr)
Proposed Modification	265	229	2,380	0	42.8	2,066
PSD Significant Level	25	40	40	40	100	40

This existing major source is subject to the requirements of 326 IAC 2-2 and 40 CFR 52.21 for PM, PM₁₀, SO₂ and NO_x because these pollutants exceed the PSD significant level.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This existing source has submitted their Part 70 permit application (T-133-6927-00002) on October 15, 1996. The equipment being reviewed under this permit shall be incorporated in the submitted Part 70 permit application.

Federal Rule Applicability

40 CFR 63 (National Emissions Standards for Hazardous Air Pollutants)

There are presently no National Emissions Standards for Hazardous Air Pollutant (NESHAP) regulations for Portland Cement Plants.

40 CFR 60 (New Source Performance Standards)

The new wet process cement kiln and its new or modified associated equipment is subject to the New Source Performance Standard (NSPS) for Portland Cement Plants (40 CFR 60 Subpart K). Pursuant to this rule, the kiln shall not exceed 0.30 pounds of particulate matter per ton of raw feed and 20 percent opacity. The clinker cooler shall not exceed 0.10 pounds of particulate matter per ton of raw feed and 10 percent opacity. The two (2) pneumatically loaded raw material storage silos, identified as Unit 1-30, one (1) cement grinding mill, identified as Unit 4-10, six (6) pneumatically loaded cement storage silos, identified as Unit 5-24, the modified existing primary gyratory rock crusher, identified as Unit 1-8, and the modified secondary raw material crusher, identified as Unit 1-14A, shall not exceed 10 percent opacity. [40 CFR 60.62]

In addition to these emission limitations, this rule requires that the cement plant shall record the daily production rates and kiln feed rates. The kiln and clinker cooler shall install, calibrate, maintain, and operate a continuous opacity monitoring systems to measure the opacity of emissions discharged into the atmosphere. [40 CFR 60.63]

State Rule Applicability

326 IAC 2-6 (Emission Reporting)

This facility is subject to 326 IAC 2-6 (Emission Reporting), because the source emits more than 100 tons per year of at least one (1) regulated pollutant. Pursuant to this rule, the owner or operator of this facility must annually submit an emission statement of the facility. The annual statement must be received by July 1 of each year and must contain the minimum requirements as specified in 326 IAC 2-6-4.

326 IAC 2-2 (Prevention of Significant Deterioration)

This proposed modification is subject to the Prevention of Deterioration (PSD) rules for PM, PM₁₀, NO_x, and SO₂ because the emissions from these pollutants are above the PSD significant threshold levels reported in 326 IAC 2-2-1. Therefore, the PSD provisions require that this major modification be reviewed to ensure compliance with the National Ambient Air Quality Standards, the applicable PSD air quality increments, and the requirements to apply the best available control technology on the project's emissions.

The *Air Quality Analysis* report included in Appendix B was conducted to show that this major modification does not violate the National Ambient Air Quality Standards (NAAQS) and does not exceed the incremental consumption above 80 percent of the PSD increment for any pollutant. The pre-construction monitoring analysis showed that the SO₂ and PM₁₀ concentration exceeded the pre-construction monitoring de minimis levels specified in 326 IAC 2-2-4(b)(3). Therefore, pursuant to 326 IAC 2-2-4(c)(6), the IDEM shall require Lone Star to conduct post-ambient monitoring for PM₁₀ and SO₂ for a minimum period of three (3) years to determine the effect of said emissions from the source modification on air quality in the area.

The best available control technologies (BACT) for the facilities covered in this major modification are determined on a case-by-case basis by reviewing similar process controls and new available technologies. In addition, the cost per ton of pollutant removed, energy requirements, and environmental impacts are weighed in IDEM's final decision. Control technology summaries of the facilities covered in this major modification are discussed in the *BACT Analysis Report* included in Appendix C.

326 IAC 5-1-2 (Visible Emissions)

Kiln No. 2 is subject to the visible emissions requirements of this rule. According to this rule, visible emissions shall not exceed an average of 40 percent opacity in any 24 consecutive reading and 60 percent opacity for more than a cumulative total of 15 minutes in any 6 hour period. However, the visible emissions from Kiln No. 2 shall be limited by the visible emissions requirements of 40 CFR 60.62 (NSPS for Portland Cement Plants) because it represents the more stringent limit.

326 IAC 6-3-2 (Particulate Matter Emissions Limitations from Process Operations)

According to this rule, if any limitation established by this rule is inconsistent with applicable limitations contained in 326 IAC 12 (NSPS), then the limitation contained in 326 IAC 12 shall apply. This major modification is subject to the requirements of 326 IAC 12, and therefore shall be required in lieu of this rule.

326 IAC 7-1.1-2 (Sulfur Dioxide Limitations)

Kiln No.2 is subject to the sulfur dioxide emissions of this rule. According to this rule, sulfur dioxide emissions shall be limited to 6.0 pounds per MMBtu for coal or coal blend combustion. However, the sulfur dioxide emissions from Kiln No. 2 shall be limited by the emission limitation determined from 326 IAC 2-2-3 (PSD BACT) because it represents the more stringent limit.

Air Toxic Emissions

Indiana presently requests applicants to provide information on emissions of the 187 hazardous air pollutants set out in the Clean Air Act Amendments of 1990. These pollutants are either carcinogenic or otherwise considered toxic and are commonly used by industries. They are listed as air toxics on the OAM Construction Permit Application Form Y.

- (a) This modification will emit levels of air toxics less than those which constitute a major source according to Section 112 of the 1990 Amendments to Clean Air Act.
- (b) See Appendix A and Appendix B for detailed air toxic calculations and analysis.

Conclusion

The construction of a 380 MMBtu per hour coal-fired wet process portland cement kiln and associated equipment will be subject to the conditions of the attached proposed **Construction Permit No. CP-133-5886-00002**.

BEST AVAILABLE CONTROL TECHNOLOGY (BACT) REVIEW

The best available control technology (BACT) analyses for PM, PM₁₀, NO_x, and SO₂ for the new kiln operations have been conducted in accordance with the top-down guidance policy outlined in the 1990 draft USEPA *New Source Review Workshop Manual*. The USEPA RACT/BACT/LAER Clearinghouse and related state permits were reviewed for control technology information.

BACT for Production Process

Lone Star Industries, Inc., is proposing to construct and operate a second wet kiln located at its existing facility in Greencastle, Indiana. This modification project exceeds the emission thresholds that requires PSD review. As part of the PSD review process, the source must apply BACT.

Although the source is proposing to construct and operate a second wet kiln, research indicates that the dry process kiln is a more fuel efficient process utilizing only half the fuel required to produce the same amount of clinker. According to the USEPA *New Source Review Workshop Manual*, "consideration of alternative production processes is warranted and appropriate for consideration in the BACT analysis. A production process is defined in terms of its physical and chemical unit operations used to produce the desired product from a specified set of raw materials. In such cases, the permit agency may require the applicant to include the inherently lower-polluting process in the list of BACT candidates." Based on this information, the dry kiln is considered an alternative production process that must be reviewed as part of the BACT analysis.

The following technology scenarios were investigated and reviewed for BACT feasibility:

Process Options	Feasibility		
	Technical	Economic	Environ/Energy
Existing Wet Kiln + New Wet Kiln	Yes - The source is familiar with the wet kiln technology which allows for optimization of product quality while minimizing pollutant generation.	Yes - New wet kiln can utilize existing ancillary equipment and has a synergy with the existing operation.	No - The wet system would utilize more fuel which increases NOx and SO2 emissions.
Existing Wet Kiln + New Dry Kiln	Yes - However, there are technical difficulties because of the differences between the two kiln systems such as different raw material sizing requirements and difference in product quality.	No - The source would not be able to utilize existing ancillary equipment. Additional labor to control a different technology would be an additional operating expense.	Yes - The benefits would be better than the wet kiln system because of the lower fuel usage.
Replacement of Existing Wet Kiln and Proposed Wet Kiln with New Dry Kiln	Yes - This process has been the technology of choice in recent years.	No - Although the operating costs would be lower, the capital costs of a dry kiln system plus write off of current asset value of the wet kiln system would make this project infeasible.	Yes - This would be the optimal choice because the whole source would utilize this inherently lower-polluting process.
Modification of Wet Kiln to a Semi-Wet Kiln	No - This is not a proven technology as there are no semi-wet kilns currently in operation.	N/A	N/A

A confidential economic evaluation conducted by Lone Star justified to the satisfaction of the OAM that the dry kiln process was not economically feasible at its Greencastle facility. Dry kilns are more economically feasible when they are constructed at new (greenfield) sites. The costs associated with replacing existing wet kiln systems becomes economically infeasible unless they can be constructed on a large enough scale to make it economically competitive. The market at the Greencastle facility is not large enough to consider a dry kiln system. Therefore, IDEM has approved the proposed wet kiln system as BACT at this location because it has been determined to be the only feasible process option.

BACT for Wet Process Cement Kiln

The wet process cement kiln shall have a maximum rated capacity of 380 MMBtu per hour. The kiln shall be coal-fired with a maximum potential firing rate of 17 tons of coal per hour and a maximum feed rate of 135 tons per hour, which results in a maximum production rate of 75 tons per hour. The cement clinker production process requires the kiln to be operated at high temperatures on a very consistent basis. A specific temperature profile is required to initiate the chemical and physical reactions required to transform the raw materials into clinker. The burning zone temperature under normal operating conditions will be in the range of 2,400 degrees Fahrenheit to 2,800 degrees Fahrenheit. The raw materials, introduced to the kilns as a slurry mixture, must reach a temperature of 2,700 degrees Fahrenheit for the chemical and physical reactions to occur which produce clinker.

BACT for NOx

Oxides of nitrogen are generated during fuel combustion by oxidation of chemically-bound nitrogen in the fuel and by thermal fixation of nitrogen in the combustion air. The formation of NOx by oxidation of chemically-bound nitrogen is referred to as "fuel NOx" and the formation of NOx by the fixation of oxygen with nitrogen in the combustion air is referred to as "thermal NOx". Reducing the availability of oxygen in the primary combustion zone inhibits fuel and thermal NOx formation.

The proposed NOx BACT for the wet kiln includes the utilization of low-NOx burners, limiting the oxygen concentration at the back end of the kiln to no more than 3 percent, and limiting the primary air in the combustion zone to no more than 8 percent. These combustion techniques shall reduce NOx generation by 15 percent. A sophisticated monitoring control system is utilized to control the oxygen concentration and primary air in the kiln to ensure proper combustion.

There is no available information in the RACT/BACT/LAER Clearinghouse regarding the wet kiln technology. The dry kiln system could not be compared to the wet kiln system because the technology of the two systems are different.

The following add-on control devices have been identified as potential NOx control technologies for the wet cement kiln process:

Control Alternative	% Control Efficiency	Feasibility			Comment
		Technical	Economic	Environ	
SNCR	50	No	No	No	Not Feasible - The long residence times at optimum temperatures necessary for proper function of the SNCR unit would be difficult to achieve due to the varying temp profile of the kiln. This control has been performed on a dry kiln system, however the difference in operating conditions make it infeasible at a wet kiln.
Staged Air Combustion	20-50	No	n/a	n/a	Not technically feasible - Attempts to install SAC on existing kilns have resulted in high volatilization levels, buildup in kiln, and significant increases in CO and SO2.
Low-NOx Burners/Good Combustion	10-25	Yes	Yes	Yes	Feasible
SCR	---	No	n/a	n/a	Not technically feasible - The catalyst causes erosion and plugging and the heavy metals inherent in the product poisons the catalyst.
Flue Gas Recirculation	---	No	n/a	n/a	Not technically feasible - FGR in cement kilns would reduce the peak flame temperature below the temperatures necessary for proper clinker formation.

As shown in the above table, the proposed BACT is the only feasible control option available for the wet process cement kiln. By implementing good combustion practices along with low NOx burners, the NOx emissions can be reduced by 15 percent. This emissions reduction correlates to NOx emission limitations from the kiln operation of **471 pounds per hour, 3.49 pounds per ton feed, and 1.24 pounds per MMBtu.**

BACT for SO2

Sulfur dioxide is generated from both the sulfur compounds in the raw materials and from the sulfur in the coal. The sulfur from both of these sources is a necessary element for clinker production.

The proposed SO2 BACT for the wet kiln includes the absorption of SO2 by the alkaline raw material. The alkaline environment of the process will remove approximately 80 percent of the SO2 generated.

The following add-on control devices have been identified as potential SO2 control technologies for the wet cement kiln process:

Control Alternative	% Control Efficiency	Feasibility			Comment
		Technical	Economic	Environ	
Absorption by alkaline material	80	Yes	Yes	Yes	Not Feasible - The reaction in the highly alkaline environment converts much of the SO ₂ to CaSO ₄ , which is a clinker component.
Low Sulfur Coal		No	N/A	N/A	Not Technically Feasible - The low sulfur coal limits the heat available and the high flame temperature required in the combustion zone of a wet kiln necessary to dry and calcinize the raw materials.
Wet Scrubber	20	Yes	No	No	Not Feasible - The large amount of waste generated to remove a small fraction of the SO ₂ emissions and the additional energy required does not environmentally justify the necessity of a wet scrubber. In addition, the economic analysis demonstrated that this technology was not feasible.
Dry Scrubber	20	Yes	No	No	Not Feasible - The economic analysis demonstrated that this technology was not feasible. In addition, the large amount of waste generated to remove only a fraction of the SO ₂ emissions does not environ-mentally justify a dry scrubber.

The OAM did not locate any information in the RACT/BACT/LAER Clearinghouse (RBLC) regarding the wet kiln technology, but the the BACT analysis performed in the above table shows that the proposed BACT is the only feasible control option available for the wet process cement kiln. Control by the absorption of the alkaline materials is consistent with information in the RBLC for dry kiln technology, however, the dry kiln systems also utilize low sulfur coal which decreases SO₂ emissions. The dry kiln system is not comparable to the wet kiln system due to technology differences. Because the raw materials enter a dry kiln as a dry mixture, additional temperature requirements are not necessary. The technology of the wet kiln requires higher temperatures to dry the raw material slurry mixture. In order to generate these higher temperatures, a higher sulfur coal is required. Low sulfur coal, such as a Western United States coal has an average heat value of only 9,400 BTU/lb versus a higher sulfur coal that has an average of 11,500 BTU/lb. Because the low sulfur coal limits the heat available and the high flame temperature required in the combustion zone of a wet kiln, it is not a feasible control option in the wet kiln process.

A confidential economic evaluation conducted by Lone Star justified to the satisfaction of the OAM that the addition of a wet scrubber or dry scrubber was not economically feasible. Therefore, IDEM has approved the proposed alkaline absorption as BACT because it has been determined to be the only feasible process option. Approximately 80 percent of the SO₂ generated from the process is absorbed by the alkaline raw materials. This correlates to SO₂ emission limitations from the kiln operation of **543 pounds per hour, 4.03 pounds per ton feed, and 1.43 pounds per MMBtu.**

BACT for PM/PM10

Two (2) methods to control the PM emissions from the kiln were evaluated including a baghouse and an electrostatic precipitator (ESP). Both technologies are feasible options, and the ESP was chosen as the proposed BACT.

The following table represents a comparison of the proposed BACT limitations with other limitations from the RACT/BACT/LAER Clearinghouse (RBLC):

Facility	PM Emission Limitations				
	Proposed BACT	Proposed Control	RBLC		
			Source	Control	Limit
380 MMBtu/hr Wet Kiln System (75 tph clinker)	0.0255 gr/dscf 40.5 lb PM/hr 7.3 lb PM10/h	Low-NOx Burners; Maximum O2 and Primary Air Limits; Minimum Temp Limit in Combustion Zone	Ashgrove Cement - UT 2/93 (150 tpy kiln)	Baghouse	0.016 gr/dscf
			Carolina Cement - NC 8/92 (298 MMBtu/hr)	ESP	45.4 lb PM/hr; 36.3 lb PM10/hr
			Florida Crushed Stone 2/93 (83 tph clinker)	Fabric Filter	0.02 lb PM/ton feed
			Great Star Cement - NV 10/95	Baghouse	23.7 lb PM10/hr; 0.015 gr/dscf
			Holnam, Inc. - UT 6/92 and 4/94	ESP	0.016 gr/dscf
			Roanoke Cement - VA 7/94 (950,000 tpy)	ESP	192 tons PM/yr; 164 ton PM10/yr

As shown in the above table, the proposed PM/PM10 emission limitation for the wet kiln process compares favorably to consistent with similar BACT decisions for the dry kiln process.

IDEM has approved the proposed ESP which has a control efficiency of 99.6 percent. This is equivalent to 0.0255 grains per dry standard cubic feet. The PM emission limitations from the wet kiln are 40.5 pounds per hour, 0.54 pounds per ton clinker, and 0.107 pounds per MMBtu. This correlates to 0.30 pounds PM per ton of feed, which satisfies the NSPS requirement and the proposed MACT standard of 0.30 pounds PM per ton of feed. The PM10 emissions limitations from the wet kiln are 37.3 pounds of PM10 per hour, 0.50 pounds per ton clinker, and 0.098 pounds per MMBtu.

Clinker Cooler

The clinker formed in the kiln are transferred to the clinker cooler. The clinker cooler recoups up to 30 percent of the heat input to the kiln system, locks in desirable product qualities by freezing mineralogy, and makes it possible to handle the cooled clinker with conventional conveying equipment.

BACT for PM/PM10

Two (2) methods to control the PM emissions from the clinker cooler were evaluated including a baghouse and an electrostatic precipitator (ESP). The proposed PM/PM10 emission limitation for the clinker cooler is consistent with similar BACT decisions. The baghouse technology was chosen as BACT which has a control efficiency of 99.9 percent. This is equivalent to 0.03 grains per dry standard cubic feet. The PM emission limitations from the clinker cooler are 11.0 pounds of PM per hour and 0.082 pounds per ton of feed, which is less than the NSPS requirement and the proposed MACT standard of 0.10 pounds per ton of feed. The PM10 emissions limit from the clinker cooler is 10.1 pounds of PM10 per hour.

Existing Sources of PM Emissions Associated with Kiln No. 2

The raw material storage silos, cement grinding mill, and cement storage silos are existing permitted facilities which have been incorporated as part of the equipment associated with the Kiln No. 2 operations. The following BACT analyses show that the existing controls are considered BACT.

Storage Silos

The two (2) raw material storage silos share a common baghouse with an efficiency of 99 percent (0.004 gr/dscf), and the six (6) cement storage silos share a common baghouse with an efficiency of 99 percent (0.019 gr/dscf). This is equivalent to 0.13 pounds of PM per hour and 0.061 pounds of PM10 per hour. The material shall be pneumatically loaded to and from these silos. These facilities shall also not exceed an opacity of 10 percent, which also satisfies the NSPS requirements.

Cement Grinding Mill

The cement grinding mill is equipped with a baghouse that has an efficiency of 99 percent, which is equivalent to 0.00027 grains per dry standard cubic feet. This facility shall also not exceed an opacity of 10 percent, which also satisfies the NSPS requirements.

Modified Existing Sources of PM Emissions to Support both Kiln No. 1 and Kiln No. 2

The existing quarry activities, primary gyratory rock crusher, and secondary raw material crusher shall be modified to support both the Kiln No. 1 and Kiln No. 2 operations. The proposed permit supersedes those conditions relating to these facilities. These facilities shall be controlled in accordance with the *Fugitive Dust Control Plan* submitted on September 19, 1997 along with the following BACT determinations.

Quarry Activities

The quarry activities include blasting the rock from the quarry and loading and transferring the rock. The moisture content of the rock shall be at least 20 percent. The Fugitive Dust Control Plan shall also be implemented during operation. The additional particulate emissions from the truck loading operations for Kiln No. 2 is 0.639 pounds of PM per hour and 0.297 pounds of PM10 per hour.

Primary Gyratory Rock Crusher

The primary gyratory rock crusher shall use a water mist spray to control the PM and PM10 emissions by 90 percent. The particulate emissions from this operation shall not exceed 0.205 pounds of PM per hour and 0.103 pounds of PM10 per hour. This facility shall also not exceed an opacity of 10 percent, which satisfies the NSPS requirements.

Secondary Raw Material Crusher

The secondary raw material crusher shall use a baghouse to control the PM and PM10 emissions by 99 percent, or 0.044 pounds of PM per hour and 0.021 pounds of PM10 per hour. This is equivalent to 0.0008 grains per dry standard cubic feet. This facility shall also not exceed an opacity of 10 percent, which satisfies the NSPS requirements.

Unmodified Existing Sources of PM Emissions to Support both Kiln No. 1 and Kiln No. 2

The existing coal handling and storage facilities, raw material handling, grinding and storage facilities, clinker handling and storage facilities, and cement grinding, storage and handling facilities shall be operated in accordance with their existing operation permits and shall also be controlled in accordance with the *Fugitive Dust Control Plan* submitted on September 19, 1997. These facilities have not been modified, but have been incorporated into this proposed permit to indicate that these facilities now support Kiln No. 2 in addition to Kiln No. 1. Therefore, existing control systems are considered BACT.

The following table represents a comparison of the proposed BACT limitations with other limitations from the RACT/BACT/LAER Clearinghouse (RBLC):

Facility	NOx Emission Limitations				
	Proposed BACT	Proposed Control	RBLC		
			Source	Control	Limit
380 MMBtu/hr Wet Kiln System (75 tph clinker)	471 lb/hr 3.49 lb/ton feed 6.28 lb/ton clinker 1.24 lb/MMBtu	Low-NOx Burners; Maximum O2 and Primary Air Limits; Minimum Temp Limit in Combustion Zone	Ashgrove Cement - Utah 2/93 (150 tpy kiln)	Dry Kiln Process	336 lb/hr
			Carolina Cement - NC 8/92 (298 MMBtu/hr)	Dry Kiln Process; Combustion Design	548 lb/hr (1.84 lb/MMBtu)
			Florida Mining and Material 11/95 (79.6 tph clinker)	Dry Kiln Process; Good Combustion	250 lb/hr 30-day average (3.14 lb/ton clinker)
			Florida Crushed Stone 2/93 (83 tph clinker)	Dry Kiln Process; Combustion Practices	2.8 lb/ton clinker
			Great Star Cement - NV 10/95	Dry Kiln Process; SNCR	3.1 lb/ton clinker
			National Cement - CA 9/95 (340 MMBtu/hr)	Dry Kiln Process; Precalciner	3.4 lb/ton clinker
			Roanoke Cement - VA 7/94 (950,000 tpy)	Dry Kiln Process; Process Control; Precalciner	2850 tpy (6 lb/ton clinker)
			Tarmac Florida 2/91 (162.5 MMBtu/hr)	Dry Kiln Process; BACT not Rqd	0.7 lb/MMBtu

The limits summarized in the above table are for the dry kiln technology.

The following table represents a comparison of the proposed BACT limitations with other limitations from the RACT/BACT/LAER Clearinghouse (RBLC):

Facility	SO2 Emission Limitations				
	Proposed BACT	Proposed Control	RBLC		
			Source	Control	Limit
380 MMBtu/hr Wet Kiln System	543 lb/hr 4.03 lb/ton feed 7.24 lb/ton clinker 1.43 lb/MMBtu	Absorption of SO2 by the alkaline raw material	Carolina Cement - NC 8/92 (298 MMBtu/hr)	Absorption by the alkaline dust	171.4 lb/hr (0.58 lb/MMBtu)
			Florida Crushed Stone 11/95 (83 tph clinker)	Absorption by the alkaline process	0.27 lb/ton clinker
			Great Star Cement - NV 10/95	Limit Fuel to Coal with 1% Sulfur	0.416 lb/ton clinker
			Roanoke Cement - Va 7/94 (950,000 tpy)	Process Control	2370 tpy (5 lb/ton clinker)
			Tarmac Florida 2/91 (162.5 MMBtu/hr)	Limit Fuel Sulfur Content	1.2 lb/MMBtu

The limits summarized in the above table are for the dry kiln technology.

Indiana Department of Environmental Management Office of Air Management

Addendum to the Technical Support Document for New Construction and Operation

Source Name: Lone Star Industries, Inc.
Source Location: 3301 South County Road 150 West, Greencastle, Indiana
County: Putnam
Construction Permit No.: CP-133-5886-00002
SIC Code: 3241
Permit Reviewer: Michele M. Williams

On February 23, 1998, the Office of Air Management (OAM) had a notice published in the *Banner Graphics*, Greencastle, Indiana stating that Lone Star Industries, Inc., had applied for a construction permit to construct and operate a second coal-fired, wet process cement kiln rated at 380 million British thermal units (MMBtu) per hour and associated equipment. Whole, chopped, shredded, or crumbed waste tires may be utilized as an alternate fuel source to supplement up to 15 percent of the heat input to the kiln. The particulate (PM and PM₁₀) emissions will be controlled by the use of electrostatic precipitators, high efficiency fabric filters, and water mist suppression. The sulfur dioxide emissions generated by the combustion of coal and waste tires in the kiln will be controlled by the adsorption of the limestone slurry. Nitrogen oxide emissions also generated by the combustion of coal and waste tires in the kiln will be controlled by the utilization of low-NOx burners and by optimizing the stoichiometric air requirements for complete combustion and stable operation. The notice also stated that OAM proposed to issue a permit for this installation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

Comment 1: Written comments on various clarifications, additions and changes to the construction permit were received by Lone Star Industries, Inc., on March 20, 1998. It should be noted that the bold-face characters represent language that has been added to the proposed permit conditions and strikeout characters represent language that has been removed from the proposed permit conditions.

Response 1: The OAM has approved the following clarifications, additions and changes to the construction permit:

1. Putnam County officials recently provided a new street address for the Greencastle manufacturing facility. "Limedale Road" has been replaced with "3301 South County Road 150 West".
2. A.2(a)(3) and D.3 of the construction permit have been revised as follows to correctly describe the conveyor system:

"one (1) enclosed ~~screw~~ conveyor that transfers the clinker to the existing clinker transfer line at a maximum rate of 75 tons per hour."

3. A.2(b)(1) and D.3 of the construction permit have been revised as follows to clarify the difference between these two silos and the six future cement storage silos stated in A.2(b)(3):

“two (2) **existing** pneumatically loaded raw material storage silos....”
4. The last paragraph of A.2(b) of the construction permit has been revised as follows:

“The fly ash silos ~~have been constructed to support~~ **will also support** the proposed Kiln No. 2 operations....”
5. Operation Condition D.1.1(a) of the construction permit has been revised as follows to clarify the emission limitation:

“This emissions limitation is equivalent to 0.30 pounds per ton of feed (**dry basis**) which satisfies...”
6. Operation Condition D.1.7(b) has been revised as follows for clarity:

“**In the event the Permittee adds the capability to burn waste tires as a supplemental fuel**, compliance tests shall be....”
7. Operation Condition D.1.8 has been revised as follows to clarify the type of compliance tests required:

“(a) Compliance tests shall be performed ~~on Stack 3-0.1 of Kiln No. 2 operations every 2 ½ years for opacity, particulate matter, and dioxin/furan emissions to demonstrate compliance with the limitations required by Operation Conditions D.1.1, D.1.4 and D.1.5~~ **when the kiln is utilizing 100 percent coal. The compliance tests shall be performed for the pollutants stated in (a)(1) of this condition to demonstrate compliance with the limitations required by Operation Conditions D.1.1, D.1.2, and D.1.3, and to obtain information to ensure public health is protected.**

(1) Opacity, PM, PM₁₀, and NOx.

(b) **In the event that the Permittee is burning tires, and the initial performance tests show an increase in pollutant emissions from that of burning 100% coal, then a performance test shall be conducted every 2 ½ years. In addition to the increase in pollutant emissions, a performance test is required every 2 ½ years for dioxin/furan emissions.**

(c) In addition to the compliance tests, the following observations and recordkeeping requirements shall be performed....”
8. Operation Condition D.1.10(c) has been revised as follows to better clarify the scheduled inspection times:

“An inspection of the ESP shall be performed a minimum of two (2) times per ~~year~~ **12 month period. The inspection will normally be conducted during scheduled kiln down times.** A record shall be kept of the results of the inspection and the number of ESP part(s) replaced.”

9. Operation Condition D.1.11 (Visible Emission Determination) has been removed from this section of the construction permit. The Permittee is already required by Operation Condition C.10 to measure visible emissions from the source to demonstrate compliance with the opacity limitations. The remaining conditions in Section D.1 have been renumbered due to this deletion.

10. Operation Condition D.1.13 (Recordkeeping Requirement) has been revised as follows to represent the appropriate operation conditions:

“The Permittee shall maintain a log of information necessary to document compliance with Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, and ~~D.1.5~~ **D.1.6...**”

11. The first sentence of Operation Condition D.1.14 (Reporting Requirement) has been revised as follows to state the appropriate operation condition:

“The Permittee shall submit records of excess emissions (defined in 326 IAC 3-1.1-3) from the continuous emissions monitoring system for each parameter described in Operation Condition D.1.12 to show compliance with Operation Conditions D.1.1(c), D.1.2, ~~D.1.5(d), and D.1.5(e)~~ **D.1.6(d), and D.1.6(e)....**”

12. The particulate matter (PM) emission limit in Operation Condition D.2.1(a) has been revised from “11.0 pounds per hour” to “13.5 pounds per hour”. There was a data entry error concerning particulate matter emissions associated with the clinker cooler operations. The calculations, TSD, and modeling was all based on an emission rate of 13.5 pounds per hour.

13. The particulate matter less than 10 microns (PM10) emission limit in Operation Condition D.2.1(b) has been revised from “10.1 pounds per hour” to “12.4 pounds per hour”. There was a data entry error concerning particulate matter emissions associated with the clinker cooler operations. The calculations, TSD, and modeling was all based on an emission rate of 12.4 pounds per hour.

14. Operation Condition D.2.4 (Visible Emission Determination) has been removed from this section of the construction permit. The Permittee is already required by Operation Condition C.10 to measure visible emissions from the source to demonstrate compliance with the opacity limitations. The remaining conditions in Section D.2 have been renumbered due to this deletion.

Comment 2: Written comments on various clarifications, additions and changes to the construction permit were received by the Environmental Protection Agency (EPA) - Region 5 district on March 24, 1998.

Response 2: The OAM has made the following changes to the construction permit in response to the EPA comments:

1. The EPA inquired if the kiln will be equipped with a bypass system. The kiln will not be equipped with a bypass system; rather, it will be equipped with a two-compartment ESP system. Only one ESP compartment will be used during normal operation, and in the event of a malfunction, the airstream will be routed to the second ESP compartment as long as the second compartment is operating properly. Operation Condition D.1.10(d) has been revised as follows to clarify compliance requirements during failure of the ESP:

“In the event that an ESP compartment failure has been observed:

1. The affected process will be shut down immediately until the failed unit has been **repaired or** replaced; or
2. **The airstream shall be routed to the second ESP compartment, as long as the second compartment is functioning properly. If both ESP compartments are malfunctioning,** ~~Based upon the findings of the inspection, any additional~~ corrective actions will be devised within eight (8) hours of discover and will include a timetable for completion.”

Comment 3: In addition to the above comments, the OAM has made additional clarifications, additions and changes to the construction permit.

Response 3: The changes are as follows:

1. Operation Condition D.1.5 has been revised as follows to allow the limit to be superseded by the final NESHAP for portland cement plants:
 - (a) “Pursuant to 326 IAC 2-1-3(i)(8), the dioxin/furan emissions, during the combustion of waste tires as a supplemental fuel, shall not exceed 8.7×10^{-11} grains of 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalents per dry standard cubic feet (gr TEQ/dscf) corrected at 7 percent oxygen unless:
 - (1) the dioxin/furan stack test shows a higher result; and
 - (2) the stack test, or subsequent test shows that the temperature at the inlet of the control device is less than 400 degrees Fahrenheit and does not exceed 1.7×10^{-10} gr TEQ/dscf corrected at 7 percent oxygen.

The compliance stack tests required by Operation Condition D.1.7 shall establish which of these limits is appropriate.

- (b) **The Permittee shall comply with the dioxin/furan emission limitation required by the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Portland Cement Manufacturing Plants (40 CFR 63 and 326 IAC 20) upon promulgation. This rule shall supersede the dioxin/furan emission limitation required by (a) above.”**

2. Sulfur is introduced into the kiln process by the raw materials and the fuel. Upon further investigation by the OAM, it was determined that the requirements in Operation Condition D.1.11 (Sulfur Dioxide Compliance) were not sufficient because it only monitored the sulfur in the fuel. The majority of the sulfur is introduced by the raw materials, and because of the variability in the raw material composition, it is also necessary to monitor the sulfur in the raw materials to demonstrate compliance with the SO₂ emission limitations required by Operation Condition D.1.2. Therefore, Operation Condition D.1.11 (Sulfur Dioxide Compliance) has been removed from the permit and proposed Operation Condition D.1.12 (Continuous Emission Monitoring), renumbered as Operation Condition D.1.11 in the final permit, has been revised as follows to include an SO₂ emissions monitor:

“Pursuant to 326 IAC 2-2, 326 IAC 3, and 326 IAC 12, the Permittee shall continuously monitor and record the following parameters from Kiln No. 2 to demonstrate compliance with the limitations and operation standards required by Operation Conditions D.1.1(c), D.1.2, ~~D.1.5(d), and D.1.5(e)~~ **D.1.6(d), and D1.6(e)**:

- (a) opacity;
- (b) ~~nitrogen oxide emission rates~~ **sulfur dioxide emission rates**;
- (c) temperature in the burning zone of Kiln No. 2; and
- (d) oxygen concentration at the back end of Kiln No. 2.”

As shown above, the NO_x CEM has been removed from Operation Condition D.1.11. The amount of NO_x generated from the kiln is based on the specific design and configuration of the low-NO_x burners, the availability of oxygen in the combustion zone, and the temperature of the combustion zone. The performance test required by Operation Condition D.1.7 will be adequate to determine that the burners are installed and operating properly. Operation Conditions D.1.6(d) and (e) require temperature and oxygen concentration limitations that inhibit fuel and thermal NO_x formation, and Operation Conditions D.1.11(c) and (d) requires that the Permittee continuously monitor the these parameters to demonstrate compliance.

3. Because the Permittee is required to operate an SO₂ CEM under Operation Condition D.1.11, an SO₂ compliance test under Operation Condition D.1.7 is no longer required. Therefore, references of SO₂ emission requirements in Operation Conditions D.1.7(a)(1), D.1.7(b)(1) and D.1.7(c)(2) have been removed from the construction permit.
4. OAM has been informed that a proposed rule may change the number of tires that can be stored at a single outdoor location. Because the storage limit may change, references to the number of tires in Operation Condition C.11 have been eliminated. Operation Condition C.11 (Solid Waste Permit) has been revised as follows:

~~“The Permittee shall comply with the requirements of 329 IAC 12. No more than a total of 500 waste tires shall be accumulated at a single outdoor location.~~ **The Permittee shall not accumulate waste tires at a single outdoor location over the amount specified in 329 IAC 12** without receiving the proper approval from the Indiana Department of Environmental Management, Office of Solid and Hazardous Waste Management.

All other waste tires on-site shall be stored in covered trucks that are permitted to transport waste tires. The storage of waste tires at Lone Star Industries shall not exceed 203 tons of waste tires or 16,224 passenger tire equivalents (PTEs) at any time."

5. Operation Condition D.1.4 has been revised to better clarify PSD applicability. The emission factors are well established for coal burning operations and the calculated VOC and CO emissions are below the PSD threshold levels. However, there is limited emission factor data for tire burning operations and the calculated VOC and CO emissions are not well known. Because the PSD review was not performed for VOC or CO emissions and the VOC and CO emissions from tire burning are not well documented, the modification must be limited to below the PSD threshold levels. Therefore, Operation Condition D.1.4 (Emission Limitations ~~from Tire Combustion~~) has been revised as follows:

"To demonstrate the PSD rules do not apply pursuant to 326 IAC 2-2, the ~~combined net emissions increase~~ from Stack 3-0.1 of Kiln No. 2 shall not exceed 9.13 pounds of VOC per hour or 22.8 pounds of CO per hour ~~during the combustion of waste tires as a supplemental fuel.~~"

6. Operation Condition D.1.6(d) has been revised as follows to better clarify kiln temperature operating requirements:

"maintain a **minimum** temperature **of 1800° F** in the burning zone of Kiln No. 2 ~~between 1800° F and 2800° F~~ under normal operation conditions **until a minimum temperature is determined from a compliant stack test;**"

7. Operation Conditions D.1.7(c)(4) and D.1.8(c)(5) have been revised as follows to represent the appropriate operation condition:

"the weight of whole waste tires added to the kiln during the performance testing session for the combustion of coal and whole waste tires stated in (b) above shall be measured and recorded. The weight of the whole waste tires shall be used to calculate the heat input from the whole waste tires. The heat input from the whole waste tires during this performance testing session must be at least 95 percent of the maximum capacity allowed by Operation Condition ~~D.1.4(i)~~ **D.1.6(i)**...."

8. Operation Condition D.1.7(d) has been revised to better clarify the timeline requirements for compliance testing:

"The Kiln No. 2 compliance tests for ~~both~~ the utilization of 100 percent coal **shall be performed within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up.** ~~and the utilization of a fuel combination of coal and whole waste tires.~~ **Upon utilization of waste tires in Kiln No. 2, the compliance tests** shall be performed no later than the 30th day that the kiln actually burns waste tires or no later than 180 days after the 1st use of waste tires as a supplemental fuel, whichever is earlier."

9. Operation Condition D.1.9 has been revised as follows to represent the appropriate operation condition:

“Pursuant to 326 IAC 12 and 40 CFR 60, Subpart F, the Permittee shall maintain daily records of the following parameters for Kiln No. 2 to demonstrate compliance with the PM and opacity limitations required by Operation Conditions D.1.1(a), D.1.1(c), ~~D.1.5(a), and D.1.5(b)~~ **D.1.6(a), and D.1.6(b)**:

- (a) clinker production rate; and
- (b) kiln feed rates.”

5. References to particulate matter (PM) in Operation Conditions D.1.1(a), D.1.7(a)1 D.1.7(b)(1), D.2., and D.2., means total particulate matter consisting of PM and PM10, measured as the sum of filterable and condensable emissions using methods approved by the department. To remove any discrepancy, these operation conditions have been revised from “PM” to “total PM”.

AIR PERMIT APPLICATION - KILN 2 PROJECT
 CONSOLIDATED EMISSION CALCULATIONS - NEW KILN 2
 AND ADDITIONAL KILN 1 PRODUCTION

OPERATION - ACTIVITY	MAXIMUM POTENTIAL EMISSIONS (TSP) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (PM-10) TONS PER YEAR	MAXIMUM CONTROLLED EMISSIONS (TSP) TONS PER YEAR	MAXIMUM CONTROLLED EMISSIONS (PM-10) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (SOX) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (NOX) TONS PER YEAR	MAXIMUM CONTROLLED EMISSIONS (NOX) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (CO) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (LEAD) TONS PER YEAR
QUARRY:									
SUBTOTAL - QUARRY OPERATIONS	34.8	15.6	3.5	1.6				4.2	
RAW MATERIALS:									
SUBTOTAL - RAW MATERIAL HANDLING	81.6	35.7	4.8	2.1					
KILN - CLINKER PRODUCTION:									
SUBTOTAL - COAL HANDLING	24.1	5.4	0.50	0.18					
SUBTOTAL - KILN 2 (NEW)	92,640.0	85,147.0	226.0	208.0	2,380	2,431	2,066	39	0.23
SUBTOTAL - KILN 1 (ADDITIONAL)	22,989.2	21,164.2	52.6	48.4	529	540		9	0.05
CLINKER STORAGE, CEMENT GRINDING:									
SUBTOTAL - CLINKER STORAGE, CEMENT GRINDING	1,421.6	709.6	14.5	7.1					
BULK CEMENT STORAGE AND SHIPPING:									
SUBTOTAL - BULK CEMENT STORAGE AND SHIPPING	1,955.1	1,000.2	24.4	14.5					
CEMENT PACKAGING:									
SUBTOTAL - CEMENT PACKAGING	6.1	3.0	0.1	0.03					
GRAND TOTAL --	119,153	108,081	326	282	2,909	2,971	2,066	52	0.28

LONE STAR INDUSTRIES, INC. - GREENCASTLE, INDIANA
 IDENTIFICATION CP-133-5886
 PLANT ID 133-00002

KILN 2 PROJECT - AIR EMISSION ESTIMATE CALCULATIONS
 EMISSIONS ASSOCIATED WITH ADDITIONAL KILN 1 PRODUCTION

SUMMARY OF AIR EMISSION CALCULATIONS

OPERATION - ACTIVITY	MAXIMUM POTENTIAL EMISSIONS (TSP) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (PM-10) TONS PER YEAR	NET ESTIMATED EMISSIONS (TSP) TONS PER YEAR
QUARRY:			
SUBTOTAL - QUARRY OPERATIONS	6.3	2.8	0.6
RAW MATERIALS:			
SUBTOTAL - RAW MATERIAL HANDLING	14.7	6.4	0.9
KILN - CLINKER PRODUCTION:			
SUBTOTAL - COAL HANDLING	4.3	1.0	0.1
SUBTOTAL - KILN 1 (EXISTING)	22,996	21,175	53
CLINKER STORAGE, CEMENT GRINDING:			
SUBTOTAL - CLINKER STORAGE, CEMENT	256	128	3
BULK CEMENT STORAGE AND SHIPPING:			
SUBTOTAL - BULK CEMENT STORAGE AND	352	180	4
CEMENT PACKAGING:			
SUBTOTAL - CEMENT PACKAGING	1	0.50	0.01
GRAND TOTAL --	23,630	21,494	62

NET ESTIMATED EMISSIONS (PM-10) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (SOX) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (NOX) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (CO) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (LEAD) TONS PER YEAR
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0.3

0.76

0.4

0.03

48

529

540

0.00

0.00

1

3

0.01

53

529

540

1

0.00

EMISSION CALCULATIONS

LONE STAR INDUSTRIES, INC.
 GREENCASTLE, INDIANA
 CP-133-5886, PLT ID 133-00002

KILN 2 PROJECT - AIR EMISSION ESTIMATE CALCULATIONS - KILN 2 PRODUCTION

SUMMARY OF AIR EMISSION CALCULATIONS

OPERATION - ACTIVITY	MAXIMUM POTENTIAL EMISSIONS (TSP) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (PM-10) TONS PER YEAR	MAXIMUM CONTROLLED EMISSIONS (TSP) TONS PER YEAR	MAXIMUM CONTROLLED EMISSIONS (PM-10) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (SOX) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (NOX) TONS PER YEAR	MAXIMUM CONTROLLED EMISSIONS (NOX) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (CO) TONS PER YEAR	MAXIMUM POTENTIAL EMISSIONS (LEAD) TONS PER YEAR
QUARRY:									
SUBTOTAL - QUARRY OPERATIONS	28.4	12.7	2.8	1.3				3.43	
RAW MATERIALS:									
SUBTOTAL - RAW MATERIAL HANDLING	66.9	29.3	4.0	1.7					
KILN - CLINKER PRODUCTION:									
SUBTOTAL - COAL HANDLING	19.8	4.5	0.4	0.1					
SUBTOTAL - KILN 2 (NEW)	92,640	85,147	226.0	208.0	2,380	2,431	2,066	39	0.23
CLINKER STORAGE, CEMENT GRINDING:									
SUBTOTAL - CLINKER STORAGE, CEMENT GRINDING	1,166	582	12	6					
BULK CEMENT STORAGE AND SHIPPING:									
SUBTOTAL - BULK CEMENT STORAGE AND SHIPPING	1,603	820	20	12					
CEMENT PACKAGING:									
SUBTOTAL - CEMENT PACKAGING	5	3	0.05	0.03					
GRAND TOTAL --	95,529	86,599	265	229	2,380	2,431	2,066	42	0.23