

TATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **032013-003** Project Number: 2012-01-008
Installation Number: 099-0002

Parent Company: Buzzi Unicem USA

Parent Company Address: 100 Broadhead Road Suite 230, Bethlehem, PA 18017

Installation Name: River Cement Company dba Buzzi Unicem USA

Installation Address: 1000 River Cement Road, Festus, MO 63028

Location Information: Jefferson County, S40, T23, R6E

Application for Authority to Construct was made for:

The use of alternate fuels in place of a portion of the petroleum coke and coal fuel currently being combusted in the preheater/precalciner cement kiln at this installation. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

MAR - 5 2013

EFFECTIVE DATE

DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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| Project No. | 2012-01-008 |

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

River Cement Company dba Buzzi Unicem USA
Jefferson County, S40, T23, R6E

1. Annual Alternate Fuels Usage Restriction
 - A. River Cement Company dba Buzzi Unicem USA shall not combust more than 125,000 tons of alternate fuel in the preheater/precalciner cement kiln (EP 4-K-09) in any consecutive 12-month period.
 - B. River Cement Company dba Buzzi Unicem USA shall maintain an accurate record of the amount of alternate fuel combusted in the preheater/precalciner cement kiln (EP 4-K-09) and shall record the monthly and running 12-month totals of alternate fuel usage to demonstrate compliance with the limitations established in Special Condition 1.A.
2. Alternate Fuels Requirements
 - A. River Cement Company dba Buzzi Unicem USA shall not introduce any alternate fuel (excludes coal and coke) into the preheater/precalciner cement kiln (EP 4-K-09) which has less than a 5,800 Btu per pound heat content (as received).
 - B. River Cement Company dba Buzzi Unicem USA shall only accept and combust alternate fuels from any one or combination of the following non-hazardous secondary material groups:
 - 1) Group 1 – Commercial and Industrial By-Products and Waste: including, but not limited to, off-specification products, plastics, rubber components, tire manufacturing by products such as tire fluff and buffings, biomass (e.g. agricultural processing residues), paper, cardboard, waxed cardboard, fibers, textiles, polyurethane foam, and rubberized asphalt.
 - 2) Group 2 – Construction and Demolition Debris (C&D): including, but not limited to materials from C&D sites such as scrap wood, scrap tires, non-asbestos shingles, carpet, plastics void of PVCs,

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

non recyclable paper and plastics.

- 3) Group 3 – Domestic Waste: the separated fraction of residential streams including, but not limited to, paper, cardboard, plastics, and fabrics.

- C. River Cement Company dba Buzzi Unicem USA shall not introduce any alternate fuel (excludes coal and coke) into the preheater/precalciner cement kiln (EP 4-K-09) which has constituent concentrations greater than the following:

| Item | Description | Limit |
|------|-------------|------------------------|
| 1 | Ash | 18.0% by weight |
| 2 | Sulfur | 1.4% by weight |
| 3 | Chlorides | 0.55% by weight |
| 4 | Antimony | 45 parts per million |
| 5 | Arsenic | 13.0 parts per million |
| 6 | Beryllium | 0.2 parts per million |
| 7 | Cadmium | 2.0 parts per million |
| 8 | Chromium | 55 parts per million |
| 9 | Lead | 53.0 parts per million |
| 10 | Mercury | 0.20 parts per million |
| 11 | Nickel | 200 parts per million |

- D. River Cement Company dba Buzzi Unicem USA shall test each alternate fuel from each supplier for heat content and each constituent concentration to verify compliance with Special Condition 2.A. and 2.C.

3. Compliance with Previously Established Emission Limitations

- A. When combusting any alternate fuels at this installation, River Cement Company dba Buzzi Unicem USA shall continue to remain in compliance with all of the limitations and/or requirements associated with the preheater/precalciner cement kiln (EP 4-K-09) that were established in the Special Conditions of Permit Number 122005-005 and later amended in Permit Number 122005-005A.

{Note: The emission limitations established in the Special Conditions of Air Pollution Control Program Permit Number 122005-005A are provided below for reference purposes only.}

| Special Condition | Basis of Limitation or Restriction | Permit Number 122005-005 & Amendment 122005-005A |
|-------------------|------------------------------------|--|
|-------------------|------------------------------------|--|

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

| Number | | Limitation/Restriction |
|--------|--|---|
| 8 | Limitation for Particulate Matter less than 10 microns in diameter (PM ₁₀) | Emission rate shall not exceed: <ul style="list-style-type: none"> • 0.1925 pounds of filterable PM₁₀ per ton of clinker • 1.7325 pounds of total PM₁₀ per ton of clinker. |
| 3 | BACT Limitation for Carbon Monoxide (CO) | Emission rate shall not exceed: <ul style="list-style-type: none"> • 2.73 pounds of CO per ton of clinker produced from the PH/PC kiln system based on a 30-day rolling average. • 1,200 pounds of CO per hour of operation from the PH/PC kiln system based on a 1-hour average. |

- B. If the above limitations and/or requirements are revised in another New Source Review permit/amendment or in the installation's Operating Permit, then River Cement Company dba Buzzi Unicem USA shall remain in compliance with these revised limitations and/or requirements.
4. Stack Testing Requirements for Alternate Fuels Proposed in this Permit
- A. River Cement Company dba Buzzi Unicem USA shall conduct, at a minimum, the performance testing indicated below for the usage of alternate fuels in the preheater/precalciner cement kiln (EP 4-K-09) to quantify the specific air pollutant emission rate(s) from these materials and to demonstrate compliance with any emission/usage limitations established in this permit for these materials.

| Pollutant | Requirement |
|-----------------|--|
| CO | Test annually over a 48-hour test period |
| SO ₂ | Test annually over a 48-hour test period |
| NO _x | Test annually over a 48-hour test period |
| VOC | Test and monitor as required by 40 CFR Part 63 Subpart LLL for THC |
| PM | Test and monitor as required by 40 CFR Part 63 Subpart LLL. |

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| Project No. | 2012-01-008 |

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

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| PM ₁₀ | Test annually over a 48-hour test period |
| PM _{2.5} | Test annually with 4 test runs for mill-on and mill-off |

- B. Alternatively, River Cement Company dba Buzzi Unicem USA may use one or more of the continuous emissions monitors associated with the preheater/precalciner cement kiln (EP 4-K-09) to quantify the specific air pollutant emission rate(s) from the usage of alternate fuels instead of these performance tests.
- C. The above performance testing for each alternate fuel should be conducted during periods of representative conditions for the specific material being tested and conducted at the maximum anticipated process/usage rate for that alternate fuel, not to include periods of start-up, shutdown, or malfunction. The usage rate at which the performance testing is conducted shall become the maximum allowable hourly usage rate for that alternate fuel.
- D. A completed Proposed Test Plan (form enclosed) must be submitted to the Air Pollution Control Program at least 30 days prior to the proposed test date for conducting any such performance tests so that a pretest meeting may be arranged, if necessary, and to assure that the test date is acceptable for an observer to be present. The Proposed Test Plan must be approved by the Director prior to conducting the above required emissions testing.
- E. Within 120 days after the initial usage of an alternate fuel, the owner/operator shall have conducted the required performance tests for that alternate fuel. If one (1) or more of the above air pollutants for which testing is required by Special Condition Number 4.A is also required to be tested to demonstrate compliance with an applicable rule (such as 40 CFR Part 63 Subpart LLL, *National Emission Standard for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry, etc.*), then River Cement Company dba Buzzi Unicem USA may conduct the performance testing according to the time frames indicated by the applicable regulation.
- F. Two (2) copies of a written report of the performance test results must be submitted to the Director within 90 days of completion of the required performance testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample

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| Project No. | 2012-01-008 |

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

calculations from the required EPA Method for at least one (1) sample run for each air pollutant tested.

- G. The test report is to fully account for all operational and emission parameters addressed both in the permit conditions as well as in any other applicable state or federal rules/regulations.
 - H. The above time frames associated with this performance testing condition may be extended upon request of River Cement Company dba Buzzi Unicem USA and approval by the Director.
 - I. No later than 30 days after the performance test results are submitted, River Cement Company dba Buzzi Unicem USA shall provide the director with a report that establishes compliance with the projected actual emissions of the tested pollutants listed in Special Condition 4.A. The emission rates shall be reported in pounds per hour and tons per year so that the Air Pollution Control Program may verify the emissions of this project. If the difference between the projected actual emissions and the baseline actual emissions are greater than what was indicated in this permit, then River Cement Company dba Buzzi Unicem USA shall submit an application for an amendment to this permit to correct the emissions calculations.
5. Record Keeping and Reporting Requirements
- A. River Cement Company dba Buzzi Unicem USA shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.
 - B. River Cement Company dba Buzzi Unicem USA shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2012-01-008
Installation ID Number: 099-0002
Permit Number:

River Cement Company dba Buzzi Unicem USA Complete: June 29, 2012
1000 River Cement Road
Festus, MO 63028

Parent Company:
Buzzi Unicem USA
100 Broadhead Road Suite 230
Bethlehem, PA 18017

Jefferson County, S40, T23, R6E

REVIEW SUMMARY

- River Cement Company dba Buzzi Unicem USA has applied for authority to use alternate fuels in place of a portion of the petroleum coke and coal fuel currently being combusted in the preheater/precalciner cement kiln at this installation. New equipment will include a three-sided storage building, a feed hopper/feeder system and educator, and associated piping.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are expected from the combustion of the alternate fuels and are limited on a concentration basis.
- No additional New Source Performance Standards (NSPS) will apply to the preheater/precalciner cement kiln as a result of the usage of the alternate fuels being proposed in this permit.
- The National Emission Standards for Hazardous Air Pollutants (NESHAPs) 40 CFR 61 Subpart E, National Emission Standard for Mercury, will apply to certain alternate fuels.
- No additional currently promulgated Maximum Achievable Control Technology (MACT) regulations will apply to the preheater/precalciner cement kiln as a result of the usage of the alternate fuels being proposed in this permit. The installation is currently subject to the requirements of the MACT for Portland Cement Manufacturing (40 CFR 63, Subpart LLL).
- No additional air pollution control equipment is being proposed at the installation in association with the usage of the alternate fuels.
- The increase in emissions due to the use of the proposed alternate fuels associated with this permit application were calculated or otherwise limited to not exceed the de

minimis levels for any air pollutant. Therefore, this review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

- This installation is located in Jefferson County, a nonattainment area for the 8-hour ozone standard and the PM_{2.5} standard and an attainment area for all other criteria pollutants. Part of Jefferson County is a nonattainment area for lead. The installation is not located in the Jefferson County lead nonattainment area.
- This installation is on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation is classified as item number 3, Portland cement plants. The installation's major source level is 100 tons per year and fugitive emissions are counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing is required for the usage of the proposed alternate fuels.
- Revisions to the Part 70 Operating Permit application are required for this installation within 1 year of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

River Cement Company dba Buzzi Unicem USA (Buzzi) operates an existing Portland cement plant located in Jefferson County. This is an existing major source of air pollutants for New Source Review (NSR) purposes and a Part 70 source under operating permits. Buzzi operates a new preheater/calcliner kiln which was started in July 2009 under Permit #122005-005. The following permits have been issued to Buzzi from the Air Pollution Control Program.

Table 1: Permits issued by the Air Pollution Control Program

| Permit Number | Description |
|---------------|---|
| 052012-012 | A Section (5) permit for the modification an existing clinker handling system and an existing raw material crushing system |
| 012010-011A | Extension of temporary permit. |
| 012010-011 | Temporary permit for four 10 MMBTU/hr natural gas fired heaters. |
| 012010-010 | A Section (5) permit for the installation of a new fly ash system. |
| 022010-005 | A Section (5) permit for the use of an alternative fuel for the cement kiln. |
| 122003-008A | Amendment of Permit 122003-008 for the applicability of NSPS Subpart Y. |
| 122005-005A | Amendment of Permit 122005-005 and correction to as-built emission sources at the installation. |
| 122005-005 | A Section (8) permit for the replacement of two existing long-dry clinker production systems and their attending raw mill systems, with a single new clinker production line that will operate with an in-line raw mill and preheater/precalcliner kiln system, in addition to adding finish grinding capacity. |

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| 122003-008 | A Section (5) permit for an indirect-fired solid fuel mill/feed system to replace the direct-fired solid fuel systems currently being used on the existing cement kilns. A net emission increase analysis was conducted on all the criteria air pollutants for this project. |
| 052002-013 | A Section (5) permit for the replacement of four existing air separators at Finish Mill Number 1 and Finish Mill Number 2 with two air separators of a slightly larger capacity. A net emission increase analysis was conducted on PM10 for this project. |
| 1299-018 | A temporary permit issued on December 2, 1999, to conduct a test program of oxygen enrichment to the combustion zone of the cement kiln. |
| OP2000112 | A Part 70 Operating Permit issued on November 6, 2000. |
| 0693-008 | A Section (5) permit issued on June 14, 1993, for modification of fuel storage permit 0687-13A and fuel utilization permit 1288-004A in order to permit a change in the total number and volume of tanks, an increase in the annual fuel storage and utilization quantity, the addition of a vacuum operated truck, railcar, and on site container cleaning facility and the addition of another burner system to each kiln for the direct burning of high viscosity liquid (HVL) waste fuel. |
| 0293-006 | A Section (5) permit issued on January 22, 1993, to increase the cement storage capacity by one (1) silo with the addition of a reclaim conveyor and five (5) dust collectors. |
| 0687-013B | An amendment to Permit No. 0687-013A issued on November 30, 1990, for modification of waste fuel storage permit. |
| 1288-004A | An amendment issued on June 18, 1991, to modify the hazardous waste combustion Permit No. 1288-004. |
| 0687-013A | An amendment issued on January 26, 1990, to modify Permit No. 0687-013A to allow the installation and operation of three (3) 22,000 gallon and six (6) 39,000 gallon storage tanks in place of the ten (10) 30,000 gallon storage tanks originally permitted. |
| 1288-004 | A Section (5) permit issued on December 9, 1988, to allow River Cement Company to burn hazardous waste fuel D001 [ignitable, nonlisted hazardous waste]. This submittal covers the physical burning of the fuel. (Ref. J.Pintor, RC, letter to M.Stansfield, MDNR, 1/29/87) "Peripherals necessary to allow a cement kiln to burn hazardous waste fuel. These include a fuel supply system and an oxygen monitor in the kiln stack." |
| 0687-013 | A Section (5) permit issued on June 29, 1987, Construction of storage tanks associated with the burning of hazardous waste fuel D001 [ignitable, nonlisted hazardous waste], (Ref. J.Pintor, RC, letter to M.Stansfield, MDNR, 1/22/87). Construction of ten (10) 30,000 gallon tanks for storage of hazardous waste fuel. |

PROJECT DESCRIPTION

Buzzi has applied for authority to use alternate fuels in place of a portion of the petroleum coke and coal fuel currently being combusted in the preheater/precalciner cement kiln at this installation. New equipment will include a three-sided storage building, a feed hopper/feeder system and educator, and associated piping for the storage and delivery of alternate fuel to the precalciner.

Buzzi previously requested and received the authority to use a diatomaceous filter cake material as an alternate fuel in the cement kiln. In the current application, specific

materials were not identified as alternate fuels. However, Buzzi has proposed limits on the sulfur, chloride, organic and metal concentrations for the alternate fuels such that the emissions when combusting the alternate fuels would not cause an increase of emissions greater than those currently being reviewed.

The usage of the alternate fuels as outlined in this permit is not expected to change or cause an increase in the design capacity of the existing kiln, in the existing raw material handling/processing operations (with the exception discussed below), or in the finish mill operations for this installation. Additional haul road, storage pile, and handling operations will occur to accommodate the alternate fuels and the emissions increase from these operations has been included in the potential to emit of the project. Table 2 outlines the equipment affected by the alternate fuel usage. However, no changes or modification to the existing equipment is necessary to utilize the new material.

Table 2: List of affected equipment

| Emission Point | Description | PTE _{PM2.5} (tpy) | PTE _{PM10} (tpy) |
|----------------|---|----------------------------|---------------------------|
| 4-K-09A | Preheater/Precalciner Kiln - AF Combustion | * | * |
| 8-B-03C | Haul Road: (unpaved) Delivery of Alternate Fuel | 0.08 | 0.76 |
| 8-B-13 | Loading and Loadout of Storage Pile | 0.0584 | 0.3856 |
| 8-B-14 | Transfer from Loader to Feed Hopper | 0.0292 | 0.1928 |
| Total** | | 0.1676 | 1.34 |

*See Table 3 for more information on emissions.

**Not including emissions from the kiln.

The usage of these alternate fuels would represent a change in the method of operation for this source operation and as such might represent either a major modification or a modification to the existing installation. However, in order to qualify as a major modification, this change in the method of operation would have to result in a significant net emission increase of any air pollutant. To determine if the use of the proposed alternative fuel would result in a significant emissions increase, projected actual emissions of the new fuel as defined in 40 CFR 52.21(b)(41) was evaluated for the use in the actual-to-projected-actual applicability test as outlined in 40 CFR 52.21(a)(2)(iv)(c). Because the new kiln initially began operations in July 2009, the kiln is considered an existing emissions unit. This applicability test was also applied to the calculation of Hazardous Air Pollutant (HAP) emissions.

The projected actual emissions are based on the maximum annual rate of an existing unit as stated in 40 CFR 52.21(b)(41) including fugitive emissions and excluding that portion of the emissions that the emission unit could have accommodated during the baseline period (i.e. demand growth). Buzzi proposes to replace 30% weight of coal/petroleum coke used in the cement kiln with an alternate fuel. A special condition can be found in this permit limiting the amount of alternate fuel that can be burned annually. Therefore, the maximum annual emissions are based on the combustion emissions of coal/petroleum coke with the limited burning capacity of the alternate fuel. Concentration limits on the alternate fuel were proposed in the application and are limited by the conditions of this permit. The emissions resulting from the usage of alternate fuel include the effects of any controls on the emission rates.

The demand growth exclusion as stated in 40 CFR 52.21(b)(41)(ii)(c) was used in the actual-to-projected-actual applicability test for this project. Based on the exclusion, Buzzi can exclude emissions that the existing unit could have accommodated prior to the project, including any increased utilization due to product demand growth. Since the start-up of the new kiln, there has been a decline in the demand for cement due to the recent economic downturn, which has affected the operations of the kiln. Buzzi states that the kiln experienced downtime equivalent to seven months in 2010 and six and a half months in 2011. Buzzi submitted justification for a market increase in cement production which supports the maximum production rate originally permitted for the new kiln. Therefore, the kiln could have accommodated clinker production equivalent to the amount found in Permit Number 122005-005 prior to the current modification (and during the baseline period). The emissions associated with the demand growth were determined using the difference between the actual production rate from 2010 and 2011 and the maximum allowable production rate. These emissions were excluded in the determination of the projected actual emissions of the kiln for use in the applicability test and are summarized in Table 3.

Table 3: Projected Actual Emissions for the Kiln (tons per year)

| Pollutant | Maximum Annual Emission Rate | Demand Growth | Projected Actual Emissions |
|----------------------|------------------------------|---------------|----------------------------|
| PM _{2.5} | 144.86 | 73.98 | 70.88 |
| PM ₁₀ | 153.74 | 78.52 | 75.22 |
| SO _x | 532.8 | 272.12 | 260.68 |
| NO _x | 3,330 | 1,700.76 | 1,629.24 |
| VOC | 233.1 | 119.05 | 114.05 |
| CO | 1,332 | 680.30 | 651.7 |
| Lead | 0.11 | 0.06 | 0.05 |
| GHG mass | 1,998,000 | 1,020,456.9 | 977,543.1 |
| GHG CO _{2e} | 2,000,537 | 1,021,670.45 | 978,866.55 |

It should be noted that for compliance purposes, the maximum annual emission rate shall not be exceeded. This is based on 40 CFR 52.21(b)(41)(i), where projected actual emissions is defined as the “maximum annual rate, in tons per year at which an existing emissions unit is projected to emit a regulated NSR pollutant in any one of the 5 years following the date the unit resumes regular operation after the project...” In this case, the demand growth listed in Table 2 is excluded in the calculation of the increase in emission resulting from the project as prescribed in 40 CFR 52.21(b)(41)(ii)(c), and projected actual emissions for use in the applicability test is the difference between the maximum annual emission rate and the demand growth. However, when looking at the 5 year period after the project, the definition of projected actual emissions only references the maximum annual rate without consideration of the demand growth. Therefore, in determining compliance with the definition of projected actual emissions, the maximum annual emission rate as listed in Table 2 cannot be exceeded.

The baseline actual emissions for existing emissions units are based on a two year average of actual emissions within the last ten year period. Since the kiln started operation in July 2009, the two years used for the baseline actual emissions were 2010

and 2011. Baseline actual emissions were taken from the installation's 2010 and 2011 Emission Inventory Questionnaire (EIQ). Table 4 summarizes the determination of the baseline emissions.

Table 4: Baseline Actual Emissions for the Kiln (tons per year)

| Pollutant | Baseline Years | Actual Emissions | | |
|-----------------------|----------------|------------------|--------------|----------------|
| | | Year 1 | Year 2 | 2-Year Average |
| PM _{2.5} | 2010-2011 | 65.36 | 68.83 | 67.10 |
| PM ₁₀ | 2010-2011 | 69.36 | 73.51 | 71.44 |
| SO _x | 2010-2011 | 240.39 | 280.96 | 260.68 |
| NO _x | 2010-2011 | 1,502.46 | 1,756.02 | 1,629.24 |
| VOC | 2010-2011 | 105.17 | 122.92 | 114.05 |
| CO | 2010-2011 | 600.98 | 702.41 | 651.70 |
| Lead | 2010-2011 | 0.04 | 0.04 | 0.04 |
| GHG mass | 2010-2011 | 859,431.41 | 1,061,459.88 | 960,445.64 |
| GHG CO ₂ e | 2010-2011 | 859,587.38 | 1,063,964.18 | 961,775.78 |

Figure 1 outlines the equation used to determine if a significant emissions increase has occurred.

$$\text{Project Emissions} = \text{Projected Actual Emissions} - \text{Baseline Actual Emissions}$$

Where: $\text{Projected Actual Emissions} = \text{Maximum Annual Emission Rate} - \text{Demand Growth}$

Figure 1. Actual-to-Projected-Actual Applicability Test Equation for this project

The preheater/precalciner cement kiln that will be burning these alternate fuels is already subject to some restrictions/limitations that were originally established in the PSD Permit (Number 122005-005) to construct the kiln and in the subsequent amendments to that permit. The new kiln was approved to burn sufficient amounts of either coal or coke to produce up to a maximum of 2,220,000 tons of clinker annually. The permit also established specific emission limitations on the new cement kiln for CO based on a Best Achievable Control Technology analysis at the time the permit was issued and for PM₁₀ based on a netting analysis. If these limitations were to increase because of usage of the proposed alternate fuels, then the netting and/or BACT analysis would have to be re-evaluated to determine if the conclusions are still valid. In order to avoid revisiting the netting and/or BACT for the original PSD permit, a special condition was included in this permit to require that preheater/precalciner cement kiln remain in compliance with these same limitations when combusting any alternate fuel.

There is a certain amount of uncertainty as to whether the emission factors used in this review would be an accurate representation of the emissions that would occur when combusting these alternate fuels in a cement kiln or in this specific cement kiln. Therefore, a Special Condition was included in this permit to require emissions testing for specific air pollutants believed to be of possible concern for the alternate fuels proposed in this permit. Specifically, Buzzi will conduct annual stack testing of PM₁₀, PM_{2.5}, CO, SO₂, and NO_x. Although stack testing has been completed for the requirements of the original construction permit, additional stack testing is required to demonstrate projected actual emissions are not being exceeded.

Alternatively, Buzzi is allowed to substitute continuous emission monitoring system (CEMS) monitoring for annual testing. The kiln system is currently equipped with a CO CEMS to demonstrate compliance with existing CO permit limits. The CO CEMS will be used to monitor emissions while combusting alternate fuels and demonstrate that those emissions do not exceed the projected actual emissions. In addition, by monitoring CO emissions, Buzzi is able to control parameters that will maximize complete oxidation of the VOC in the alternate fuel. Therefore no increase of VOC emissions is expected from the combustion of the alternate fuel.

Testing is also required for the modification to determine if the alternate fuel will meet the concentration limits listed in Special Condition 2. Buzzi proposed to take limitations on the concentrations of metal HAPs in order to keep the increase in potential HAPs emissions for these fuels to below their respective SMAL. Therefore, no additional screen modeling was performed. By limiting all HAP metals and organic HAP in the alternate fuel, no increase in the emissions of HAP is expected.

Special conditions were included in this permit to restrict the usage of the alternate fuels to the replacement of 30% of coal as proposed in the permit application. Limitations were established on the maximum amount of alternate fuel that could be used in any consecutive 12-month period and on the maximum percentage of alternate fuel that could be used in the cement kiln at any specific time.

When proposing to burn alternate fuels in any combustion system, there is always the issue of whether the material/fuel is being burned for mainly for the energy recovery or for the destruction of the material. If the main purpose was for the destruction of the material, then the combustion unit would be considered to be an incinerator and subject to regulations and requirements under CAA 129. For the kiln to remain subject to CAA 112, the combustion of the alternate fuels proposed in this permit and any possible additional alternate fuels identified in the future should qualify for energy recovery purposes, and a special condition was included that requires the alternate fuel to meet the definition of a non-hazardous secondary material as defined in 40 CFR 241.3. If Buzzi decides to combust alternative materials other than NHSM, the kiln would need to comply with the applicable regulations.

One last concern for this review was that once the stack test(s) were conducted for an alternate fuel and more accurate emission rates were determined, the results/conclusions of the increase in potential emissions analysis would change. Therefore, a special condition was included in this permit to require that if the testing demonstrated that the emission rate(s) for an air pollutant increased over those used in this review for an alternate fuel, then a re-evaluation of the amount of the increased potential emissions would be done.

EMISSIONS/CONTROLS EVALUATION

The emission factors for the alternate fuel used in this analysis were obtained from information submitted by the applicant on the characteristics of the alternate fuel. A special condition is included in this permit that requires the testing of the composition of

the alternate fuel to ensure that the content of sulfur and trace metals of the alternate fuel material will not exceed that of coal/coke. By including this testing condition, there will not be an increase in HAP or SOx emissions.

The emission factors for the unpaved haul roads were taken from AP-42 Section 13.2.2 Unpaved Haul Roads (11/06). The emission factors for the handling and storage of the alternate fuel were taken from AP-42 Section 13.2.4 Aggregate Handling and Storage Piles (11/06). The following table provides an emissions summary for this project.

Table 5: Emissions Summary (tons per year)

| Pollutant | Regulatory <i>De Minimis</i> Levels | Existing Potential Emissions | Baseline Emissions (2010-11 EIQ) | Projected Actual Emissions* | Project Emissions (PAE – BAE) |
|-------------------------|-------------------------------------|------------------------------|----------------------------------|-----------------------------|-------------------------------|
| PM ₁₀ | 15.0 | Major | 71.44 | 76.56 | 5.12 |
| PM _{2.5} | 10.0 | Major | 67.10 | 71.05 | 3.95 |
| SOx | 40.0 | Major | 260.68 | 260.68 | 0 |
| NOx | 40.0 | Major | 1629.24 | 1629.24 | 0 |
| VOC | 40.0 | Major | 114.05 | 114.05 | 0 |
| CO | 100.0 | Major | 651.70 | 651.7 | 0 |
| HAPs | 10.0/25.0 | Major | N/A | 116.35 | N/A |
| GHG (mass) | 0 | Major | 960,446 | 977,543 | 17,097 |
| GHG (CO ₂ e) | 75,000 | Major | 961,776 | 978,867 | 17,091 |

N/A = Not Applicable

*Including PTE of affected equipment in Table 2.

According to 40 CFR 52.21(a)(2)(iv)(c), a modification is not a major modification if the sum of the potential-to-emit of the new equipment and the differences between the PAE and the BAE for existing emission units is less than the significant emissions level. Table 5 summarizes the actual-to-projected actual applicability test for the project. The potential emissions of the affected equipment in Table 4 have also been included in the project emissions increase for a comparison of the project emissions increase to the significant emissions levels. With the limitations in this construction permit, the increases in potential emissions for the alternate fuels do not exceed the de minimis/significant levels for any air pollutant. Therefore, this permit was reviewed under Section (5) of Missouri Rule 10 CSR 10-6.060, *Construction Permits Required*.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

APPLICABLE REQUIREMENTS

River Cement Company dba Buzzi Unicem USA shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information, 10 CSR 10-6.110*
- *Operating Permits, 10 CSR 10-6.065*
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin, 10 CSR 10-6.170*
- *Restriction of Emission of Visible Air Contaminants, 10 CSR 10-6.220*
- *Restriction of Emission of Odors, 10 CSR 10-6.165*

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes, 10 CSR 10-6.400*
- *Maximum Achievable Control Technology (MACT) Regulations, 10 CSR 10-6.075, National Emission Standards for Portland Cement Manufacturing, 40 CFR Part 63, Subpart LLL*
- *Emission Standards for Hazardous Air Pollutants, 10 CSR 10-6.080 – National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Mercury, 40 CFR Part 61, Subpart E*
- *Restriction of Emission of Sulfur Compounds, 10 CSR 10-6.260*

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

Emily Wilbur
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated December 20, 2011, received January 4, 2012, designating Buzzi Unicem USA as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

Ms. Kathryn Jost
Environmental Engineer
River Cement Company dba Buzzi Unicem USA
P.O. Box 1003
Festus, MO 63028

RE: New Source Review Permit - Project Number: 2012-01-008

Dear Ms. Jost:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact Emily Wilbur, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:ew

Enclosures

c: St. Louis Regional Office
PAMS File: 2012-01-008

Permit Number: