Indiana Department of Environmental Management
We Protect Hoosiers and Our Environment.
100 N. Senate Avenue • Indianapolis, IN 46204
(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov

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Governor

Carol S. Comer
Commissioner

NOTICE OF 30-DAY PERIOD
FOR PUBLIC COMMENT

Preliminary Findings Regarding a
Significant Modification to a
Part 70 Operating Permit

for Lone Star Industries, Inc. dba Buzzi Unicem USA, Inc. in Putnam County

Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002

The Indiana Department of Environmental Management (IDEM) has received an application from Lone Star Industries, Inc. dba Buzzi Unicem USA, located at 3301 South CR 150 West, Greencastle, Indiana 46135, for a significant modification of its Part 70 Operating Permit Renewal issued on December 23, 2014. If approved by IDEM's Office of Air Quality (OAQ), this proposed modification would allow Lone Star Industries, Inc. dba Buzzi Unicem USA to make certain changes at its existing source. Lone Star Industries, Inc. dba Buzzi Unicem USA submitted an application relating to the addition of a new bulk solids handling operation consisting of a hydrapulper mixer and two slurry mix tanks used to blend liquid hazardous waste for combustion in the kiln. This application requested the replacement of the fan housing of baghouse 210L, the removal of baghouse 500L with emissions from the bucket elevator identified as Point 3-22 (500V) now controlled by existing baghouse 503L and existing baghouse 503L1, the addition of a new dust collector 828L, and the revision of the normal pressure drop operating range of baghouse 606L.

The applicant intends to construct and operate new equipment that will emit air pollutants; therefore, the permit contains new or different permit conditions. In addition, some conditions from previously issued permits/approvals have been corrected, changed, or removed. These corrections, changes, and removals may include Title I changes. IDEM has reviewed this application and has developed preliminary findings, consisting of a draft permit and several supporting documents, which would allow the applicant to make this change.

A copy of the permit application and IDEM's preliminary findings are available at:

Putnam County Public Library
103 East Poplar Street
Greencastle, Indiana 46135

A copy of the preliminary findings is available on the Internet at: http://www.in.gov/ai/appfiles/idem-caats/.

How can you participate in this process?

The date that this notice is published in a newspaper marks the beginning of a 30-day public comment period. If the 30th day of the comment period falls on a day when IDEM offices are closed for business, all comments must be postmarked or delivered in person on the next business day that IDEM is open.

You may request that IDEM hold a public hearing about this draft permit. If adverse comments concerning the **air pollution impact** of this draft permit are received, with a request for a public hearing, IDEM will decide whether or not to hold a public hearing. IDEM could also decide to hold a public meeting instead of, or in addition to, a public hearing. If a public hearing or meeting is held, IDEM will make a separate announcement of the date, time, and location of that hearing or meeting. At a hearing,

you would have an opportunity to submit written comments and make verbal comments. At a meeting, you would have an opportunity to submit written comments, ask questions, and discuss any air pollution concerns with IDEM staff.

Comments and supporting documentation, or a request for a public hearing should be sent in writing to IDEM at the address below. If you comment via e-mail, please include your full U.S. mailing address so that you can be added to IDEM's mailing list to receive notice of future action related to this permit. If you do not want to comment at this time, but would like to receive notice of future action related to this permit application, please contact IDEM at the address below. Please refer to permit number 133-35865-00002 and 133-35884-00002 in all correspondence.

Comments should be sent to:

David Matousek
IDEM, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251
(800) 451-6027, ask for extension 2-8253
Or dial directly: (317) 232-8253
Fax: (317) 232-6749 attn: David Matousek
E-mail: dmatouse@idem.IN.gov

All comments will be considered by IDEM when we make a decision to issue or deny the permit. Comments that are most likely to affect final permit decisions are those based on the rules and laws governing this permitting process (326 IAC 2), air quality issues, and technical issues. IDEM does not have legal authority to regulate zoning, odor, or noise. For such issues, please contact your local officials.

For additional information about air permits and how the public and interested parties can participate, refer to the IDEM Permit Guide on the Internet at: http://www.in.gov/idem/5881.htm; and the Citizens' Guide to IDEM on the Internet at: http://www.in.gov/idem/6900.htm.

What will happen after IDEM makes a decision?

Following the end of the public comment period, IDEM will issue a Notice of Decision stating whether the permit has been issued or denied. If the permit is issued, it may be different than the draft permit because of comments that were received during the public comment period. If comments are received during the public notice period, the final decision will include a document that summarizes the comments and IDEM's response to those comments. If you have submitted comments or have asked to be added to the mailing list, you will receive a Notice of the Decision. The notice will provide details on how you may appeal IDEM's decision, if you disagree with that decision. The final decision will also be available on the Internet at the address indicated above, at the local library indicated above, and the IDEM public file room on the 12th floor of the Indiana Government Center North, 100 N. Senate Avenue, Indianapolis, Indiana 46204-2251.

If you have any questions, please contact David Matousek of my staff at the above address.

Nathan C. Bell, Section Chief
Permits Branch
Office of Air Quality

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Mr. Robert West, Environmental Manager
Lone Star Industries, Inc.
P.O. Box 482
Greencastle, Indiana 46135

Re: 133-35884-00002
Significant Permit Modification to
Part 70 Renewal No.: T133-33667-00002

Dear Mr. West:

Lone Star Industries, Inc. was issued Part 70 Operating Permit Renewal No. T133-33667-00002 on December 23, 2014 for a stationary portland cement manufacturing plant. Appplications requesting changes to the permit were received on May 26, 2015 and December 9, 2015. Pursuant to the provisions of 326 IAC 2-7-12, a significant permit modification to this permit is hereby approved as described in the attached Technical Support Document.

Please find attached the entire Part 70 Operating Permit as modififed, including the following revised attachment:

Attachment E: 40 CFR 63, Subpart LLL, National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry

The permit references the below listed attachments. Since these attachments have been provided in previous issued approvals for this source, IDEM, OAQ has not included a copy of these attachments with this modification:

Attachment A: Fugitive Dust Control Plan
Attachment B: 40 CFR 60, Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants
Attachment C: 40 CFR 60, Subpart Y, Standards of Performance for Coal Preparation and Processing Plants
Attachment D: 40 CFR 60, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984
Attachment F: 40 CFR 63, Subpart EEE, National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors
Attachment G: 40 CFR 61, Subpart FF, National Emission Standard for Benzene Waste Operations
Attachment H: 40 CFR 61, Subpart V, National Emission Standard for Equipment Leaks (Fugitive Emission Sources)
Attachment I: 40 CFR 63, Subpart DD, National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations
Attachment J: 40 CFR 63, Subpart ZZZZ, National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Previously issued approvals for this source containing these attachments are available on the Internet at: http://www.in.gov/ai/appfiles/idem-caats/.

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Federal rules under Title 40 of United States Code of Federal Regulations may also be found on the U.S. Government Printing Office's Electronic Code of Federal Regulations (eCFR) website, located on the Internet at: http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40tab_02.tpl.

A copy of the permit is available on the Internet at: http://www.in.gov/ai/appfiles/idem-caats/. For additional information about air permits and how the public and interested parties can participate, refer to the IDEM Permit Guide on the Internet at: http://www.in.gov/idem/5881.htm; and the Citizens' Guide to IDEM on the Internet at: http://www.in.gov/idem/6900.htm. This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5.

If you have any questions on this matter, please contact David Matousek of my staff, OAQ, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana, 46204-2251, or call at (800) 451-6027, and ask for David Matousek or extension 2-8253 or dial (317) 232-8253.

Sincerely,

Nathan C. Bell, Section Chief
Permits Branch
Office of Air Quality

Attachments: Significant Permit Modification and Technical Support Document

cc: File - Putnam County
Putnam County Health Department
U.S. EPA, Region 5
Compliance and Enforcement Branch

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Part 70 Operating Permit Renewal
OFFICE OF AIR QUALITY

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Lone Star Industries, Inc. dba Buzzi Unicem USA
3301 S. County Road 150 West
Greencastle, Indiana 46135

(herein known as the Permittee) is hereby authorized to operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this permit.

The Permittee must comply with all conditions of this permit. Noncompliance with any provisions of this permit is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Noncompliance with any provision of this permit, except any provision specifically designated as not federally enforceable, constitutes a violation of the Clean Air Act. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. An emergency does constitute an affirmative defense in an enforcement action provided the Permittee complies with the applicable requirements set forth in Section B, Emergency Provisions.

This permit is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

Operation Permit No.: T133-33667-00002		
Issued by: Original Signed by: Nathan C. Bell, Section Chief Permits Branch Office of Air Quality	Issuance Date: Expiration Date:	December 23, 2014 December 23, 2019

Significant Permit Modification No.: 133-35884-00002		
Issued by: Nathan C. Bell, Section Chief Permits Branch Office of Air Quality	Issuance Date: Expiration Date:	 December 23, 2019

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Attachment G: 40 CFR 61, Subpart FF
Attachment H: 40 CFR 61, Subpart V
Attachment I: 40 CFR 63, Subpart DD
Attachment J: 40 CFR 63, Subpart ZZZZ

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SECTION A SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the source contained in conditions A.1 through A.3 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(14)] [326 IAC 2-7-1(22)]

The Permittee owns and operates a stationary portland cement manufacturing plant.

Source Address:	3301 S. County Road 150 West, Greencastle, Indiana 46135
General Source Phone Number:	(765) 653-8816
SIC Code:	3241 (Cement, Hydraulic), 1422 (Crushed and Broken Limestone)
County Location:	Putnam
Source Location Status:	Attainment for all criteria pollutants
Source Status:	Part 70 Operating Permit Program Major Source, under PSD Rules Major Source, Section 112 of the Clean Air Act 1 of 28 Source Categories

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(14)]

This stationary source consists of the following emission units and pollution control devices:

(a) Quarry Activities:

(1) Removal and transfer of overburden material, drilling and blasting of limestone, and loading of raw materials using mobile equipment. Historic activities include the plant-wide use of overburden as raw materials, for landfill construction, erosion and dust control activities.

(b) Raw Material Sizing Activities:

(1) One (1) primary crusher, identified as Point 1-8 (201G) and one (1) vibrating feeder, identified as Point 1-9A (201V); both constructed in 1969, modified in 1998 and 1999, with a nominal capacity of 1,300 tons of limestone per hour, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(2) Outside storage piles, modified in 1999, with a throughput of 1,300 tons per hour, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(3) Raw material sizing transfer equipment including:

(A) One (1) apron feeder, identified as Point 1-14 (206V), constructed in 1969 and modified in 1999, with a nominal throughput of 400 tons per hour, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(B) One (1) belt conveyor, identified as Point 1-9B (214V), constructed in 1969, with a nominal throughput of 1,300 tons per hour, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(C) Three (3) pan feeders, identified as Point 1-11 (202V-204V), all constructed in 1969 and modified in 1999, with a nominal capacity of 1,300 tons per hour each, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(D) Three (3) belt conveyors, identified as Point 1-15 (215V, 305V, 251V), constructed in 1969, 1969, and 2000, respectively, with a nominal capacity of 1,300 tons per hour each, equipped with one (1) fabric filter system (FF 1-15, baghouse 209L) to control particulate emissions. Under 40 CFR 60, Subpart OOO, 215V is considered an affected facility.

(E) One (1) secondary crusher system, identified as SC-1, constructed in 2001, with a nominal capacity of 600 tons of limestone and additives per hour; controlled by six (6) baghouses/dust collectors 208L, 208L1, 210L, 202320, 202345, and 202380, exhausting to six (6) stacks 208L, 208L1, 210L, DC201 DC202 and DC203, respectively. The secondary crusher system is totally enclosed and consists of the following pieces of equipment:

(i) One (1) Hazemag single rotor impactor crusher, identified as GC202185.01, with a nominal capacity of 600 tons per hour, constructed in 2008, with emissions controlled by a baghouse, identified as 208L and exhausting through stack 208L. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(ii) Two (2) metso cone crushers, identified as GC202140.06 and GC202145.06, each with a nominal capacity of 350 tons per hour, each, constructed in 2008, with emissions controlled by two (2) dust collectors, identified as 202320 and 202345 and exhausting through stacks 202320 and 202345. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(iii) One (1) belt conveyor, identified as 202370, with a nominal capacity of 600 tons per hour, constructed in 2008, with emissions controlled by a dust collector, identified as 202380 and exhausting through stack 202380. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(iv) One (1) belt conveyor, identified as Point 1-16A (202G2V2), with a nominal capacity of 525 tons per hour; one (1) crusher, identified as Point 1-16C (202G2), with a nominal capacity of 525 tons per hour; one (1) belt conveyor, identified as Point 1-16D (202G2V3), with a nominal capacity of 525 tons per hour; all constructed in 2001, one (1) belt conveyor (205GV), all equipped with one (1) fabric filter system (FF 1-16, baghouse 208L1) to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(v) One (1) apron feeder, identified as Point 1-24 (202G2V1), with a nominal capacity of 600 tons per hour, constructed in 2001, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(vi) One (1) belt conveyor, identified as Point 1-25C (202G1V1); one (1) belt conveyor, identified as Point 1-25E (202G1V2); and one (1) belt conveyor, identified as Point 1-25F (202GV2); each with a nominal capacity of 600 tons per hour, all constructed in 2001, equipped with one (1) fabric filter system (FF 1-25, baghouse 208L) to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(vii) One (1) screen, identified as Point 1-26C (204G); three (3) belt conveyors, identified as Point 1-26D (202GV3 or 202GV3-1 or 202GV3-2); and one (1) belt conveyor, identified as Point 1-26E (202GV4); each with a nominal capacity of 600 tons per hour, all constructed in 2001, equipped with one (1) fabric filter system (FF 1-26, baghouse 210L) to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(F) One (1) clay slip operation, identified as CS-1, constructed in 2015, with a maximum rated capacity of 50 tons of clay (overburden consisting generally of clay with up to 5% limestone) per hour. The clay slip processing system includes covered overburden storage, with processing equipment totally enclosed; consists of the following pieces of equipment:

(i) One hopper, identified as HP-101 and one (1) Apron Feeder, identified as AP-101, constructed in 2015, with a nominal capacity of 60 tons per hour, constructed in 2015, with emissions controlled within a building enclosure. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(ii) Two (1) belt conveyors, identified as Points C-101, and C-102, constructed in 2015, with a nominal capacity of 50 tons per hour each. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(iii) One (1) Wet Clay Crusher identified as CR-101, constructed in 2015, with a nominal capacity of 50 tons per hour. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(iv) One (1) Log Washer identified as LW-101, constructed in 2015, with a nominal capacity of 50 tons per hour. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(v) One (1) Horizontal Deck Screen, identified as RS-101, constructed in 2015, with a nominal capacity of 50 tons per hour, with emissions controlled by wet suppression, within a building enclosure. Under 40 CFR 60, Subpart OOO, this is considered an affected facility. The average feed to the raw mill surge system will be 302 gpm wet slurry (50% water), including up to 32 tph clay and 1 tph limestone.

(vi) Two (2) slurry holding tanks, constructed in 2015 with a nominal throughput of 302 gallons per minute.

(c) One (1) gypsum material handling process, constructed in 2002 and modified in 2009, with a nominal production of 150 tons per hour of the blended synthetic gypsum material or rock gypsum, including the following units:

(1) One (1) synthetic gypsum transporting system, identified as 1-47. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Two (2) outdoor synthetic gypsum storage piles, identified as 62 and 64, with a nominal throughput of 268,056 tons per year, using wet suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) Three (3) synthetic gypsum hoppers, identified as 508120, 508140 and 508165; three (3) sets of screw conveyors (4 in each set), identified as 508130, 508150 and 508175; three (3) weigh belts, identified as 508125, 508145 and 508170; and four belt conveyors, identified as 661BC (508136 to mill #3) constructed in 2012, 604BC, 605BC (GC508156 and GC508157 to mill #1) and 602BC1 (GC508176 to mill #2), constructed in 2014, with a nominal throughput of 10.2 tons per hour each, using wet suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) rock gypsum and limestone material hopper (234F) and two (2) conveyor belts (234V, 234FV), identified as 1-38, with a nominal throughput of 150 tons per hour, constructed in 2002, using wet suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(d) Raw Material Ball Mill Operation, with a nominal capacity of 400 tons of raw material per hour, including the following units:

(1) Raw material ball mill transfer equipment including four (4) belt conveyors, identified as Point 1-17A (252V-255V); four (4) raw material bins, identified as Point 1-17B (350F-353F); all constructed on April 1, 2000, with a nominal capacity of 525 tons per hour, equipped with one (1) fabric filter system (FF 1-17, baghouse 350L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Two (2) weigh feeders, identified as Point 1-18A (352V-353V); one (1) conveyor belt, identified as Point 1-18B (358V); two (2) apron feeders, identified as Point 1-18C; and two (2) scavenger conveyors, identified as Point 1 18D (350V2, 351V2); all constructed on April 1, 2000, with a nominal capacity of 400 tons per hour; all utilizing a building enclosure to control particulate emissions. Two (2) weigh feeders (350V, 351V); equipped with one (1) fabric filter system (FF-18, baghouse 352L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(e) Fly Ash Storage and Additive Activities, including the following units:

(1) Two (2) rotary feeders (270V2, 271V2), one (1) weigh screw (275V), one (1) Pfister rotary feeder (276V), and one (1) weigh bin (273F) constructed March 2009; two screw conveyors, identified as Point 1-19A (273V, 274V); one (1) fly ash hopper, identified as Point 1-19B (273FA); and one (1) FK pump (273JA); all constructed on April 1, 2000, and modified February 8, 2002, with exception of 273FA and 273JA which were constructed in 2003, each with a nominal capacity

of 20 tons per hour, equipped with one (1) fabric filter system (FF 1-7, 273L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) One (1) fly ash silo, identified as Point 1-39 (270F), constructed on April 1, 2000, with a nominal capacity of 1,250 tons, equipped with two (2) fabric filter systems (FF 1-39, 270L, and baghouse 274L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) fly ash silo, identified as Point 1-40 (271F), constructed on April 1, 2000, with a nominal capacity of 1,250 tons, equipped with two (2) fabric filter systems (FF 1-40, 271L, and baghouse 274L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) Two (2) additive silos, identified as Point 1-21A (318F, 328F), each with a nominal capacity of 500 tons, four (4) rotary feeders, identified as Point 1-21B (318V, 318VV, 328V, 328VV), with a nominal capacity of 30 tons per hour each; all constructed on May 17, 1996, equipped with one (1) fabric filter system (FF 1-21, baghouse 319L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) additive feed bin, identified as Point 1-22 (308F), constructed after August 17, 1971 and before May 17, 1996, with a nominal capacity of 200 tons, covered by a building enclosure (BE 1-22) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) One (1) rotary feeder, identified as Point 1-23A (308V), constructed in 1996; and one (1) weigh belt, identified as Point 1-23B (309V), constructed after August 17, 1971; each with a nominal capacity of 30 tons per hour, covered by a building enclosure (BE 1-23) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(f) Coal Mill Operation:

(1) Coal storage piles, modified in 1999, with a throughput of 100 tons per hour utilizing building enclosures (BE 2-1) or compaction (CMP 2 16) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(2) Coal transfer equipment:

(A) Four (4) vibrating feeders, identified as Point 2-2A (209V-211V, 213V); one (1) belt conveyor, identified as Point 2-2B (222V); and one (1) coal grizzly, identified as Point 2-2C (223V); all constructed before 1974 and modified in 1999, with a nominal capacity of 100 tons per hour each, utilizing water mist suppression or equivalent dust suppression to control particulate emissions and covered by a building enclosure (BE 2-2) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(B) One (1) belt conveyor, identified as Point 2-4 (420V), constructed before 1974 and modified in 2000, with a nominal capacity of 100 tons per hour, covered by a building enclosure (BE 2-4) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

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(C) One (1) belt conveyor, identified as Point 2-6B (420V3), constructed on May 1, 2000, with a nominal capacity of 100 tons per hour, equipped with one (1) shared fabric filter system (FF 2-6, baghouse 420L2) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(D) One (1) belt conveyor (420V1), constructed on May 1, 2000, with a nominal capacity of 100 tons per hour, equipped with one (1) fabric filter system (baghouse 420L1) which exhausts into the building. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(3) Three (3) coal reject piles, identified as Points 2-3, 2-5, and 2-15, modified in 1999, with a throughput of 100 tons per hour, utilizing mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(4) One (1) raw coal bin, identified as Point 2-9 (435F), constructed May 1, 2000, with a nominal capacity of 100 tons, equipped with one (1) fabric filter system (FF 2-9, baghouse 435L) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(5) One (1) weigh feeder, identified as Point 2-10A (435V); and one (1) conveyor belt, identified as Point 2-10B (436V); all constructed on May 1, 2000, each with a nominal capacity of 61 tons per hour, covered by a building enclosure (BE 2-10) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(6) One (1) coal mill, identified as Point 2-11A (436G), with a nominal capacity of 40 tons of coal per hour, using a fuel oil fired burner during startup, and when additional heat is needed, and clinker cooler gas at other times to remove moisture from the coal (Note: For the purposes of NSPS Subpart Y, this is also a thermal dryer); and three (3) screw conveyors, identified as Point 2-11B (436LV, 436L1V, 436GV1), each with a nominal capacity of 40 tons per hour; all constructed on May 1, 2000, one (1) coal mill reject screw identified as 351155, and equipped with one (1) fabric filter system (FF 2-11, baghouse 436L) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(7) Two (2) screw conveyors, identified as Point 2-13B (437V, 438V), with a nominal capacity of 40 tons per hour; two (2) rotary feeders, identified as Point 2-13C (436LVV, 436L1VV), with a nominal capacity of 40 tons per hour; and one (1) pulverized coal bin, identified as Point 2-13A (438F), with a nominal capacity of 100 tons; all constructed on May 1, 2000, and equipped with one (1) fabric filter system (FF 2-13, baghouse 438L) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(g) One (1) alternate raw material feed system, constructed in 2007, operating at a maximum capacity of 20 tons per hour each, and consisting of the following pieces of equipment:

(1) Slag pile, identified as one of the materials identified in Point 1-13, controlled with water mist spray as needed. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) One (1) slag hopper, identified as 301132.01, with emissions uncontrolled. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) weight feeder, identified as 289V, with emissions uncontrolled. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) covered belt conveyor, identified as GC301132.05, and one (1) screw conveyor identified as 301132.08. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) bucket elevator, identified as 292V. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) Paved delivery roads with particulate emissions controlled by vacuum sweeping.

(7) One (1) non-hazardous alternate raw materials storage building. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(h) Kiln Operation, with a nominal capacity of 360 tons of dry raw feed per hour and 208 tons clinker per hour. Stack 3-1 includes a SO_2, NOx and CO_2 continuous emissions monitor (CEMS), particulate matter detection system (PMDS) and a continuous opacity monitoring system (COMS). This operation consists of the following:

(1) One (1) hammermill dryer, identified as Point 3-1C (440G), constructed on May 1, 2000, with a nominal capacity of 258 tons per hour, equipped with one (1) electrostatic precipitator (402L) with a 2,000 HP motor to control particulate emissions, exhausting to stack 3-1. Under 40 CFR 63, Subpart DD, and 40 CFR 63, Subpart EEE, this is considered an affected source.

(2) One (1) pre-heater, pre-calciner Portland cement kiln, originally constructed in 1966 and modified to the semi-dry system in 2000. The semi-dry kiln system includes one (1) calciner tower with staged combustion, identified as Point 3-1B (440PH), and one (1) rotary kiln, identified as Point 3-1A (401B), with a combined nominal rated capacity of 827 million British thermal units per hour. An oxygen enrichment system, constructed in 2006, introduces oxygen into the first stage pre-calciner and the front end of the rotary kiln. The semi-dry kiln system has a nominal rated clinker capacity of 208 tons per hour, using coal and the following supplemental fuels:

(A) hazardous waste fuel at a maximum rate allowed by the approved Boiler and Industrial Furnace Permit required by 40 CFR 270;

(B) plastic chips, carpet fibers, paper products, wood chips, chipped tires, toner, cosmetics, seed corn, and oil absorbent material including oil filter fluff;

(C) petroleum coke;

(D) distillate fuel for burner startup activities; and

(E) alternative fuel (spent pot liner).

Particulate emissions from the calciner and kiln are controlled by one (1) electrostatic precipitator (402L) with a 2000 HP motor, exhausting to stack 3-1. The ESP consists of nine (9) screw conveyors, identified as Point 3-1D (403V-410V, 404FV), constructed in 1968 and modified in 1999; and one (1) kiln dust chamber, identified as Point 3-1F (401BF1), constructed on January 1, 1969; each with a nominal capacity of (10) tons per hour. NOx emissions are controlled by a low-NOx calciner. The calciner exit includes a THC and O_2

continuous emissions monitor (CEMS). Under 40 CFR 63, Subpart EEE, and 40 CFR Part 63, Subpart DD, the calciner and kiln system is considered an affected source.

(3) One (1) return dust bin, identified as Point 3-3A (405F), constructed before 1971 and modified in 1999, with a nominal capacity of 100 tons; one (1) waste dust bin, identified as Point 3-3F (404F), constructed before 1971 and modified in 1999, with a nominal capacity of 75 tons; one (1) hopper, identified as Point 3-3C (445F), constructed on May 1, 2000, with a nominal capacity of 60 tons per hour; two (2) bucket elevators, identified as Point 3-3G (411V, 413V), constructed before August 17, 1971, with a nominal capacity of 60 tons per hour; and two (2) rotary feeders, identified as Point 3-3H (405FVV, 305286); one (1) screw conveyor, identified as Point 3-3I (405FVV1), constructed in 2003 except 305286 constructed in 2008 each with a nominal capacity of 60 tons per hour; and two (2) screw conveyors, identified as 305287 and 305288; all equipped with one fabric filter system (FF 3-3, baghouse 403L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) non-routine raw material dust truck loading station, constructed before 1971 and modified in 1999, covered by a building enclosure (BE 3-25) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) conditioning tower, identified as Point 3-5A (480F), with a nominal capacity of 40 tons per hour, using lime injection to control sulfur dioxide emissions; and one (1) alkali bypass system, identified as Point 3-5B, one (1) hopper, identified as Point 3-5C (484F), with a nominal capacity of ten (10) tons per hour; one (1) dust cyclone, identified as Point 3-5D (480FL), with a nominal capacity of 31 tons per hour; four (4) screw conveyors, identified as Point 3-5E (480LV1-LV3, 480V), each with a nominal capacity of ten (10) tons per hour; one (1) weigh hopper, identified as Point 3-5I (481FF); and one (1) pug mill, identified as Point 3-5J (484L); all constructed on May 1, 2000; one rotary feeder (481FV11) constructed in 2008, one screw conveyor (481J12) constructed in 2008, each with a nominal capacity of ten (10) tons per hour; all equipped with one (1) fabric filter system (FF 3-5, baghouse 480L), which exhausts to stack 3-1, to control particulate emissions. The alkali bypass duct contains a CO and O_2 CEMS. Under 40 CFR 63, Subpart EEE, this is considered an affected source.

(6) One (1) reject dust bin for cement kiln dust, identified as Point 3-7A (481F), with a nominal capacity of 150 tons, constructed on May 1, 2000, equipped with one (1) fabric filter system (FF 3-7, baghouse 483L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) One (1) alkali bypass system cement kiln dust truck loading station, identified as Point 3-8, constructed in 2000, utilizing mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) One (1) pneumatic dust pump, identified as FK Pump 485J and in-line diverter valve, installed in 2011. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(i) Clinker Cooler Operations, with a nominal capacity of 208 tons of clinker per hour:

(1) One (1) clinker cooler, identified as Point 3-9A (401C), constructed before August 17, 1971 and modified in 2000, with a nominal capacity of 208 tons per hour; one (1) clinker breaker, identified as Point 3-9B (401CG), constructed on January 1,

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1969 and modified in 2000, with a nominal capacity of 208 tons per hour; one (1) dropout chamber, identified as Point 3-9C (401CL), constructed January 1, 1969, with a nominal capacity of 20 tons per hour; two (2) vibrating feeders, identified as Point 3-9F (427V, 428V), constructed before August 17, 1971 and modified in 2000, with a nominal capacity of 208 tons per hour each; and one (1) drag conveyor, identified as Point 3-9G (401CV), and eight (8) screw conveyors (422V, 470CV2, 470CV3, 470CV9, 470CV10, 474V-476V), nine (9) rotary feeders (401CV1 and 471CLV1-8), all constructed before August 17, 1971 and modified in 2001, each with a nominal capacity of ten (10) tons per hour; all equipped with one (1) fabric filter system (FF 3-9, baghouse 471-CL) to control particulate emissions, exhausting to stack 3-2. Stack 3-2 has a continuous opacity monitoring system (COMS) and PM continuous parametric monitoring system (CPMS). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Two (2) belt conveyors, identified as Point 3-11A (421V, 509V); and two (2) bucket elevators, identified as Point 3-11B (418V, 419V); all constructed before 1971 and modified in 2000, with a nominal capacity of 208 tons per hour each (note that belt conveyor (421V) is a non-routine belt; all equipped with one (1) fabric filter system (FF 3-11, baghouse 406L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) non-routine outdoor clinker pile, identified as Point 3-13, modified in 1999, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) belt conveyor (turning tower), identified as Point 3-12 (510V), constructed before 1971 and modified in 2000, with a nominal capacity of 208 tons per hour, equipped with one (1) fabric filter system (FF 3-12, baghouse 506L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) bucket elevator, identified as Point 3-22 (500V), constructed on October 1, 1999, with a nominal capacity of 250 tons per hour, equipped with one (1) fabric filter system (FF 3-14, baghouses 503L and 503L1) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) Two (2) feeders, identified as Point 3-24A (207F, 208F); and one (1) belt conveyor, identified as Point 3-24B (219V); each constructed before August 17, 1971, with a nominal capacity of 300 tons per hour each, equipped with one (1) fabric filter system (FF 3-24, baghouse 220L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) Seven (7) clinker silos, identified as Point 3-14 (501A-507A), constructed before 1971 and modified in 1999, each with a nominal capacity of 5000 tons, equipped with two (2) fabric filter system (FF 3-14, baghouses 503L and 503L1) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) One (1) belt conveyor, identified as Point 3-21 (220V), constructed before August 17, 1971, equipped with one (1) fabric filter system (FF 3-21, baghouse 221L) which was installed in 2001 to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(j) Finish Mill Operations:

(1) Four (4) vibrating feeders, identified as Point 3-15 (504V-507V), constructed before 1971 and modified in 1999, with a nominal capacity of 250 tons per hour each, equipped with one (1) fabric filter system (FF 3-15, baghouse 505L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Four (4) vibrating feeders, identified as Point 3-17A (501V-503V, 508V); and one (1) belt conveyor, identified as Point 3-17B (221V); with a nominal capacity of 250 tons per hour each; all constructed before 1971 and modified in 1999, equipped with one (1) fabric filter system (FF 3-17, baghouse 504L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) Two (2) belt conveyors, identified as Point 3-20B (514V, 511V), constructed before August 17, 1971; one (1) bucket elevator, identified as Point 3-20A (513V), constructed on June 1, 2000; and one (1) belt conveyor, identified as 511V2, constructed in 2003; each with a nominal capacity of 250 tons per hour, 514V, 511V, and 513V are equipped with one (1) fabric filter system (FF 3-20, baghouse 513L) to control particulate emissions. 511V2 is equipped with baghouse 507L to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) belt conveyor, identified as Point 4-13A (515V), constructed in 1969 and modified in 2000, with a nominal capacity of 250 tons per hour; and four (4) silos, identified as Point 4-13B; 652A, constructed on January 1, 1969, with a nominal capacity of 2,260 tons, equipped with one (1) fabric filter system (FF 4-13, baghouse 515L) to control particulate emissions. 650A, 651A, and 653A, constructed on January 1, 1969 with a nominal capacity of 2,440; 2,315; and 200 tons, respectively, and controlled by baghouses 670L, 671L, and 672L, respectfully, (constructed in 2006) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) belt conveyor, identified as Point 4-14 (516V), constructed on January 1, 1969, with a nominal capacity of 250 tons per hour, equipped with one (1) fabric filter system (FF 4-14, baghouse 516L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) No. 1 Finish Mill, modified in 1993, with a nominal capacity of 70 tons of clinker per hour:

(A) Two (2) belt conveyors, identified as Point 4-1A (639V, 640V), constructed in 1971 and modified in 1999, with a nominal capacity of 250 tons per hour each; one (1) clinker bin, identified as Point 4-1B (601F), constructed before 1971 and modified in 1999, with a nominal capacity of 260 tons; one (1) gypsum bin, identified as Point 4-1C (603F), constructed before 1971 and modified in 1999, with a nominal capacity of 240 tons per hour; one (1) spill screw, identified as Point 4-1D (646V), constructed in 2002, with a nominal capacity of five (5) tons per hour; and one (1) belt conveyor, identified as 614V, modified in 2003, with a maximum capacity of 250 tons of clinker per hour; all equipped with one (1) fabric filter system (FF 4-1, baghouse 617L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

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(B) One (1) No. 1 finish mill, identified as Point 4-2A (603G), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; one (1) elevator, identified as Point 4-2B (626V), constructed before 1971 and modified in 1999, with a nominal capacity of 200 tons per hour; and one (1) spill screw, identified as Point 4-2D (642V), constructed 1969 and modified in 1999, with a nominal capacity of five (5) tons per hour; all equipped with one (1) fabric filter system (FF 4-2, baghouse 613L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(C) One (1) air separator, identified as Point 4-3A (605G), constructed in 1994 and modified in 1999, with a nominal capacity of 200 tons per hour; one (1) tailing screw, identified as Point 4-3D (613V), constructed in 1969 and modified in 1999, with a nominal capacity of 200 tons per hour; two (2) cement coolers, identified as Point 4-3E (603C, 604C), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour each; one (1) F.K. pump hopper, identified as Point 4-3G (611F), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; one (1) mill feed belt, identified as Point 4-3H (641V), constructed in 1974 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; and one (1) clinker F.O.W. belt, identified as Point 4-3I (601V), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons per hour; equipped with one (1) fabric filter system (FF 4-3, baghouse 606L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(D) One (1) fringe bin for off-specification cement and cement kiln dust, identified as Point 4-16A (604F), constructed before August 17, 1971, with a nominal capacity of 66 tons; and two (2) screw feeders, identified as Point 4-16B (611V, 604F1V), constructed on January 1, 1969, with a nominal capacity of 20 tons per hour each; equipped with one (1) fabric filter system (FF 4-16, baghouse 605L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(E) One (1) weigh belt, identified as Point 4-15A (605V), and one (1) belt conveyor, identified as Point 4-15B (616V), constructed before 1974, covered by a building enclosure to control particulate matter. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) No. 2 Finish Mill, with a capacity of 70 tons of clinker per hour:

(A) Two (2) conveyor belts, identified as Point 4-4A (639V, 640V), constructed 1969 and modified in 1999, with a nominal capacity of 250 tons per hour; one (1) clinker bin, identified as Point 4-4B (602F), constructed before 1971 and modified in 1999, with a nominal capacity of 260 tons; one (1) gypsum bin, identified as Point 4-4C (603F), constructed before 1971 and modified in 1999, with a nominal capacity of 240 tons; one (1) clinker F.O.W. belt, identified as Point 4-4D, (602V), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons per hour; and one (1) feed belt, identified as Point 4-4E (644V), constructed in 1975 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; all equipped with one (1) fabric filter system (FF 4-4, baghouse 636L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

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(B) One (1) No. 2 finish mill, identified as Point 4-5A (602G), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; and one (1) spill screw, identified as Point 4-5B (645V), constructed in 1969 and modified in 1999, with a nominal capacity of 5 tons per hour; all equipped with one (1) fabric filter system (FF 4-5, baghouse 603L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(C) One (1) air separator, identified as Point 4-6A (604G), constructed before 1971 and modified in 1999, with a nominal capacity of 200 tons per hour; one (1) elevator, identified as Point 4-6B (621V), constructed before 1971 and modified in 1999, with a nominal capacity of 200 tons per hour; one (1) tailing screw, identified as Point 4-6D (612V), constructed in 1969 and modified in 1999, with a nominal capacity of 200 tons per hour; two (2) cement coolers, identified as Point 4-6E (601C, 602C), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour each; one (1) F.K. pump hopper, identified as Point 4-6F (610F), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; and one (1) mill feed belt, identified as Point 4-6G (644V), constructed in 1975 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; all equipped with one (1) fabric filter system (FF 4-6, baghouse 602L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) No. 3 Finish Mill, with a nominal capacity of 95 tons of clinker per hour:

(A) One (1) No. 3 finish mill, identified as Point 4-9 (660G), constructed on June 1, 2000, with a nominal capacity of 95 tons of clinker per hour, equipped with one (1) fabric filter system (FF 4-9, baghouse 660L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(B) One (1) hopper, identified as Point 4-10C (667F), with a nominal capacity of 95 tons of clinker per hour; one (1) cooler, identified as Point 4-10D (664C), with a nominal capacity of 95 tons of clinker per hour; and one (1) feed belt, identified as Point 4-10E (654V), with a nominal capacity of 95 tons of clinker per hour; all constructed on June 1, 2000, equipped with one (1) fabric filter system (FF 4-10, baghouse 661L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(C) One (1) fringe bin for off-specification cement and cement kiln dust, identified as Point 4-11B (665F), with a nominal capacity of 80 tons; one (1) elevator, identified as Point 4-11C (661V), with a nominal capacity of 230 tons per hour equipped with one (1) clean-up hopper and one (1) clean-up screw 509530; and one (1) rotary feeder, identified as Point 4-11D (665FV), with a nominal capacity of 50 tons per hour; all constructed on June 1, 2000 and cleanup screw 1201V and hopper, constructed in 2007 with a nominal capacity of 10 tons per hour; all equipped with one (1) fabric filter system (FF 4-11, baghouse 665L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(D) One (1) air separator, identified as Point 4-12A (664G), constructed on June 1, 2000, with a nominal capacity of 230 tons per hour, and equipped with one (1) fabric filter system (FF 4-12, baghouse 664L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(E) Two (2) weigh feeders, identified as Point 4-17 (652V, 653V), constructed on January 1, 1969; and two (2) weigh feeders (650V, 651V), constructed on January 1, 1969, equipped with two (2) dust collectors (650L, 651L), installed in 2000, venting indoors; with a nominal capacity of 40 tons per hour each, covered by a building enclosure (BE 4-17) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(k) Cement Storage, Loading, and Packaging Activities:

(1) Three (3) Group 5 silos, identified as Point 5-1 (705A, 707A, 709A), constructed before 1971 and modified in 1999, with a nominal storage capacity of 10,000 tons each, with particulate emission controlled by one (1) fabric filter system (FF 5-1, baghouse 757L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Three (3) Group 5 silos, identified as Point 5-2 (706A, 708A, 710A), constructed before 1971 and modified in 1999, with a nominal storage capacity of 10,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-2, baghouse 758L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) Two (2) Group 4 silos, identified as Point 5-3 (702A, 704A), constructed in 1967 and modified in 1999, with a nominal storage capacity of 5,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-3, baghouse 702L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) Two (2) Group 4 silos, identified as Point 5-4 (701A, 703A), constructed in 1967 and modified in 1999, with a nominal storage capacity of 5,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-4, baghouse 701L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) Two (2) silos, identified as Point 5-29 (711A, 712A), constructed on January 1, 1969, with a nominal storage capacity of 5,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-29, baghouse 713L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) One (1) screen, identified as Point 5-5C (701G), constructed before 1971 and modified in 1999; and one (1) truck loader, identified as Point 5-5D (708L), constructed before 1971 and modified in 1999; each with a nominal capacity of 500 tons per hour, equipped with one (1) fabric filter system (FF 5-5, baghouse 703L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) One (1) screen, identified as Point 5-6B (702G), constructed before 1971 and modified in 1999; and one (1) railcar/truck loader, identified as Point 5-6C (709L), constructed before 1971 and modified in 1999; each with a nominal capacity of 500 tons per hour, equipped with one (1) fabric filter system (FF 5-6, baghouse 706L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

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(8) One (1) hopper, identified as Point 5-7B (701F), constructed before 1971 and modified in 1999, with a nominal capacity of 40 tons per hour, equipped with one (1) fabric filter system (FF 5-7, baghouse 710L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(9) One (1) hopper, identified as Point 5-8 (730F), constructed before 1971 and modified in 1999, with a nominal capacity of 40 tons per hour, equipped with one (1) fabric filter system (FF 5-8, baghouse 715L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(10) Three (3) screw conveyors, identified as Point 5-9A (809V, 809V1, 809V2), constructed before 1971, with a nominal capacity of 40 tons per hour each; one (1) alleviator, identified as Point 5-9C, constructed before 1971, with a nominal capacity of 40 tons per hour; and fourteen (14) Group 2 silos, identified as Point 5-9B (2S-7S, 9S, 11S-17S), constructed in 1924, with a combined nominal capacity of 24,842 tons; all equipped with one (1) fabric filter (FF 5-9, baghouse 808L) to control particulate matter. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(11) One (1) silo, identified as Point 5-10 (8S), constructed in 1924 and modified in 1999, with a nominal capacity of 5420 tons, equipped with one (1) fabric filter system (FF 5-10, baghouse 807L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(12) One (1) silo, identified as Point 5-11 (10S), constructed in 1924 and modified in 1999, with a nominal capacity of 5420 tons, equipped with one (1) fabric filter system (FF 5-11, baghouse 810L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(13) Four (4) Group 3 silos, identified as Point 5-13 (26S, 27S, 28S, and 29S), constructed in 1924 and modified in 1999, with a nominal capacity of 2,736 tons each, equipped with one (1) fabric filter system (FF 5-13, baghouse 27DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(14) Three (3) Group 3 silos, identified as Point 5-14 (18S, 20S, 22S), constructed in 1924 and modified in 1999, with a nominal capacity of 3,112 tons each, equipped with one (1) fabric filter system (FF 5-14, baghouse 22DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(15) Two (2) Group 3 silos, identified as Point 5-15 (24S, 30S), constructed in 1924 and modified in 1999, with a nominal capacity of 2,780 tons each, equipped with one (1) fabric filter system (FF 5-15, baghouse 24DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(16) Four (4) Group 3 silos, identified as Point 5-17 (19S, 21S, 23S, 25S), constructed in 1924 and modified in 1999, with a nominal capacity of 2,736 tons each, equipped with one (1) fabric filter system (FF 5-17, baghouse 25DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(17) One (1) screen elevator, identified as Point 5-18A (829V2), constructed before 1971, with a nominal capacity of 40 tons per hour, particulate emissions controlled by dust collector 828L. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

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(18) One (1) elevator, identified as Point 5-19B (829V1), constructed before 1971, with a nominal capacity of 40 tons per hour, particulate emissions controlled by dust collector 828L. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(19) Two (2) bulk tanks, identified as Point 5-23A (831F, 833F), with a nominal capacity of 20 tons each; and one (1) truck loader, identified as Point 5-23C, with a nominal capacity of 40 tons per hour; all constructed before 1971 and modified in 1999, except for 831V2 which was constructed in 2003, and equipped with one (1) fabric filter system (FF 5-23, baghouse 833L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(20) Three (3) bulk tanks, identified as Point 5-24A (832F, 834F, 835F), with a nominal capacity of 20 tons each, constructed before 1950 and modified in 1999, and equipped with one (1) fabric filter system (FF 5-24, baghouse 835L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(21) One (1) silo, identified as Point 5-26A (782F), with a nominal capacity of 2,430 tons; and one (1) bucket elevator, identified as Point 5-26B (781V), with a nominal capacity of 500 tons per hour; all constructed on December 1, 2000, and equipped with one (1) fabric filter system (FF 5-26, baghouse 782L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(22) One (1) lump breaker, identified as Point 5-27B (783V3); one (1) spout, identified as Point 5-27C (785L); and one (1) truck loader, identified as Point 5-27D; all constructed on December 1, 2000, with a nominal capacity of 500 tons per hour each, and equipped with one (1) fabric filter system (FF 5-27, baghouse 783L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(23) One (1) lump breaker, identified as Point 5-28B (784V3); one (1) spout, identified as Point 5-28C (786L); and one (1) truck loader, identified as Point 5-28D; all constructed on December 1, 2000, with a nominal capacity of 500 tons per hour each, and equipped with one (1) fabric filter system (FF 5-28, baghouse 784L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(24) Five (5) screw conveyors, identified as Point 5-30B (755V, 759V-762V), constructed in 1978; six (6) rotary feeders, identified as Point 5-30C (755M-760M), constructed in 1978; and one (1) hopper, identified as Point 5-30D (750F), constructed before August 17, 1971; with a nominal capacity of 40 tons per hour each, covered by a building enclosure (BE 5-30) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(25) Seventeen (17) screw conveyors, identified as Point 5-33A (818V1-825V1, 818V2-825V2, 830V) covered by a building enclosure (BE 5-33) to control particulate emissions; Two (2) screw conveyors, identified as Point 5-18C (828V1, 828V2), particulate emissions controlled by a dust collector 828L; and three (3) screen screws, identified as Point 5-33B (806V, 829V4, 830V1); all constructed before 1950, with a nominal capacity of 40 tons per hour each, and covered by a building enclosure (BE 5-33) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

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(l) One (1) blend facility, consisting of the following units:

(1) Five (5) screw conveyors, identified as Point 5-35A (22SC, 24SCG, 24SC, 30SC, 31SC), all constructed in 1989, with a nominal capacity of 40 tons per hour each, covered by a building enclosure (BE 5-35) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) One (1) transfer pod, identified as Point 5-36 (22) constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-36, filter 22-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) transfer pod, identified as Point 5-37 (24-G), constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-37, filter 24-PVDC-G) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) transfer pod, identified as Point 5-38 (24), constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-38, filter 24-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) transfer pod, identified as Point 5-39 (30), constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-39, filter 30-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) One (1) receiving tank, identified as Point 5-40, constructed in August 1989, with a nominal capacity of 20 tons, equipped with one (1) fabric filter system (FF 5-40, baghouse 40-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) One (1) blending tank, identified as Point 5-41A, with a nominal capacity of 20 tons; and one (1) blending pod, identified as Point 5-41C, with a nominal capacity of 25 cubic feet; all constructed in August 1989, equipped with one (1) fabric filter system (FF 5-41, baghouse 41-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) Two (2) silos, identified as Point 5-42 (50S, 51S), constructed August 1989, with a nominal capacity of 175 tons each, equipped with one (1) fabric filter system (FF 5-42, baghouse 50-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(9) Two (2) silos, identified as Point 5-43 (52S, 53S), constructed August 1989, with a nominal capacity of 175 tons each, equipped with one (1) fabric filter system (FF 5-43, baghouse 53-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(10) One (1) transfer pod, identified as Point 5-44B (50PV), constructed in August 1989, with a nominal capacity of 40 tons per hour, equipped with one (1) fabric filter system (FF 5-44, filter 50-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(m) Packhouse operations consisting of the following:

(1) One (1) elevator, identified as Point 6-1A (838V), constructed in 1945; one (1) packer bin, identified as Point 6-1B (Bin #1), constructed in 1946; one (1) packing machine, identified as Point 6-1C (842LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-1D (842F, 842FA), constructed in 1946; two (2) rotary feeders, identified as Point 6-1E (842M, 842MA), constructed in 1946; and four (4) screw conveyors, identified as Point 6-1F (842LV1, 837V, 837V1, 831V2), constructed in 1945; all modified in 1999, with a nominal capacity of 34 tons per hour each, and equipped with one (1) fabric filter system (FF 6-1, baghouse 842L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) One (1) elevator, identified as Point 6-2A (838V1), constructed in 1945; one (1) packer bin, identified as Point 6-2B (Bin #2), constructed in 1946; one (1) packing machine, identified as Point 6-2C (843LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-2D (843F, 843FA), constructed in 1945; two (2) rotary feeders, identified as Point 6-2E (843M, 843MA), constructed before 1971; and four (4) screw conveyors (843LV1, 817V1, 817V3, 817V7), identified as Point 6-2G; constructed in 1945; all modified in 1999, with a nominal capacity of 46 tons per hour each, and equipped with one (1) fabric filter system (FF 6-2, baghouse 843L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) elevator, identified as Point 6-3A (838V2), constructed in 1945; one (1) packer bin, identified as Point 6-3B (Bin #3), constructed in 1946; one (1) packing machine, identified as Point 6-3C (844LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-3D (844F, 844FA), constructed in 1945; two (2) rotary feeders, identified as Point 6-3E (844M, 844MA), constructed before 1971; and one (1) screw conveyor, identified as Point 6-3F (844LV1), constructed before 1971; all modified in 1999, with a nominal capacity of 65 tons per hour each, and equipped with one (1) fabric filter system (FF 6-3, baghouse 844L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) elevator, identified as Point 6-4A (838V3), constructed in 1945; one (1) packer bin, identified as Point 6-4B (Bin #4), constructed in 1946; one (1) packing machine, identified as Point 6-4C (845LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-4D (845F, 845FA), constructed in 1945; two (2) rotary feeders, identified as Point 6-4E (845M, 845MA), constructed before 1971; and one (1) screw conveyor, identified as Point 6-4F (845LV1), constructed before 1971; all modified in 1999, with a nominal capacity of 40 tons per hour each, and equipped with one (1) fabric filter system (FF 6-4, baghouse 845L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) Fourteen (14) conveyors, identified as Point 6-5 (842V-846V, 848V, 845V1, 847V1, 847V2, 848V1, 848V2, 849V1, 849V2, 849V3), constructed before 1971, with a nominal capacity of 185 tons per hour each, covered by a building enclosure (BE 6-5) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) Two (2) palletizers, identified as Point 6-6 (900H, 901H), constructed before 1971, with a nominal capacity of 185 tons per hour each, covered by a building enclosure (BE 6-6) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) One (1) truck loader, identified as Point 6-7, constructed before 1971, with a nominal capacity of 185 tons per hour, covered by a building enclosure (BE 6 7) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(n) One (1) truck unloading silo, identified as Tank 9 (240F), constructed in 2007, for unloading and pneumatically conveying alternative fuel (spent pot liner) to a silo, with a maximum throughput capacity of 33 tons per hour, with a maximum storage capacity of 700 tons, with particulate emissions controlled by a dust collector (identified as 240L), and exhausting to stack 240L. This is an affected facility under 40 CFR 63, Subpart LLL.

(o) One (1) enclosed pneumatic conveyance system, identified as 241F, constructed in 2007, for pneumatically conveying alternative fuel (spent pot liner) from the silo to the cement kiln, with a maximum throughput capacity of four (4) tons per hour, with particulate emissions controlled by a bin vent filter (identified as 241L), and exhausting to stack 241L. This is an affected facility under 40 CFR 63, Subpart LLL.

(p) One (1) portable screen and conveyor unit for the sizing of plant materials with a nominal throughput of 100 tons per hour, including reclamation of partially formatted clinker product, including the following units:

(1) One (1) vibrating feeder (F3-33)
(2) One (1) portable vibrating screen (S3-34)
(3) One (1) conveyor belt (S3-34)
(4) Hauling (F3-32)
(5) Handling (F3-32a)

Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

Under 40 CFR 63, Subpart LLL, the portable screen and conveyor units are considered affected facilities while the units are reworking partially formatted clinker.

(q) One (1) portable impact crushing plant, for the reclamation of partially formatted clinker and the resizing of aggregate prior to the raw material pile feeding the raw mill system, approved in 2014 for construction, with a nominal throughput of 100 tons per hour, bottlenecked by the raw material feed system, particulate matter and opacity controlled by water mist spray, containing the following processes:

(1) Handling (PF3-37a);
(2) One (1) vibrating feeder (PF3-38);
(3) One (1) optional screen;
(4) One (1) portable crusher (PC3-38);
(5) Two (2) conveyor belts (PS3-39) consisting of one main conveyor and one side conveyor;
(6) Two (2) open reclaimed clinker storage piles; and
(7) Two (2) open resized aggregate storage piles.

Under 40 CFR 63, Subpart LLL, the open reclaimed clinker storage piles are considered affected facilities while the units are reworking partially formatted clinker.

Under 40 CFR 60, Subpart OOO, the following portions of the portable impact crushing plant are affected facilities while resizing aggregate prior to the raw material pile feeding the raw mill system: handling, vibrating feeder, screening, crusher, conveyor transfer points, and aggregate storage piles.

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(r) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001**.** The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(1) One (1) hydrapulper, approved in 2016 for construction, identified as HP-02, with a nominal vessel volume of 2,500 gallons, and process volume of 2,250 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(i) One (1) waste feed hopper loaded from roll-off bulk containers, approved in 2016 for construction, identified as HP-01, with a nominal storage capacity of 25 yd^3 or 5,000 gallons of solids. Solids are transferred out of the hopper by an enclosed feed auger with a nominal capacity of 800 cubic feet of solids per hour. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Two (2) organic liquid slurry mix tanks, approved in 2016 for construction, identified as tank T12 and tank T13, each with a nominal storage capacity of 10,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(2) One (1) process permitted to blend solids in containers on loadout pads A or B, with hydraulic drives and agitators installed in 2012, identified as blend box, with a nominal vessel volume of 25 yd^3 (5,714 gallons), and a batch volume of 3,910 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(3) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(4) Three (3) liquid organic loadout areas consisting of three concrete pads, identified as Pad A and Pad B, both constructed in 1986, and Pad C, constructed in 1994.

(5) Fugitive VOC and HAP emissions from waste receiving, pumps, valves, connectors. [40 CFR 61, Subpart V]

A.3 Specifically Regulated Insignificant Activities [326 IAC 2-7-1(21)] [326 IAC 2-7-4(c)] [326 IAC 2-7-5(14)]

This stationary source also includes the following insignificant activities which are specifically regulated, as defined in 326 IAC 2-7-1(21):

(a) The following equipment related to manufacturing activities not resulting in the emission of HAPs: brazing equipment, cutting torches, soldering equipment, welding equipment [326 IAC 6-3-2];

(b) Cutting 200,000 linear feet or less of one inch (1") plate or equivalent [326 IAC 6-3-2];

(c) Trimmers that do not produce fugitive emissions and that are equipped with a dust collection or trim material recovery device such as a bag filter or cyclone [326 IAC 6-3-2]; and

(d) Conveyors as follows [326 IAC 6-3-2]:

(1) Covered conveyors for coal or coke conveying or less than or equal to 360 tons per day;
(2) Covered conveyors for limestone conveying of less than or equal to 7,200 tons per day for sources other than mineral processing plants constructed after August 31, 1983;
(3) Uncovered coal conveying of less than or equal to 120 tons per day; and
(4) Underground conveyors.

(e) Degreasing operations that do not exceed 145 gallons per 12 months, except if subject to 326 IAC 20-6 [326 IAC 8-3-2][326 IAC 8-3-8].

(f) One (1) non-hazardous waste alternate fuels handling process, identified as Point 2-18, constructed in 2007, with a maximum capacity of ten (10) tons of non-hazardous waste alternate fuel per hour, consisted of the following: [326 IAC 6-3-2]

(1) Two (2) hoppers, identified as 295F and 296F;
(2) Two (2) screw conveyors, identified as 295V and 296V;
(3) Two (2) weight feeders, identified as 295V1 and 296V1;
(4) Three (3) covered drag chain conveyors, identified as 296DCC, 297DCC, and 298DCC; and
(5) Two (2) bucket elevators, identified as 296BE and 297BE.

(g) Storage piles for non-hazardous waste alternate fuels, located inside a three-sided building, with a total maximum throughput rate of ten (10) tons/hr. [326 IAC 6-4]

(h) One (1) gasoline dispensing operations having a storage capacity of 1,016 gallons, handling less than or equal to 1,300 gallons per day and less than 10,000 gallons per month, located in the plant. [40 CFR 63, Subpart CCCCCC]

(i) One (1) gasoline dispensing operations having a storage capacity of 300 gallons, handling less than or equal to 1,300 gallons per day and less than 10,000 gallons per month, located in the packhouse. [40 CFR 63, Subpart CCCCCC]

(j) One (1) diesel-fired kiln emergency generator, identified as GC301273, with a maximum capacity of 755 bhp, constructed in 1999 and exhausting to stack GC301273.
[40 CFR 63, Subpart ZZZZ]

(k) One (1) diesel-fired emergency water pump, identified as GC653010, with a maximum capacity of 225 bhp, constructed in 1999 and exhausting to stack GC653010.
[40 CFR 63, Subpart ZZZZ]

(l) Diesel-fired portable engines (nonroad engines):

(1) One (1) 636 bhp quarry dewatering generator, identified as GC610049, constructed in 2006.
(2) One (1) 855 bhp quarry auxiliary generator, identified as GC610050, constructed in 1999.

(m) One (1) outdoor clinker storage pile, constructed in 1966, with a throughput of 100 tons of clinker per hour. Under 40 CFR 63, Subpart LLL, this is an affected facility.

A.4 Part 70 Permit Applicability [326 IAC 2-7-2]

This stationary source is required to have a Part 70 permit by 326 IAC 2-7-2 (Applicability) because:

(a) It is a major source, as defined in 326 IAC 2-7-1(22);

(b) It is a source in a source category designated by the United States Environmental Protection Agency (U.S. EPA) under 40 CFR 70.3 (Part 70 - Applicability).

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SECTION B GENERAL CONDITIONS

B.1 Definitions [326 IAC 2-7-1]

Terms in this permit shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-7) shall prevail.

B.2 Permit Term [326 IAC 2-7-5(2)] [326 IAC 2-1.1-9.5] [326 IAC 2-7-4(a)(1)(D)] [IC 13-15-3-6(a)]

(a) This permit, T133-33667-00002, is issued for a fixed term of five (5) years from the issuance date of this permit, as determined in accordance with IC 4-21.5-3-5(f) and IC 13-15-5-3. Subsequent revisions, modifications, or amendments of this permit do not affect the expiration date of this permit.

(b) If IDEM, OAQ, upon receiving a timely and complete renewal permit application, fails to issue or deny the permit renewal prior to the expiration date of this permit, this existing permit shall not expire and all terms and conditions shall continue in effect, including any permit shield provided in 326 IAC 2-7-15, until the renewal permit has been issued or denied.

B.3 Term of Conditions [326 IAC 2-1.1-9.5]

Notwithstanding the permit term of a permit to construct, a permit to operate, or a permit modification, any condition established in a permit issued pursuant to a permitting program approved in the state implementation plan shall remain in effect until:

(a) the condition is modified in a subsequent permit action pursuant to Title I of the Clean Air Act; or

(b) the emission unit to which the condition pertains permanently ceases operation.

B.4 Enforceability [326 IAC 2-7-7] [IC 13-17-12]

Unless otherwise stated, all terms and conditions in this permit, including any provisions designed to limit the source's potential to emit, are enforceable by IDEM, the United States Environmental Protection Agency (U.S. EPA) and by citizens in accordance with the Clean Air Act.

B.5 Severability [326 IAC 2-7-5(5)]

The provisions of this permit are severable; a determination that any portion of this permit is invalid shall not affect the validity of the remainder of the permit.

B.6 Property Rights or Exclusive Privilege [326 IAC 2-7-5(6)(D)]

This permit does not convey any property rights of any sort or any exclusive privilege.

B.7 Duty to Provide Information [326 IAC 2-7-5(6)(E)]

(a) The Permittee shall furnish to IDEM, OAQ, within a reasonable time, any information that IDEM, OAQ may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. Upon request, the Permittee shall also furnish to IDEM, OAQ copies of records required to be kept by this permit.

(b) For information furnished by the Permittee to IDEM, OAQ, the Permittee may include a claim of confidentiality in accordance with 326 IAC 17.1. When furnishing copies of requested records directly to U. S. EPA, the Permittee may assert a claim of confidentiality in accordance with 40 CFR 2, Subpart B.

B.8 Certification [326 IAC 2-7-4(f)] [326 IAC 2-7-6(1)] [326 IAC 2-7-5(3)(C)]

(a) A certification required by this permit meets the requirements of 326 IAC 2-7-6(1) if:

(1) it contains a certification by a "responsible official" as defined by 326 IAC 2-7-1(35), and

(2) the certification states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(b) The Permittee may use the attached Certification Form, or its equivalent with each submittal requiring certification. One (1) certification may cover multiple forms in one (1) submittal.

(c) A "responsible official" is defined at 326 IAC 2-7-1(35).

B.9 Annual Compliance Certification [326 IAC 2-7-6(5)]

(a) The Permittee shall annually submit a compliance certification report which addresses the status of the source's compliance with the terms and conditions contained in this permit, including emission limitations, standards, or work practices. All certifications shall cover the time period from January 1 to December 31 of the previous year, and shall be submitted no later than July 1 of each year to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

and

United States Environmental Protection Agency, Region V
Air and Radiation Division, Air Enforcement Branch - Indiana (AE-17J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

(b) The annual compliance certification report required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(c) The annual compliance certification report shall include the following:

(1) The appropriate identification of each term or condition of this permit that is the basis of the certification;

(2) The compliance status;

(3) Whether compliance was continuous or intermittent;

(4) The methods used for determining the compliance status of the source, currently and over the reporting period consistent with 326 IAC 2-7-5(3); and

(5) Such other facts, as specified in Sections D of this permit, as IDEM, OAQ may require to determine the compliance status of the source.

The submittal by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

B.10 Preventive Maintenance Plan [326 IAC 2-7-5(12)] [326 IAC 1-6-3]

(a) A Preventive Maintenance Plan meets the requirements of 326 IAC 1-6-3 if it includes, at a minimum:

(1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

The Permittee shall implement the PMPs.

(b) If required by specific condition(s) in Section D of this permit where no PMP was previously required, the Permittee shall prepare and maintain Preventive Maintenance Plans (PMPs) no later than ninety (90) days after issuance of this permit or ninety (90) days after initial start-up, whichever is later, including the following information on each facility:

(1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

If, due to circumstances beyond the Permittee's control, the PMPs cannot be prepared and maintained within the above time frame, the Permittee may extend the date an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

The PMP extension notification does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

The Permittee shall implement the PMPs.

(c) A copy of the PMPs shall be submitted to IDEM, OAQ upon request and within a reasonable time, and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ may require the Permittee to revise its PMPs whenever lack of proper maintenance causes or is the primary contributor to an exceedance of any limitation on emissions. The

PMPs and their submittal do not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(d) To the extent the Permittee is required by 40 CFR Part 60/63 to have an Operation Maintenance, and Monitoring (OMM) Plan for a unit, such Plan is deemed to satisfy the PMP requirements of 326 IAC 1-6-3 for that unit.

B.11 Emergency Provisions [326 IAC 2-7-16]

(a) An emergency, as defined in 326 IAC 2-7-1(12), is not an affirmative defense for an action brought for noncompliance with a federal or state health-based emission limitation.

(b) An emergency, as defined in 326 IAC 2-7-1(12), constitutes an affirmative defense to an action brought for noncompliance with a technology-based emission limitation if the affirmative defense of an emergency is demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that describe the following:

(1) An emergency occurred and the Permittee can, to the extent possible, identify the causes of the emergency;

(2) The permitted facility was at the time being properly operated;

(3) During the period of an emergency, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit;

(4) For each emergency lasting one (1) hour or more, the Permittee notified IDEM, OAQ within four (4) daytime business hours after the beginning of the emergency, or after the emergency was discovered or reasonably should have been discovered;

Telephone Number: 1-800-451-6027 (ask for Office of Air Quality, Compliance and Enforcement Branch), or
Telephone Number: 317-233-0178 (ask for Office of Air Quality, Compliance and Enforcement Branch)
Facsimile Number: 317-233-6865

(5) For each emergency lasting one (1) hour or more, the Permittee submitted the attached Emergency Occurrence Report Form or its equivalent, either by mail or facsimile to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

within two (2) working days of the time when emission limitations were exceeded due to the emergency.

The notice fulfills the requirement of 326 IAC 2-7-5(3)(C)(ii) and must contain the following:

(A) A description of the emergency;

(B) Any steps taken to mitigate the emissions; and

(C) Corrective actions taken.

The notification which shall be submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(6) The Permittee immediately took all reasonable steps to correct the emergency.

(c) In any enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency has the burden of proof.

(d) This emergency provision supersedes 326 IAC 1-6 (Malfunctions). This permit condition is in addition to any emergency or upset provision contained in any applicable requirement.

(e) The Permittee seeking to establish the occurrence of an emergency shall make records available upon request to ensure that failure to implement a PMP did not cause or contribute to an exceedance of any limitations on emissions. However, IDEM, OAQ may require that the Preventive Maintenance Plans required under 326 IAC 2-7-4(c)(8) be revised in response to an emergency.

(f) Failure to notify IDEM, OAQ by telephone or facsimile of an emergency lasting more than one (1) hour in accordance with (b)(4) and (5) of this condition shall constitute a violation of 326 IAC 2-7 and any other applicable rules.

(g) If the emergency situation causes a deviation from a technology-based limit, the Permittee may continue to operate the affected emitting facilities during the emergency provided the Permittee immediately takes all reasonable steps to correct the emergency and minimize emissions.

B.12 Permit Shield [326 IAC 2-7-15] [326 IAC 2-7-20] [326 IAC 2-7-12]

(a) Pursuant to 326 IAC 2-7-15, the Permittee has been granted a permit shield. The permit shield provides that compliance with the conditions of this permit shall be deemed compliance with any applicable requirements as of the date of permit issuance, provided that either the applicable requirements are included and specifically identified in this permit or the permit contains an explicit determination or concise summary of a determination that other specifically identified requirements are not applicable. The Indiana statutes from IC 13 and rules from 326 IAC, referenced in conditions in this permit, are those applicable at the time the permit was issued. The issuance or possession of this permit shall not alone constitute a defense against an alleged violation of any law, regulation or standard, except for the requirement to obtain a Part 70 permit under 326 IAC 2-7 or for applicable requirements for which a permit shield has been granted.

This permit shield does not extend to applicable requirements which are promulgated after the date of issuance of this permit unless this permit has been modified to reflect such new requirements.

(b) If, after issuance of this permit, it is determined that the permit is in nonconformance with an applicable requirement that applied to the source on the date of permit issuance, IDEM, OAQ shall immediately take steps to reopen and revise this permit and issue a compliance order to the Permittee to ensure expeditious compliance with the applicable requirement until the permit is reissued. The permit shield shall continue in effect so long as the Permittee is in compliance with the compliance order.

(c) No permit shield shall apply to any permit term or condition that is determined after issuance of this permit to have been based on erroneous information supplied in the permit application. Erroneous information means information that the Permittee knew to

be false, or in the exercise of reasonable care should have been known to be false, at the time the information was submitted.

(d) Nothing in 326 IAC 2-7-15 or in this permit shall alter or affect the following:

(1) The provisions of Section 303 of the Clean Air Act (emergency orders), including the authority of the U.S. EPA under Section 303 of the Clean Air Act;

(2) The liability of the Permittee for any violation of applicable requirements prior to or at the time of this permit's issuance;

(3) The applicable requirements of the acid rain program, consistent with Section 408(a) of the Clean Air Act; and

(4) The ability of U.S. EPA to obtain information from the Permittee under Section 114 of the Clean Air Act.

(e) This permit shield is not applicable to any change made under 326 IAC 2-7-20(b)(2) (Sections 502(b)(10) of the Clean Air Act changes) and 326 IAC 2-7-20(c)(2) (trading based on State Implementation Plan (SIP) provisions).

(f) This permit shield is not applicable to modifications eligible for group processing until after IDEM, OAQ, has issued the modifications. [326 IAC 2-7-12(c)(7)]

(g) This permit shield is not applicable to minor Part 70 permit modifications until after IDEM, OAQ, has issued the modification. [326 IAC 2-7-12(b)(8)]

B.13 Prior Permits Superseded [326 IAC 2-1.1-9.5] [326 IAC 2-7-10.5]

(a) All terms and conditions of permits established prior to T133-33667-00002 and issued pursuant to permitting programs approved into the state implementation plan have been either:

(1) incorporated as originally stated,

(2) revised under 326 IAC 2-7-10.5, or

(3) deleted under 326 IAC 2-7-10.5.

(b) Provided that all terms and conditions are accurately reflected in this permit, all previous registrations and permits are superseded by this Part 70 operating permit.

B.14 Termination of Right to Operate [326 IAC 2-7-10] [326 IAC 2-7-4(a)]

The Permittee's right to operate this source terminates with the expiration of this permit unless a timely and complete renewal application is submitted at least nine (9) months prior to the date of expiration of the source's existing permit, consistent with 326 IAC 2-7-3 and 326 IAC 2-7-4(a).

B.15 Permit Modification, Reopening, Revocation and Reissuance, or Termination [326 IAC 2-7-5(6)(C)] [326 IAC 2-7-8(a)] [326 IAC 2-7-9]

(a) This permit may be modified, reopened, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a Part 70 Operating Permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any condition of this permit. [326 IAC 2-7-5(6)(C)] The notification by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(b) This permit shall be reopened and revised under any of the circumstances listed in IC 13-15-7-2 or if IDEM, OAQ determines any of the following:

(1) That this permit contains a material mistake.

(2) That inaccurate statements were made in establishing the emissions standards or other terms or conditions.

(3) That this permit must be revised or revoked to assure compliance with an applicable requirement. [326 IAC 2-7-9(a)(3)]

(c) Proceedings by IDEM, OAQ to reopen and revise this permit shall follow the same procedures as apply to initial permit issuance and shall affect only those parts of this permit for which cause to reopen exists. Such reopening and revision shall be made as expeditiously as practicable. [326 IAC 2-7-9(b)]

(d) The reopening and revision of this permit, under 326 IAC 2-7-9(a), shall not be initiated before notice of such intent is provided to the Permittee by IDEM, OAQ at least thirty (30) days in advance of the date this permit is to be reopened, except that IDEM, OAQ may provide a shorter time period in the case of an emergency. [326 IAC 2-7-9(c)]

B.16 Permit Renewal [326 IAC 2-7-3] [326 IAC 2-7-4] [326 IAC 2-7-8(e)]

(a) The application for renewal shall be submitted using the application form or forms prescribed by IDEM, OAQ and shall include the information specified in 326 IAC 2-7-4. Such information shall be included in the application for each emission unit at this source, except those emission units included on the trivial or insignificant activities list contained in 326 IAC 2-7-1(21) and 326 IAC 2-7-1(42). The renewal application does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

Request for renewal shall be submitted to:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

(b) A timely renewal application is one that is:

(1) Submitted at least nine (9) months prior to the date of the expiration of this permit; and

(2) If the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(c) If the Permittee submits a timely and complete application for renewal of this permit, the source's failure to have a permit is not a violation of 326 IAC 2-7 until IDEM, OAQ takes final action on the renewal application, except that this protection shall cease to apply if, subsequent to the completeness determination, the Permittee fails to submit by the deadline specified, pursuant to 326 IAC 2-7-4(a)(2)(D), in writing by IDEM, OAQ any additional information identified as being needed to process the application.

B.17 Permit Amendment or Modification [326 IAC 2-7-11] [326 IAC 2-7-12]

(a) Permit amendments and modifications are governed by the requirements of 326 IAC 2-7-11 or 326 IAC 2-7-12 whenever the Permittee seeks to amend or modify this permit.

(b) Any application requesting an amendment or modification of this permit shall be submitted to:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

Any such application does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) The Permittee may implement administrative amendment changes addressed in the request for an administrative amendment immediately upon submittal of the request. [326 IAC 2-7-11(c)(3)]

B.18 Permit Revision Under Economic Incentives and Other Programs [326 IAC 2-7-5(8)] [326 IAC 2-7-12(b)(2)]

(a) No Part 70 permit revision or notice shall be required under any approved economic incentives, marketable Part 70 permits, emissions trading, and other similar programs or processes for changes that are provided for in a Part 70 permit.

(b) Notwithstanding 326 IAC 2-7-12(b)(1) and 326 IAC 2-7-12(c)(1), minor Part 70 permit modification procedures may be used for Part 70 modifications involving the use of economic incentives, marketable Part 70 permits, emissions trading, and other similar approaches to the extent that such minor Part 70 permit modification procedures are explicitly provided for in the applicable State Implementation Plan (SIP) or in applicable requirements promulgated or approved by the U.S. EPA.

B.19 Operational Flexibility [326 IAC 2-7-20] [326 IAC 2-7-10.5]

(a) The Permittee may make any change or changes at the source that are described in 326 IAC 2-7-20(b) or (c) without a prior permit revision, if each of the following conditions is met:

(1) The changes are not modifications under any provision of Title I of the Clean Air Act;

(2) Any preconstruction approval required by 326 IAC 2-7-10.5 has been obtained;

(3) The changes do not result in emissions which exceed the limitations provided in this permit (whether expressed herein as a rate of emissions or in terms of total emissions);

(4) The Permittee notifies the:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

and

United States Environmental Protection Agency, Region V
Air and Radiation Division, Regulation Development Branch - Indiana (AR-18J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

in advance of the change by written notification at least ten (10) days in advance of the proposed change. The Permittee shall attach every such notice to the Permittee's copy of this permit; and

(5) The Permittee maintains records on-site, on a rolling five (5) year basis, which document all such changes and emission trades that are subject to 326 IAC 2-7-20(b)(1) and (c)(1). The Permittee shall make such records available, upon reasonable request, for public review.

Such records shall consist of all information required to be submitted to IDEM, OAQ in the notices specified in 326 IAC 2-7-20(b)(1) and (c)(1).

(b) The Permittee may make Section 502(b)(10) of the Clean Air Act changes (this term is defined at 326 IAC 2-7-1(37)) without a permit revision, subject to the constraint of 326 IAC 2-7-20(a). For each such Section 502(b)(10) of the Clean Air Act change, the required written notification shall include the following:

(1) A brief description of the change within the source;

(2) The date on which the change will occur;

(3) Any change in emissions; and

(4) Any permit term or condition that is no longer applicable as a result of the change.

The notification which shall be submitted is not considered an application form, report or compliance certification. Therefore, the notification by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) Emission Trades [326 IAC 2-7-20(c)]
The Permittee may trade emissions increases and decreases at the source, where the applicable SIP provides for such emission trades without requiring a permit revision, subject to the constraints of Section (a) of this condition and those in 326 IAC 2-7-20(c).

(d) Alternative Operating Scenarios [326 IAC 2-7-20(d)]
The Permittee may make changes at the source within the range of alternative operating scenarios that are described in the terms and conditions of this permit in accordance with 326 IAC 2-7-5(9). No prior notification of IDEM, OAQ or U.S. EPA is required.

(e) Backup fuel switches specifically addressed in, and limited under, Section D of this permit shall not be considered alternative operating scenarios. Therefore, the notification requirements of part (a) of this condition do not apply.

B.20 Source Modification Requirement [326 IAC 2-7-10.5]

A modification, construction, or reconstruction is governed by the requirements of 326 IAC 2.

B.21 Inspection and Entry [326 IAC 2-7-6] [IC 13-14-2-2] [IC 13-30-3-1] [IC 13-17-3-2]

Upon presentation of proper identification cards, credentials, and other documents as may be required by law, and subject to the Permittee's right under all applicable laws and regulations to assert that the information collected by the agency is confidential and entitled to be treated as such, the Permittee shall allow IDEM, OAQ, U.S. EPA, or an authorized representative to perform the following:

(a) Enter upon the Permittee's premises where a Part 70 source is located, or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

(b) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, have access to and copy any records that must be kept under the conditions of this permit;

(c) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, inspect any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit;

(d) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, sample or monitor substances or parameters for the purpose of assuring compliance with this permit or applicable requirements; and

(e) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, utilize any photographic, recording, testing, monitoring, or other equipment for the purpose of assuring compliance with this permit or applicable requirements.

B.22 Transfer of Ownership or Operational Control [326 IAC 2-7-11]

(a) The Permittee must comply with the requirements of 326 IAC 2-7-11 whenever the Permittee seeks to change the ownership or operational control of the source and no other change in the permit is necessary.

(b) Any application requesting a change in the ownership or operational control of the source shall contain a written agreement containing a specific date for transfer of permit responsibility, coverage and liability between the current and new Permittee. The application shall be submitted to:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

Any such application does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) The Permittee may implement administrative amendment changes addressed in the request for an administrative amendment immediately upon submittal of the request. [326 IAC 2-7-11(c)(3)]

B.23 Annual Fee Payment [326 IAC 2-7-19] [326 IAC 2-7-5(7)] [326 IAC 2-1.1-7]

(a) The Permittee shall pay annual fees to IDEM, OAQ within thirty (30) calendar days of receipt of a billing. Pursuant to 326 IAC 2-7-19(b), if the Permittee does not receive a bill from IDEM, OAQ the applicable fee is due April 1 of each year.

(b) Except as provided in 326 IAC 2-7-19(e), failure to pay may result in administrative enforcement action or revocation of this permit.

(c) The Permittee may call the following telephone numbers: 1-800-451-6027 or 317-233-4230 (ask for OAQ, Billing, Licensing, and Training Section), to determine the appropriate permit fee.

B.24 Credible Evidence [326 IAC 2-7-5(3)] [326 IAC 2-7-6] [62 FR 8314] [326 IAC 1-1-6]

For the purpose of submitting compliance certifications or establishing whether or not the Permittee has violated or is in violation of any condition of this permit, nothing in this permit shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether the Permittee would have been in compliance with the condition of this permit if the appropriate performance or compliance test or procedure had been performed.

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SECTION C SOURCE OPERATION CONDITIONS

Entire Source

Emission Limitations and Standards [326 IAC 2-7-5(1)]

C.1 Particulate Emission Limitations For Processes with Process Weight Rates Less Than One Hundred (100) Pounds per Hour [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2(e)(2), particulate emissions from any process not exempt under 326 IAC 6-3-1(b) or (c) which has a maximum process weight rate less than 100 pounds per hour and the methods in 326 IAC 6-3-2(b) through (d) do not apply shall not exceed 0.551 pounds per hour.

C.2 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-1 (Applicability) and 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

(a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.3 Open Burning [326 IAC 4-1] [IC 13-17-9]

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. The previous sentence notwithstanding, the Permittee may open burn in accordance with an open burning approval issued by the Commissioner under 326 IAC 4-1-4.1.

C.4 Incineration [326 IAC 4-2] [326 IAC 9-1-2]

The Permittee shall not operate an incinerator except as provided in 326 IAC 4-2 or in this permit. The Permittee shall not operate a refuse incinerator or refuse burning equipment except as provided in 326 IAC 9-1-2 or in this permit.

C.5 Fugitive Dust Emissions [326 IAC 6-4]

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions). 326 IAC 6-4-2(4) is not federally enforceable.

C.6 Fugitive Particulate Matter Emission Limitations [326 IAC 6-5]

Pursuant to 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive particulate matter emissions shall be controlled according to the attached plan as in Attachment A. The provisions of 326 IAC 6-5 are not federally enforceable.

C.7 Stack Height [326 IAC 1-7]

The Permittee shall comply with the applicable provisions of 326 IAC 1-7 (Stack Height Provisions), for all exhaust stacks through which a potential (before controls) of twenty-five (25) tons per year or more of particulate matter or sulfur dioxide is emitted. The provisions of 326 IAC 1-7-1(3), 326 IAC 1-7-2, 326 IAC 1-7-3(c) and (d), 326 IAC 1-7-4, and 326 IAC 1-7-5(a), (b), and (d) are not federally enforceable.

C.8 Asbestos Abatement Projects [326 IAC 14-10] [326 IAC 18] [40 CFR 61, Subpart M]

(a) Notification requirements apply to each owner or operator. If the combined amount of regulated asbestos containing material (RACM) to be stripped, removed or disturbed is at least 260 linear feet on pipes or 160 square feet on other facility components, or at least thirty-five (35) cubic feet on all facility components, then the notification requirements of 326 IAC 14-10-3 are mandatory. All demolition projects require notification whether or not asbestos is present.

(b) The Permittee shall ensure that a written notification is sent on a form provided by the Commissioner at least ten (10) working days before asbestos stripping or removal work or before demolition begins, per 326 IAC 14-10-3, and shall update such notice as necessary, including, but not limited to the following:

(1) When the amount of affected asbestos containing material increases or decreases by at least twenty percent (20%); or

(2) If there is a change in the following:

(A) Asbestos removal or demolition start date;

(B) Removal or demolition contractor; or

(C) Waste disposal site.

(c) The Permittee shall ensure that the notice is postmarked or delivered according to the guidelines set forth in 326 IAC 14-10-3(2).

(d) The notice to be submitted shall include the information enumerated in 326 IAC 14-10-3(3).

All required notifications shall be submitted to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

The notice shall include a signed certification from the owner or operator that the information provided in this notification is correct and that only Indiana licensed workers and project supervisors will be used to implement the asbestos removal project. The notifications do not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(e) Procedures for Asbestos Emission Control
The Permittee shall comply with the applicable emission control procedures in 326 IAC 14-10-4 and 40 CFR 61.145(c). Per 326 IAC 14-10-1, emission control requirements are applicable for any removal or disturbance of RACM greater than three (3) linear feet on pipes or three (3) square feet on any other facility components or a total of at least 0.75 cubic feet on all facility components.

(f) Demolition and Renovation
The Permittee shall thoroughly inspect the affected facility or part of the facility where the demolition or renovation will occur for the presence of asbestos pursuant to 40 CFR 61.145(a).

(g) Indiana Licensed Asbestos Inspector
The Permittee shall comply with 326 IAC 14-10-1(a) that requires the owner or operator, prior to a renovation/demolition, to use an Indiana Licensed Asbestos Inspector to thoroughly inspect the affected portion of the facility for the presence of asbestos. The requirement to use an Indiana Licensed Asbestos inspector is not federally enforceable.

Testing Requirements [326 IAC 2-7-6(1)]

C.9 Performance Testing [326 IAC 3-6]

(a) For performance testing required by this permit, a test protocol, except as provided elsewhere in this permit, shall be submitted to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

no later than thirty-five (35) days prior to the intended test date. The protocol submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(b) The Permittee shall notify IDEM, OAQ of the actual test date at least fourteen (14) days prior to the actual test date. The notification submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) Pursuant to 326 IAC 3-6-4(b), all test reports must be received by IDEM, OAQ not later than forty-five (45) days after the completion of the testing. An extension may be granted by IDEM, OAQ if the Permittee submits to IDEM, OAQ a reasonable written explanation not later than five (5) days prior to the end of the initial forty-five (45) day period.

Compliance Requirements [326 IAC 2-1.1-11]

C.10 Compliance Requirements [326 IAC 2-1.1-11]

The commissioner may require stack testing, monitoring, or reporting at any time to assure compliance with all applicable requirements by issuing an order under 326 IAC 2-1.1-11. Any monitoring or testing shall be performed in accordance with 326 IAC 3 or other methods approved by the commissioner or the U. S. EPA.

Compliance Monitoring Requirements [326 IAC 2-7-5(1)] [326 IAC 2-7-6(1)]

C.11 Compliance Monitoring [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)] [40 CFR 64] [326 IAC 3-8]

(a) For new units:
Unless otherwise specified in the approval for the new emission unit(s), compliance monitoring for new emission units shall be implemented on and after the date of initial start-up.

(b) For existing units:
Unless otherwise specified in this permit, for all monitoring requirements not already legally required, the Permittee shall be allowed up to ninety (90) days from the date of permit issuance to begin such monitoring. If, due to circumstances beyond the Permittee's control, any monitoring equipment required by this permit cannot be installed and operated no later than ninety (90) days after permit issuance, the Permittee may extend the compliance schedule related to the equipment for an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

in writing, prior to the end of the initial ninety (90) day compliance schedule, with full justification of the reasons for the inability to meet this date.

The notification which shall be submitted by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) For monitoring required by CAM, at all times, the Permittee shall maintain the monitoring, including but not limited to, maintaining necessary parts for routine repairs of the monitoring equipment.

(d) For monitoring required by CAM, except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), the Permittee shall conduct all monitoring in continuous operation (or shall collect data at all required intervals) at all times that the pollutant-specific emissions unit is operating. Data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities shall not be used for purposes of this part, including data averages and calculations, or fulfilling a minimum data availability requirement, if applicable. The owner or operator shall use all the data collected during all other periods in assessing the operation of the control device and associated control system. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.

C.12 Instrument Specifications [326 IAC 2-1.1-11] [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

(a) When required by any condition of this permit, an analog instrument used to measure a parameter related to the operation of an air pollution control device shall have a scale such that the expected maximum reading for the normal range shall be no less than twenty percent (20%) of full scale. The analog instrument shall be capable of measuring values outside of the normal range.

(b) The Permittee may request that the IDEM, OAQ approve the use of an instrument that does not meet the above specifications provided the Permittee can demonstrate that an alternative instrument specification will adequately ensure compliance with permit conditions requiring the measurement of the parameters.

Corrective Actions and Response Steps [326 IAC 2-7-5] [326 IAC 2-7-6]

C.13 Emergency Reduction Plans [326 IAC 1-5-2] [326 IAC 1-5-3]

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

(a) The Permittee shall maintain the most recently submitted written emergency reduction plans (ERPs) consistent with safe operating procedures.

(b) Upon direct notification by IDEM, OAQ 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 episode level. [326 IAC 1-5-3]

C.14 Risk Management Plan [326 IAC 2-7-5(11)] [40 CFR 68]

If a regulated substance, as defined in 40 CFR 68, is present at a source in more than a threshold quantity, the Permittee must comply with the applicable requirements of 40 CFR 68.

C.15 Response to Excursions or Exceedances [40 CFR 64] [326 IAC 3-8] [326 IAC 2-7-5] [326 IAC 2-7-6]

(I) Upon detecting an excursion where a response step is required by the D Section, or an exceedance of a limitation, not subject to CAM, in this permit:

(a) The Permittee shall take reasonable response steps to restore operation of the emissions unit (including any control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing excess emissions.

(b) The response shall include minimizing the period of any startup, shutdown or malfunction. The response may include, but is not limited to, the following:

(1) initial inspection and evaluation;

(2) recording that operations returned or are returning to normal without operator action (such as through response by a computerized distribution control system); or

(3) any necessary follow-up actions to return operation to normal or usual manner of operation.

(c) A determination of whether the Permittee has used acceptable procedures in response to an excursion or exceedance will be based on information available, which may include, but is not limited to, the following:

(1) monitoring results;

(2) review of operation and maintenance procedures and records; and/or

(3) inspection of the control device, associated capture system, and the process.

(d) Failure to take reasonable response steps shall be considered a deviation from the permit.

(e) The Permittee shall record the reasonable response steps taken.

(II)

(a) CAM Response to excursions or exceedances.

(1) Upon detecting an excursion or exceedance, subject to CAM, the Permittee shall restore operation of the pollutant-specific emissions unit (including the control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing the period of any startup, shutdown or malfunction and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions). Such actions may include initial inspection and evaluation, recording that operations returned to normal without operator action (such as through response by a computerized distribution control system), or any necessary follow-up actions to return

operation to within the indicator range, designated condition, or below the applicable emission limitation or standard, as applicable.

(2) Determination of whether the Permittee has used acceptable procedures in response to an excursion or exceedance will be based on information available, which may include but is not limited to, monitoring results, review of operation and maintenance procedures and records, and inspection of the control device, associated capture system, and the process.

(b) If the Permittee identifies a failure to achieve compliance with an emission limitation, subject to CAM, or standard, subject to CAM, for which the approved monitoring did not provide an indication of an excursion or exceedance while providing valid data, or the results of compliance or performance testing document a need to modify the existing indicator ranges or designated conditions, the Permittee shall promptly notify the IDEM, OAQ and, if necessary, submit a proposed significant permit modification to this permit to address the necessary monitoring changes. Such a modification may include, but is not limited to, reestablishing indicator ranges or designated conditions, modifying the frequency of conducting monitoring and collecting data, or the monitoring of additional parameters.

(c) Based on the results of a determination made under paragraph (II)(a)(2) of this condition, the EPA or IDEM, OAQ may require the Permittee to develop and implement a Quality Improvement Plan (QIP). The Permittee shall develop and implement a QIP if notified to in writing by the EPA or IDEM, OAQ.

(d) Elements of a QIP:
The Permittee shall maintain a written QIP, if required, and have it available for inspection. The plan shall conform to 40 CFR 64.8 b (2).

(e) If a QIP is required, the Permittee shall develop and implement a QIP as expeditiously as practicable and shall notify the IDEM, OAQ if the period for completing the improvements contained in the QIP exceeds 180 days from the date on which the need to implement the QIP was determined.

(f) Following implementation of a QIP, upon any subsequent determination pursuant to paragraph (II)(c) of this condition the EPA or the IDEM, OAQ may require that the Permittee make reasonable changes to the QIP if the QIP is found to have:

(1) Failed to address the cause of the control device performance problems; or

(2) Failed to provide adequate procedures for correcting control device performance problems as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.

(g) Implementation of a QIP shall not excuse the Permittee from compliance with any existing emission limitation or standard, or any existing monitoring, testing, reporting or recordkeeping requirement that may apply under federal, state, or local law, or any other applicable requirements under the Act.

(h) CAM recordkeeping requirements.

(1) The Permittee shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan required pursuant to paragraph (II)(c) of this condition and any activities undertaken to implement a quality improvement plan, and other supporting information required to be maintained under this

condition (such as data used to document the adequacy of monitoring, or records of monitoring maintenance or corrective actions). Section C - General Record Keeping Requirements of this permit contains the Permittee's obligations with regard to the records required by this condition.

(2) Instead of paper records, the owner or operator may maintain records on alternative media, such as microfilm, computer files, magnetic tape disks, or microfiche, provided that the use of such alternative media allows for expeditious inspection and review, and does not conflict with other applicable recordkeeping requirements

C.16 Actions Related to Noncompliance Demonstrated by a Stack Test [326 IAC 2-7-5] [326 IAC 2-7-6]

(a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall submit a description of its response actions to IDEM, OAQ no later than seventy-five (75) days after the date of the test.

(b) A retest to demonstrate compliance shall be performed no later than one hundred eighty (180) days after the date of the test. Should the Permittee demonstrate to IDEM, OAQ that retesting in one hundred eighty (180) days is not practicable, IDEM, OAQ may extend the retesting deadline.

(c) IDEM, OAQ reserves the authority to take any actions allowed under law in response to noncompliant stack tests.

The response action documents submitted pursuant to this condition do require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

C.17 Emission Statement [326 IAC 2-7-5(3)(C)(iii)] [326 IAC 2-7-5(7)] [326 IAC 2-7-19(c)] [326 IAC 2-6]

Pursuant to 326 IAC 2-6-3(a)(1), the Permittee shall submit by July 1 of each year an emission statement covering the previous calendar year. The emission statement shall contain, at a minimum, the information specified in 326 IAC 2-6-4(c) and shall meet the following requirements:

(1) Indicate estimated actual emissions of all pollutants listed in 326 IAC 2-6-4(a);

(2) Indicate estimated actual emissions of regulated pollutants as defined by 326 IAC 2-7-1(33) (“Regulated pollutant, which is used only for purposes of Section 19 of this rule”) from the source, for purpose of fee assessment.

The statement must be submitted to:

Indiana Department of Environmental Management
Technical Support and Modeling Section, Office of Air Quality
100 North Senate Avenue
MC 61-50 IGCN 1003
Indianapolis, Indiana 46204-2251

The emission statement does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

C.18 General Record Keeping Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-6] [326 IAC 2-2] [326 IAC 2-3]

(a) Records of all required monitoring data, reports and support information required by this permit shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. Support information includes the following, where applicable:

(AA) All calibration and maintenance records.
(BB) All original strip chart recordings for continuous monitoring instrumentation.
(CC) Copies of all reports required by the Part 70 permit.

Records of required monitoring information include the following, where applicable:

(AA) The date, place, as defined in this permit, and time of sampling or measurements.
(BB) The dates analyses were performed.
(CC) The company or entity that performed the analyses.
(DD) The analytical techniques or methods used.
(EE) The results of such analyses.
(FF) The operating conditions as existing at the time of sampling or measurement.

These records shall be physically present or electronically accessible at the source location for a minimum of three (3) years. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.

(b) Unless otherwise specified in this permit, for all record keeping requirements not already legally required, the Permittee shall be allowed up to ninety (90) days from the date of permit issuance or the date of initial start-up, whichever is later, to begin such record keeping.

(c) If there is a reasonable possibility (as defined in 326 IAC 2-2-8 (b)(6)(A), 326 IAC 2-2-8 (b)(6)(B), 326 IAC 2-3-2 (l)(6)(A), and/or 326 IAC 2-3-2 (l)(6)(B)) that a “project” (as defined in 326 IAC 2-2-1(oo) and/or 326 IAC 2-3-1(jj)) at an existing emissions unit, other than projects at a source with a Plantwide Applicability Limitation (PAL), which is not part of a “major modification” (as defined in 326 IAC 2-2-1(dd) and/or 326 IAC 2-3-1(y)) may result in significant emissions increase and the Permittee elects to utilize the “projected actual emissions” (as defined in 326 IAC 2-2-1(pp) and/or 326 IAC 2-3-1(kk)), the Permittee shall comply with following:

(1) Before beginning actual construction of the “project” (as defined in 326 IAC 2-2-1(oo) and/or 326 IAC 2-3-1(jj)) at an existing emissions unit, document and maintain the following records:

(A) A description of the project.

(B) Identification of any emissions unit whose emissions of a regulated new source review pollutant could be affected by the project.

(C) A description of the applicability test used to determine that the project is not a major modification for any regulated NSR pollutant, including:

(i) Baseline actual emissions;

(ii) Projected actual emissions;

(iii) Amount of emissions excluded under section 326 IAC 2-2-1(pp)(2)(A)(iii) and/or 326 IAC 2-3-1 (kk)(2)(A)(iii); and

(iv) An explanation for why the amount was excluded, and any netting calculations, if applicable.

(d) If there is a reasonable possibility (as defined in 326 IAC 2-2-8 (b)(6)(A) and/or 326 IAC 2-3-2 (l)(6)(A)) that a "project" (as defined in 326 IAC 2-2-1(oo) and/or 326 IAC 2-3-1(jj)) at an existing emissions unit, other than projects at a source with a Plantwide Applicability Limitation (PAL), which is not part of a "major modification" (as defined in 326 IAC 2-2-1(dd) and/or 326 IAC 2-3-1(y)) may result in significant emissions increase and the Permittee elects to utilize the "projected actual emissions" (as defined in 326 IAC 2-2-1(pp) and/or 326 IAC 2-3-1(kk)), the Permittee shall comply with following:

(1) Monitor the emissions of any regulated NSR pollutant that could increase as a result of the project and that is emitted by any existing emissions unit identified in (1)(B) above; and

(2) Calculate and maintain a record of the annual emissions, in tons per year on a calendar year basis, for a period of five (5) years following resumption of regular operations after the change, or for a period of ten (10) years following resumption of regular operations after the change if the project increases the design capacity of or the potential to emit that regulated NSR pollutant at the emissions unit.

C.19 General Reporting Requirements [326 IAC 2-7-5(3)(C)] [326 IAC 2-1.1-11] [326 IAC 2-2] [326 IAC 2-3] [40 CFR 64] [326 IAC 3-8]

(a) The Permittee shall submit the attached Quarterly Deviation and Compliance Monitoring Report or its equivalent. Proper notice submittal under Section B -Emergency Provisions satisfies the reporting requirements of this paragraph. Any deviation from permit requirements, the date(s) of each deviation, the cause of the deviation, and the response steps taken must be reported except that a deviation required to be reported pursuant to an applicable requirement that exists independent of this permit, shall be reported according to the schedule stated in the applicable requirement and does not need to be included in this report. This report shall be submitted not later than thirty (30) days after the end of the reporting period. The Quarterly Deviation and Compliance Monitoring Report shall include a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35). A deviation is an exceedance of a permit limitation or a failure to comply with a requirement of the permit.

On and after the date by which the Permittee must use monitoring that meets the requirements of 40 CFR Part 64 and 326 IAC 3-8, the Permittee shall submit CAM reports to the IDEM, OAQ.

A report for monitoring under 40 CFR Part 64 and 326 IAC 3-8 shall include, at a minimum, the information required under paragraph (a) of this condition and the following information, as applicable:

(1) Summary information on the number, duration and cause (including unknown cause, if applicable) of excursions or exceedances, as applicable, and the corrective actions taken;

(2) Summary information on the number, duration and cause (including unknown cause, if applicable) for monitor downtime incidents (other than downtime associated with zero and span or other daily calibration checks, if applicable); and

(3) A description of the actions taken to implement a QIP during the reporting period as specified in Section C-Response to Excursions or Exceedances. Upon completion of a QIP, the owner or operator shall include in the next summary report documentation that the implementation of the plan has been completed and reduced the likelihood of similar levels of excursions or exceedances occurring.

The Permittee may combine the Quarterly Deviation and Compliance Monitoring Report and a report pursuant to 40 CFR 64 and 326 IAC 3-8.

(b) The address for report submittal is:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

(c) Unless otherwise specified in this permit, any notice, report, or other submission required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(d) Reporting periods are based on calendar years, unless otherwise specified in this permit. For the purpose of this permit “calendar year” means the twelve (12) month period from January 1 to December 31 inclusive.

(e) If the Permittee is required to comply with the recordkeeping provisions of (d) in Section C - General Record Keeping Requirements for any “project” (as defined in 326 IAC 2-2-1 (oo) and/or 326 IAC 2-3-1 (jj)) at an existing emissions unit, and the project meets the following criteria, then the Permittee shall submit a report to IDEM, OAQ:

(1) The annual emissions, in tons per year, from the project identified in (c)(1) in Section C- General Record Keeping Requirements exceed the baseline actual emissions, as documented and maintained under Section C- General Record Keeping Requirements (c)(1)(C)(i), by a significant amount, as defined in 326 IAC 2-2-1 (ww) and/or 326 IAC 2-3-1 (pp), for that regulated NSR pollutant, and

(2) The emissions differ from the preconstruction projection as documented and maintained under Section C - General Record Keeping Requirements (c)(1)(C)(ii).

(f) The report for project at an existing emissions unit shall be submitted no later than sixty (60) days after the end of the year and contain the following:

(1) The name, address, and telephone number of the major stationary source.

(2) The annual emissions calculated in accordance with (d)(1) and (2) in Section C - General Record Keeping Requirements.

(3) The emissions calculated under the actual-to-projected actual test stated in 326 IAC 2-2-2(d)(3) and/or 326 IAC 2-3-2(c)(3).

(4) Any other information that the Permittee wishes to include in this report such as an explanation as to why the emissions differ from the preconstruction projection.

Reports required in this part shall be submitted to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

(g) The Permittee shall make the information required to be documented and maintained in accordance with (c) in Section C- General Record Keeping Requirements available for review upon a request for inspection by IDEM, OAQ. The general public may request this information from the IDEM, OAQ under 326 IAC 17.1.

Stratospheric Ozone Protection

C.20 Compliance with 40 CFR 82 and 326 IAC 22-1

Pursuant to 40 CFR 82 (Protection of Stratospheric Ozone), Subpart F, except as provided for motor vehicle air conditioners in Subpart B, the Permittee shall comply with applicable standards for recycling and emissions reduction.

SECTION D.1 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description:

(a) Quarry Activities:

(1) Removal and transfer of overburden material, drilling and blasting of limestone, and loading of raw materials using mobile equipment. Historic activities include the plant-wide use of overburden as raw materials, for landfill construction, erosion and dust control activities.

(b) Raw Material Sizing Activities:

(1) One (1) primary crusher, identified as Point 1-8 (201G) and one (1) vibrating feeder, identified as Point 1-9A (201V); both constructed in 1969, modified in 1998 and 1999, with a nominal capacity of 1,300 tons of limestone per hour, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(2) Outside storage piles, modified in 1999, with a throughput of 1,300 tons per hour, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(3) Raw material sizing transfer equipment including:

(A) One (1) apron feeder, identified as Point 1-14 (206V), constructed in 1969 and modified in 1999, with a nominal throughput of 400 tons per hour, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(B) One (1) belt conveyor, identified as Point 1-9B (214V), constructed in 1969, with a nominal throughput of 1,300 tons per hour, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(C) Three (3) pan feeders, identified as Point 1-11 (202V-204V), all constructed in 1969 and modified in 1999, with a nominal capacity of 1,300 tons per hour each, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(D) Three (3) belt conveyors, identified as Point 1-15 (215V, 305V, 251V), constructed in 1969, 1969, and 2000, respectively, with a nominal capacity of 1,300 tons per hour each, equipped with one (1) fabric filter system (FF 1-15, baghouse 209L) to control particulate emissions. Under 40 CFR 60, Subpart OOO, 215V is considered an affected facility.

(E) One (1) secondary crusher system, identified as SC-1, constructed in 2001, with a nominal capacity of 600 tons of limestone and additives per hour; controlled by six (6) baghouses/dust collectors 208L, 208L1, 210L, 202320, 202345, and 202380, exhausting to six (6) stacks 208L, 208L1, 210L, DC201 DC202 and DC203, respectively. The secondary crusher system is totally enclosed and consists of the following pieces of equipment:

(i) One (1) Hazemag single rotor impactor crusher, identified as GC202185.01, with a nominal capacity of 600 tons per hour, constructed in 2008, with emissions controlled by a baghouse, identified as 208L and exhausting through stack 208L. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(ii) Two (2) metso cone crushers, identified as GC202140.06 and GC202145.06, each with a nominal capacity of 350 tons per hour, each, constructed in 2008, with emissions controlled by two (2) dust collectors, identified as 202320 and 202345 and exhausting through stacks 202320 and 202345. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(iii) One (1) belt conveyor, identified as 202370, with a nominal capacity of 600 tons per hour, constructed in 2008, with emissions controlled by a dust collector, identified as 202380 and exhausting through stack 202380. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(iv) One (1) belt conveyor, identified as Point 1-16A (202G2V2), with a nominal capacity of 525 tons per hour; one (1) crusher, identified as Point 1-16C (202G2), with a nominal capacity of 525 tons per hour; one (1) belt conveyor, identified as Point 1-16D (202G2V3), with a nominal capacity of 525 tons per hour; all constructed in 2001, one (1) belt conveyor (205GV), all equipped with one (1) fabric filter system (FF 1-16, baghouse 208L1) to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(v) One (1) apron feeder, identified as Point 1-24 (202G2V1), with a nominal capacity of 600 tons per hour, constructed in 2001, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(vi) One (1) belt conveyor, identified as Point 1-25C (202G1V1); one (1) belt conveyor, identified as Point 1-25E (202G1V2); and one (1) belt conveyor, identified as Point 1-25F (202GV2); each with a nominal capacity of 600 tons per hour, all constructed in 2001, equipped with one (1) fabric filter system (FF 1-25, baghouse 208L) to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(vii) One (1) screen, identified as Point 1-26C (204G); three (3) belt conveyors, identified as Point 1-26D (202GV3 or 202GV3-1 or 202GV3-2); and one (1) belt conveyor, identified as Point 1-26E (202GV4); each with a nominal capacity of 600 tons per hour, all constructed in 2001, equipped with one (1) fabric filter system (FF 1-26, baghouse 210L) to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(F) One (1) clay slip operation, identified as CS-1, constructed in 2015, with a maximum rated capacity of 50 tons of clay (overburden consisting generally of clay with up to 5% limestone) per hour. The clay slip processing system includes covered overburden storage, with processing equipment totally enclosed; consists of the following pieces of equipment:

(i) One hopper, identified as HP-101 and one (1) Apron Feeder, identified as AP-101, constructed in 2015, with a nominal capacity of 60 tons per hour, constructed in 2015, with emissions controlled within a building enclosure. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(ii) Two (1) belt conveyors, identified as Points C-101, and C-102, constructed in 2015, with a nominal capacity of 50 tons per hour each. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(iii) One (1) Wet Clay Crusher identified as CR-101, constructed in 2015, with a nominal capacity of 50 tons per hour. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(iv) One (1) Log Washer identified as LW-101, constructed in 2015, with a nominal capacity of 50 tons per hour. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(v) One (1) Horizontal Deck Screen, identified as RS-101, constructed in 2015, with a nominal capacity of 50 tons per hour, with emissions controlled by wet suppression, within a building enclosure. Under 40 CFR 60, Subpart OOO, this is considered an affected facility. The average feed to the raw mill surge system will be 302 gpm wet slurry (50% water), including up to 32 tph clay and 1 tph limestone.

(vi) Two (2) slurry holding tanks, constructed in 2015 with a nominal throughput of 302 gallons per minute.

(c) One (1) gypsum material handling process, constructed in 2002 and modified in 2009, with a nominal production of 150 tons per hour of the blended synthetic gypsum material or rock gypsum, including the following units:

(1) One (1) synthetic gypsum transporting system, identified as 1-47. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Two (2) outdoor synthetic gypsum storage piles, identified as 62 and 64, with a nominal throughput of 268,056 tons per year, using wet suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) Three (3) synthetic gypsum hoppers, identified as 508120, 508140 and 508165; three (3) sets of screw conveyors (4 in each set), identified as 508130, 508150 and 508175; three (3) weigh belts, identified as 508125, 508145 and 508170; and four belt conveyors, identified as 661BC (508136 to mill #3) constructed in 2012, 604BC, 605BC (GC508156 and GC508157 to mill #1) and 602BC1 (GC508176 to mill #2), constructed in 2014, with a nominal throughput of 10.2 tons per hour each, using wet suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) rock gypsum and limestone material hopper (234F) and two (2) conveyor belts (234V, 234FV), identified as 1-38, with a nominal throughput of 150 tons per hour, constructed in 2002, using wet suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(d) Raw Material Ball Mill Operation, with a nominal capacity of 400 tons of raw material per hour, including the following units:

(1) Raw material ball mill transfer equipment including four (4) belt conveyors, identified as Point 1-17A (252V-255V); four (4) raw material bins, identified as Point 1-17B (350F-353F); all constructed on April 1, 2000, with a nominal capacity of 525 tons per hour, equipped with one (1) fabric filter system (FF 1-17, baghouse 350L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Two (2) weigh feeders, identified as Point 1-18A (352V-353V); one (1) conveyor belt, identified as Point 1-18B (358V); two (2) apron feeders, identified as Point 1-18C; and two (2) scavenger conveyors, identified as Point 1 18D (350V2, 351V2); all constructed on April 1, 2000, with a nominal capacity of 400 tons per hour; all utilizing a building enclosure to control particulate emissions. Two (2) weigh feeders (350V, 351V); equipped with one (1) fabric filter system (FF-18, baghouse 352L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(e) Fly Ash Storage and Additive Activities, including the following units:

(1) Two (2) rotary feeders (270V2, 271V2), one (1) weigh screw (275V), one (1) Pfister rotary feeder (276V), and one (1) weigh bin (273F) constructed March 2009; two screw conveyors, identified as Point 1-19A (273V, 274V); one (1) fly ash hopper, identified as Point 1-19B (273FA); and one (1) FK pump (273JA); all constructed on April 1, 2000, and modified February 8, 2002, with exception of 273FA and 273JA which were constructed in 2003, each with a nominal capacity of 20 tons per hour, equipped with one (1) fabric filter system (FF 1-27, 273L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) One (1) fly ash silo, identified as Point 1-39 (270F), constructed on April 1, 2000, with a nominal capacity of 1,250 tons, equipped with two (2) fabric filter systems (FF 1-39, 270L, and baghouse 274L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) fly ash silo, identified as Point 1-40 (271F), constructed on April 1, 2000, with a nominal capacity of 1,250 tons, equipped with two (2) fabric filter systems (FF 1-40, 271L, and baghouse 274L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) Two (2) additive silos, identified as Point 1-21A (318F, 328F), each with a nominal capacity of 500 tons, four (4) rotary feeders, identified as Point 1-21B (318V, 318VV, 328V, 328VV), with a nominal capacity of 30 tons per hour each; all constructed on May 17, 1996, equipped with one (1) fabric filter system (FF 1-21, baghouse 319L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) additive feed bin, identified as Point 1-22 (308F), constructed after August 17, 1971 and before May 17, 1996, with a nominal capacity of 200 tons, covered by a building enclosure (BE 1-22) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) One (1) rotary feeder, identified as Point 1-23A (308V), constructed in 1996; and one (1) weigh belt, identified as Point 1-23B (309V), constructed after August 17, 1971; each with a nominal capacity of 30 tons per hour, covered by a building enclosure (BE 1-23) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(f) Coal Mill Operation:

(1) Coal storage piles, modified in 1999, with a throughput of 100 tons per hour utilizing building enclosures (BE 2-1) or compaction (CMP 2 16) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(2) Coal transfer equipment:

(A) Four (4) vibrating feeders, identified as Point 2-2A (209V-211V, 213V); one (1) belt conveyor, identified as Point 2-2B (222V); and one (1) coal grizzly, identified as Point 2-2C (223V); all constructed before 1974 and modified in 1999, with a nominal capacity of 100 tons per hour each, utilizing water mist suppression or equivalent dust suppression to control particulate emissions and covered by a building enclosure (BE 2-2) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(B) One (1) belt conveyor, identified as Point 2-4 (420V), constructed before 1974 and modified in 2000, with a nominal capacity of 100 tons per hour, covered by a building enclosure (BE 2-4) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(C) One (1) belt conveyor, identified as Point 2-6B (420V3), constructed on May 1, 2000, with a nominal capacity of 100 tons per hour, equipped with one (1) shared fabric filter system (FF 2-6, baghouse 420L2) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(D) One (1) belt conveyor (420V1), constructed on May 1, 2000, with a nominal capacity of 100 tons per hour, equipped with one (1) fabric filter system (baghouse 420L1) which exhausts into the building. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(3) Three (3) coal reject piles, identified as Points 2-3, 2-5, and 2-15, modified in 1999, with a throughput of 100 tons per hour, utilizing mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(4) One (1) raw coal bin, identified as Point 2-9 (435F), constructed May 1, 2000, with a nominal capacity of 100 tons, equipped with one (1) fabric filter system (FF 2-9, baghouse 435L) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(5) One (1) weigh feeder, identified as Point 2-10A (435V); and one (1) conveyor belt, identified as Point 2-10B (436V); all constructed on May 1, 2000, each with a nominal capacity of 61 tons per hour, covered by a building enclosure (BE 2-10) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(6) One (1) coal mill, identified as Point 2-11A (436G), with a nominal capacity of 40 tons of coal per hour, using a fuel oil fired burner during startup, and when additional heat is needed, and clinker cooler gas at other times to remove moisture from the coal (Note: For the purposes of NSPS Subpart Y, this is also a thermal dryer); and three (3) screw conveyors, identified as Point 2-11B (436LV, 436L1V, 436GV1), each with a nominal capacity of 40 tons per hour; all constructed on May 1, 2000, one (1) coal mill reject screw identified as 351155, and equipped with one (1) fabric filter system (FF 2-11, baghouse 436L) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(7) Two (2) screw conveyors, identified as Point 2-13B (437V, 438V), with a nominal capacity of 40 tons per hour; two (2) rotary feeders, identified as Point 2-13C (436LVV, 436L1VV), with a nominal capacity of 40 tons per hour; and one (1) pulverized coal bin, identified as Point 2-13A (438F), with a nominal capacity of 100 tons; all constructed on May 1, 2000, and equipped with one (1) fabric filter system (FF 2-13, baghouse 438L) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(g) One (1) alternate raw material feed system, constructed in 2007, operating at a maximum capacity of 20 tons per hour each, and consisting of the following pieces of equipment:

(1) Slag pile, identified as one of the materials identified in Point 1-13, controlled with water mist spray as needed. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) One (1) slag hopper, identified as 301132.01, with emissions uncontrolled. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) weight feeder, identified as 289V, with emissions uncontrolled. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) covered belt conveyor, identified as GC301132.05, and one (1) screw conveyor identified as 301132.08. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) bucket elevator, identified as 292V. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) Paved delivery roads with particulate emissions controlled by vacuum sweeping.

(7) One (1) non-hazardous alternate raw materials storage building. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(h) Kiln Operation, with a nominal capacity of 360 tons of dry raw feed per hour and 208 tons clinker per hour. Stack 3-1 includes a SO_2, NOx and CO_2 continuous emissions monitor (CEMS), particulate matter detection system (PMDS) and a continuous opacity monitoring system (COMS). This operation consists of the following:

(1) One (1) hammermill dryer, identified as Point 3-1C (440G), constructed on May 1, 2000, with a nominal capacity of 258 tons per hour, equipped with one (1) electrostatic precipitator (402L) with a 2,000 HP motor to control particulate emissions, exhausting to stack 3-1. Under 40 CFR 63, Subpart DD, and 40 CFR 63, Subpart EEE, this is considered an affected source.

(2) One (1) pre-heater, pre-calciner Portland cement kiln, originally constructed in 1966 and modified to the semi-dry system in 2000. The semi-dry kiln system includes one (1) calciner tower with staged combustion, identified as Point 3-1B (440PH), and one (1) rotary kiln, identified as Point 3-1A (401B), with a combined nominal rated capacity of 827 million British thermal units per hour. An oxygen enrichment system, constructed in 2006, introduces oxygen into the first stage pre-calciner and the front end of the rotary kiln. The semi-dry kiln system has a nominal rated clinker capacity of 208 tons per hour, using coal and the following supplemental fuels:

(A) hazardous waste fuel at a maximum rate allowed by the approved Boiler and Industrial Furnace Permit required by 40 CFR 270;

(B) plastic chips, carpet fibers, paper products, wood chips, chipped tires, toner, cosmetics, seed corn, and oil absorbent material including oil filter fluff;

(C) petroleum coke;

(D) distillate fuel for burner startup activities; and

(E) alternative fuel (spent pot liner).

Particulate emissions from the calciner and kiln are controlled by one (1) electrostatic precipitator (402L) with a 2000 HP motor, exhausting to stack 3-1. The ESP consists of nine (9) screw conveyors, identified as Point 3-1D (403V-410V, 404FV), constructed in 1968 and modified in 1999; and one (1) kiln dust chamber, identified as Point 3-1F (401BF1), constructed on January 1, 1969; each with a nominal capacity of (10) tons per hour. NOx emissions are controlled by a low-NOx calciner. The calciner exit includes a THC and O_2 continuous emissions monitor (CEMS). Under 40 CFR 63, Subpart EEE, and 40 CFR Part 63, Subpart DD, the calciner and kiln system is considered an affected source.

(3) One (1) return dust bin, identified as Point 3-3A (405F), constructed before 1971 and modified in 1999, with a nominal capacity of 100 tons; one (1) waste dust bin, identified as Point 3-3F (404F), constructed before 1971 and modified in 1999, with a nominal capacity of 75 tons; one (1) hopper, identified as Point 3-3C (445F), constructed on May 1, 2000, with a nominal capacity of 60 tons per hour; two (2) bucket elevators, identified as Point 3-3G (411V, 413V), constructed before August 17, 1971, with a nominal capacity of 60 tons per hour; and two (2) rotary feeders, identified as Point 3-3H (405FVV, 305286); one (1) screw conveyor, identified as Point 3-3I (405FVV1), constructed in 2003 except 305286 constructed in 2008 each with a nominal capacity of 60 tons per hour; and two (2) screw conveyors, identified as 305287 and 305288; all equipped with one fabric filter system (FF 3-3, baghouse 403L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) non-routine raw material dust truck loading station, constructed before 1971 and modified in 1999, covered by a building enclosure (BE 3-25) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) conditioning tower, identified as Point 3-5A (480F), with a nominal capacity of 40 tons per hour, using lime injection to control sulfur dioxide emissions; and one (1) alkali bypass system, identified as Point 3-5B, one (1) hopper, identified as Point 3-5C (484F), with a nominal capacity of ten (10) tons per hour; one (1) dust cyclone, identified as Point 3-5D (480FL), with a nominal capacity of 31 tons per hour; four (4) screw conveyors, identified as Point 3-5E (480LV1-LV3, 480V), each with a nominal capacity of ten (10) tons per hour; one (1) weigh hopper, identified as Point 3-5I (481FF); and one (1) pug mill, identified as Point 3-5J (484L); all constructed on May 1, 2000; one rotary feeder (481FV11) constructed in 2008, one screw conveyor (481J12) constructed in 2008, each with a nominal capacity of ten (10) tons per hour; all equipped with one (1) fabric filter system (FF 3-5, baghouse 480L), which exhausts to stack 3-1, to control particulate emissions. The alkali bypass duct contains a CO and O_2 CEMS. Under 40 CFR 63, Subpart EEE, this is considered an affected source.

(6) One (1) reject dust bin for cement kiln dust, identified as Point 3-7A (481F), with a nominal capacity of 150 tons, constructed on May 1, 2000, equipped with one (1) fabric filter system (FF 3-7, baghouse 483L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) One (1) alkali bypass system cement kiln dust truck loading station, identified as Point 3-8, constructed in 2000, utilizing mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 63, Subpart EEE, this is considered an affected source.

(8) One (1) pneumatic dust pump, identified as FK Pump 485J and in-line diverter valve, installed in 2011. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(i) Clinker Cooler Operations, with a nominal capacity of 208 tons of clinker per hour:

(1) One (1) clinker cooler, identified as Point 3-9A (401C), constructed before August 17, 1971 and modified in 2000, with a nominal capacity of 208 tons per hour; one (1) clinker breaker, identified as Point 3-9B (401CG), constructed on January 1, 1969 and modified in 2000, with a nominal capacity of 208 tons per hour; one (1) dropout chamber, identified as Point 3-9C (401CL), constructed January 1, 1969, with a nominal capacity of 20 tons per hour; two (2) vibrating feeders, identified as Point 3-9F (427V, 428V), constructed before August 17, 1971 and modified in 2000, with a nominal capacity of 208 tons per hour each; and one (1) drag conveyor, identified as Point 3-9G (401CV), and eight (8) screw conveyors (422V, 470CV2, 470CV3, 470CV9, 470CV10, 474V-476V), nine (9) rotary feeders (401CV1 and 471CLV1-8), all constructed before August 17, 1971 and modified in 2001, each with a nominal capacity of ten (10) tons per hour; all equipped with one (1) fabric filter system (FF 3-9, baghouse 471-CL) to control particulate emissions, exhausting to stack 3-2. Stack 3-2 has a continuous opacity monitoring system (COMS) and PM continuous parametric monitoring system (CPMS). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Two (2) belt conveyors, identified as Point 3-11A (421V, 509V); and two (2) bucket elevators, identified as Point 3-11B (418V, 419V); all constructed before 1971 and modified in 2000, with a nominal capacity of 208 tons per hour each (note that belt conveyor (421V) is a non-routine belt; all equipped with one (1) fabric filter system (FF 3-11, baghouse 406L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) non-routine outdoor clinker pile, identified as Point 3-13, modified in 1999, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) belt conveyor (turning tower), identified as Point 3-12 (510V), constructed before 1971 and modified in 2000, with a nominal capacity of 208 tons per hour, equipped with one (1) fabric filter system (FF 3-12, baghouse 506L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) bucket elevator, identified as Point 3-22 (500V), constructed on October 1, 1999, with a nominal capacity of 250 tons per hour, equipped with one (1) fabric filter system (FF 3-14, baghouses 503L and 503L1) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) Two (2) feeders, identified as Point 3-24A (207F, 208F); and one (1) belt conveyor, identified as Point 3-24B (219V); each constructed before August 17, 1971, with a nominal capacity of 300 tons per hour each, equipped with one (1) fabric filter system (FF 3-24, baghouse 220L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) Seven (7) clinker silos, identified as Point 3-14 (501A-507A), constructed before 1971 and modified in 1999, each with a nominal capacity of 5000 tons, equipped with two (2) fabric filter system (FF 3-14, baghouses 503L and 503L1) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) One (1) belt conveyor, identified as Point 3-21 (220V), constructed before August 17, 1971, equipped with one (1) fabric filter system (FF 3-21, baghouse 221L) which was installed in 2001 to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(j) Finish Mill Operations:

(1) Four (4) vibrating feeders, identified as Point 3-15 (504V-507V), constructed before 1971 and modified in 1999, with a nominal capacity of 250 tons per hour each, equipped with one (1) fabric filter system (FF 3-15, baghouse 505L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Four (4) vibrating feeders, identified as Point 3-17A (501V-503V, 508V); and one (1) belt conveyor, identified as Point 3-17B (221V); with a nominal capacity of 250 tons per hour each; all constructed before 1971 and modified in 1999, equipped with one (1) fabric filter system (FF 3-17, baghouse 504L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) Two (2) belt conveyors, identified as Point 3-20B (514V, 511V), constructed before August 17, 1971; one (1) bucket elevator, identified as Point 3-20A (513V), constructed on June 1, 2000; and one (1) belt conveyor, identified as 511V2, constructed in 2003; each with a nominal capacity of 250 tons per hour, 514V, 511V, and 513V are equipped with one (1) fabric filter system (FF 3-20, baghouse 513L) to control particulate emissions. 511V2 is equipped with baghouse 507L to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) belt conveyor, identified as Point 4-13A (515V), constructed in 1969 and modified in 2000, with a nominal capacity of 250 tons per hour; and four (4) silos, identified as Point 4-13B; 652A, constructed on January 1, 1969, with a nominal capacity of 2,260 tons, equipped with one (1) fabric filter system (FF 4-13, baghouse 515L) to control particulate emissions. 650A, 651A, and 653A, constructed on January 1, 1969 with a nominal capacity of 2,440; 2,315; and 200 tons, respectively, and controlled by baghouses 670L, 671L, and 672L, respectfully, (constructed in 2006) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) belt conveyor, identified as Point 4-14 (516V), constructed on January 1, 1969, with a nominal capacity of 250 tons per hour, equipped with one (1) fabric filter system (FF 4-14, baghouse 516L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) No. 1 Finish Mill, modified in 1993, with a nominal capacity of 70 tons of clinker per hour:

(A) Two (2) belt conveyors, identified as Point 4-1A (639V, 640V), constructed in 1971 and modified in 1999, with a nominal capacity of 250 tons per hour each; one (1) clinker bin, identified as Point 4-1B (601F), constructed before 1971 and modified in 1999, with a nominal capacity of 260 tons; one (1) gypsum bin, identified as Point 4-1C (603F), constructed before 1971 and modified in 1999, with a nominal capacity of 240 tons per hour; one (1) spill screw, identified as Point 4-1D (646V), constructed in 2002, with a nominal capacity of five (5) tons per hour; and one (1) belt conveyor, identified as 614V, modified in 2003, with a maximum capacity of 250 tons of clinker per hour; all equipped with one (1) fabric filter system (FF 4-1, baghouse 617L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(B) One (1) No. 1 finish mill, identified as Point 4-2A (603G), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; one (1) elevator, identified as Point 4-2B (626V), constructed before 1971 and modified in 1999, with a nominal capacity of 200 tons per hour; and one (1) spill screw, identified as Point 4-2D (642V), constructed 1969 and modified in 1999, with a nominal capacity of five (5) tons per hour; all equipped with one (1) fabric filter system (FF 4-2, baghouse 613L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(C) One (1) air separator, identified as Point 4-3A (605G), constructed in 1994 and modified in 1999, with a nominal capacity of 200 tons per hour; one (1) tailing screw, identified as Point 4-3D (613V), constructed in 1969 and modified in 1999, with a nominal capacity of 200 tons per hour; two (2) cement coolers, identified as Point 4-3E (603C, 604C), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour each; one (1) F.K. pump hopper, identified as Point 4-3G (611F), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; one (1) mill feed belt, identified as Point 4-3H (641V), constructed in 1974 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; and one (1) clinker F.O.W. belt, identified as Point 4-3I (601V), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons per hour; equipped with one (1) fabric filter system (FF 4-3, baghouse 606L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(D) One (1) fringe bin for off-specification cement and cement kiln dust, identified as Point 4-16A (604F), constructed before August 17, 1971, with a nominal capacity of 66 tons; and two (2) screw feeders, identified as Point 4-16B (611V, 604F1V), constructed on January 1, 1969, with a nominal capacity of 20 tons per hour each; equipped with one (1) fabric filter system (FF 4-16, baghouse 605L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(E) One (1) weigh belt, identified as Point 4-15A (605V), and one (1) belt conveyor, identified as Point 4-15B (616V), constructed before 1974, covered by a building enclosure to control particulate matter. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) No. 2 Finish Mill, with a capacity of 70 tons of clinker per hour:

(A) Two (2) conveyor belts, identified as Point 4-4A (639V, 640V), constructed 1969 and modified in 1999, with a nominal capacity of 250 tons per hour; one (1) clinker bin, identified as Point 4-4B (602F), constructed before 1971 and modified in 1999, with a nominal capacity of 260 tons; one (1) gypsum bin, identified as Point 4-4C (603F), constructed before 1971 and modified in 1999, with a nominal capacity of 240 tons; one (1) clinker F.O.W. belt, identified as Point 4-4D, (602V), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons per hour; and one (1) feed belt, identified as Point 4-4E (644V), constructed in 1975 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; all equipped with one (1) fabric filter system (FF 4-4, baghouse 636L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(B) One (1) No. 2 finish mill, identified as Point 4-5A (602G), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; and one (1) spill screw, identified as Point 4-5B (645V), constructed in 1969 and modified in 1999, with a nominal capacity of 5 tons per hour; all equipped with one (1) fabric filter system (FF 4-5, baghouse 603L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(C) One (1) air separator, identified as Point 4-6A (604G), constructed before 1971 and modified in 1999, with a nominal capacity of 200 tons per hour; one (1) elevator, identified as Point 4-6B (621V), constructed before 1971 and modified in 1999, with a nominal capacity of 200 tons per hour; one (1) tailing screw, identified as Point 4-6D (612V), constructed in 1969 and modified in 1999, with a nominal capacity of 200 tons per hour; two (2) cement coolers, identified as Point 4-6E (601C, 602C), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour each; one (1) F.K. pump hopper, identified as Point 4-6F (610F), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; and one (1) mill feed belt, identified as Point 4-6G (644V), constructed in 1975 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; all equipped with one (1) fabric filter system (FF 4-6, baghouse 602L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) No. 3 Finish Mill, with a nominal capacity of 95 tons of clinker per hour:

(A) One (1) No. 3 finish mill, identified as Point 4-9 (660G), constructed on June 1, 2000, with a nominal capacity of 95 tons of clinker per hour, equipped with one (1) fabric filter system (FF 4-9, baghouse 660L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(B) One (1) hopper, identified as Point 4-10C (667F), with a nominal capacity of 95 tons of clinker per hour; one (1) cooler, identified as Point 4-10D (664C), with a nominal capacity of 95 tons of clinker per hour; and one (1) feed belt, identified as Point 4-10E (654V), with a nominal capacity of 95 tons of clinker per hour; all constructed on June 1, 2000, equipped with one (1) fabric filter system (FF 4-10, baghouse 661L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(C) One (1) fringe bin for off-specification cement and cement kiln dust, identified as Point 4-11B (665F), with a nominal capacity of 80 tons; one (1) elevator, identified as Point 4-11C (661V), with a nominal capacity of 230 tons per hour equipped with one (1) clean-up hopper and one (1) clean-up screw 509530; and one (1) rotary feeder, identified as Point 4-11D (665FV), with a nominal capacity of 50 tons per hour; all constructed on June 1, 2000 and cleanup screw 1201V and hopper, constructed in 2007 with a nominal capacity of 10 tons per hour; all equipped with one (1) fabric filter system (FF 4-11, baghouse 665L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(D) One (1) air separator, identified as Point 4-12A (664G), constructed on June 1, 2000, with a nominal capacity of 230 tons per hour, and equipped with one (1) fabric filter system (FF 4-12, baghouse 664L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(E) Two (2) weigh feeders, identified as Point 4-17 (652V, 653V), constructed on January 1, 1969; and two (2) weigh feeders (650V, 651V), constructed on January 1, 1969, equipped with two (2) dust collectors (650L, 651L), installed in 2000, venting indoors; with a nominal capacity of 40 tons per hour each, covered by a building enclosure (BE 4-17) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(k) Cement Storage, Loading, and Packaging Activities:

(1) Three (3) Group 5 silos, identified as Point 5-1 (705A, 707A, 709A), constructed before 1971 and modified in 1999, with a nominal storage capacity of 10,000 tons each, with particulate emission controlled by one (1) fabric filter system (FF 5-1, baghouse 757L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Three (3) Group 5 silos, identified as Point 5-2 (706A, 708A, 710A), constructed before 1971 and modified in 1999, with a nominal storage capacity of 10,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-2, baghouse 758L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) Two (2) Group 4 silos, identified as Point 5-3 (702A, 704A), constructed in 1967 and modified in 1999, with a nominal storage capacity of 5,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-3, baghouse 702L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) Two (2) Group 4 silos, identified as Point 5-4 (701A, 703A), constructed in 1967 and modified in 1999, with a nominal storage capacity of 5,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-4, baghouse 701L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) Two (2) silos, identified as Point 5-29 (711A, 712A), constructed on January 1, 1969, with a nominal storage capacity of 5,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-29, baghouse 713L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) One (1) screen, identified as Point 5-5C (701G), constructed before 1971 and modified in 1999; and one (1) truck loader, identified as Point 5-5D (708L), constructed before 1971 and modified in 1999; each with a nominal capacity of 500 tons per hour, equipped with one (1) fabric filter system (FF 5-5, baghouse 703L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) One (1) screen, identified as Point 5-6B (702G), constructed before 1971 and modified in 1999; and one (1) railcar/truck loader, identified as Point 5-6C (709L), constructed before 1971 and modified in 1999; each with a nominal capacity of 500 tons per hour, equipped with one (1) fabric filter system (FF 5-6, baghouse 706L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) One (1) hopper, identified as Point 5-7B (701F), constructed before 1971 and modified in 1999, with a nominal capacity of 40 tons per hour, equipped with one (1) fabric filter system (FF 5-7, baghouse 710L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(9) One (1) hopper, identified as Point 5-8 (730F), constructed before 1971 and modified in 1999, with a nominal capacity of 40 tons per hour, equipped with one (1) fabric filter system (FF 5-8, baghouse 715L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(10) Three (3) screw conveyors, identified as Point 5-9A (809V, 809V1, 809V2), constructed before 1971, with a nominal capacity of 40 tons per hour each; one (1) alleviator, identified as Point 5-9C, constructed before 1971, with a nominal capacity of 40 tons per hour; and fourteen (14) Group 2 silos, identified as Point 5-9B (2S-7S, 9S, 11S-17S), constructed in 1924, with a combined nominal capacity of 24,842 tons; all equipped with one (1) fabric filter (FF 5-9, baghouse 808L) to control particulate matter. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(11) One (1) silo, identified as Point 5-10 (8S), constructed in 1924 and modified in 1999, with a nominal capacity of 5420 tons, equipped with one (1) fabric filter system (FF 5-10, baghouse 807L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(12) One (1) silo, identified as Point 5-11 (10S), constructed in 1924 and modified in 1999, with a nominal capacity of 5420 tons, equipped with one (1) fabric filter system (FF 5-11, baghouse 810L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(13) Four (4) Group 3 silos, identified as Point 5-13 (26S, 27S, 28S, and 29S), constructed in 1924 and modified in 1999, with a nominal capacity of 2,736 tons each, equipped with one (1) fabric filter system (FF 5-13, baghouse 27DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(14) Three (3) Group 3 silos, identified as Point 5-14 (18S, 20S, 22S), constructed in 1924 and modified in 1999, with a nominal capacity of 3,112 tons each, equipped with one (1) fabric filter system (FF 5-14, baghouse 22DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(15) Two (2) Group 3 silos, identified as Point 5-15 (24S, 30S), constructed in 1924 and modified in 1999, with a nominal capacity of 2,780 tons each, equipped with one (1) fabric filter system (FF 5-15, baghouse 24DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(16) Four (4) Group 3 silos, identified as Point 5-17 (19S, 21S, 23S, 25S), constructed in 1924 and modified in 1999, with a nominal capacity of 2,736 tons each, equipped with one (1) fabric filter system (FF 5-17, baghouse 25DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(17) One (1) screen elevator, identified as Point 5-18A (829V2), constructed before 1971, with a nominal capacity of 40 tons per hour, particulate emissions controlled by dust collector 828L. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(18) One (1) elevator, identified as Point 5-19B (829V1), constructed before 1971, with a nominal capacity of 40 tons per hour, particulate emissions controlled by dust collector 828L. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(19) Two (2) bulk tanks, identified as Point 5-23A (831F, 833F), with a nominal capacity of 20 tons each; and one (1) truck loader, identified as Point 5-23C, with a nominal capacity of 40 tons per hour; all constructed before 1971 and modified in 1999, except for 831V2 which was constructed in 2003, and equipped with one (1) fabric filter system (FF 5-23, baghouse 833L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(20) Three (3) bulk tanks, identified as Point 5-24A (832F, 834F, 835F), with a nominal capacity of 20 tons each, constructed before 1950 and modified in 1999, and equipped with one (1) fabric filter system (FF 5-24, baghouse 835L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(21) One (1) silo, identified as Point 5-26A (782F), with a nominal capacity of 2,430 tons; and one (1) bucket elevator, identified as Point 5-26B (781V), with a nominal capacity of 500 tons per hour; all constructed on December 1, 2000, and equipped with one (1) fabric filter system (FF 5-26, baghouse 782L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(22) One (1) lump breaker, identified as Point 5-27B (783V3); one (1) spout, identified as Point 5-27C (785L); and one (1) truck loader, identified as Point 5-27D; all constructed on December 1, 2000, with a nominal capacity of 500 tons per hour each, and equipped with one (1) fabric filter system (FF 5-27, baghouse 783L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(23) One (1) lump breaker, identified as Point 5-28B (784V3); one (1) spout, identified as Point 5-28C (786L); and one (1) truck loader, identified as Point 5-28D; all constructed on December 1, 2000, with a nominal capacity of 500 tons per hour each, and equipped with one (1) fabric filter system (FF 5-28, baghouse 784L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(24) Five (5) screw conveyors, identified as Point 5-30B (755V, 759V-762V), constructed in 1978; six (6) rotary feeders, identified as Point 5-30C (755M-760M), constructed in 1978; and one (1) hopper, identified as Point 5-30D (750F), constructed before August 17, 1971; with a nominal capacity of 40 tons per hour each, covered by a building enclosure (BE 5-30) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(25) Seventeen (17) screw conveyors, identified as Point 5-33A (818V1-825V1, 818V2-825V2, 830V) covered by a building enclosure (BE 5-33) to control particulate emissions; Two (2) screw conveyors, identified as Point 5-18C (828V1, 828V2), particulate emissions controlled by a dust collector 828L; and three (3) screen screws, identified as Point 5-33B (806V, 829V4, 830V1); all constructed before 1950, with a nominal capacity of 40 tons per hour each, and covered by a building enclosure (BE 5-33) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(l) One (1) blend facility, consisting of the following units:

(1) Five (5) screw conveyors, identified as Point 5-35A (22SC, 24SCG, 24SC, 30SC, 31SC), all constructed in 1989, with a nominal capacity of 40 tons per hour each, covered by a building enclosure (BE 5-35) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) One (1) transfer pod, identified as Point 5-36 (22) constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-36, filter 22-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) transfer pod, identified as Point 5-37 (24-G), constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-37, filter 24-PVDC-G) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) transfer pod, identified as Point 5-38 (24), constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-38, filter 24-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) transfer pod, identified as Point 5-39 (30), constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-39, filter 30-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) One (1) receiving tank, identified as Point 5-40, constructed in August 1989, with a nominal capacity of 20 tons, equipped with one (1) fabric filter system (FF 5-40, baghouse 40-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) One (1) blending tank, identified as Point 5-41A, with a nominal capacity of 20 tons; and one (1) blending pod, identified as Point 5-41C, with a nominal capacity of 25 cubic feet; all constructed in August 1989, equipped with one (1) fabric filter system (FF 5-41, baghouse 41-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) Two (2) silos, identified as Point 5-42 (50S, 51S), constructed August 1989, with a nominal capacity of 175 tons each, equipped with one (1) fabric filter system (FF 5-42, baghouse 50-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(9) Two (2) silos, identified as Point 5-43 (52S, 53S), constructed August 1989, with a nominal capacity of 175 tons each, equipped with one (1) fabric filter system (FF 5-43, baghouse 53-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(10) One (1) transfer pod, identified as Point 5-44B (50PV), constructed in August 1989, with a nominal capacity of 40 tons per hour, equipped with one (1) fabric filter system (FF 5-44, filter 50-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(m) Packhouse operations consisting of the following:

(1) One (1) elevator, identified as Point 6-1A (838V), constructed in 1945; one (1) packer bin, identified as Point 6-1B (Bin #1), constructed in 1946; one (1) packing machine, identified as Point 6-1C (842LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-1D (842F, 842FA), constructed in 1946; two (2) rotary feeders, identified as Point 6-1E (842M, 842MA), constructed in 1946; and four (4) screw conveyors, identified as Point 6-1F (842LV1, 837V, 837V1, 831V2), constructed in 1945; all modified in 1999, with a nominal capacity of 34 tons per hour each, and equipped with one (1) fabric filter system (FF 6-1, baghouse 842L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) One (1) elevator, identified as Point 6-2A (838V1), constructed in 1945; one (1) packer bin, identified as Point 6-2B (Bin #2), constructed in 1946; one (1) packing machine, identified as Point 6-2C (843LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-2D (843F, 843FA), constructed in 1945; two (2) rotary feeders, identified as Point 6-2E (843M, 843MA), constructed before 1971; and four (4) screw conveyors (843LV1, 817V1, 817V3, 817V7), identified as Point 6-2G; constructed in 1945; all modified in 1999, with a nominal capacity of 46 tons per hour each, and equipped with one (1) fabric filter system (FF 6-2, baghouse 843L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) elevator, identified as Point 6-3A (838V2), constructed in 1945; one (1) packer bin, identified as Point 6-3B (Bin #3), constructed in 1946; one (1) packing machine, identified as Point 6-3C (844LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-3D (844F, 844FA), constructed in 1945; two (2) rotary feeders, identified as Point 6-3E (844M, 844MA), constructed before 1971; and one (1) screw conveyor, identified as Point 6-3F (844LV1), constructed before

1971; all modified in 1999, with a nominal capacity of 65 tons per hour each, and equipped with one (1) fabric filter system (FF 6-3, baghouse 844L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) elevator, identified as Point 6-4A (838V3), constructed in 1945; one (1) packer bin, identified as Point 6-4B (Bin #4), constructed in 1946; one (1) packing machine, identified as Point 6-4C (845LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-4D (845F, 845FA), constructed in 1945; two (2) rotary feeders, identified as Point 6-4E (845M, 845MA), constructed before 1971; and one (1) screw conveyor, identified as Point 6-4F (845LV1), constructed before 1971; all modified in 1999, with a nominal capacity of 40 tons per hour each, and equipped with one (1) fabric filter system (FF 6-4, baghouse 845L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) Fourteen (14) conveyors, identified as Point 6-5 (842V-846V, 848V, 845V1, 847V1, 847V2, 848V1, 848V2, 849V1, 849V2, 849V3), constructed before 1971, with a nominal capacity of 185 tons per hour each, covered by a building enclosure (BE 6-5) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) Two (2) palletizers, identified as Point 6-6 (900H, 901H), constructed before 1971, with a nominal capacity of 185 tons per hour each, covered by a building enclosure (BE 6-6) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) One (1) truck loader, identified as Point 6-7, constructed before 1971, with a nominal capacity of 185 tons per hour, covered by a building enclosure (BE 6 7) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(n) One (1) truck unloading silo, identified as Tank 9 (240F), constructed in 2007, for unloading and pneumatically conveying alternative fuel (spent pot liner) to a silo, with a maximum throughput capacity of 33 tons per hour, with a maximum storage capacity of 700 tons, with particulate emissions controlled by a dust collector (identified as 240L), and exhausting to stack 240L. This is an affected facility under 40 CFR 63, Subpart LLL.

(o) One (1) enclosed pneumatic conveyance system, identified as 241F, constructed in 2007, for pneumatically conveying alternative fuel (spent pot liner) from the silo to the cement kiln, with a maximum throughput capacity of four (4) tons per hour, with particulate emissions controlled by a bin vent filter (identified as 241L), and exhausting to stack 241L. This is an affected facility under 40 CFR 63, Subpart LLL.

(p) One (1) portable screen and conveyor unit for the sizing of plant materials with a nominal throughput of 100 tons per hour, including reclamation of partially formatted clinker product, including the following units:

(1) One (1) vibrating feeder (F3-33)
(2) One (1) portable vibrating screen (S3-34)
(3) One (1) conveyor belt (S3-34)
(4) Hauling (F3-32)
(5) Handling (F3-32a)

Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

Under 40 CFR 63, Subpart LLL, the portable screen and conveyor units are considered affected facilities while the units are reworking partially formatted clinker.

(r) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001**.** The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(1) One (1) hydrapulper, approved in 2016 for construction, identified as HP-02, with a nominal vessel volume of 2,500 gallons, and process volume of 2,250 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(i) One (1) waste feed hopper loaded from roll-off bulk containers, approved in 2016 for construction, identified as HP-01, with a nominal storage capacity of 25 yd^3 or 5,000 gallons of solids. Solids are transferred out of the hopper by an enclosed feed auger with a nominal capacity of 800 cubic feet of solids per hour. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Two (2) organic liquid slurry mix tanks, approved in 2016 for construction, identified as tank T12 and tank T13, each with a nominal storage capacity of 10,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(2) One (1) process permitted to blend solids in containers on loadout pads A or B, with hydraulic drives and agitators installed in 2012, identified as blend box, with a nominal vessel volume of 25 yd^3 (5,714 gallons), and a batch volume of 3,910 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(3) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(4) Three (3) liquid organic loadout areas consisting of three concrete pads, identified as Pad A and Pad B, both constructed in 1986, and Pad C, constructed in 1994.

(5) Fugitive VOC and HAP emissions from waste receiving, pumps, valves, connectors. [40 CFR 61, Subpart V]

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.1.1 PSD BACT Limit [326 IAC 2-2-3]

(a) Pursuant to CP133-10159-00002, issued on April 16, 1999, T113-6927-00002, issued April 14, 2004, and 326 IAC 2-2-3 (Prevention of Significant Deterioration BACT), the following limitations apply:

Operation	Units	Emission Point	Filterable PM Limits	Filterable PM10 Limits
Raw Material	one (1) belt conveyor (251V)	FF 1-15 (209L)	0.015 gr/dscf 1.60 lbs/hr	0.015 gr/dscf 1.60 lbs/hr
	four (4) belt conveyors (252V-255V) four (4) raw material bins (350F-353F)	FF 1-17 (350L) FF 1-18 (352L)	0.010 gr/dscf 1.08 lbs/hr	0.010 gr/dscf 1.08 lbs/hr
Fly Ash	one (1) fly ash silo (270F) one (1) fly ash silo (271F)	FF 1-39 (270L) FF 1-40 (271L) (274L)	0.015 gr/dscf 0.11 lbs/hr	0.015 gr/dscf 0.11 lbs/hr
	two (2) screw conveyors (273V, 274V) one (1) fly ash hopper (273FA) one (1) weigh bin (273F)	FF 1-7 (273L)	0.010 gr/dscf 0.26 lbs/hr	0.010 gr/dscf 0.26 lbs/hr
Coal Mill	one (1) raw coal bin (435F)	FF 2-9 (435L)	0.010 gr/dscf 0.33 lbs/hr	0.010 gr/dscf 0.33 lbs/hr
	one (1) coal mill (436G) three (3) screw conveyor (436LV, 436L1V, 436GV1)	FF 2-11 (436L)	0.010 gr/dscf 4.45 lbs/hr	0.010 gr/dscf 4.45 lbs/hr
	two (2) screw conveyors (437V, 438V) two (2) rotary feeders (436LVV, 436L1VV) one (1) pulverized coal bin (438F)	FF 2-13 (438L)	0.010 gr/dscf 0.14 lbs/hr	0.010 gr/dscf 0.14 lbs/hr
	one (1) belt conveyor (420V3)	FF 2-6 (420L2)	0.010 gr/dscf 0.17 lbs/hr	0.010 gr/dscf 0.17 lbs/hr
	one (1) belt conveyor (420V1)	420L1 (vent indoor)	0.010 gr/dscf 0.17 lbs/hr	0.010 gr/dscf 0.17 lbs/hr
Kiln	one (1) hammermill dryer (440G) one (1) calciner tower (440PH) one (1) rotary kiln (401B) one (1) alkali bypass system (3-5B)	Stack 3-1	0.016 gr/dscf 91.3 lbs/hr	0.014 gr/dscf 88.7 lbs/hr
	one (1) return dust bin (405F) one (1) waste dust bin (404F)	FF 3-3 (403L)	0.020 gr/dscf 1.40 lbs/hr	0.020 gr/dscf 1.40 lbs/hr
	one (1) reject dust bin for cement kiln dust (481F)	FF 3-7 (483L)	0.010 gr/dscf 0.64 lbs/hr	0.010 gr/dscf 0.64 lbs/hr

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Operation	Units	Emission Point	Filterable PM Limits	Filterable PM10 Limits
Clinker Cooler	one (1) clinker cooler (401C) one (1) clinker breaker (401CG) one (1) dropout chamber (401CL) two (2) vibrating feeders (427V, 428V) one (1) drag conveyor (401CV) eight (8) screw conveyors (422V, 470CV2, 470CV3, 470CV9, 470CV10, 474V-476V) one (1) belt conveyor (421V) two (2) bucket elevators (418V, 419V)*	FF 3-9 (471-CL, Stack 3-2)	0.015 gr/dscf 7.25 lbs/hr	0.015 gr/dscf 7.25 lbs/hr
	one (1) belt conveyor (509V) one (1) bucket elevator (418V)*	FF 3-11 (406L)	0.015 gr/dscf 0.64 lbs/hr	0.015 gr/dscf 0.64 lbs/hr
	one (1) belt conveyor (510V)	FF 3-12 (506L)	0.015 gr/dscf 0.48 lbs/hr	0.015 gr/dscf 0.48 lbs/hr
	seven (7) clinker silos (501A-507A)	FF 3-14 (503L)	0.015 gr/dscf 0.59 lbs/hr	0.015 gr/dscf 0.59 lbs/hr
	one (1) bucket elevator (500V)	FF 3-14 (503L and 503L1)	0.010 gr/dscf 0.28 lbs/hr	0.010 gr/dscf 0.28 lbs/hr
Finish Mill	four (4) vibrating feeders (504-507V)	FF 3-15 (505L)	0.015 gr/dscf 0.59 lbs/hr	0.015 gr/dscf 0.59 lbs/hr
	four (4) vibrating feeders (501V-503V, 508V) one (1) belt conveyor (221V)	FF 3-17 (504L)	0.015 gr/dscf 0.59 lbs/hr	0.015 gr/dscf 0.59 lbs/hr
	two (2) belt conveyors (514V, 511V) one (1) bucket elevator (513V)	FF 3-20 (513L)	0.010 gr/dscf 0.64 lbs/hr	0.010 gr/dscf 0.64 lbs/hr
	one (1) belt conveyor (51 5V) four (4) silos (650A-653A) (652A) three (3) silos (650A, 651A, and 653A)	FF 4-13 (515L) 670L, 671L, 672L	0.010 gr/dscf 0.60 lbs/hr	0.010 gr/dscf 0.60 lbs/hr
	two (2) belt conveyors (639V, 640V) one (1) clinker bin (601F) one (1) gypsum bin (603F) one (1) spill screw (646V)	FF 4-1 (617L)	0.020 gr/dscf 1.12 lbs/hr	0.020 gr/dscf 1.12 lbs/hr
	one (1) No. 1 finish mill (603G) one (1) elevator (626V) one (1) spill screw (642V)	FF 4-2 (613L)	0.020 gr/dscf 2.07 lbs/hr	0.020 gr/dscf 2.07 lbs/hr
	one (1) air separator (605G) one (1) tailing screw (613V) two (2) cement coolers (603C, 604C) one (1) F.K. pump hopper (611F) one (1) mill feed belt (641V) one (1) clinker F.O.W. belt (601V)	FF 4-3 (606L)	0.015 gr/dscf 9.64 lbs/hr	0.015 gr/dscf 9.64 lbs/hr
	two (2) conveyor belts (639V, 640V) one (1) clinker bin (602F) one (1) gypsum bin (603F) one (1) clinker F.O.W. belt (602V) one (1) feed belt (644V)	FF 4-4 (636L)	0.015 gr/dscf 0.98 lbs/hr	0.015 gr/dscf 0.98 lbs/hr
	one (1) No. 2 finish mill (602G) one (1) spill screw (645V)	FF 4-5 (603L)	0.020 gr/dscf 2.07 lbs/hr	0.020 gr/dscf 2.07 lbs/hr
	one (1) air separator (604G) one (1) elevator (621V) one (1) tailing screw (612V), two (2) cement coolers (601C, 602C) one (1) F.K. pump hopper (610F) one (1) mill feed belt (644V)	FF 4-6 (602L)	0.020 gr/dscf 2.07 lbs/hr	0.020 gr/dscf 2.07 lbs/hr
	one (1) No. 3 finish mill (660G)	FF 4-9 (660L)	0.010 gr/dscf 1.97 lbs/hr	0.010 gr/dscf 1.97 lbs/hr
	one (1) hopper (667F) one (1) cooler (664C) one (1) feed belt (654V)	FF 4-10 (661L)	0.010 gr/dscf 0.55 lbs/hr	0.010 gr/dscf 0.55 lbs/hr

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Operation	Units	Emission Point	Filterable PM Limits	Filterable PM10 Limits
	one (1) fringe bin (665F) one (1) elevator (661V) one (1) rotary feeder (665FV)	FF 4-11 (665L)	0.010 gr/dscf 0.36 lbs/hr	0.010 gr/dscf 0.36 lbs/hr
	one (1) air separator (664G)	FF 4-12 (664L)	0.010 gr/dscf 6.43 lbs/hr	0.010 gr/dscf 6.43 lbs/hr
Cement Storage	three (3) Group 5 silos (705A, 707A, 709A)	FF 5-1 (757L)	0.015 gr/dscf 12.86 lbs/hr	0.015 gr/dscf 12.86 lbs/hr
	three (3) Group 5 silos (706A, 708A, 710A)	FF 5-2 (758L)	0.015 gr/dscf 12.86 lbs/hr	0.015 gr/dscf 12.86 lbs/hr
	two (2) Group 4 silos (702A, 704A)	FF 5-3 (702L)	0.020 gr/dscf 1.88 lbs/hr	0.020 gr/dscf 1.88 lbs/hr
	two (2) Group 4 silos (701A, 703A)	FF 5-4 (701L)	0.020 gr/dscf 0.45 lbs/hr	0.020 gr/dscf 0.45 lbs/hr
	one (1) screen (701G) one (1) truck loader (708L)	FF 5-5 (703L)	0.020 gr/dscf 1.88 lbs/hr	0.020 gr/dscf 1.88 lbs/hr
	one (1) screen (702G) one (1) railcar/truck loader (709L)	FF 5-6 (706L)	0.020 gr/dscf 0.45 lbs/hr	0.020 gr/dscf 0.45 lbs/hr
	one (1) hopper (701F)	FF 5-7 (710L)	0.020 gr/dscf 0.45 lbs/hr	0.020 gr/dscf 0.45 lbs/hr
	one (1) hopper (730F)	FF 5-8 (715L)	0.020 gr/dscf 1.88 lbs/hr	0.020 gr/dscf 1.88 lbs/hr
	one (1) silo (8S)	FF 5-10 (807L)	0.015 gr/dscf 0.32 lbs/hr	0.015 gr/dscf 0.32 lbs/hr
	one (1) silo (10S)	FF 5-11 (810L)	0.020 gr/dscf 0.36 lbs/hr	0.020 gr/dscf 0.36 lbs/hr
	four (4) Group 3 silos (26S, 27S, 28S, and 29S)	FF 5-13 (27DC)	0.020 gr/dscf 0.28 lbs/hr	0.020 gr/dscf 0.28 lbs/hr
	three (3) Group 3 silos (18S, 20S, 22S)	FF 5-14 (22DC)	0.020 gr/dscf 0.28 lbs/hr	0.020 gr/dscf 0.28 lbs/hr
	two (2) Group 3 silos (24S, 30S)	FF 5-15 (24DC)	0.020 gr/dscf 0.28 lbs/hr	0.020 gr/dscf 0.28 lbs/hr
	four (4) Group 3 silos (19S, 21S, 23S, 25S)	FF 5-17 (25DC)	0.020 gr/dscf 0.28 lbs/hr	0.020 gr/dscf 0.28 lbs/hr
	two (2) bulk tanks (831F, 833F) one (1) truck loader	FF 5-23 (833L)	0.020 gr/dscf 0.73 lbs/hr	0.020 gr/dscf 0.73 lbs/hr
Cement Storage	three (3) bulk tanks (832F, 834F, 835F)	FF 5-24 (835L)	0.020 gr/dscf 0.73 lbs/hr	0.020 gr/dscf 0.73 lbs/hr
	one (1) silo (782F) one (1) bucket elevator (781V)	FF 5-26 (782L)	0.010 gr/dscf 0.67 lbs/hr	0.010 gr/dscf 0.67 lbs/hr
	one (1) lump breaker (783V3) one (1) spout (785L) one (1) truck loader	FF 5-27 (783L)	0.010 gr/dscf 0.40 lbs/hr	0.010 gr/dscf 0.40 lbs/hr
	one (1) lump breaker (784V3) one (1) spout (786L) one (1) truck loader	FF 5-28 (784L)	0.010 gr/dscf 0.40 lbs/hr	0.010 gr/dscf 0.40 lbs/hr
Packhouse	one (1) elevator (838V) one (1) packer bin (Bin #1) one (1) packing machine (842LF) two (2) circulating tanks (842F, 842FA) two (2) rotary feeders (842M, 842MA) four (4) screw conveyors (842LV1, 837V, 837V1, 831V2)	FF 6-1 (842L)	0.020 gr/dscf 0.13 lbs/hr	0.020 gr/dscf 0.13 lbs/hr

Operation	Units	Emission Point	Filterable PM Limits	Filterable PM10 Limits
	one (1) elevator (838V1) one (1) packer bin (Bin #2) one (1) packing machine (843LF) two (2) circulating tanks (843F, 843FA) two (2) rotary feeders (843M, 843MA) four (4) screw conveyors (843LV1, 817V1, 817V3, 817V7)	FF 6-2 (843L)	0.015 gr/dscf 0.93 lbs/hr	0.015 gr/dscf 0.93 lbs/hr
	one (1) elevator (838V2) one (1) packer bin (Bin #3) one (1) packing machine (844LF) two (2) circulating tanks (844F, 844FA) two (2) rotary feeders (844M, 844MA) one (1) screw conveyor (844LV1)	FF 6-3 (844L)	0.015 gr/dscf 0.93 lbs/hr	0.015 gr/dscf 0.93 lbs/hr
	one (1) elevator (838V3) one (1) packer bin (Bin #4), one (1) packing machine(845LF) two (2) circulating tanks (845F, 845FA) two (2) rotary feeders (845M, 845MA) one (1) screw conveyor (845LV1)	FF 6-4 (845L)	0.015 gr/dscf 0.93 lbs/hr	0.015 gr/dscf 0.93 lbs/hr

*Particulate emissions from 418V can be controlled by either the FF 3-11 (406L) or FF 3-9 (471-CL).

(b) Pursuant to CP133-10159-00002, issued April 16, 1999, the following limitations apply:

(1) The overburden removed from the quarry activities shall not exceed 1.2 million tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(2) The limestone input rate to the primary crusher shall not exceed 2,262,479 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(3) The total input of additives including slag, bottom ash, sand, shale, limestone and alternate raw materials to the secondary crusher system (SC-1) shall not exceed 2,574,685 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(4) The fly ash input rate to the kiln operations shall not exceed 135,289 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(5) The coal input rate to the coal mill shall not exceed 313,552 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(6) The raw material feed input rate to the kiln system shall not exceed 3,149,427 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(7) The coal input rate to the kiln burner system shall not exceed 157,680 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(8) The coal input rate to the calciner burner system shall not exceed 201,480 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(9) The total coal input rate to the kiln and calciner burner systems shall not exceed 313,552 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(10) The clinker production rate shall not exceed 1,606,000 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(11) The clinker input rate to the No. 1 finish mill shall not exceed 517,942 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(12) The clinker input rate to the No. 2 finish mill shall not exceed 517,942 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(13) The clinker input rate to the No. 3 finish mill shall not exceed 700,567 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(c) Pursuant to T113-6927-00002, issued April 14, 2004, the following emission units shall use the particulate control methods listed in the table below:

Units	Control Method
outside storage piles one (1) primary crusher (201G) one (1) vibrating feeder (201V) one (1) apron feeder (206V) three (3) vibrating feeders (202V-204V)	water mist suppression or equivalent
four (4) weigh feeders (350V-353V) one (1) conveyor belt (358V); two (2) apron feeders (350V1, 351V1) two (2) scavenger conveyors (350V2, 351V2)	building enclosure
coal storage piles	building enclosure (BE 2-1)
four (4) vibrating feeders (209V-211V, 213V) one (1) belt conveyor (222V) one (1) coal grizzly (223V)	building enclosure (BE 2-2)
one (1) belt conveyor (420V)	building enclosure (BE 2-4)
three (3) coal reject piles	water mist suppression or equivalent
one (1) weigh feeder (435V) one (1) conveyor belt (436V)	building enclosure (BE 2-10)
one (1) non-routine raw material dust truck loading station	building enclosure (BE 3-25)
one (1) alkali bypass system cement kiln dust truck loading station (3-8)	water mist suppression or equivalent
one (1) non-routine outdoor clinker pile (3-13)	water mist suppression or equivalent

D.1.2 PSD Minor Limits [326 IAC 2-2]

(a) Pursuant to CP133-10159-00002, issued on April 16, 1999, in order to render the requirements of 326 IAC 2-2 (PSD) not applicable, the PM/PM10 emissions for baghouses/dust collectors, identified as 208L, 208L1, 210L, 202320, 202345, and 202380 of the secondary crusher system (SC-1) shall be less than 0.0108 pounds per ton of input to SC-1. Compliance with this limit and the secondary crusher system throughput limit of 2,574,685 tons per twelve (12) consecutive month period shall limit the PM and PM10 emissions to less than 13.9 tons per twelve (12) consecutive month period and shall render the requirements of 326 IAC 2-2 (PSD) not applicable to the installation of the secondary crusher system (SC-1).

(b) Pursuant to T133-6927-00002, issued on April 14, 2004, in order to render the requirements of 326 IAC 2-2 (PSD) not applicable, the Permittee shall comply with the following:

(1) The emissions from the gypsum material handling process shall be limited to the following:

Units	Emission Point	PM/PM10 Limits
one (1) finished gypsum material hopper (234F) two (2) conveyor belts (234V, 234FV)	1-38	0.24 lbs/hr

Compliance with this limit shall limit the total emissions from this process to less than 15 tons/yr for PM10 and less than 25 tons/yr for PM and shall render the requirements of 326 IAC 2-2 (PSD) not applicable to the gypsum material handling process.

(c) Pursuant to CP133-10159-00002, issued on April 16, 1999, in order to render the requirements of 326 IAC 2-2 (PSD) not applicable, the Permittee shall comply with the following:

(1) The emissions from the following fly ash units shall comply with the limitations listed in the table below:

Units	Emission Point	PM/PM10 Limits
two (2) additive silos (318F, 328F) four (4) rotary feeders (318V, 318VV, 328V, 328VV)	FF 1-21 (319L)	0.15 lbs/hr

Compliance with this limit shall render the requirements of 326 IAC 2-2 (PSD) not applicable to the units listed in the table above.

(d) Pursuant to T133-6927-00002, issued on April 14, 2004, in order to render the requirements of 326 IAC 2-2 (PSD) not applicable, the following emission units shall use the particulate control methods listed in the table below:

Emission Units	Control Methods
one (1) additive feed bin (308F) one (1) rotary feeder (308V)	building enclosure

Compliance with this requirement shall render the requirements of 326 IAC 2-2 (PSD) not applicable to these units.

(e) In order to render the requirements of 326 IAC 2-2 (PSD) not applicable to the modification permitted in MSM 133-25345-00002, the Permittee shall comply with the following:

(1) The throughput of spent pot liner shall be less than 35,040 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

(2) The PM10 emissions from the truck unloading Tank 9 (240F) shall be less than 0.4 pounds per ton of material unloaded and transferred to the silo.

(3) The PM10 emissions from the enclosed pneumatic conveyance system (241F) shall be less than 0.4 pounds per ton of material transferred to the kiln.

Compliance with these limits shall render the requirements of 326 IAC 2-2 (PSD) not applicable to the modification permitted in MSM 133-25345-00002.

(f) Pursuant to T133-6927-00002, issued on April 14, 2004, in order to render the requirements of 326 IAC 2-2 (PSD) not applicable, the following emission units shall use the control methods listed in the table below:

Emission Units	Control Methods
slag pile (1-13)	water mist suppression or equivalent

Compliance with this requirement shall render the requirements of 326 IAC 2-2 (PSD) not applicable to this unit.

(g) Pursuant to T133-6927-00002, issued on April 14, 2004, in order to render the requirements of 326 IAC 2-2 (PSD) not applicable, the emissions from the following Blend units shall be limited as below:

Operation	Units	Point	PM/PM10 Limits
Blend	one (1) receiving tank	FF 5-40 (40-DC)	0.14 lbs/hr
	one (1) blending tank one (1) blending pod	FF 5-41 (41-DC)	0.14 lbs/hr
	two (2) silos (50S, 51S)	FF 5-42 (50-DC)	0.11 lbs/hr
	two (2) silos (52S, 53S)	FF 5-43 (53-DC)	0.11 lbs/hr

Compliance with these limits shall render the requirements of 326 IAC 2-2 (PSD) not applicable to the units listed in the table above.

(h) Pursuant to T133-6927-00002, issued on April 14, 2004, in order to render the requirements of 326 IAC 2-2 (PSD) not applicable, the following emission units shall use the particulate control methods listed in the table below:

Units	Control Method
five (5) screw conveyors (22SC, 24SCG, 24SC, 30SC, 31SC	Building Enclosure (BE 5-35)
one (1) transfer pod (22)	Filter (22-PVDC)
one (1) transfer pod (24-G)	Filter (24-PVDC-G)
one (1) transfer pod (24)	Filter (24-PVDC)
one (1) transfer pod (30)	Filter (30-PVDC)
one (1) transfer pod (50PV)	Filter (50-PVDC)

Compliance with these requirements shall render the requirements of 326 IAC 2-2 (PSD) not applicable to the units listed in the table above.

(i) Pursuant to significant source modification number 133-35865-00002 and in order to render the provisions of 326 IAC 2-2 (Prevention of Significant Deterioration (PSD)) not applicable, the Permittee shall comply with the following:

(1) VOC emissions from the hydrapulper shall not exceed 0.58 pounds per batch before control;

(2) Throughput of the hydrapulper shall not exceed 10,084 batches per twelve (12) consecutive month period, with compliance determined at the end of each month;

(3) VOC emissions from the blend box shall not exceed 2.20 pounds per batch before control;

(4) Throughput of the blend box shall not exceed 5,090 batches per twelve (12) consecutive month period, with compliance determined at the end of each month.

D.1.3 Particulate Emission Limitations [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the following facilities shall be limited as follows when operating at the listed process weight rate:

Operations	Process Weight Rate (ton/hr) (P)	Allowable Emissions For All Units Combined (lbs/hour) (E)
Raw Material Sizing Activities, excluding the units venting through baghouses 202320, 202345, and 202380, 209L, 208L1, 208L, and 210L	1,300	81.0
Gypsum Material Handling Process excluding 234F, 234V and 234FV	150	55.4
Raw Material Ball Mill Operations, excluding the units venting through baghouse 350L	400	66.3
Fly Ash Storage Activities, excluding the units venting through baghouse 270L, 271L, 319L and 273L	30	40.0
Coal Mill Operation, excluding the units venting through baghouses 420L2, 420L1, 435L, 436L, and 438L	100	51.3
Alternate Raw Material Feed System	20	30.5
Kiln Operations, excluding the units venting through stack 3-1, baghouses 403L and 483L	208	58.9
Clinker Cooler Operations, excluding the units venting through baghouses 471CL, 406L, 506L, 503L, and 503L1	208	58.9
Finish Mill Operations, excluding the units venting through baghouses 505L, 504L, 507L, 513L, 515L, 670L, 671L, and 672L, 617L, 617L 613L, 606L, 636L, 603L, 602L, 660L, 661L, 665L, and 664L	250	61.0
Cement Storage, Loading, and Packaging Activities, excluding the units venting through baghouses 757L, 758L, 702L, 701L, 703L, 706L, 710L, 715L, 807L, 810L, 27DC, 22DC, 24DC, 25DC, 833L, 835L, 782L, 783L, and 784L	500	69.0
Blend Facility Operations excluding the units venting through baghouses 40-DC, 41-DC, 50-DC and 53-DC	40	42.5
Packhouse Operations, excluding the units venting through baghouses 842L, 843L, 844L, and 845L	185	57.7
Truck Unloading / Silo Loading 240F	33	40.9
Pneumatic Transfer 241F	4	10.4
Portable Screen and Conveyor Unit	100	51.3

NOTE: Pursuant to 326 IAC 6-3-2(e)(3), when the process weight exceeds 200 tons per hour, the maximum allowable emission may exceed that shown in this table, provided the concentration of particulate matter in the gas discharged to the atmosphere is less than 0.10 pounds per 1,000 pounds of gases.

The limitations for these facilities were calculated using the following equations:

(a) Interpolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 4.10\ P^{0.67}$ where E = rate of emission in pounds per hour and
P = process weight rate in tons per hour

(b) Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 55.0\ P^{0.11} - 40$ where E = rate of emission in pounds per hour and
P = process weight rate in tons per hour

D.1.4 Sulfur Dioxide Emission Limitations [326 IAC 2-2]

Pursuant to CP133-10159-00002, issued on April 16, 1999, the SO_2 emissions from Stack 3-1 of the semi-dry process kiln and calciner tower shall not exceed 4.13 pounds of SO_2 per ton of clinker produced and 1.01 lbs/MMBtu. Compliance with this limit and the clinker production limit of 1,606,000 tons per twelve (12) consecutive month period shall limit the SO_2 emissions to less than 3,317 tons per twelve (12) consecutive month period. Compliance with this limit ensures that the increase in SO_2 emissions from the 1999 modification are less than 40 tons/yr and renders the requirements of 326 IAC 2-2 (PSD) not applicable to the 1999 modification.

The lime injection system associated with the conditioning tower (3-5A) shall be operated as necessary to reduce SO_2 emissions.

Compliance with this SO_2 emission limit is demonstrated by SO_2 CEMs.

D.1.5 Sulfur Dioxide (SO2) [326 IAC 7-1.1-1]

Pursuant to 326 IAC 7-1.1 (SO_2 Emissions Limitations), the Permittee shall comply with the following:

(a) SO_2 emissions from the kiln burner and calciner burner shall each be less than 6.0 pounds per MMBtu heat input, when combusting coal or coal blend.

(b) SO_2 emissions from the kiln burner and calciner burner shall each be less than 0.5 pounds per MMBtu heat input, when combusting fuel oil.

(c) SO_2 emissions from the coal mill fuel oil-fired burner (2-11A, 436G) shall be less than 0.5 pounds per MMBtu heat input, when combusting fuel oil.

Pursuant to 326 IAC 7-2-1, compliance shall be demonstrated on a calendar month average.

D.1.6 Nitrogen Oxide Emission Limitations [326 IAC 2-2]

Pursuant to CP133-10159-00002, issued on April 16, 1999, the NOx emissions from Stack 3-1 of the semi-dry process kiln shall be controlled by the low-NO_X calciner and good combustion practices and shall not exceed 5.514 pounds per ton of clinker produced. Compliance with this limit and the clinker production limit of 1,606,000 tons per twelve (12) consecutive month period shall limit the NOx emissions to less than 4,428 tons per twelve (12) consecutive month period. Compliance with this limit ensures that the increase in NOx emissions from the 1999 modification are less than 40 tons/yr and renders the requirements of 326 IAC 2-2 (PSD) not applicable to the 1999 modification. Compliance with this NOx emission limit is demonstrated by NOx CEMs.

D.1.7 Nitrogen Oxide Emissions [326 IAC 10-3]

The preheater, precalciner cement kiln (3-1A, 401B) is subject to 326 IAC 10-3 (Nitrogen Oxide Reduction Program for Specific Source Categories) because it has a process rate greater than twenty-two (22) tons per hour. Pursuant to this rule, the following requirements apply:

(a) Pursuant to 326 IAC 10-3-3(a)(3), the Permittee shall use semi-dry precalciner kiln processing and the NOx emissions from the cement kiln shall not exceed 5.10 pounds per ton of clinker produced during the ozone control period, which is defined as May 31 to September 30 for the year of 2004 and during the period from May 1 to September 30 for every year after.

(b) Pursuant to 326 IAC 10-3-4, beginning May 31, 2004 and each ozone control period thereafter, the NOx emissions during the ozone control period of each year shall be monitored using a NOx CEMS in accordance with 40 CFR 60, Subpart A and 40 CFR 60, Appendix B. The Permittee shall also comply with the quality assurance procedures specified in 40 CFR 60, Appendix F and 326 IAC 3, as applicable.

D.1.8 Carbon Monoxide Emission Limitations [326 IAC 2-2]

Pursuant to CP133-10159-00002, issued on April 16, 1999, the CO emissions from Stack 3-1 of the semi-dry process kiln shall be controlled by good combustion practices and shall not exceed 3.649 pounds per ton of clinker produced. Compliance with this limit and the clinker production limit of 1,606,000 tons per twelve (12) consecutive month period shall limit the CO emissions to less than 2,930 tons per twelve (12) consecutive month period. Compliance with this limit ensures that the increase in CO emissions from the 1999 modification are less than 100 tons/yr and renders the requirements of 326 IAC 2-2 (PSD) not applicable to the 1999 modification.

D.1.9 Lead Emissions [326 IAC 2-2]

Pursuant to T113-6927-00002, issued April 14, 2004, the emissions of lead from the kiln shall be less than 0.00106 pounds per ton of clinker produced. Compliance with this limit and the clinker production limit of 1,606,000 tons per twelve (12) consecutive month period shall limit the lead emissions to less than 0.85 tons per twelve (12) consecutive month period. Compliance with this limit shall limit the lead emission increase from the 1999 modification to less than the PSD significant threshold of 0.6 tons/yr and shall render the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration) not applicable to the 1999 modification.

D.1.10 Beryllium Emissions [326 IAC 2-2]

Pursuant to T113-6927-00002, issued April 14, 2004, the emissions of beryllium from the kiln shall be less than 7.8×10^{-7} pounds per ton of clinker produced. Compliance with this limit and the clinker production limit of 1,606,000 tons per twelve (12) consecutive month period shall limit the beryllium emissions to less than 0.00063 tons per twelve (12) consecutive month period. Compliance with this limit shall limit the beryllium emission increase from the 1999 modification to less than the PSD significant threshold of 0.0004 tons/yr and shall render the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration) not applicable to the 1999 modification.

D.1.11 Mercury Emissions [326 IAC 2-2]

Pursuant to T113-6927-00002, issued April 14, 2004, the emissions of mercury from the kiln shall be less than 0.000224 pounds per ton of clinker produced. Compliance with this limit and the clinker production limit of 1,606,000 tons per twelve (12) consecutive month period shall limit the mercury emissions to less than 0.18 tons per twelve (12) consecutive month period. Compliance with this limit shall limit the mercury emission increase from the 1999 modification to less than the PSD significant threshold of 0.1 tons/yr and shall render the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration) not applicable to the 1999 modification.

D.1.12 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan is required for these facilities and any control devices. Section B - Preventative Maintenance Plan contains the Permittee's obligation with regard to the preventive maintenance plan required by this condition.

Compliance Determination Requirements

D.1.13 Particulate Control

(a) In order to assure compliance with Conditions D.1.1, D.1.2, and D.1.3, the baghouses for particulate control associated with the raw material sizing activities, the coal mill operation, the gypsum material handling process, the raw material ball mill operation, clinker cooler operations, the fly ash storage activities and the dust collector and bin vent filter for the truck unloading, pneumatic transfer operations, the finish mill operations, the cement storage, loading, and packing activities, the blend facility, and the packhouse

operations shall be in operation and control emissions from the facilities at all times when the facilities are in operation.

(b) In order to assure compliance with Condition D.1.1, the electrostatic precipitator (ESP) for particulate control shall be in operation and control emissions from all the emission units which vent through kiln stack (Stack 3-1) at all times that these facilities are in operation.

(c) In order to assure compliance with Condition D.1.1, the baghouses for particulate control shall be in operation and control emissions from kiln operations associated with baghouses 403L and 483L all times that these facilities are in operation.

(d) In the event that bag failure is observed in a multi-compartment baghouse, if operations will continue for ten (10) days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify the IDEM, OAQ of the expected date the failed units will be repaired or replaced. The notification shall also include the status of the applicable compliance monitoring parameters with respect to normal, and the results of any response actions taken up to the time of notification.

D.1.14 Nitrogen Oxide (NOx) Control

In order to assure compliance with Conditions D.1.6 and D.1.7, the low-NOx calciner shall be in operation and control emissions from the kiln (3-1A, 401B) at all times that the kiln (3-1A, 401B) is in operation.

D.1.15 Lime Injection Operation

In order to assure compliance with sulfur dioxide limit in Condition D.1.4, pursuant to CP133-10159-00002, issued April 16, 1999, the lime injection system associated with the conditioning tower (3-5A) shall be operated as necessary.

D.1.16 Water Spray Operating Condition

Pursuant to CP133-10159-00002, issued April 16, 1999, and in order to determine compliance with Conditions D.1.1, D.1.2, and D.1.3, the water mist spray systems associated with the quarry activities, coal mill operation, kiln operation, and raw material sizing activities shall be operated on an as-needed basis while its associated equipment is in operation and the temperature is above 35 degrees Fahrenheit (35°F).

D.1.17 Sulfur Dioxide Emissions and Sulfur Content [326 IAC 7-2] [326 IAC 2-7-5(3)(A)] [326 IAC 2-7-6]

(a) Pursuant to 326 IAC 7-2, compliance with the limits in Conditions D.1.4 and D.1.5(a) shall be determined utilizing one of the following methods:

(1) A continuous emission monitoring (CEMS), pursuant to 326 IAC 3-5-1 may be used. Upon such notification, the other requirements of 326 IAC 7-2 shall not apply. [326 IAC 7-2-1(g)]

(2) Compliance may also be determined by conducting a stack test for sulfur dioxide emissions from the kilns, in accordance with 326 IAC 3-6, utilizing the procedures in 40 CFR 60, Appendix A, Method 6, 6A, 6C, and 8. [326 IAC 7-2-1(d)]

(3) A determination of noncompliance pursuant to any of the methods specified in (1) or (2) above shall not be refuted by evidence of compliance pursuant to the other method.

(b) In order to assure compliance with Conditions D.1.5(b) and D.1.5(c), the Permittee shall determine the sulfur dioxide (SO_2) emissions from the combustion of oil in the kiln burner, calciner burner, and coal mill fuel oil-fired burner utilizing one (1) of the following options:

(1) Fuel sampling and analysis shall be performed using one of the following procedures:

(A) Providing vendor analysis of fuel delivered, if accompanied by a vendor certification, or;

(B) Analyzing the oil sample to determine the sulfur content of the oil via the procedures in 40 CFR 60, Appendix A, Method 19.

(i) Oil samples may be collected from the fuel tank immediately after the fuel tank is filled and before any oil is combusted; and

(ii) If a partially empty fuel tank is refilled, a new sample and analysis would be required upon filling.

(2) Compliance may also be determined by conducting a stack test for sulfur dioxide emissions from the coal mill's fuel oil-fired burner during startup, using 40 CFR 60, Appendix A, Method 6 in accordance with the procedures in 326 IAC 3-6.

A determination of noncompliance pursuant to any of the methods specified in (1) or (2) above shall not be refuted by evidence of compliance pursuant to the other method.

Compliance Monitoring Requirements [326 IAC 2-7-5(1)] [326 IAC 2-7-6(1)]

D.1.18 Broken or Failed Bag Detection

(a) For a single compartment baghouse controlling emissions from a process operated continuously, a failed unit and the associated process shall be shut down immediately until the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(b) For a single compartment baghouse controlling emissions from a batch process, the feed to the process shall be shut down immediately until the failed unit has been repaired or replaced. The emissions unit shall be shut down no later than the completion of the processing of the material in the line. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

Bag failure can be indicated by a significant drop in the baghouse's pressure reading with abnormal visible emissions, by an opacity violation, or by other means such as gas temperature, flow rate, air infiltration, leaks, dust traces or triboflows.

D.1.19 Maintenance of Continuous Emissions Monitoring [326 IAC 3-5] [326 IAC 2-7-6(1),(6)]

(a) Pursuant to 326 IAC 3-5-1(a)(5) (Continuous Monitoring of Emissions) and 326 IAC 2-1.1-11, a continuous opacity monitoring system (COMS) shall be installed, calibrated, maintained, and operated for measuring the opacity from the kiln and clinker cooler.

(b) All continuous opacity monitors shall meet the performance specifications of 40 CFR 60 and 326 IAC 3-5-2 and are subject to monitor system certification requirements pursuant to 326 IAC 3-5-3.

(c) In the event that a breakdown of a COMS occurs, a record shall be made of the times and reasons of the breakdown and efforts made to correct the problem.

(d) Whenever a COMS is malfunctioning or is down for maintenance or repairs for a period of twenty-four (24) hours or more and a backup COMS is not online within twenty-four (24) hours of shutdown or malfunction of the primary COMS, the Permittee shall provide a certified opacity reader, who may be an employee of the Permittee or an independent contractor, to self-monitor the emissions from the emission unit stack.

(1) Visible emission readings shall be performed in accordance with 40 CFR 60, Appendix A, Method 9, for a minimum of five (5) consecutive six (6) minute averaging periods beginning not more than twenty-four (24) hours after the start of the malfunction or down time.

(2) Method 9 opacity readings shall be repeated for a minimum of five (5) consecutive six (6) minute averaging periods at least twice per day during daylight operations, with at least four (4) hours between each set of readings, until a COMS is online.

(3) Method 9 readings may be discontinued once a COMS is online.

(4) Any opacity exceedances determined by Method 9 readings shall be reported with the Quarterly Opacity Exceedances Reports.

(e) Nothing in this permit, shall excuse the Permittee from complying with the requirements to operate a continuous emission monitor system pursuant to 326 IAC 3-.

D.1.20 Maintenance of Continuous Emissions Monitoring (CEMS) [326 IAC 3-5] [326 IAC 2-7-5(3)(A)] [40 CFR 63, Subpart EEE] [326 IAC 10-3]

(a) Pursuant to 326 IAC 3-5-1 (Continuous Monitoring of Emissions), the Permittee shall install, calibrate, certify, operate, and maintain continuous emission monitoring system(s) (CEMS) and related equipment for measuring SO_2, CO_2 and NOx emission rates from kiln stack 3-1.

(b) All CEMS required by this permit shall meet all applicable performance specifications of 40 CFR 60 and 40 CFR 75 or any other applicable performance specifications, and are subject to monitor system certification requirements pursuant to 326 IAC 3-5-3.

(c) In the event that a breakdown of a CEMS occurs, a record shall be made of the times and reasons for the breakdown and the efforts made to correct the problem.

(d) Whenever a CEMS is malfunctioning or will be down for calibration, maintenance, or repairs for a period of four (4) hours or more, a calibrated backup CEMS shall be brought online within four (4) hours of shutdown of the primary CEMS, and shall be operated until such time as the primary CEMS is back in operation.

(e) Nothing in this permit, shall excuse the Permittee from complying with the requirements to operate a continuous emission monitor system pursuant to 326 IAC 3-5, 40 CFR 63, Subpart EEE and 326 IAC 10-3.

D.1.21 Visible Emissions Notations [40 CFR 64]

(a) Visible emission notations of raw material baghouse/dust collector exhausts (208L, 208L1, 209L, 210L, 202320, 202345, and 202380), raw material ball mill operation (350L, 352L), the fly ash storage activities (274L, 270L, 271L, 273L and 319L), coal mill operation stack exhausts (420L1, 420L2, 435L, 436L, 438L), the kiln operations (403L, 483L, 480L), excluding the kiln exhaust stack (3-1), clinker cooler operation stack exhausts (406L, 506L, 220L, 503L, 503L1, and 221L), the finish mill operations, the cement storage, loading, and packaging activities, the blend facility, and the packhouse operations stack exhausts shall be performed once per day during normal daylight operations.

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(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) 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 visible emissions for that specific process.

(e) If abnormal emissions are observed, the Permittee shall take reasonable response steps. Section C - Response to Excursions or Exceedances contains the Permittee's obligations with regard to the reasonable response steps required by this condition. Failure to take response steps shall be considered a deviation from this permit.

D.1.22 Parametric Monitoring [40 CFR 64]

(a) The Permittee shall record the pressure drop across the baghouses used in conjunction with the operations listed below at least once per day when those processes are in operation. When for any one reading, the pressure drop across a baghouse is outside the normal range listed below,

Emission Unit	Control	Range
Raw Material Sizing	208L, 208L1, 209L, 210L, 202320, 202345, and 202380	1.0 to 8.0 inches
Ball Mill	350L, 352L	1.0 to 8.0 inches
Fly ash	273L, 270L, 271L, 274L, 319L	1.0 to 8.0 inches
Coal Mill	420L2, 435L	0.1 to 4.0 inches
	420L1, 436L, 438L	1.0 to 8.0 inches
Kiln	403L, 483L, 480L	1.0 to 8.0 inches
Clinker cooler	406L, 506L, 471-CL, 220L, 503L, 503L1, 221L	1.0 to 8.0 inches
Finish Mill	606L	0.25 to 7.25 inches
	505L, 504L, 507L, 513L, 515L, 670L, 671L, 672L, 516L, 617L, 613L, 605L, 636L, 603L, 602L, 660L, 661L, 665L,	1.0 to 8.0 inches
	664L	2.0 to 10.0 inches
Cement	757L, 758L, 702L, 701L, 713L, 703L, 706L, 710L, 715L, 808L, 807L, 810L, 27DC, 22DC, 24DC, 25DC, 833L, 835L, 782L, 783L, 784L	1.0 to 8.0 inches
Blend	40-DC, 41-DC, 50-DC, 53-DC	1.0 to 8.0 inches
Packhouse	842L, 843L, 844L, 845L	1.0 to 8.0 inches

the Permittee shall take a reasonable response. The normal range for this unit is a pressure drop as listed in the table above unless a different upper-bound or lower-bound value for this range is determined during the latest stack test. Section C - Response to Excursions or Exceedances contains the Permittee's obligations with regard to the reasonable response steps required by this condition. A pressure reading that is outside the above mentioned range is not a deviation from this permit. Failure to take response steps shall be considered a deviation from this permit.

(b) The instrument used for determining the pressure shall comply with Section C - Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated or replaced at least once every six (6) months.

D.1.23 ESP Parametric Monitoring [40 CFR 64]

(a) When the kiln particulate matter detection system (PMDS) is not in operation, the Permittee shall monitor and record the total KVA (Kilovolt-Amperes) of the electrostatic precipitator (ESP) every minute when the kiln is in operation. When for any one rolling hourly average KVA is below the normal minimum, the Permittee shall take a reasonable response. The Response to Excursions or Exceedances shall also contain troubleshooting contingency and response steps for when any one (1) minute reading drops five (5) KVA below the predetermined baseline. The normal minimum for his unit is 153 KVA, unless a different lower bound value is determined during the latest stack test. Section C - Response to Excursions and Exceedances contains the Permittee's obligation with regard to the reasonable response required by this condition. A reading that is outside the above mentioned value is not a deviation from this permit. Failure to take a reasonable response shall be considered a deviation from this permit.

The instrument used for determining the total power shall comply with Section C - Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated or replaced at least once every six (6) months.

(b) Pursuant to CP133-10159-00002, issued April 16, 1999, in the event that an ESP failure has been observed:

(1) All reasonable measures shall be taken to correct, as expeditiously as practicable, the condition causing the emissions to exceed the allowable limits.

(2) All possible steps shall be taken to minimize the impact of the excessive emissions on ambient air quality which may include, but not limited to, curtailment of operations and/or shutdown of the facility.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.1.24 Record Keeping Requirements

(a) To document the compliance status with Conditions D.1.1(b) and D.1.2(e)(1), the Permittee shall maintain records each month and each compliance period of the following:

(1) Overburden removed from the quarry activities;

(2) Limestone input to the primary crusher;

(3) Total input of raw materials to the secondary crusher system;

(4) Fly ash input to the kiln system;

(5) Coal input rate to the coal mill;

(6) Raw material feed input to the kiln system;

(7) Coal input rate to the kiln and calciner burner systems, each and total;

(8) Clinker production rate; and

(9) Clinker input to the No. 1 finish mill, the No. 2 finish mill, and the No. 3 finish mill, each.

(10) Throughput amount, in tons, of spent pot liner through the truck unloading operations;

(b) To document the compliance status with Conditions D.1.6 and D.1.7 and pursuant to 326 IAC 10-3-5(a)(2), for each ozone control period, the Permittee shall maintain records of the following:

(1) Emissions, in pounds of NOx per ton of clinker produced from each affected Portland cement kiln; and

(2) Daily clinker production records.

(3) The date, time, and duration of any startup, shutdown, or malfunction in the operation of any of the Portland cement kilns, affected boilers, or the emissions monitoring equipment.

(4) The results of any performance testing.

(5) If a unit is equipped with a CEMS, identification of time periods:

(A) during which NOx standards are exceeded, the reason for the exceedance, and action taken to correct the exceedance and to prevent similar future exceedances; and

(B) for which operating conditions and pollutant data were not obtained including reasons for not obtaining sufficient data and a description of corrective actions taken.

(6) All records required to be produced or maintained shall be retained on site for a period of five (5) years. The records shall be made available to the department or the U.S. EPA upon request.

(c) To document the compliance status with Conditions D.1.5(b), D.1.5(c) and D.1.17(b), the Permittee shall maintain records in accordance with (1) through (7) below.

(1) Calendar dates covered in the compliance determination period;

(2) Actual fuel oil usage since last compliance determination period and equivalent sulfur dioxide emissions;

(3) Sulfur content and heat content of oil used;

(4) A certification, signed by the owner or operator, that the records of the fuel supplier certifications represent all of the fuel combusted during the period.

If the fuel supplier certification is used to demonstrate compliance instead of determining compliance pursuant to 326 IAC 3-7-4, the following, as a minimum, shall be maintained:

(5) Fuel supplier certifications;

(6) The name of the fuel supplier; and

(7) A statement from the fuel supplier that certifies the sulfur content of the coal and fuel oil.

The Permittee shall retain records of all recording/monitoring data and support information for a period of five (5) years or longer if specified elsewhere in this permit, from the date of the monitoring sample, measurement, or report. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit.

(d) To document the compliance status with Condition D.1.19, and pursuant to 326 IAC 3-5-6, on and after the certification of the continuous opacity monitor system (COMS), the Permittee shall maintain records, including raw data, of all monitoring data and supporting information for a minimum of five (5) years from the date of any of the following:

(1) A monitoring sample.

(2) A measurement.

(3) A test.

(4) A certification.

(5) A report.

The records shall include the following:

(6) A documentation relating to design, installation, and testing of elements of the monitoring system and documentation relating to required corrective action or compliance plan activities.

(7) All maintenance logs, calibration checks, and other required quality assurance activities.

(8) All records of corrective and preventive action.

(9) A log of plant operations, including dates of facility downtime, time of commencement and completion of each downtime, the reason for each downtime and the nature of system repairs and adjustments.

(10) All records of COMS malfunctions, out of control periods, calibration and adjustment activities, and repair of maintenance activities.

(e) To document the compliance status with Conditions D.1.4, D.1.5(a), D.1.6 and D.1.20, and pursuant to 326 IAC 3-5-6, on and after the certification of the continuous emissions monitor, the Permittee shall maintain records, including raw data, of all monitoring data and supporting information for a minimum of five (5) years from the date of any of the following:

(1) A monitoring sample.

(2) A measurement.

(3) A test.

(4) A certification.

(5) A report.

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The records shall include the following:

(6) A documentation relating to design, installation, and testing of elements of the monitoring system and documentation relating to required corrective action or compliance plan activities.

(7) All maintenance logs, calibration checks, and other required quality assurance activities.

(8) All records of corrective and preventive action.

(9) A log of plant operations, including dates of facility downtime, time of commencement and completion of each downtime, the reason for each downtime and the nature of system repairs and adjustments.

(10) All records of CEMS malfunctions, out of control periods, calibration and adjustment activities, and repair of maintenance activities.

(f) To document the compliance status with Condition D.1.21, the Permittee shall maintain records of daily visible emission notations. The Permittee shall include in its daily record when a visible emission notation is not taken and the reason for the lack of visible emission notation (e.g., the process did not operate that day).

(g) To document the compliance status with Condition D.1.22, the Permittee shall maintain records of pressure drop readings. The Permittee shall include in its daily record when a pressure drop reading is not taken and the reason for the lack of pressure drop reading (e.g., the process did not operate that day).

(h) To document the compliance status with Condition D.1.23, the Permittee shall maintain records in accordance with (1) through (5) below. Records shall be complete and sufficient to establish compliance with the limits established in this section. The records shall include the following:

(1) All continuous emissions monitoring data.

(2) When the kiln particulate matter detection system (PMDS) is not in operation, records of the total KVA of the electrostatic precipitator (ESP) on a one (1) hour rolling average.

(3) Method 9 opacity readings for the kiln whenever required by this permit.

(4) All preventive maintenance measures taken.

(5) All response steps taken and the outcome for each.

(i) In order to document the compliant status with Condition D.1.2(i)(2), the Permittee shall maintain monthly records of the number of batches processed in the hydrapulper.

(j) In order to document the compliant status with Condition D.1.2(i)(4), the Permittee shall maintain monthly records of the number of batches processed in the blend box.

(k) Section C - General Record Keeping Requirements, of this permit contains the Permittee's obligations with regard to the records required by this condition.

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D.1.25 Reporting Requirements

(a) Quarterly summaries of the information to document the compliance status with Conditions D.1.1(b), D.1.2(e)(1), D.1.2(i)(2), D.1.2(i)(4), D.1.4, D.1.5 and D.1.6 shall be submitted using the reporting forms located at the end of this permit, or their equivalent, not later than thirty (30) days after the end of the quarter being reported. Section C - General Reporting contains the Permittee's obligation with regard to the reporting required by this condition. The reports submitted by the Permittee do require a certification that meets the requirements of 326 IAC 2-7-6(1) by a “responsible official” as defined by 326 IAC 2-7-1(35).

(b) Pursuant to 326 IAC 10-3-5(c), the Permittee shall submit a report documenting the total NOx emissions and the average NOx emission rate for the ozone control period of each year by October 31. For Portland cement kilns complying with 326 IAC 10-3-3(a)(1), estimated emissions and emissions rate shall be determined in accordance with 326 IAC 10-3-3(d) or from CEMS data and a certification that the low NOx calciner was installed, operated, and maintained according to 326 IAC 10-3 shall be included with this report. Section C - General Reporting contains the Permittee's obligation with regard to the reporting required by this condition. The report submitted by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a “responsible official” as defined by 326 IAC 2-7-1(35).

(c) To document the compliance status with Condition D.1.19(d)(4), a quarterly report of opacity exceedances, as defined in 326 IAC 3-5-7, shall be submitted not later than thirty (30) days after the end of the quarter being reported. Section C - General Reporting contains the Permittee's obligation with regard to the reporting required by this condition. The report submitted by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a “responsible official” as defined by 326 IAC 2-7-1(35).

(d) In order to document the compliance status with Conditions D.1.19 and D.1.20, pursuant to 326 IAC 3-5-7(c), a quarterly report of each continuous monitoring system instrument downtime, except for zero (0) and span checks, which shall be reported separately, shall include the following:

(1) Date of downtime.
(2) Time of commencement.
(3) Duration of each downtime.
(4) Reasons for each downtime.
(5) Nature of system repairs and adjustments.

Section C - General Reporting contains the Permittee's obligation with regard to the reporting required by this condition. The report submitted by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a “responsible official” as defined by 326 IAC 2-7-1(35).

SECTION D.2 EMISSION UNIT OPERATION CONDITIONS

Emission Unit Description:

(s) One (1) portable impact crushing plant, for the reclamation of partially formatted clinker and the resizing of aggregate prior to the raw material pile feeding the raw mill system, approved in 2014 for construction, with a nominal throughput of 100 tons per hour, bottlenecked by the raw material feed system, particulate matter and opacity controlled by water mist spray, containing the following processes:

(1) Handling (PF3-37a);
(2) One (1) vibrating feeder (PF3-38);
(3) One (1) optional screen;
(4) One (1) portable crusher (PC3-38);
(5) Two (2) conveyor belts (PS3-39) consisting of one main conveyor and one side conveyor;
(6) Two (2) open reclaimed clinker storage piles; and
(7) Two (2) open resized aggregate storage piles.

Under 40 CFR 63, Subpart LLL, the open reclaimed clinker storage piles are considered affected facilities while the units are reworking partially formatted clinker.

Under 40 CFR 60, Subpart OOO, the following portions of the portable impact crushing plant are affected facilities while resizing aggregate prior to the raw material pile feeding the raw mill system: handling, vibrating feeder, screening, crusher, conveyor transfer points, and aggregate storage piles.

Insignificant Activities

(a) The following equipment related to manufacturing activities not resulting in the emission of HAPs: brazing equipment, cutting torches, soldering equipment, welding equipment [326 IAC 6-3-2];

(b) Cutting 200,000 linear feet or less of one inch (1") plate or equivalent [326 IAC 6-3-2];

(c) Trimmers that do not produce fugitive emissions and that are equipped with a dust collection or trim material recovery device such as a bag filter or cyclone [326 IAC 6-3-2]; and

(d) Conveyors as follows [326 IAC 6-3-2]:

(1) Covered conveyors for coal or coke conveying or less than or equal to 360 tons per day;

(2) Covered conveyors for limestone conveying of less than or equal to 7,200 tons per day for sources other than mineral processing plants constructed after August 31, 1983;

(3) Uncovered coal conveying of less than or equal to 120 tons per day; and

(4) Underground conveyors.

(e) Degreasing operations that do not exceed 145 gallons per 12 months, except if subject to 326 IAC 20-6 [326 IAC 8-3-2][326 IAC 8-3-8].

(f) One (1) non-hazardous waste alternate fuels handling process, identified as Point 2-18, constructed in 2007, with a maximum capacity of ten (10) tons of non-hazardous waste alternate fuel per hour, consisted of the following: [326 IAC 6-3-2]

(1) Two (2) hoppers, identified as 295F and 296F;

(2) Two (2) screw conveyors, identified as 295V and 296V;

(3) Two (2) weight feeders, identified as 295V1 and 296V1;

(4) Three (3) covered drag chain conveyors, identified as 296DCC, 297DCC, and 298DCC; and

(5) Two (2) bucket elevators, identified as 296BE and 297BE.

(g) Storage piles for non-hazardous waste alternate fuels, located inside a three-sided building, with a total maximum throughput rate of ten (10) tons/hr. [326 IAC 6-4]

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.2.1 Particulate Emission Limitations [326 IAC 6-3-2]

(a) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), Particulate emissions from the listed facilities (a) through (d), and (f) shall not exceed the pounds per hour limitation calculated using the following equation:

Interpolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 4.10\ P^{0.67}$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

(b) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), the allowable particulate matter (PM) emission rate from the portable crusher system shall not exceed the pounds per hour limits shown in the table below when operating at the maximum process weight rates show in the table below.

PM Emission Limitations						
Emission Point	Description	Capacity (ton/hr)	Equation Used for Limit	326 6-3-2 Limit (lb/hr)	PTE (lb/hr)	Control Needed for Limit
PF3-37a	Excavator to Loader	100	a	51.28	0.0016	No
PF3-38	Vibrating Feeder	100	a	51.28	0.30	No
PF3-38	Primary Screen	100	a	51.28	2.50	No
PC3-38	Portable Crusher	100	a	51.28	0.54	No

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PM Emission Limitations						
Emission Point	Description	Capacity (ton/hr)	Equation Used for Limit	326 6-3-2 Limit (lb/hr)	PTE (lb/hr)	Control Needed for Limit
PC3-39	Main Conveyor	76.9	a	48.68	0.23	No
PC3-39	Side Conveyor	23.1	b	33.60	0.07	No

The pounds per hour limitations were calculated using the following equations:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the following equation:

$E = 55.0 \times P^{0.11} - 40$ (Equation a)

Where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour.

Interpolation and extrapolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the following equation:

$E = 4.10 \times P^{0.67}$ (Equation b)

Where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour.

D.2.2 Volatile Organic Compounds (VOC) [326 IAC 8-3-2]

Pursuant to 326 IAC 8-3-2 (Cold Cleaner Degreaser Control Equipment and Operating Requirements), the Permittee shall ensure the following control equipment and operating requirements are met for each of the degreasing operations:

(a) Ensure the following control equipment and operating requirements are met:

(1) Equip the degreaser with a cover.

(2) Equip the degreaser with a device for draining cleaned parts.

(3) Close the degreaser cover whenever parts are not being handled in the degreaser.

(4) Drain cleaned parts for at least fifteen (15) seconds or until dripping ceases.

(5) Provide a permanent, conspicuous label that lists the operating requirements in subdivisions (3), (4), (6), and (7).

(6) Store waste solvent only in covered containers.

(7) Prohibit the disposal or transfer of waste solvent in such a manner that could allow greater than twenty percent (20%) of the waste solvent (by weight) to evaporate into the atmosphere.

(b) Ensure the following additional control equipment and operating requirements are met:

(1) Equip the degreaser with one (1) of the following control devices if the solvent is heated to a temperature of greater than forty-eight and nine-tenths (48.9) degrees Celsius (one hundred twenty (120) degrees Fahrenheit):

(A) A freeboard that attains a freeboard ratio of seventy-five hundredths (0.75) or greater.

(B) A water cover when solvent used is insoluble in, and heavier than, water.

(C) A refrigerated chiller.

(D) Carbon adsorption.

(E) An alternative system of demonstrated equivalent or better control as those outlined in clauses (A) through (D) that is approved by the department. An alternative system shall be submitted to the U.S. EPA as a SIP revision.

(2) Ensure the degreaser cover is designed so that it can be easily operated with one (1) hand if the solvent is agitated or heated.

(3) If used, solvent spray:

(A) must be a solid, fluid stream; and

(B) shall be applied at a pressure that does not cause excessive splashing.

D.2.3 Volatile Organic Compounds (VOC) [326 IAC 8-3-8]

Pursuant to 326 IAC 8-3-8 (Material Requirements for Cold Cleaner Degreasers), on and after January 1, 2015, the Permittee shall not operate a cold cleaning degreaser with a solvent vapor pressure that exceeds one (1) millimeter of mercury (nineteen-thousandths (0.019) pound per square inch) measured at twenty (20) degrees Celsius (sixty-eight (68) degrees Fahrenheit).

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.2.4 Record Keeping Requirements

(a) To document the compliance status with Condition D.2.3, on and after January 1, 2015, the Permittee shall maintain the following records for each purchase of solvent used in the cold cleaner degreasing operations. These records shall be retained on-site or accessible electronically for the most recent three (3) year period and shall be reasonably accessible for an additional two (2) year period.

(1) The name and address of the solvent supplier.

(2) The date of purchase.

(3) The type of solvent purchased.

(4) The total volume of the solvent purchased.

(5) The true vapor pressure of the solvent measured in millimeters of mercury at twenty (20) degrees Celsius (sixty-eight (68) degrees Fahrenheit).

(b) Section C - General Record Keeping Requirements of this permit contains the Permittee's obligations with regard to the records required by this condition.

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SECTION E.1 FACILITY OPERATION CONDITIONS

Facility Description:

(b) Raw Material Sizing Activities:

(1) One (1) primary crusher, identified as Point 1-8 (201G) and one (1) vibrating feeder, identified as Point 1-9A (201V); both constructed in 1969, modified in 1998 and 1999, with a nominal capacity of 1,300 tons of limestone per hour, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(2) Outside storage piles, modified in 1999, with a throughput of 1,300 tons per hour, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(3) Raw material sizing transfer equipment including:

(A) One (1) apron feeder, identified as Point 1-14 (206V), constructed in 1969 and modified in 1999, with a nominal throughput of 400 tons per hour, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(B) One (1) belt conveyor, identified as Point 1-9B (214V), constructed in 1969, with a nominal throughput of 1,300 tons per hour, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(C) Three (3) pan feeders, identified as Point 1-11 (202V-204V), all constructed in 1969 and modified in 1999, with a nominal capacity of 1,300 tons per hour each, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(D) Three (3) belt conveyors, identified as Point 1-15 (215V, 305V, 251V), constructed in 1969, 1969, and 2000, respectively, with a nominal capacity of 1,300 tons per hour each, equipped with one (1) fabric filter system (FF 1-15, baghouse 209L) to control particulate emissions. Under 40 CFR 60, Subpart OOO, 215V is considered an affected facility.

(E) One (1) secondary crusher system, identified as SC-1, constructed in 2001, with a nominal capacity of 600 tons of limestone and additives per hour; controlled by six (6) baghouses/dust collectors 208L, 208L1, 210L, 202320, 202345, and 202380, exhausting to six (6) stacks 208L, 208L1, 210L, DC201 DC202 and DC203, respectively. The secondary crusher system is totally enclosed and consists of the following pieces of equipment:

(i) One (1) Hazemag single rotor impactor crusher, identified as GC202185.01, with a nominal capacity of 600 tons per hour, constructed in 2008, with emissions controlled by a baghouse, identified as 208L and exhausting through stack 208L. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(ii) Two (2) metso cone crushers, identified as GC202140.06 and GC202145.06, each with a nominal capacity of 350 tons per hour, each, constructed in 2008, with emissions controlled by two (2) dust collectors, identified as 202320 and 202345 and exhausting through stacks 202320 and 202345. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(iii) One (1) belt conveyor, identified as 202370, with a nominal capacity of 600 tons per hour, constructed in 2008, with emissions controlled by a dust collector, identified as 202380 and exhausting through stack 202380. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(iv) One (1) belt conveyor, identified as Point 1-16A (202G2V2), with a nominal capacity of 525 tons per hour; one (1) crusher, identified as Point 1-16C (202G2), with a nominal capacity of 525 tons per hour; one (1) belt conveyor, identified as Point 1-16D (202G2V3), with a nominal capacity of 525 tons per hour; all constructed in 2001, one (1) belt conveyor (205GV), all equipped with one (1) fabric filter system (FF 1-16, baghouse 208L1) to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(v) One (1) apron feeder, identified as Point 1-24 (202G2V1), with a nominal capacity of 600 tons per hour, constructed in 2001, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(vi) One (1) belt conveyor, identified as Point 1-25C (202G1V1); one (1) belt conveyor, identified as Point 1-25E (202G1V2); and one (1) belt conveyor, identified as Point 1-25F (202GV2); each with a nominal capacity of 600 tons per hour, all constructed in 2001, equipped with one (1) fabric filter system (FF 1-25, baghouse 208L) to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(vii) One (1) screen, identified as Point 1-26C (204G); three (3) belt conveyors, identified as Point 1-26D (202GV3 or 202GV3-1 or 202GV3-2); and one (1) belt conveyor, identified as Point 1-26E (202GV4); each with a nominal capacity of 600 tons per hour, all constructed in 2001, equipped with one (1) fabric filter system (FF 1-26, baghouse 210L) to control particulate emissions. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(F) One (1) clay slip operation, identified as CS-1, constructed in 2015, with a maximum rated capacity of 50 tons of clay (overburden consisting generally of clay with up to 5% limestone) per hour. The clay slip processing system includes covered overburden storage, with processing equipment totally enclosed; consists of the following pieces of equipment:

(i) One hopper, identified as HP-101 and one (1) Apron Feeder, identified as AP-101, constructed in 2015, with a nominal capacity of 60 tons per hour, constructed in 2015, with emissions controlled within a building enclosure. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(ii) Two (1) belt conveyors, identified as Points C-101, and C-102, constructed in 2015, with a nominal capacity of 50 tons per hour each. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(iii) One (1) Wet Clay Crusher identified as CR-101, constructed in 2015, with a nominal capacity of 50 tons per hour. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(iv) One (1) Log Washer identified as LW-101, constructed in 2015, with a nominal capacity of 50 tons per hour. Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

(v) One (1) Horizontal Deck Screen, identified as RS-101, constructed in 2015, with a nominal capacity of 50 tons per hour, with emissions controlled by wet suppression, within a building enclosure. Under 40 CFR 60, Subpart OOO, this is considered an affected facility. The average feed to the raw mill surge system will be 302 gpm wet slurry (50% water), including up to 32 tph clay and 1 tph limestone.

(vi) Two (2) slurry holding tanks, constructed in 2015 with a nominal throughput of 302 gallons per minute.

(q) One (1) portable screen and conveyor unit for the sizing of plant materials with a nominal throughput of 100 tons per hour, including reclamation of partially formatted clinker product, including the following units:

(1) One (1) vibrating feeder (F3-33)
(2) One (1) portable vibrating screen (S3-34)
(3) One (1) conveyor belt (S3-34)
(4) Hauling (F3-32)
(5) Handling (F3-32a)

Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

Under 40 CFR 63, Subpart LLL, the portable screen and conveyor units are considered affected facilities while the units are reworking partially formatted clinker.

(s) One (1) portable impact crushing plant, for the reclamation of partially formatted clinker and the resizing of aggregate prior to the raw material pile feeding the raw mill system, approved in 2014 for construction, with a nominal throughput of 100 tons per hour, bottlenecked by the raw material feed system, particulate matter and opacity controlled by water mist spray, containing the following processes:

(1) Handling (PF3-37a);
(2) One (1) vibrating feeder (PF3-38);
(3) One (1) optional screen;
(4) One (1) portable crusher (PC3-38);
(5) Two (2) conveyor belts (PS3-39) consisting of one main conveyor and one side conveyor;
(6) Two (2) open reclaimed clinker storage piles; and
(7) Two (2) open resized aggregate storage piles.

Under 40 CFR 63, Subpart LLL, the open reclaimed clinker storage piles are considered affected facilities while the units are reworking partially formatted clinker.

Under 40 CFR 60, Subpart OOO, the following portions of the portable impact crushing plant are affected facilities while resizing aggregate prior to the raw material pile feeding the raw mill system: handling, vibrating feeder, screening, crusher, conveyor transfer points, and aggregate storage piles.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

E.1.1 General Provisions Relating to New Source Performance Standards (NSPS) [326 IAC 12-1] [40 CFR Part 60, Subpart A]

Pursuant to 40 CFR 60.1, the Permittee shall comply with the provisions of 40 CFR Part 60, Subpart A - General Provisions, which are incorporated by reference as 326 IAC 12-1, except as otherwise specified in 40 CFR 60, Subpart OOO.

E.1.2 Nonmetallic Mineral Processing Plants NSPS [326 IAC 12] [40 CFR Part 60, Subpart OOO]

The Permittee who operates a stationary portland cement manufacturing plant shall comply with the following provisions of 40 CFR Part 60, Subpart OOO, which are incorporated by reference as 326 IAC 12 (included as Attachment B of this permit):

(1) 40 CFR 60.670
(2) 40 CFR 60.671
(3) 40 CFR 60.672
(4) 40 CFR 60.673
(5) 40 CFR 60.674
(6) 40 CFR 60.675
(7) 40 CFR 60.676
(8) Table 1 and Table 3

SECTION E.2 FACILITY OPERATION CONDITIONS

Facility Description:

(f) Coal Mill Operation:

(1) Coal storage piles, modified in 1999, with a throughput of 100 tons per hour utilizing building enclosures (BE 2-1) or compaction (CMP 2 16) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(2) Coal transfer equipment:

(A) Four (4) vibrating feeders, identified as Point 2-2A (209V-211V, 213V); one (1) belt conveyor, identified as Point 2-2B (222V); and one (1) coal grizzly, identified as Point 2-2C (223V); all constructed before 1974 and modified in 1999, with a nominal capacity of 100 tons per hour each, utilizing water mist suppression or equivalent dust suppression to control particulate emissions and covered by a building enclosure (BE 2-2) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(B) One (1) belt conveyor, identified as Point 2-4 (420V), constructed before 1974 and modified in 2000, with a nominal capacity of 100 tons per hour, covered by a building enclosure (BE 2-4) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(C) One (1) belt conveyor, identified as Point 2-6B (420V3), constructed on May 1, 2000, with a nominal capacity of 100 tons per hour, equipped with one (1) shared fabric filter system (FF 2-6, baghouse 420L2) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(D) One (1) belt conveyor (420V1), constructed on May 1, 2000, with a nominal capacity of 100 tons per hour, equipped with one (1) fabric filter system (baghouse 420L1) which exhausts into the building. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(3) Three (3) coal reject piles, identified as Points 2-3, 2-5, and 2-15, modified in 1999, with a throughput of 100 tons per hour, utilizing mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(4) One (1) raw coal bin, identified as Point 2-9 (435F), constructed May 1, 2000, with a nominal capacity of 100 tons, equipped with one (1) fabric filter system (FF 2-9, baghouse 435L) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(5) One (1) weigh feeder, identified as Point 2-10A (435V); and one (1) conveyor belt, identified as Point 2-10B (436V); all constructed on May 1, 2000, each with a nominal capacity of 61 tons per hour, covered by a building enclosure (BE 2-10) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(6) One (1) coal mill, identified as Point 2-11A (436G), with a nominal capacity of 40 tons of coal per hour, using a fuel oil fired burner during startup, and when additional heat is needed, and clinker cooler gas at other times to remove moisture from the coal (Note: For the purposes of NSPS Subpart Y, this is also a thermal dryer); and three (3) screw conveyors, identified as Point 2-11B (436LV, 436L1V, 436GV1), each with a nominal capacity of 40 tons per hour; all constructed on May 1, 2000, one (1) coal mill reject screw identified as 351155, and equipped with one (1) fabric filter system (FF 2-11, baghouse 436L) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(7) Two (2) screw conveyors, identified as Point 2-13B (437V, 438V), with a nominal capacity of 40 tons per hour; two (2) rotary feeders, identified as Point 2-13C (436LVV, 436L1VV), with a nominal capacity of 40 tons per hour; and one (1) pulverized coal bin, identified as Point 2-13A (438F), with a nominal capacity of 100 tons; all constructed on May 1, 2000, and equipped with one (1) fabric filter system (FF 2-13, baghouse 438L) to control particulate emissions. Under 40 CFR 60, Subpart Y, this is considered an affected facility.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

E.2.1 General Provisions Relating to New Source Performance Standards for Standards (NSPS) Y [326 IAC 12-1] [40 CFR Part 60, Subpart A]

Pursuant to 40 CFR 60.1, the Permittee shall comply with the provisions of 40 CFR Part 60, Subpart A - General Provisions, which are incorporated by reference as 326 IAC 12-1, except as otherwise specified in 40 CFR 60, Subpart Y.

E.2.2 Coal Preparation Plants NSPS [326 IAC 12] [40 CFR Part 60, Subpart Y]

The Permittee who operates coal preparation plants shall comply with the following provisions of 40 CFR Part 60, Subpart Y which are incorporated by reference as 326 IAC 12 (included as Attachment C of this permit):

(1) 40 CFR 60.250
(2) 40 CFR 60.251
(3) 40 CFR 60.252
(4) 40 CFR 60.253
(5) 40 CFR 60.254

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SECTION E.3 FACILITY OPERATION CONDITIONS

Facility Description:

(r) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001**.** The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(3) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

E.3.1 General Provisions Relating to New Source Performance Standards (NSPS) [326 IAC 12-1] [40 CFR Part 60, Subpart A]

Pursuant to 40 CFR 60.1, the Permittee shall comply with the provisions of 40 CFR Part 60, Subpart A - General Provisions, which are incorporated by reference as 326 IAC 12-1, except as otherwise specified in 40 CFR 60, Subpart Kb.

E.3.2 Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984 NSPS [326 IAC 12] [40 CFR Part 60, Subpart Kb]

The Permittee who owns/operates storage vessel/s shall comply with the following provisions of 40 CFR Part 60, Subpart Kb which are incorporated by reference as 326 IAC 12, (included as Attachment D of this permit) for Tanks 1 through 8, 10 and 11:

(1) 40 CFR 60.110b(a);
(2) 40 CFR 60.111b;
(3) 40 CFR 60.112b(a)(3)(ii);
(4) 40 CFR 60.113b(c);
(5) 40 CFR 60.115b(c);
(6) 40 CFR 60.116b(a), (b), (f), and (g); and
(7) 40 CFR 60.117b.

SECTION E.4 FACILITY OPERATION CONDITIONS

Facility Description:

(c) One (1) gypsum material handling process, constructed in 2002 and modified in 2009, with a nominal production of 150 tons per hour of the blended synthetic gypsum material or rock gypsum, including the following units:

(1) One (1) synthetic gypsum transporting system, identified as 1-47. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Two (2) outdoor synthetic gypsum storage piles, identified as 62 and 64, with a nominal throughput of 268,056 tons per year, using wet suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) Three (3) synthetic gypsum hoppers, identified as 508120, 508140 and 508165; three (3) sets of screw conveyors (4 in each set), identified as 508130, 508150 and 508175; three (3) weigh belts, identified as 508125, 508145 and 508170; and four belt conveyors, identified as 661BC (508136 to mill #3) constructed in 2012, 604BC, 605BC (GC508156 and GC508157 to mill #1) and 602BC1 (GC508176 to mill #2), constructed in2014, with a nominal throughput of 10.2 tons per hour each, using wet suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) rock gypsum and limestone material hopper (234F) and two (2) conveyor belts (234V, 234FV), identified as 1-38, with a nominal throughput of 150 tons per hour, constructed in 2002, using wet suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(d) Raw Material Ball Mill Operation, with a nominal capacity of 400 tons of raw material per hour, including the following units:

(1) Raw material ball mill transfer equipment including four (4) belt conveyors, identified as Point 1-17A (252V-255V); four (4) raw material bins, identified as Point 1-17B (350F-353F); all constructed on April 1, 2000, with a nominal capacity of 525 tons per hour, equipped with one (1) fabric filter system (FF 1-17, baghouse 350L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Two (2) weigh feeders, identified as Point 1-18A (352V-353V); one (1) conveyor belt, identified as Point 1-18B (358V); two (2) apron feeders, identified as Point 1-18C; and two (2) scavenger conveyors, identified as Point 1 18D (350V2, 351V2); all constructed on April 1, 2000, with a nominal capacity of 400 tons per hour; all utilizing a building enclosure to control particulate emissions. Two (2) weigh feeders (350V, 351V); equipped with one (1) fabric filter system (FF-18, baghouse 352L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(e) Fly Ash Storage and Additive Activities, including the following units:

(1) Two (2) rotary feeders (270V2, 271V2), one (1) weigh screw (275V), one (1) Pfister rotary feeder (276V), and one (1) weigh bin (273F) constructed March 2009; two screw conveyors, identified as Point 1-19A (273V, 274V); one (1) fly ash hopper, identified as Point 1-19B (273FA); and one (1) FK pump (273JA); all constructed on April 1, 2000, and modified February 8, 2002, with exception of 273FA and 273JA which were constructed in 2003, each with a nominal capacity

of 20 tons per hour, equipped with one (1) fabric filter system (FF 1-7, 273L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) One (1) fly ash silo, identified as Point 1-39 (270F), constructed on April 1, 2000, with a nominal capacity of 1,250 tons, equipped with two (2) fabric filter systems (FF 1-39, 270L, and baghouse 274L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) fly ash silo, identified as Point 1-40 (271F), constructed on April 1, 2000, with a nominal capacity of 1,250 tons, equipped with two (2) fabric filter systems (FF 1-40, 271L, and baghouse 274L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) Two (2) additive silos, identified as Point 1-21A (318F, 328F), each with a nominal capacity of 500 tons, four (4) rotary feeders, identified as Point 1-21B (318V, 318VV, 328V, 328VV), with a nominal capacity of 30 tons per hour each; all constructed on May 17, 1996, equipped with one (1) fabric filter system (FF 1-21, baghouse 319L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) additive feed bin, identified as Point 1-22 (308F), constructed after August 17, 1971 and before May 17, 1996, with a nominal capacity of 200 tons, covered by a building enclosure (BE 1-22) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) One (1) rotary feeder, identified as Point 1-23A (308V), constructed in 1996; and one (1) weigh belt, identified as Point 1-23B (309V), constructed after August 17, 1971; each with a nominal capacity of 30 tons per hour, covered by a building enclosure (BE 1-23) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(g) One (1) alternate raw material feed system, constructed in 2007, operating at a maximum capacity of 20 tons per hour each, and consisting of the following pieces of equipment:

(1) Slag pile, identified as one of the materials identified in Point 1-13, controlled with water mist spray as needed. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) One (1) slag hopper, identified as 301132.01, with emissions uncontrolled. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) weight feeder, identified as 289V, with emissions uncontrolled. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) covered belt conveyor, identified as GC301132.05, and one (1) screw conveyor identified as 301132.08.. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) bucket elevator, identified as 292V. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) Paved delivery roads with particulate emissions controlled by vacuum sweeping.

(7) One (1) non-hazardous alternate raw materials storage building. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(h) Kiln Operation, with a nominal capacity of 360 tons of dry raw feed per hour and 208 tons clinker per hour. Stack 3-1 includes a SO_2, NOx and CO_2 continuous emissions monitor (CEMS), particulate matter detection system (PMDS) and a continuous opacity monitoring system (COMS). This operation consists of the following:

(3) One (1) return dust bin, identified as Point 3-3A (405F), constructed before 1971 and modified in 1999, with a nominal capacity of 100 tons; one (1) waste dust bin, identified as Point 3-3F (404F), constructed before 1971 and modified in 1999, with a nominal capacity of 75 tons; one (1) hopper, identified as Point 3-3C (445F), constructed on May 1, 2000, with a nominal capacity of 60 tons per hour; two (2) bucket elevators, identified as Point 3-3G (411V, 413V), constructed before August 17, 1971, with a nominal capacity of 60 tons per hour; and two (2) rotary feeders, identified as Point 3-3H (405FVV, 305286); one (1) screw conveyor, identified as Point 3-3I (405FVV1), constructed in 2003 except 305286 constructed in 2008 each with a nominal capacity of 60 tons per hour; and two (2) screw conveyors, identified as 305287 and 305288; all equipped with one fabric filter system (FF 3-3, baghouse 403L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) non-routine raw material dust truck loading station, constructed before 1971 and modified in 1999, covered by a building enclosure (BE 3-25) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) One (1) reject dust bin for cement kiln dust, identified as Point 3-7A (481F), with a nominal capacity of 150 tons, constructed on May 1, 2000, equipped with one (1) fabric filter system (FF 3-7, baghouse 483L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) One (1) alkali bypass system cement kiln dust truck loading station, identified as Point 3-8, constructed in 2000, utilizing mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) One (1) pneumatic dust pump, identified as FK Pump 485J and in-line diverter valve, installed in 2011. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(i) Clinker Cooler Operations, with a nominal capacity of 208 tons of clinker per hour:

(1) One (1) clinker cooler, identified as Point 3-9A (401C), constructed before August 17, 1971 and modified in 2000, with a nominal capacity of 208 tons per hour; one (1) clinker breaker, identified as Point 3-9B (401CG), constructed on January 1, 1969 and modified in 2000, with a nominal capacity of 208 tons per hour; one (1) dropout chamber, identified as Point 3-9C (401CL), constructed January 1, 1969, with a nominal capacity of 20 tons per hour; two (2) vibrating feeders, identified as Point 3-9F (427V, 428V), constructed before August 17, 1971 and modified in 2000, with a nominal capacity of 208 tons per hour each; and one (1) drag conveyor, identified as Point 3-9G (401CV), and eight (8) screw conveyors (422V, 470CV2, 470CV3, 470CV9, 470CV10, 474V-476V), nine (9) rotary feeders (401CV1 and 471CLV1-8), all constructed before August 17, 1971 and modified in 2001, each with a nominal capacity of ten (10) tons per hour; all equipped with one (1) fabric filter system (FF 3-9, baghouse 471-CL) to control particulate emissions, exhausting to stack 3-2. Stack 3-2 has a continuous opacity monitoring system (COMS) and PM continuous parametric monitoring system (CPMS). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Two (2) belt conveyors, identified as Point 3-11A (421V, 509V); and two (2) bucket elevators, identified as Point 3-11B (418V, 419V); all constructed before 1971 and modified in 2000, with a nominal capacity of 208 tons per hour each (note that belt conveyor (421V) is a non-routine belt; all equipped with one (1) fabric filter system (FF 3-11, baghouse 406L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) non-routine outdoor clinker pile, identified as Point 3-13, modified in 1999, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) belt conveyor (turning tower), identified as Point 3-12 (510V), constructed before 1971 and modified in 2000, with a nominal capacity of 208 tons per hour, equipped with one (1) fabric filter system (FF 3-12, baghouse 506L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) bucket elevator, identified as Point 3-22 (500V), constructed on October 1, 1999, with a nominal capacity of 250 tons per hour, equipped with one (1) fabric filter system (FF 3-14, baghouses 503L and 503L1) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) Two (2) feeders, identified as Point 3-24A (207F, 208F); and one (1) belt conveyor, identified as Point 3-24B (219V); each constructed before August 17, 1971, with a nominal capacity of 300 tons per hour each, equipped with one (1) fabric filter system (FF 3-24, baghouse 220L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) Seven (7) clinker silos, identified as Point 3-14 (501A-507A), constructed before 1971 and modified in 1999, each with a nominal capacity of 5000 tons, equipped with two (2) fabric filter system (FF 3-14, baghouses 503L and 503L1) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) One (1) belt conveyor, identified as Point 3-21 (220V), constructed before August 17, 1971, equipped with one (1) fabric filter system (FF 3-21, baghouse 221L) which was installed in 2001 to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(j) Finish Mill Operations:

(1) Four (4) vibrating feeders, identified as Point 3-15 (504V-507V), constructed before 1971 and modified in 1999, with a nominal capacity of 250 tons per hour each, equipped with one (1) fabric filter system (FF 3-15, baghouse 505L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Four (4) vibrating feeders, identified as Point 3-17A (501V-503V, 508V); and one (1) belt conveyor, identified as Point 3-17B (221V); with a nominal capacity of 250 tons per hour each; all constructed before 1971 and modified in 1999, equipped with one (1) fabric filter system (FF 3-17, baghouse 504L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) Two (2) belt conveyors, identified as Point 3-20B (514V, 511V), constructed before August 17, 1971; one (1) bucket elevator, identified as Point 3-20A (513V), constructed on June 1, 2000; and one (1) belt conveyor, identified as 511V2, constructed in 2003; each with a nominal capacity of 250 tons per hour, 514V, 511V, and 513V are equipped with one (1) fabric filter system (FF 3-20, baghouse 513L) to control particulate emissions. 511V2 is equipped with baghouse 507L to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) belt conveyor, identified as Point 4-13A (515V), constructed in 1969 and modified in 2000, with a nominal capacity of 250 tons per hour; and four (4) silos, identified as Point 4-13B; 652A, constructed on January 1, 1969, with a nominal capacity of 2,260 tons, equipped with one (1) fabric filter system (FF 4-13, baghouse 515L) to control particulate emissions. 650A, 651A, and 653A, constructed on January 1, 1969 with a nominal capacity of 2,440; 2,315; and 200 tons, respectively, and controlled by baghouses 670L, 671L, and 672L, respectfully, (constructed in 2006) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) belt conveyor, identified as Point 4-14 (516V), constructed on January 1, 1969, with a nominal capacity of 250 tons per hour, equipped with one (1) fabric filter system (FF 4-14, baghouse 516L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) No. 1 Finish Mill, modified in 1993, with a nominal capacity of 70 tons of clinker per hour:

(A) Two (2) belt conveyors, identified as Point 4-1A (639V, 640V), constructed in 1971 and modified in 1999, with a nominal capacity of 250 tons per hour each; one (1) clinker bin, identified as Point 4-1B (601F), constructed before 1971 and modified in 1999, with a nominal capacity of 260 tons; one (1) gypsum bin, identified as Point 4-1C (603F), constructed before 1971 and modified in 1999, with a nominal capacity of 240 tons per hour; one (1) spill screw, identified as Point 4-1D (646V), constructed in 2002, with a nominal capacity of five (5) tons per hour; and one (1) belt conveyor, identified as 614V, modified in 2003, with a maximum capacity of 250 tons of clinker per hour; all equipped with one (1) fabric filter system (FF 4-1, baghouse 617L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(B) One (1) No. 1 finish mill, identified as Point 4-2A (603G), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; one (1) elevator, identified as Point 4-2B (626V), constructed before 1971 and modified in 1999, with a nominal capacity of 200 tons per hour; and one (1) spill screw, identified as Point 4-2D (642V), constructed 1969 and modified in 1999, with a nominal capacity of five (5) tons per hour; all equipped with one (1) fabric filter system (FF 4-2, baghouse 613L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(C) One (1) air separator, identified as Point 4-3A (605G), constructed in 1994 and modified in 1999, with a nominal capacity of 200 tons per hour; one (1) tailing screw, identified as Point 4-3D (613V), constructed in 1969 and modified in 1999, with a nominal capacity of 200 tons per hour; two (2) cement coolers, identified as Point 4-3E (603C, 604C), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker

per hour each; one (1) F.K. pump hopper, identified as Point 4-3G (611F), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; one (1) mill feed belt, identified as Point 4-3H (641V), constructed in 1974 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; and one (1) clinker F.O.W. belt, identified as Point 4-3I (601V), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons per hour; equipped with one (1) fabric filter system (FF 4-3, baghouse 606L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(D) One (1) fringe bin for off-specification cement and cement kiln dust, identified as Point 4-16A (604F), constructed before August 17, 1971, with a nominal capacity of 66 tons; and two (2) screw feeders, identified as Point 4-16B (611V, 604F1V), constructed on January 1, 1969, with a nominal capacity of 20 tons per hour each; equipped with one (1) fabric filter system (FF 4-16, baghouse 605L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(E) One (1) weigh belt, identified as Point 4-15A (605V), and one (1) belt conveyor, identified as Point 4-15B (616V), constructed before 1974, covered by a building enclosure to control particulate matter. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) No. 2 Finish Mill, with a capacity of 70 tons of clinker per hour:

(A) Two (2) conveyor belts, identified as Point 4-4A (639V, 640V), constructed 1969 and modified in 1999, with a nominal capacity of 250 tons per hour; one (1) clinker bin, identified as Point 4-4B (602F), constructed before 1971 and modified in 1999, with a nominal capacity of 260 tons; one (1) gypsum bin, identified as Point 4-4C (603F), constructed before 1971 and modified in 1999, with a nominal capacity of 240 tons; one (1) clinker F.O.W. belt, identified as Point 4-4D, (602V), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons per hour; and one (1) feed belt, identified as Point 4-4E (644V), constructed in 1975 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; all equipped with one (1) fabric filter system (FF 4-4, baghouse 636L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(B) One (1) No. 2 finish mill, identified as Point 4-5A (602G), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; and one (1) spill screw, identified as Point 4-5B (645V), constructed in 1969 and modified in 1999, with a nominal capacity of 5 tons per hour; all equipped with one (1) fabric filter system (FF 4-5, baghouse 603L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(C) One (1) air separator, identified as Point 4-6A (604G), constructed before 1971 and modified in 1999, with a nominal capacity of 200 tons per hour; one (1) elevator, identified as Point 4-6B (621V), constructed before 1971 and modified in 1999, with a nominal capacity of 200 tons per hour; one (1) tailing screw, identified as Point 4-6D (612V), constructed in 1969 and modified in 1999, with a nominal capacity of 200 tons per hour; two (2) cement coolers, identified as Point 4-6E (601C, 602C), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour each; one (1) F.K. pump hopper, identified as Point 4-6F (610F), constructed in 1969 and modified in 1999, with a nominal capacity of 70

tons of clinker per hour; and one (1) mill feed belt, identified as Point 4-6G (644V), constructed in 1975 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; all equipped with one (1) fabric filter system (FF 4-6, baghouse 602L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) No. 3 Finish Mill, with a nominal capacity of 95 tons of clinker per hour:

(A) One (1) No. 3 finish mill, identified as Point 4-9 (660G), constructed on June 1, 2000, with a nominal capacity of 95 tons of clinker per hour, equipped with one (1) fabric filter system (FF 4-9, baghouse 660L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(B) One (1) hopper, identified as Point 4-10C (667F), with a nominal capacity of 95 tons of clinker per hour; one (1) cooler, identified as Point 4-10D (664C), with a nominal capacity of 95 tons of clinker per hour; and one (1) feed belt, identified as Point 4-10E (654V), with a nominal capacity of 95 tons of clinker per hour; all constructed on June 1, 2000, equipped with one (1) fabric filter system (FF 4-10, baghouse 661L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(C) One (1) fringe bin for off-specification cement and cement kiln dust, identified as Point 4-11B (665F), with a nominal capacity of 80 tons; one (1) elevator, identified as Point 4-11C (661V), with a nominal capacity of 230 tons per hour equipped with one (1) clean-up hopper and one (1) clean-up screw 509530; and one (1) rotary feeder, identified as Point 4-11D (665FV), with a nominal capacity of 50 tons per hour; all constructed on June 1, 2000 and cleanup screw 1201V and hopper, constructed in 2007 with a nominal capacity of 10 tons per hour; all equipped with one (1) fabric filter system (FF 4-11, baghouse 665L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(D) One (1) air separator, identified as Point 4-12A (664G), constructed on June 1, 2000, with a nominal capacity of 230 tons per hour, and equipped with one (1) fabric filter system (FF 4-12, baghouse 664L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(E) Two (2) weigh feeders, identified as Point 4-17 (652V, 653V), constructed on January 1, 1969; and two (2) weigh feeders (650V, 651V), constructed on January 1, 1969, equipped with two (2) dust collectors (650L, 651L), installed in 2000, venting indoors; with a nominal capacity of 40 tons per hour each, covered by a building enclosure (BE 4-17) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(k) Cement Storage, Loading, and Packaging Activities:

(1) Three (3) Group 5 silos, identified as Point 5-1 (705A, 707A, 709A), constructed before 1971 and modified in 1999, with a nominal storage capacity of 10,000 tons each, with particulate emission controlled by one (1) fabric filter system (FF 5-1, baghouse 757L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Three (3) Group 5 silos, identified as Point 5-2 (706A, 708A, 710A), constructed before 1971 and modified in 1999, with a nominal storage capacity of 10,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-2, baghouse 758L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) Two (2) Group 4 silos, identified as Point 5-3 (702A, 704A), constructed in 1967 and modified in 1999, with a nominal storage capacity of 5,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-3, baghouse 702L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) Two (2) Group 4 silos, identified as Point 5-4 (701A, 703A), constructed in 1967 and modified in 1999, with a nominal storage capacity of 5,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-4, baghouse 701L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) Two (2) silos, identified as Point 5-29 (711A, 712A), constructed on January 1, 1969, with a nominal storage capacity of 5,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-29, baghouse 713L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) One (1) screen, identified as Point 5-5C (701G), constructed before 1971 and modified in 1999; and one (1) truck loader, identified as Point 5-5D (708L), constructed before 1971 and modified in 1999; each with a nominal capacity of 500 tons per hour, equipped with one (1) fabric filter system (FF 5-5, baghouse 703L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) One (1) screen, identified as Point 5-6B (702G), constructed before 1971 and modified in 1999; and one (1) railcar/truck loader, identified as Point 5-6C (709L), constructed before 1971 and modified in 1999; each with a nominal capacity of 500 tons per hour, equipped with one (1) fabric filter system (FF 5-6, baghouse 706L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) One (1) hopper, identified as Point 5-7B (701F), constructed before 1971 and modified in 1999, with a nominal capacity of 40 tons per hour, equipped with one (1) fabric filter system (FF 5-7, baghouse 710L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(9) One (1) hopper, identified as Point 5-8 (730F), constructed before 1971 and modified in 1999, with a nominal capacity of 40 tons per hour, equipped with one (1) fabric filter system (FF 5-8, baghouse 715L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(10) Three (3) screw conveyors, identified as Point 5-9A (809V, 809V1, 809V2), constructed before 1971, with a nominal capacity of 40 tons per hour each; one (1) alleviator, identified as Point 5-9C, constructed before 1971, with a nominal capacity of 40 tons per hour; and fourteen (14) Group 2 silos, identified as Point 5-9B (2S-7S, 9S, 11S-17S), constructed in 1924, with a combined nominal capacity of 24,842 tons; all equipped with one (1) fabric filter (FF 5-9, baghouse 808L) to control particulate matter. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(11) One (1) silo, identified as Point 5-10 (8S), constructed in 1924 and modified in 1999, with a nominal capacity of 5420 tons, equipped with one (1) fabric filter system (FF 5-10, baghouse 807L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(12) One (1) silo, identified as Point 5-11 (10S), constructed in 1924 and modified in 1999, with a nominal capacity of 5420 tons, equipped with one (1) fabric filter system (FF 5-11, baghouse 810L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(13) Four (4) Group 3 silos, identified as Point 5-13 (26S, 27S, 28S, and 29S), constructed in 1924 and modified in 1999, with a nominal capacity of 2,736 tons each, equipped with one (1) fabric filter system (FF 5-13, baghouse 27DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(14) Three (3) Group 3 silos, identified as Point 5-14 (18S, 20S, 22S), constructed in 1924 and modified in 1999, with a nominal capacity of 3,112 tons each, equipped with one (1) fabric filter system (FF 5-14, baghouse 22DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(15) Two (2) Group 3 silos, identified as Point 5-15 (24S, 30S), constructed in 1924 and modified in 1999, with a nominal capacity of 2,780 tons each, equipped with one (1) fabric filter system (FF 5-15, baghouse 24DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(16) Four (4) Group 3 silos, identified as Point 5-17 (19S, 21S, 23S, 25S), constructed in 1924 and modified in 1999, with a nominal capacity of 2,736 tons each, equipped with one (1) fabric filter system (FF 5-17, baghouse 25DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(17) One (1) screen elevator, identified as Point 5-18A (829V2), constructed before 1971, with a nominal capacity of 40 tons per hour, particulate emissions controlled by dust collector 828L. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(18) One (1) elevator, identified as Point 5-19B (829V1), constructed before 1971, with a nominal capacity of 40 tons per hour, particulate emissions controlled by dust collector 828L. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(19) Two (2) bulk tanks, identified as Point 5-23A (831F, 833F), with a nominal capacity of 20 tons each; and one (1) truck loader, identified as Point 5-23C, with a nominal capacity of 40 tons per hour; all constructed before 1971 and modified in 1999, except for 831V2 which was constructed in 2003, and equipped with one (1) fabric filter system (FF 5-23, baghouse 833L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(20) Three (3) bulk tanks, identified as Point 5-24A (832F, 834F, 835F), with a nominal capacity of 20 tons each, constructed before 1950 and modified in 1999, and equipped with one (1) fabric filter system (FF 5-24, baghouse 835L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(21) One (1) silo, identified as Point 5-26A (782F), with a nominal capacity of 2,430 tons; and one (1) bucket elevator, identified as Point 5-26B (781V), with a nominal capacity of 500 tons per hour; all constructed on December 1, 2000, and equipped with one (1) fabric filter system (FF 5-26, baghouse 782L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(22) One (1) lump breaker, identified as Point 5-27B (783V3); one (1) spout, identified as Point 5-27C (785L); and one (1) truck loader, identified as Point 5-27D; all constructed on December 1, 2000, with a nominal capacity of 500 tons per hour each, and equipped with one (1) fabric filter system (FF 5-27, baghouse 783L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(23) One (1) lump breaker, identified as Point 5-28B (784V3); one (1) spout, identified as Point 5-28C (786L); and one (1) truck loader, identified as Point 5-28D; all constructed on December 1, 2000, with a nominal capacity of 500 tons per hour each, and equipped with one (1) fabric filter system (FF 5-28, baghouse 784L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(24) Five (5) screw conveyors, identified as Point 5-30B (755V, 759V-762V), constructed in 1978; six (6) rotary feeders, identified as Point 5-30C (755M-760M), constructed in 1978; and one (1) hopper, identified as Point 5-30D (750F), constructed before August 17, 1971; with a nominal capacity of 40 tons per hour each, covered by a building enclosure (BE 5-30) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(25) Seventeen (17) screw conveyors, identified as Point 5-33A (818V1-825V1, 818V2-825V2, 830V) covered by a building enclosure (BE 5-33) to control particulate emissions; Two (2) screw conveyors, identified as Point 5-18C (828V1, 828V2), particulate emissions controlled by a dust collector 828L; and three (3) screen screws, identified as Point 5-33B (806V, 829V4, 830V1); all constructed before 1950, with a nominal capacity of 40 tons per hour each, and covered by a building enclosure (BE 5-33) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(l) One (1) blend facility, consisting of the following units:

(1) Five (5) screw conveyors, identified as Point 5-35A (22SC, 24SCG, 24SC, 30SC, 31SC), all constructed in 1989, with a nominal capacity of 40 tons per hour each, covered by a building enclosure (BE 5-35) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) One (1) transfer pod, identified as Point 5-36 (22) constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-36, filter 22-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) transfer pod, identified as Point 5-37 (24-G), constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-37, filter 24-PVDC-G) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) transfer pod, identified as Point 5-38 (24), constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-38, filter 24-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) One (1) transfer pod, identified as Point 5-39 (30), constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-39, filter 30-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) One (1) receiving tank, identified as Point 5-40, constructed in August 1989, with a nominal capacity of 20 tons, equipped with one (1) fabric filter system (FF 5-40, baghouse 40-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) One (1) blending tank, identified as Point 5-41A, with a nominal capacity of 20 tons; and one (1) blending pod, identified as Point 5-41C, with a nominal capacity of 25 cubic feet; all constructed in August 1989, equipped with one (1) fabric filter system (FF 5-41, baghouse 41-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) Two (2) silos, identified as Point 5-42 (50S, 51S), constructed August 1989, with a nominal capacity of 175 tons each, equipped with one (1) fabric filter system (FF 5-42, baghouse 50-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(9) Two (2) silos, identified as Point 5-43 (52S, 53S), constructed August 1989, with a nominal capacity of 175 tons each, equipped with one (1) fabric filter system (FF 5-43, baghouse 53-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(10) One (1) transfer pod, identified as Point 5-44B (50PV), constructed in August 1989, with a nominal capacity of 40 tons per hour, equipped with one (1) fabric filter system (FF 5-44, filter 50-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(m) Packhouse operations consisting of the following:

(1) One (1) elevator, identified as Point 6-1A (838V), constructed in 1945; one (1) packer bin, identified as Point 6-1B (Bin #1), constructed in 1946; one (1) packing machine, identified as Point 6-1C (842LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-1D (842F, 842FA), constructed in 1946; two (2) rotary feeders, identified as Point 6-1E (842M, 842MA), constructed in 1946; and four (4) screw conveyors, identified as Point 6-1F (842LV1, 837V, 837V1, 831V2), constructed in 1945; all modified in 1999, with a nominal capacity of 34 tons per hour each, and equipped with one (1) fabric filter system (FF 6-1, baghouse 842L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) One (1) elevator, identified as Point 6-2A (838V1), constructed in 1945; one (1) packer bin, identified as Point 6-2B (Bin #2), constructed in 1946; one (1) packing machine, identified as Point 6-2C (843LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-2D (843F, 843FA), constructed in 1945; two (2) rotary feeders, identified as Point 6-2E (843M, 843MA), constructed before 1971; and four (4) screw conveyors (843LV1, 817V1, 817V3, 817V7), identified as Point 6-2G; constructed in 1945; all modified in 1999, with a nominal capacity of 46 tons

per hour each, and equipped with one (1) fabric filter system (FF 6-2, baghouse 843L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) One (1) elevator, identified as Point 6-3A (838V2), constructed in 1945; one (1) packer bin, identified as Point 6-3B (Bin #3), constructed in 1946; one (1) packing machine, identified as Point 6-3C (844LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-3D (844F, 844FA), constructed in 1945; two (2) rotary feeders, identified as Point 6-3E (844M, 844MA), constructed before 1971; and one (1) screw conveyor, identified as Point 6-3F (844LV1), constructed before 1971; all modified in 1999, with a nominal capacity of 65 tons per hour each, and equipped with one (1) fabric filter system (FF 6-3, baghouse 844L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) elevator, identified as Point 6-4A (838V3), constructed in 1945; one (1) packer bin, identified as Point 6-4B (Bin #4), constructed in 1946; one (1) packing machine, identified as Point 6-4C (845LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-4D (845F, 845FA), constructed in 1945; two (2) rotary feeders, identified as Point 6-4E (845M, 845MA), constructed before 1971; and one (1) screw conveyor, identified as Point 6-4F (845LV1), constructed before 1971; all modified in 1999, with a nominal capacity of 40 tons per hour each, and equipped with one (1) fabric filter system (FF 6-4, baghouse 845L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) Fourteen (14) conveyors, identified as Point 6-5 (842V-846V, 848V, 845V1, 847V1, 847V2, 848V1, 848V2, 849V1, 849V2, 849V3), constructed before 1971, with a nominal capacity of 185 tons per hour each, covered by a building enclosure (BE 6-5) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) Two (2) palletizers, identified as Point 6-6 (900H, 901H), constructed before 1971, with a nominal capacity of 185 tons per hour each, covered by a building enclosure (BE 6-6) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) One (1) truck loader, identified as Point 6-7, constructed before 1971, with a nominal capacity of 185 tons per hour, covered by a building enclosure (BE 6 7) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(o) One (1) truck unloading silo, identified as Tank 9 (240F), constructed in 2007, for unloading and pneumatically conveying alternative fuel (spent pot liner) to a silo, with a maximum throughput capacity of 33 tons per hour, with a maximum storage capacity of 700 tons, with particulate emissions controlled by a dust collector (identified as 240L), and exhausting to stack 240L. This is an affected facility under 40 CFR 63, Subpart LLL.

(p) One (1) enclosed pneumatic conveyance system, identified as 241F, constructed in 2007, for pneumatically conveying alternative fuel (spent pot liner) from the silo to the cement kiln, with a maximum throughput capacity of four (4) tons per hour, with particulate emissions controlled by a bin vent filter (identified as 241L), and exhausting to stack 241L. This is an affected facility under 40 CFR 63, Subpart LLL.

(q) One (1) portable screen and conveyor unit for the sizing of plant materials with a nominal throughput of 100 tons per hour, including reclamation of partially formatted clinker product, including the following units:

(1) One (1) vibrating feeder (F3-33)
(2) One (1) portable vibrating screen (S3-34)
(3) One (1) conveyor belt (S3-34)
(4) Hauling (F3-32)
(5) Handling (F3-32a)

Under 40 CFR 60, Subpart OOO, this is considered an affected facility.

Under 40 CFR 63, Subpart LLL, the portable screen and conveyor units are considered affected facilities while the units are reworking partially formatted clinker.

(s) One (1) portable impact crushing plant, for the reclamation of partially formatted clinker and the resizing of aggregate prior to the raw material pile feeding the raw mill system, approved in 2014 for construction, with a nominal throughput of 100 tons per hour, bottlenecked by the raw material feed system, particulate matter and opacity controlled by water mist spray, containing the following processes:

(1) Handling (PF3-37a);
(2) One (1) vibrating feeder (PF3-38);
(3) One (1) optional screen;
(4) One (1) portable crusher (PC3-38);
(5) Two (2) conveyor belts (PS3-39) consisting of one main conveyor and one side conveyor;
(6) Two (2) open reclaimed clinker storage piles; and
(7) Two (2) open resized aggregate storage piles.

Under 40 CFR 63, Subpart LLL, the open reclaimed clinker storage piles are considered affected facilities while the units are reworking partially formatted clinker.

Under 40 CFR 60, Subpart OOO, the following portions of the portable impact crushing plant are affected facilities while resizing aggregate prior to the raw material pile feeding the raw mill system: handling, vibrating feeder, screening, crusher, conveyor transfer points, and aggregate storage piles.

Insignificant Activities

(n) One (1) outdoor clinker storage pile, constructed in 1966, with a throughput of 100 tons of clinker per hour. Under 40 CFR 63, Subpart LLL, this is an affected facility.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

E.4.1 General Provisions Relating to NESHAP [40 CFR Part 63, Subpart A] [326 IAC 20-1]

Pursuant to 40 CFR 63.1340, the Permittee shall comply with the provisions of 40 CFR Part 63, Subpart A - General Provisions, which are incorporated by reference as 326 IAC 20-1, as specified in Table 1 of 40 CFR Part 63, Subpart LLL in accordance with schedule in 40 CFR 63 Subpart LLL.

E.4.2 Portland Cement Manufacturing Industry NESHAP [40 CFR Part 63, Subpart LLL] [326 IAC 20-27]

The Permittee which is a portland cement plant shall comply with the following provisions of 40 CFR Part 63, Subpart LLL, which is incorporated by reference as 326 IAC 20-27 (included as Attachment E of this permit).

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(1) 40 CFR 63.1340(a), (b)(2 through 9), (c), and (d);
(2) 40 CFR 63.1341;
(3) 40 CFR 63.1342;
(4) 40 CFR 63.1343(a), (b)(1), (c), (d)
(5) 40 CFR 63.1345;
(6) 40 CFR 63.1347;
(7) 40 CFR 63.1348(a)(1, 2, and 4), (b)(1, 2, 3, 6, and 9), (c), and (d);
(8) 40 CFR 63.1349(a), (b)(1, 2, 4, and 7), (c), (d), and (e);
(9) 40 CFR 63.1350(a)(1, 3, and 4), (b), (d), (f), (i), and (m);
(10) 40 CFR 63.1351(a)(1), (b), (c), (d), and (e);
(11) 40 CFR 63.1352(b);
(12) 40 CFR 63.1353;
(13) 40 CFR 63.1354(a), (b)(1, 2, 3, 6, 7, 8, 9, and 10), (c);
(14) 40 CFR 63.1355(a), (b), (c), (f), (g), and (h);
(15) 40 CFR 63.1356;
(16) 40 CFR 63.1358; and
(17) Table 1.

SECTION E.5 FACILITY OPERATION CONDITIONS

Facility Description:

(h) Kiln Operation, with a nominal capacity of 360 tons of dry raw feed per hour and 208 tons clinker per hour. Stack 3-1 includes a SO_2, NOx and CO_2 continuous emissions monitor (CEMS), particulate matter detection system (PMDS) and a continuous opacity monitoring system (COMS). This operation consists of the following:

(1) One (1) hammermill dryer, identified as Point 3-1C (440G), constructed on May 1, 2000, with a nominal capacity of 258 tons per hour, equipped with one (1) electrostatic precipitator (402L) with a 2,000 HP motor to control particulate emissions, exhausting to stack 3-1. Under 40 CFR 63, Subpart DD, and 40 CFR 63, Subpart EEE, this is considered an affected source.

(2) One (1) pre-heater, pre-calciner Portland cement kiln, originally constructed in 1966 and modified to the semi-dry system in 2000. The semi-dry kiln system includes one (1) calciner tower with staged combustion, identified as Point 3-1B (440PH), and one (1) rotary kiln, identified as Point 3-1A (401B), with a combined nominal rated capacity of 827 million British thermal units per hour. An oxygen enrichment system, constructed in 2006, introduces oxygen into the first stage pre-calciner and the front end of the rotary kiln. The semi-dry kiln system has a nominal rated clinker capacity of 208 tons per hour, using coal and the following supplemental fuels:

(A) hazardous waste fuel at a maximum rate allowed by the approved Boiler and Industrial Furnace Permit required by 40 CFR 270;

(B) plastic chips, carpet fibers, paper products, wood chips, chipped tires, toner, cosmetics, seed corn, and oil absorbent material including oil filter fluff;

(C) petroleum coke;

(D) distillate fuel for burner startup activities; and

(E) alternative fuel (spent pot liner).

Particulate emissions from the calciner and kiln are controlled by one (1) electrostatic precipitator (402L) with a 2000 HP motor, exhausting to stack 3-1. The ESP consists of nine (9) screw conveyors, identified as Point 3-1D (403V-410V, 404FV), constructed in 1968 and modified in 1999; and one (1) kiln dust chamber, identified as Point 3-1F (401BF1), constructed on January 1, 1969; each with a nominal capacity of (10) tons per hour. NOx emissions are controlled by a low-NOx calciner. The calciner exit includes a THC and O_2 continuous emissions monitor (CEMS). Under 40 CFR 63, Subpart EEE, and 40 CFR Part 63, Subpart DD, the calciner and kiln system is considered an affected source.

(5) One (1) conditioning tower, identified as Point 3-5A (480F), with a nominal capacity of 40 tons per hour, using lime injection to control sulfur dioxide emissions; and one (1) alkali bypass system, identified as Point 3-5B, one (1) hopper, identified as Point 3-5C (484F), with a nominal capacity of ten (10) tons per hour; one (1) dust cyclone, identified as Point 3-5D (480FL), with a nominal capacity of 31 tons per hour; four (4) screw conveyors, identified as Point 3-5E (480LV1-LV3, 480V), each with a nominal capacity of ten (10) tons per hour; one (1) weigh hopper, identified as Point 3-5I (481FF); and one (1) pug mill, identified as Point 3-5J (484L); all constructed on May 1, 2000; one rotary feeder

(481FV11) constructed in 2008, one screw conveyor (481J12) constructed in 2008, each with a nominal capacity of ten (10) tons per hour; all equipped with one (1) fabric filter system (FF 3-5, baghouse 480L), which exhausts to stack 3-1, to control particulate emissions. The alkali bypass duct contains a CO and O_2 CEMS. Under and 40 CFR 63, Subpart EEE, this is considered an affected source. (The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

E.5.1 General Provisions Relating to NESHAP [40 CFR Part 63, Subpart A] [326 IAC 20-1]

Pursuant to 40 CFR 63.1200, the Permittee shall comply with the provisions of 40 CFR Part 63, Subpart A - General Provisions, which are incorporated by reference as 326 IAC 20-1, except as otherwise specified in 40 CFR 63, Subpart EEE (included as Attachment F of this permit).

E.5.2 Hazardous Waste Combustors NESHAP [40 CFR Part 63, Subpart EEE] [326 IAC 20-28]

The Permittee which engages in hazardous waste combustion shall comply with the following provisions of 40 CFR Part 63, Subpart EEE which are incorporated by reference as 326 IAC 20-28, (included as Attachment F of this permit).

(1) 40 CFR 63.1200
(2) 40 CFR 63.1201
(3) 40 CFR 63.1203(a), (c), (d), & (e)
(4) 40 CFR 63.1204(a), (c), (d), (f), & (h)
(5) 40 CFR 63.1205(a), (c), (d), & (e)
(6) 40 CFR 63.1206
(7) 40 CFR 63.1207
(8) 40 CFR 63.1208
(9) 40 CFR 63.1209
(10) 40 CFR 63.1210
(11) 40 CFR 63.1211
(12) 40 CFR 63.1212
(13) 40 CFR 63.1213
(14) 40 CFR 63.1214
(15) 40 CFR 63.1215
(16) 40 CFR 63.1216
(17) 40 CFR 63.1217
(18) 40 CFR 63.1220
(19) 40 CFR 63.1221

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SECTION E.6 FACILITY OPERATION CONDITIONS

Facility Description:

(2) One (1) pre-heater, pre-calciner Portland cement kiln, originally constructed in 1966 and modified to the semi-dry system in 2000. The semi-dry kiln system includes one (1) calciner tower with staged combustion, identified as Point 3-1B (440PH), and one (1) rotary kiln, identified as Point 3-1A (401B), with a combined nominal rated capacity of 827 million British thermal units per hour. An oxygen enrichment system, constructed in 2006, introduces oxygen into the first stage pre-calciner and the front end of the rotary kiln. The semi-dry kiln system has a nominal rated clinker capacity of 208 tons per hour, using coal and the following supplemental fuels:

(A) hazardous waste fuel at a maximum rate allowed by the approved Boiler and Industrial Furnace Permit required by 40 CFR 270;

(B) plastic chips, carpet fibers, paper products, wood chips, chipped tires, toner, cosmetics, seed corn, and oil absorbent material including oil filter fluff;

(C) petroleum coke;

(D) distillate fuel for burner startup activities; and

(E) alternative fuel (spent pot liner).

Particulate emissions from the calciner and kiln are controlled by one (1) electrostatic precipitator (402L) with a 2000 HP motor, exhausting to stack 3-1. The ESP consists of nine (9) screw conveyors, identified as Point 3-1D (403V-410V, 404FV), constructed in 1968 and modified in 1999; and one (1) kiln dust chamber, identified as Point 3-1F (401BF1), constructed on January 1, 1969; each with a nominal capacity of (10) tons per hour. NOx emissions are controlled by a low-NOx calciner. The calciner exit includes a THC and O_2 continuous emissions monitor (CEMS). Under 40 CFR 63, Subpart EEE, and 40 CFR Part 63, Subpart DD, the calciner and kiln system is considered an affected source.

(r) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001**.** The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(1) One (1) hydrapulper, approved in 2016 for construction, identified as HP-02, with a nominal vessel volume of 2,500 gallons, and process volume of 2,250 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(i) One (1) waste feed hopper loaded from roll-off bulk containers, approved in 2016 for construction, identified as HP-01, with a nominal storage capacity of 25 yd^3 or 5,000 gallons of solids. Solids are transferred out of the hopper by an enclosed feed auger with a nominal capacity of 800 cubic feet of solids per hour. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Two (2) organic liquid slurry mix tanks, approved in 2016 for construction, identified as tank T12 and tank T13, each with a nominal storage capacity of 10,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(2) One (1) process permitted to blend solids in containers on loadout pads A or B, with hydraulic drives and agitators installed in 2012, identified as blend box, with a nominal vessel volume of 25 yd^3 (5,714 gallons), and a batch volume of 3,910 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(3) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

E.6.1 General Provisions Relating to NESHAP [40 CFR Part 61, Subpart A] [326 IAC 14-1]

Pursuant to 40 CFR 61.340, the Permittee shall comply with the provisions of 40 CFR Part 61, Subpart A - General Provisions, which are incorporated by reference as 326 IAC 14-1, except as otherwise specified in 40 CFR Part 61, Subpart FF.

E.6.2 Benzene Waste Operations NESHAP [40 CFR Part 61, Subpart FF]

The Permittee which engages benzene waste operations shall comply with the following provisions of 40 CFR Part 61, Subpart FF (included as Attachment G of this permit).

(1) 40 CFR 61.340(b), (c), and (d);
(2) 40 CFR 61.341;
(3) 40 CFR 61.342(b), (c), and (g);
(4) 40 CFR 61.343(a), (c), (d), and (e);
(5) 40 CFR 61.345;
(6) 40 CFR 61.349(a)(1), (a)(2)(i, and ii), (b), (c), (d), (e), (f), (g) and (h);
(7) 40 CFR 61.350;
(8) 40 CFR 61.354(a), (c)(5), (c)(7), (d), (e), and (f);
(9) 40 CFR 61.355(a)(1), (a)(2), (a)(3), (a)(6), (b), (c), (h), (i), and (j);
(10) 40 CFR 61.356(a), (b)(1 and 2), (d), (e), (f)(1), (f)(2)(i)(A, F and G), (g), and (h);
(11) 40 CFR 61.356(i), (j)(1), (j)(2), (j)(3), (j)(4), (j)(9), (j)(10), and (n);
(12) 40 CFR 61.357(a), (d)(1), (d)(2), (d)(6), (d)(7)(iv)(A, D, H, and I), and (d)(7)(v);
(13) 40 CFR 61.358; and
(14) Appendix A, Appendix B, and Appendix C to Part 61.

SECTION E.7 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

(r) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001**.** The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(5) Fugitive VOC and HAP emissions from waste receiving, pumps, valves, connectors. [40 CFR 61, Subpart V]

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

E.7.1 General Provisions Relating to NESHAP [40 CFR Part 61, Subpart A] [326 IAC 14-1]

Pursuant to 40 CFR Part 61.01(c), the Permittee shall comply with the provisions of 40 CFR Part 61, Subpart A - General Provisions, which are incorporated by reference as 326 IAC 14-1, except when otherwise specified in 40 CFR Part 61, Subpart V.

E.7.2 Equipment Leaks (Fugitive Emission Sources) NESHAP [40 CFR Part 61, Subpart V] [326 IAC 14-8]

The Permittee shall comply with the following provisions of 40 CFR Part 61, Subpart V, which are incorporated by reference as 326 IAC 14-8 (included as Attachment H of this permit) for equipment at this sources which is intended to operate in volatile hazardous air pollutant (VHAP) service, such as pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems required by this subpart:

(1) 40 CFR 61.240(a), (b), and (c);
(2) 40 CFR 61.241;
(3) 40 CFR 61.242-1;
(4) 40 CFR 61.242-2(a through g);
(5) 40 CFR 61.242-4;
(6) 40 CFR 61.242-6;
(7) 40 CFR 61.242-7;
(8) 40 CFR 61.242-8;
(9) 40 CFR 61.242-10;
(10) 40 CFR 61.242-11(a), (b), (c), (e), (f)(2), (g) through (m);
(11) 40 CFR 61.243-1;
(12) 40 CFR 61.243-2;
(13) 40 CFR 61.244;
(14) 40 CFR 61.245;
(15) 40 CFR 61.246; and
(16) 40 CFR 61.247(a)(1), (a)(2), (a)(3), (a)(5), (b), (c), (d), and (e).

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SECTION E.8 FACILITY OPERATION CONDITIONS

Facility Description:

(h) Kiln Operation, with a nominal capacity of 360 tons of dry raw feed per hour and 208 tons clinker per hour. Stack 3-1 includes a SO_2, NOx and CO_2 continuous emissions monitor (CEMS), particulate matter detection system (PMDS) and a continuous opacity monitoring system (COMS). This operation consists of the following:

(1) One (1) hammermill dryer, identified as Point 3-1C (440G), constructed on May 1, 2000, with a nominal capacity of 258 tons per hour, equipped with one (1) electrostatic precipitator (402L) with a 2,000 HP motor to control particulate emissions, exhausting to stack 3-1. Under 40 CFR 63, Subpart DD, and 40 CFR 63, Subpart EEE, this is considered an affected source.

(2) One (1) pre-heater, pre-calciner Portland cement kiln, originally constructed in 1966 and modified to the semi-dry system in 2000. The semi-dry kiln system includes one (1) calciner tower with staged combustion, identified as Point 3-1B (440PH), and one (1) rotary kiln, identified as Point 3-1A (401B), with a combined nominal rated capacity of 827 million British thermal units per hour. An oxygen enrichment system, constructed in 2006, introduces oxygen into the first stage pre-calciner and the front end of the rotary kiln. The semi-dry kiln system has a nominal rated clinker capacity of 208 tons per hour, using coal and the following supplemental fuels:

(A) hazardous waste fuel at a maximum rate allowed by the approved Boiler and Industrial Furnace Permit required by 40 CFR 270;

(B) plastic chips, carpet fibers, paper products, wood chips, chipped tires, toner, cosmetics, seed corn, and oil absorbent material including oil filter fluff;

(C) petroleum coke;

(D) distillate fuel for burner startup activities; and

(E) alternative fuel (spent pot liner).

Particulate emissions from the calciner and kiln are controlled by one (1) electrostatic precipitator (402L) with a 2000 HP motor, exhausting to stack 3-1. The ESP consists of nine (9) screw conveyors, identified as Point 3-1D (403V-410V, 404FV), constructed in 1968 and modified in 1999; and one (1) kiln dust chamber, identified as Point 3-1F (401BF1), constructed on January 1, 1969; each with a nominal capacity of (10) tons per hour. NOx emissions are controlled by a low-NOx calciner. The calciner exit includes a THC and O_2 continuous emissions monitor (CEMS). Under 40 CFR 63, Subpart EEE, and 40 CFR Part 63, Subpart DD, the calciner and kiln system is considered an affected source.

(r) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001**.** The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(1) One (1) hydrapulper, approved in 2016 for construction, identified as HP-02, with a nominal vessel volume of 2,500 gallons, and process volume of 2,250 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(i) One (1) waste feed hopper loaded from roll-off bulk containers, approved in 2016 for construction, identified as HP-01, with a nominal storage capacity of 25 yd^3 or 5,000 gallons of solids. Solids are transferred out of the hopper by an enclosed feed auger with a nominal capacity of 800 cubic feet of solids per hour. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Two (2) organic liquid slurry mix tanks, approved in 2016 for construction, identified as tank T12 and tank T13, each with a nominal storage capacity of 10,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(2) One (1) process permitted to blend solids in containers on loadout pads A or B, with hydraulic drives and agitators installed in 2012, identified as blend box, with a nominal vessel volume of 25 yd^3 (5,714 gallons), and a batch volume of 3,910 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(3) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

E.8.1 General Provisions Relating to NESHAP [40 CFR Part 63, Subpart A] [326 IAC 20-1]

Pursuant to 40 CFR 63.680(f), the Permittee shall comply with the provisions of 40 CFR Part 63, Subpart A - General Provisions, which are incorporated by reference as 326 IAC 20-1, except as otherwise specified in 40 CFR Part 63, Subpart DD.

E.8.2 Offsite Waste and Recovery Operations NESHAP [40 CFR Part 63, Subpart DD] [326 IAC 20-23]

The Permittee which engages benzene waste operations shall comply with the following provisions of 40 CFR Part 63, Subpart DD, which are incorporated by reference as 326 IAC 20-23, (included as Attachment I of this permit).

(1) 40 CFR 63.680(a)(1), (a)(2)(i), (b), (c)(1), (c)(3), (e)(2), (f), and (g);
(2) 40 CFR 63.681;
(3) 40 CFR 63.683(a), (b), (d), (e), and (f);
(4) 40 CFR 63.685(a), (b)(2), (d)(3), (d)(5), (g), and (i);

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(5) 40 CFR 63.688(a), and (b)(3)(i);
(6) 40 CFR 63.691(a), (b)(1)(i), (c);
(7) 40 CFR 63.693(a), (b), (c)(1, 2, and 3), (c)(4)(i),(c)(5, 6, 7, and 8);
(8) 40 CFR 63.693(c), (d)(1), (d)(2)(ii), (d)(3), (d)(4), (e)(1), (e)(2)(ii), (e)(3) and (g);
(9) 40 CFR 63.694;
(10) 40 CFR 63.695(a), (b)(3), (b)(4), (c), (e), and (f);
(11) 40 CFR 63.696(a), (b), (e), (f), (g), (h), and (i);
(12) 40 CFR 63.697(a), and (b)(1 through 5);
(13) 40 CFR 63.698; and
(14) Table 1, Table 2, and Table 5.

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SECTION E.9 FACILITY OPERATION CONDITIONS

Facility Description:

(j) One (1) diesel-fired kiln emergency generator, identified as GC301273, with a maximum capacity of 755 bhp, constructed in 1999 and exhausting to stack GC301273. [40 CFR 63, Subpart ZZZZ]

(k) One (1) diesel-fired emergency water pump, identified as GC653010, with a maximum capacity of 225 bhp, constructed in 1999 and exhausting to stack GC653010. [40 CFR 63, Subpart ZZZZ]

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

E.9.1 General Provisions Relating to NESHAP [40 CFR Part 63, Subpart A] [326 IAC 20-1]

Pursuant to 40 CFR 63, the Permittee shall comply with the provisions of 40 CFR Part 63, Subpart A - General Provisions for engines associated with the clutch test cells (TC-1 through TC-7), which are incorporated by reference as 326 IAC 20-1, except as otherwise specified in 40 CFR 63, Subpart ZZZZ.

E.9.2 Stationary Reciprocating Internal Combustion Engines NESHAP [40 CFR Part 63, Subpart ZZZZ] [326 IAC 20-82]

Pursuant to 40 CFR 63, Subpart ZZZZ, the Permittee shall comply with the following provisions of 40 CFR Part 63, Subpart ZZZZ, which are incorporated by reference as 326 IAC 20-82, (included as Attachment J of this permit) for emergency generator GC301273 and emergency water pump GC653010:

Emergency generator GC301273 is subject to the following portions of 40 CFR 63, Subpart ZZZZ:

(1) 40 CFR 63.6580
(2) 40 CFR 63.6585
(3) 40 CFR 63.6590(a)(1)
(4) 40 CFR 63.6595(a)(1) and (c)
(5) 40 CFR 63.6585
(6) 40 CFR 63.6604(b)
(7) 40 CFR 63.6605
(8) 40 CFR 63.6625(h),(i)
(9) 40 CFR 63.6640(f)
(10) 40 CFR 63.6585
(11) 40 CFR 63.6655(a),(d),(e),(f)
(12) 40 CFR 63.6665
(13) 40 CFR 63.6670
(14) 40 CFR 63.6675

Emergency water pump GC653010 is subject to the following portions of 40 CFR 63, Subpart ZZZZ:

(1) 40 CFR 63.6580
(2) 40 CFR 63.6585
(3) 40 CFR 63.6590(a)(1)
(4) 40 CFR 63.6595(a)(1) and (c)
(5) 40 CFR 63.6602
(6) 40 CFR 63.6605
(7) 40 CFR 63.6625(e)(2), (f), (h), and (i)

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(8) 40 CFR 63.6640(a),(b),(d),(e),(f)
(9) 40 CFR 63.6650(h)
(10) 40 CFR 63.6655(a),(b),(d),(e),(f)
(11) 40 CFR 63.6665
(12) 40 CFR 63.6670
(13) 40 CFR 63.6675
(14) Table 2c
(15) Table 6

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH
PART 70 OPERATING PERMIT
CERTIFICATION

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 S. County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002

This certification shall be included when submitting monitoring, testing reports/results or other documents as required by this permit.

Please check what document is being certified:

☐ Annual Compliance Certification Letter

☐ Test Result (specify) _____.

☐ Report (specify) _____.

☐ Notification (specify) _____.

☐ Affidavit (specify) _____.

☐ Other (specify) _____.

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.
Signature:
Printed Name:
Title/Position:
Phone:
Date:

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251
Phone: (317) 233-0178
Fax: (317) 233-6865

PART 70 OPERATING PERMIT
EMERGENCY OCCURRENCE REPORT

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 S. County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002

This form consists of 2 pages **Page 1 of 2**

☐ This is an emergency as defined in 326 IAC 2-7-1(12) • The Permittee must notify the Office of Air Quality (OAQ), within four (**4**) business hours (1-800-451-6027 or 317-233-0178, ask for Compliance Section); and • The Permittee must submit notice in writing or by facsimile within two (**2**) working days (Facsimile Number: 317-233-6865), and follow the other requirements of 326 IAC 2-7-16.

If any of the following are not applicable, mark N/A

Facility/Equipment/Operation:
Control Equipment:
Permit Condition or Operation Limitation in Permit:
Description of the Emergency:
Describe the cause of the Emergency:

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If any of the following are not applicable, mark N/A **Page 2 of 2**

Date/Time Emergency started:
Date/Time Emergency was corrected:
Was the facility being properly operated at the time of the emergency? Y N
Type of Pollutants Emitted: TSP, PM-10, SO_2, VOC, NO_X, CO, Pb, other:
Estimated amount of pollutant(s) emitted during emergency:
Describe the steps taken to mitigate the problem:
Describe the corrective actions/response steps taken:
Describe the measures taken to minimize emissions:
If applicable, describe the reasons why continued operation of the facilities are necessary to prevent imminent injury to persons, severe damage to equipment, substantial loss of capital investment, or loss of product or raw materials of substantial economic value:

Form Completed by:_____

Title / Position: _____

Date:_____

Phone: _____

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report Coal Mill Burner When Combusting Only Fuel Oil

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 South County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002
Facility: Coal Mill Fuel Oil Fired Burner
Parameter: Sulfur Dioxide (SO_2) emissions from fuel oil combustion
Limit: 0.5 pounds per million Btu heat input

QUARTER: _____YEAR: _____

Month	Monthly Average Fuel Oil Sulfur Content (%)	Monthly Average Fuel Oil Heat Content (MMBtu/lb)	Fuel Oil Consumption (Gallons)	Equivalent Sulfur Dioxide Emissions (lbs/MMBtu)

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report Kiln When Combusting Only Fuel Oil

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 South County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002
Facility: Kiln
Parameter: Sulfur Dioxide (SO_2) emissions from fuel oil combustion
Limit: 0.5 pounds per million Btu heat input

QUARTER: _____YEAR: _____

Month	Monthly Average Fuel Oil Sulfur Content (%)	Monthly Average Fuel Oil Heat Content (MMBtu/lb)	Fuel Oil Consumption (Gallons)	Equivalent Sulfur Dioxide Emissions (lbs/MMBtu)

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report Kiln When Combusting Coal

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 South County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002
Facility: Kiln
Parameter: Sulfur Dioxide (SO_2) emissions from coal combustion
Limit: 6.0 pounds per million Btu heat input

QUARTER: _____YEAR: _____

Month	Monthly Average Coal Sulfur Content (%)	Monthly Average Coal Heat Content (MMBtu/lb)	Coal Consumption (Gallons)	Equivalent Coal Emissions (lbs/MMBtu)

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report - Kiln SO2

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 South County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002
Facility: Kiln
Parameter: Sulfur Dioxide (SO_2) emissions
Limit: SO_2 emissions shall be less than 3,317 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

QUARTER: _____YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	This Month	Previous 11 Months	12 Month Total

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report - Kiln NOx

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 South County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002
Facility: Kiln
Parameter: Nitrogen Oxide (NOx) emissions
Limit: NOx emissions shall be less than 4,428 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

QUARTER: _____YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	This Month	Previous 11 Months	12 Month Total

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report - Quarry Activities

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 South County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002
Facility: Quarry Activities, Raw Material Sizing, Ball Mill Operation, Fly Ash Storage Activities, and Coal Mill Operation
Parameter: Production
Limit: See table below

QUARTER: _____YEAR: _____

Month	Production Facility	Column 1	Column 2	Column 1 + Column 2	Production Limit, tons per twelve (12) consecutive month period
		This Month	Previous 11 Months	3 Month Total	
Month 1	Overburden Material				1.2 million overburden
	Input to Primary Crusher				2,262,479 limestone
	Input to Secondary Crusher				2,574,685 slag, bottom ash, sand, shale, limestone, and alternate raw materials
	Input to Coal Mill				313,552 coal
	Fly Ash Input to Kiln				135,289 fly ash
Month 2	Overburden Material				1.2 million overburden
	Input to Primary Crusher				2,262,479 limestone
	Input to Secondary Crusher				2,574,685 slag, bottom ash, sand, shale, limestone, and alternate raw materials
	Input to Coal Mill				313,552 coal
	Fly Ash Input to Kiln				135,289 fly ash
Month 3	Overburden Material				1.2 million overburden
	Input to Primary Crusher				2,262,479 limestone
	Input to Secondary Crusher				2,574,685 slag, bottom ash, sand, shale, limestone, and alternate raw materials
	Input to Coal Mill				313,552 coal
	Fly Ash Input to Kiln				135,289 fly ash

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report - Kiln Production

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 South County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002
Facility: Kiln Operations
Parameter: Production
Limit: See table below

QUARTER: _____YEAR: _____

Month	Production Facility	Column 1	Column 2	Column 1 + Column 2	Production Limit, tons per twelve (12) consecutive month period
		This Month	Previous 11 Months	12 Month Total	
Month 1	Kiln Raw Material Input				3,149,427 raw feed
	Total Coal Input				313,552 coal
	Clinker Production				1,606,000 clinker
Month 2	Kiln Raw Material Input				3,149,427 raw feed
	Total Coal Input				313,552 coal
	Clinker Production				1,606,000 clinker
Month 3	Kiln Raw Material Input				3,149,427 raw feed
	Total Coal Input				313,552 coal
	Clinker Production				1,606,000 clinker

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report - Finish Mill Input

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 South County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002
Facility: Finish Mill Operations
Parameter: Production
Limit: See table below

QUARTER: _____YEAR: _____

Month	Production Facility	Column 1	Column 2	Column 1 + Column 2	Production Limit, tons per twelve (12) consecutive month period
		This Month	Previous 11 Months	12 Month Total	
Month 1	Input to No. 1 Finish Mill				517,942 clinker
	Input to No. 2 Finish Mill				517,942 clinker
	Input to No. 3 Finish Mill				700,567 clinker
Month 2	Input to No. 1 Finish Mill				517,942 clinker
	Input to No. 2 Finish Mill				517,942 clinker
	Input to No. 3 Finish Mill				700,567 clinker
Month 3	Input to No. 1 Finish Mill				517,942 clinker
	Input to No. 2 Finish Mill				517,942 clinker
	Input to No. 3 Finish Mill				700,567 clinker

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

DRAFT

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report - Pot Liner

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 South County Rd 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002
Facility: Truck Unloading, Pneumatic Conveyance, Silo Loading, Kiln Loading
Parameter: Tons of Pot Liner Throughput
Limit: The throughput shall not exceed 35,040 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.

QUARTER: _____YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	This Month	Previous 11 Months	12 Month Total
Month 1			
Month 2			
Month 3			

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

DRAFT

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report - Hydrapulper

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 South County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002
Facility: Hydrapulper (Condition D.1.2(i)(2))
Parameter: Batches processed
Limit: 10,084 batches per twelve consecutive month period.

QUARTER : _____ YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	This Month	Previous 11 Months	12 Month Total

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report - Blend Box

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 South County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002
Facility: Blend Box (Condition D.1.2(i)(4))
Parameter: Batches processed
Limit: 5,090 batches per twelve consecutive month period.

QUARTER : _____ YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	This Month	Previous 11 Months	12 Month Total

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

DRAFT

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH
PART 70 OPERATING PERMIT
QUARTERLY DEVIATION AND COMPLIANCE MONITORING REPORT

Source Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Address: 3301 S. County Road 150 West, Greencastle, Indiana 46135
Part 70 Permit No.: T133-33667-00002

Months: _____ to _____ Year: _____

This report shall be submitted quarterly based on a calendar year. Proper notice submittal under Section B -Emergency Provisions satisfies the reporting requirements of paragraph (a) of Section C-General Reporting. Any deviation from the requirements of this permit, the date(s) of each deviation, the probable cause of the deviation, and the response steps taken must be reported. A deviation required to be reported pursuant to an applicable requirement that exists independent of the permit, shall be reported according to the schedule stated in the applicable requirement and does not need to be included in this report. Additional pages may be attached if necessary. If no deviations occurred, please specify in the box marked "No deviations occurred this reporting period".	
☐ NO DEVIATIONS OCCURRED THIS REPORTING PERIOD.	
☐ THE FOLLOWING DEVIATIONS OCCURRED THIS REPORTING PERIOD	
Permit Requirement (specify permit condition #)	
Date of Deviation:	**Duration of Deviation:**
Number of Deviations:	
Probable Cause of Deviation:	
Response Steps Taken:	
Permit Requirement (specify permit condition #)	
Date of Deviation:	**Duration of Deviation:**
Number of Deviations:	
Probable Cause of Deviation:	
Response Steps Taken:	

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Permit Requirement (specify permit condition #)	
Date of Deviation:	**Duration of Deviation:**
Number of Deviations:	
Probable Cause of Deviation:	
Response Steps Taken:	
Permit Requirement (specify permit condition #)	
Date of Deviation:	**Duration of Deviation:**
Number of Deviations:	
Probable Cause of Deviation:	
Response Steps Taken:	
Permit Requirement (specify permit condition #)	
Date of Deviation:	**Duration of Deviation:**
Number of Deviations:	
Probable Cause of Deviation:	
Response Steps Taken:	

Form Completed by:_____

Title / Position: _____

Date:_____

Phone: _____

Attachment E

Part 70 Operating Permit No: T133-33667-00002

[Downloaded from the eCFR on September 19, 2015]

Electronic Code of Federal Regulations

Title 40: Protection of Environment

PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES

Subpart LLL—National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry

SOURCE: 64 FR 31925, June 14, 1999, unless otherwise noted.

General

§63.1340 What parts of my plant does this subpart cover?

(a) The provisions of this subpart apply to each new and existing portland cement plant which is a major source or an area source as defined in §63.2.

(b) The affected sources subject to this subpart are:

(1) Each kiln including alkali bypasses and inline coal mills, except for kilns that burn hazardous waste and are subject to and regulated under subpart EEE of this part;

(2) Each clinker cooler at any portland cement plant;

(3) Each raw mill at any portland cement plant;

(4) Each finish mill at any portland cement plant;

(5) Each raw material dryer at any portland cement plant;

(6) Each raw material, clinker, or finished product storage bin at any portland cement plant that is a major source;

(7) Each conveying system transfer point including those associated with coal preparation used to convey coal from the mill to the kiln at any portland cement plant that is a major source;

(8) Each bagging and bulk loading and unloading system at any portland cement plant that is a major source; and

(9) Each open clinker storage pile at any portland cement plant.

(c) Onsite sources that are subject to standards for nonmetallic mineral processing plants in subpart OOO, part 60 of this chapter are not subject to this subpart. Crushers are not covered by this subpart regardless of their location.

(d) If you are subject to any of the provisions of this subpart you are also subject to title V permitting requirements.

[75 FR 55051, Sept. 9, 2010, as amended at 78 FR 10036, Feb. 12, 2013]

§63.1341 Definitions.

All terms used in this subpart that are not defined in this section have the meaning given to them in the CAA and in subpart A of this part.

Affirmative defense means, in the context of an enforcement proceeding, a response or defense put forward by a defendant, regarding which the defendant has the burden of proof, and the merits of which are independently and objectively evaluated in a judicial or administrative proceeding.

Alkali bypass means a duct between the feed end of the kiln and the preheater tower through which a portion of the kiln exit gas stream is withdrawn and quickly cooled by air or water to avoid excessive buildup of alkali, chloride and/or sulfur on the raw feed. This may also be referred to as the “kiln exhaust gas bypass”.

Bagging system means the equipment which fills bags with portland cement.

Bin means a manmade enclosure for storage of raw materials, clinker, or finished product prior to further processing at a portland cement plant.

Clinker means the product of the process in which limestone and other materials are heated in the kiln and is then ground with gypsum and other materials to form cement.

Clinker cooler means equipment into which clinker product leaving the kiln is placed to be cooled by air supplied by a forced draft or natural draft supply system.

Continuous monitor means a device which continuously samples the regulated parameter specified in §63.1350 of this subpart without interruption, evaluates the detector response at least once every 15 seconds, and computes and records the average value at least every 60 seconds, except during allowable periods of calibration and except as defined otherwise by the continuous emission monitoring system performance specifications in appendix B to part 60 of this chapter.

Conveying system means a device for transporting materials from one piece of equipment or location to another location within a facility. Conveying systems include but are not limited to the following: feeders, belt conveyors, bucket elevators and pneumatic systems.

Conveying system transfer point means a point where any material including but not limited to feed material, fuel, clinker or product, is transferred to or from a conveying system, or between separate parts of a conveying system.

Crusher means a machine designed to reduce large rocks from the quarry into materials approximately the size of gravel.

*Dioxins and furans (D/F)*means tetra-, penta-, hexa-, hepta-, and octa-chlorinated dibenzo dioxins and furans.

Facility means all contiguous or adjoining property that is under common ownership or control, including properties that are separated only by a road or other public right-of-way.

Feed means the prepared and mixed materials, which include but are not limited to materials such as limestone, clay, shale, sand, iron ore, mill scale, cement kiln dust and flyash, that are fed to the kiln. Feed does not include the fuels used in the kiln to produce heat to form the clinker product.

Finish mill means a roll crusher, ball and tube mill or other size reduction equipment used to grind clinker to a fine powder. Gypsum and other materials may be added to and blended with clinker in a finish mill. The finish mill also includes the air separator associated with the finish mill.

Greenfield kiln, in-line kiln/raw mill, or raw material dryer means a kiln, in-line kiln/raw mill, or raw material dryer for which construction is commenced at a plant site (where no kilns and no in-line kiln/raw mills were in operation at any time prior to March 24, 1998) after March 24, 1998.

Hazardous waste is defined in §261.3 of this chapter.

In-line coal mill means those coal mills using kiln exhaust gases in their process. Coal mills with a heat source other than the kiln or coal mills using exhaust gases from the clinker cooler are not an in-line coal mill.

In-line kiln/raw mill means a system in a portland cement production process where a dry kiln system is integrated with the raw mill so that all or a portion of the kiln exhaust gases are used to perform the drying operation of the raw mill, with no auxiliary heat source used. In this system the kiln is capable of operating without the raw mill operating, but the raw mill cannot operate without the kiln gases, and consequently, the raw mill does not generate a separate exhaust gas stream.

Kiln means a device, including any associated preheater or precalciner devices, inline raw mills, inline coal mills or alkali bypasses that produces clinker by heating limestone and other materials for subsequent production of portland cement. Because the inline raw mill and inline coal mill are considered an integral part of the kiln, for purposes of determining the appropriate emissions limit, the term kiln also applies to the exhaust of the inline raw mill and the inline coal mill.

Kiln exhaust gas bypass means alkali bypass.

Monovent means an exhaust configuration of a building or emission control device (e. g. positive pressure fabric filter) that extends the length of the structure and has a width very small in relation to its length (i. e., length to width ratio is typically greater than 5:1). The exhaust may be an open vent with or without a roof, louvered vents, or a combination of such features.

New brownfield kiln, in-line kiln raw mill, or raw material dryer means a kiln, in-line kiln/raw mill or raw material dryer for which construction is commenced at a plant site (where kilns and/or in-line kiln/raw mills were in operation prior to March 24, 1998) after March 24, 1998.

New source means any source that commenced construction or reconstruction after May 6, 2009, for purposes of determining the applicability of the kiln, clinker cooler and raw material dryer emissions limits for mercury, PM, THC, and HCl.

One-minute average means the average of thermocouple or other sensor responses calculated at least every 60 seconds from responses obtained at least once during each consecutive 15 second period.

Open clinker storage pile means a clinker storage pile on the ground for more than three days that is not completely enclosed in a building or structure.

Operating day means any 24-hour period beginning at 12:00 midnight during which the kiln produces any amount of clinker. For calculating the 30-day rolling average emissions, kiln operating days do not include the hours of operation during startup or shutdown.

Portland cement plant means any facility manufacturing portland cement.

Raw material dryer means an impact dryer, drum dryer, paddle-equipped rapid dryer, air separator, or other equipment used to reduce the moisture content of feed or other materials.

Raw mill means a ball and tube mill, vertical roller mill or other size reduction equipment, that is not part of an in-line kiln/raw mill, used to grind feed to the appropriate size. Moisture may be added or removed from the feed during the grinding operation. If the raw mill is used to remove moisture from feed materials, it is also, by definition, a raw material dryer. The raw mill also includes the air separator associated with the raw mill.

Rolling average means the weighted average of all data, meeting QA/QC requirements or otherwise normalized, collected during the applicable averaging period. The period of a rolling average stipulates the frequency of data averaging and reporting. To demonstrate compliance with an operating parameter a 30-day rolling average period requires calculation of a new average value each operating day and shall include the average of all the hourly averages of the specific operating parameter. For demonstration of compliance with an emissions limit based on

pollutant concentration a 30-day rolling average is comprised of the average of all the hourly average concentrations over the previous 30 operating days. For demonstration of compliance with an emissions limit based on lbs-pollutant per production unit the 30-day rolling average is calculated by summing the hourly mass emissions over the previous 30 operating days, then dividing that sum by the total production during the same period.

Run average means the average of the recorded parameter values for a run.

Shutdown means the cessation of kiln operation. Shutdown begins when feed to the kiln is halted and ends when continuous kiln rotation ceases.

Sorbent means activated carbon, lime, or any other type of material injected into kiln exhaust for the purposes of capturing and removing any hazardous air pollutant.

Startup means the time from when a shutdown kiln first begins firing fuel until it begins producing clinker. Startup begins when a shutdown kiln turns on the induced draft fan and begins firing fuel in the main burner. Startup ends when feed is being continuously introduced into the kiln for at least 120 minutes or when the feed rate exceeds 60 percent of the kiln design limitation rate, whichever occurs first.

TEQ means the international method of expressing toxicity equivalents for dioxins and furans as defined in U.S. EPA, Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 Update, March 1989.

Total organic HAP means, for the purposes of this subpart, the sum of the concentrations of compounds of formaldehyde, benzene, toluene, styrene, m-xylene, p-xylene, o-xylene, acetaldehyde, and naphthalene as measured by EPA Test Method 320 or Method 18 of appendix A to this part or ASTM D6348-03[1] or a combination of these methods, as appropriate. If measurement results for any pollutant are reported as below the method detection level (e.g., laboratory analytical results for one or more sample components are below the method defined analytical detection level), you must use the method detection level as the measured emissions level for that pollutant in calculating the total organic HAP value. The measured result for a multiple component analysis (e.g., analytical values for multiple Method 18 fractions) may include a combination of method detection level data and analytical data reported above the method detection level. The owner or operator of an affected source may request the use of other test methods to make this determination under paragraphs 63.7(e)(2)(ii) and (f) of this part.

[1]When using ASTM D6348-03, the following conditions must be met:

(1) The test plan preparation and implementation in the Annexes to ASTM D6348-03, Sections A1 through A8 are mandatory; (2) For ASTM D6348-03 Annex A5 (Analyte Spiking Technique), the percent R must be determined for each target analyte (see Equation A5.5); (3) For the ASTM D6348-03 test data to be acceptable for a target analyte percent R must be 70 percent ≥R ≤130 percent; and (4) The percent R value for each compound must be reported in the test report and all field measurements corrected with the calculated percent R value for that compound using the following equation: Reported Result = The measured concentration in the stack divided by the calculated percent R value and then the whole term multiplied by 100.

Totally enclosed conveying system transfer point means a conveying system transfer point that is enclosed on all sides, top, and bottom.

[64 FR 31925, June 14, 1999, as amended at 67 FR 16619, Apr. 5, 2002; 75 FR 55051, Sept. 9, 2010; 78 FR 10037, Feb. 12, 2013; 80 FR 44778, July 27, 2015]

Emission Standards and Operating Limits

§63.1342 Standards: General.

Table 1 to this subpart provides cross references to the 40 CFR part 63, subpart A, general provisions, indicating the applicability of the general provisions requirements to subpart LLL.

[71 FR 76549, Dec. 20, 2006]

§63.1343 What standards apply to my kilns, clinker coolers, raw material dryers, and open clinker storage piles?

(a) *General.* The provisions in this section apply to each kiln and any alkali bypass associated with that kiln, clinker cooler, raw material dryer, and open clinker storage pile. All D/F, HCl, and total hydrocarbon (THC) emissions limit are on a dry basis. The D/F, HCl, and THC limits for kilns are corrected to 7 percent oxygen. All THC emissions limits are measured as propane. Standards for mercury and THC are based on a rolling 30-day average. If using a CEMS to determine compliance with the HCl standard, this standard is based on a rolling 30-day average. You must ensure appropriate corrections for moisture are made when measuring flow rates used to calculate mercury emissions. The 30-day period means all operating hours within 30 consecutive kiln operating days excluding periods of startup and shutdown. All emissions limits for kilns, clinker coolers, and raw material dryers currently in effect that are superseded by the limits below continue to apply until the compliance date of the limits below, or until the source certifies compliance with the limits below, whichever is earlier.

(b) *Kilns, clinker coolers, raw material dryers, raw mills, and finish mills.* (1) The emissions limits for these sources are shown in Table 1.

Table 1—Emissions Limits for Kilns, Clinker Coolers, Raw Material Dryers, Raw and Finish Mills

If your source is a (an):	And the operating mode is:	And if is located at a:	Your emissions limits are:	And the units of the emissions limit are:	The oxygen correction factor is:
1. Existing kiln	Normal operation	Major or area source	PM[1] 0.07	lb/ton clinker	NA.
			D/F[2] 0.2	ng/dscm (TEQ)	7 percent.
			Mercury 55	lb/MM tons clinker	NA.
			THC[34] 24	ppmvd	7 percent.
2. Existing kiln	Normal operation	Major source	HCl 3	ppmvd	7 percent.
3. Existing kiln	Startup and shutdown	Major or area source	Work practices (63.1346(g))	NA	NA.
4. New kiln	Normal operation	Major or area source	PM[1] 0.02	lb/ton clinker	NA.
			D/F[2] 0.2	ng/dscm (TEQ)	7 percent.
			Mercury 21	lb/MM tons clinker	NA.
			THC[34] 24	ppmvd	7 percent.
5. New kiln	Normal operation	Major source	HCl 3	ppmvd	7 percent.
6. New kiln	Startup and shutdown	Major or area source	Work practices (63.1346(g))	NA	NA.
7. Existing clinker cooler	Normal operation	Major or area source	PM 0.07	lb/ton clinker	NA.
8. Existing clinker cooler	Startup and shutdown	Major or area source	Work practices (63.1348(b)(9))	NA	NA.
9. New clinker cooler	Normal operation	Major or area source	PM 0.02	lb/ton clinker	NA.
10. New clinker cooler	Startup and shutdown	Major or area source	Work practices (63.1348(b)(9))	NA	NA.
11. Existing or new raw material dryer	Normal operation	Major or area source	THC[34] 24	ppmvd	NA.

If your source is a (an):	And the operating mode is:	And if is located at a:	Your emissions limits are:	And the units of the emissions limit are:	The oxygen correction factor is:
12. Existing or new raw material dryer	Startup and shutdown	Major or area source	Work practices (63.1348(b)(9))	NA	NA.
13. Existing or new raw or finish mill	All operating modes	Major source	Opacity 10	percent	NA.

[1]The initial and subsequent PM performance tests are performed using Method 5 or 5I and consist of three test runs.

[2]If the average temperature at the inlet to the first PM control device (fabric filter or electrostatic precipitator) during the D/F performance test is 400 °F or less, this limit is changed to 0.40 ng/dscm (TEQ).

[3]Measured as propane.

[4]Any source subject to the 24 ppmvd THC limit may elect to meet an alternative limit of 12 ppmvd for total organic HAP.

(2) When there is an alkali bypass and/or an inline coal mill with a separate stack associated with a kiln, the combined PM emissions from the kiln and the alkali bypass stack and/or the inline coal mill stack are subject to the PM emissions limit. Existing kilns that combine the clinker cooler exhaust and/or alkali bypass and/or coal mill exhaust with the kiln exhaust and send the combined exhaust to the PM control device as a single stream may meet an alternative PM emissions limit. This limit is calculated using Equation 1 of this section:

$$PM_{alt} = (0.0060 \times 1.65)(Q_k + Q_c + Q_{ab} + Q_{cm})/(7000) \quad \text{(Eq. 1)}$$

Where:

PM_{alt} = Alternative PM emission limit for commingled sources.

0.006 = The PM exhaust concentration (gr/dscf) equivalent to 0.070 lb per ton clinker where clinker cooler and kiln exhaust gas are not combined.

1.65 = The conversion factor of ton feed per ton clinker.

Q_k = The exhaust flow of the kiln (dscf/ton feed).

Q_c = The exhaust flow of the clinker cooler (dscf/ton feed).

Q_{ab} = The exhaust flow of the alkali bypass (dscf/ton feed).

Q_{cm} = The exhaust flow of the coal mill (dscf/ton feed).

7000 = The conversion factor for grains (gr) per lb.

For new kilns that combine kiln exhaust, clinker cooler gas and/or coal mill and alkali bypass exhaust, the limit is calculated using Equation 2 of this section:

$$PM_{alt} = (0.0020 \times 1.65)(Q_k + Q_c + Q_{ab} + Q_{cm})/(7000) \quad \text{(Eq. 2)}$$

Where:

PM_{alt} = Alternative PM emission limit for commingled sources.

0.002 = The PM exhaust concentration (gr/dscf) equivalent to 0.020 lb per ton clinker where clinker cooler and kiln exhaust gas are not combined.

1.65 = The conversion factor of ton feed per ton clinker.

Q_k = The exhaust flow of the kiln (dscf/ton feed).

Q_c = The exhaust flow of the clinker cooler (dscf/ton feed).

Q_{ab} = The exhaust flow of the alkali bypass (dscf/ton feed).

Q_{cm} = The exhaust flow of the coal mill (dscf/ton feed).

7000 = The conversion factor for gr per lb.

(c) *Open clinker storage pile.* The owner or operator of an open clinker storage pile must prepare, and operate in accordance with, the fugitive dust emissions control measures, described in their operation and maintenance plan (see §63.1347 of this subpart), that is appropriate for the site conditions as specified in paragraphs (c)(1) through (3) of this section. The operation and maintenance plan must also describe the measures that will be used to minimize fugitive dust emissions from piles of clinker, such as accidental spillage, that are not part of open clinker storage piles.

(1) The operation and maintenance plan must identify and describe the location of each current or future open clinker storage pile and the fugitive dust emissions control measures the owner or operator will use to minimize fugitive dust emissions from each open clinker storage pile.

(2) For open clinker storage piles, the operations and maintenance plan must specify that one or more of the following control measures will be used to minimize to the greatest extent practicable fugitive dust from open clinker storage piles: Locating the source inside a partial enclosure, installing and operating a water spray or fogging system, applying appropriate chemical dust suppression agents, use of a wind barrier, compaction, use of tarpaulin or other equally effective cover or use of a vegetative cover. You must select, for inclusion in the operations and maintenance plan, the fugitive dust control measure or measures listed in this paragraph that are most appropriate for site conditions. The plan must also explain how the measure or measures selected are applicable and appropriate for site conditions. In addition, the plan must be revised as needed to reflect any changing conditions at the source.

(3) Temporary piles of clinker that result from accidental spillage or clinker storage cleaning operations must be cleaned up within 3 days.

(d) Emission limits in effect prior to September 9, 2010. Any source defined as an existing source in §63.1351, and that was subject to a PM, mercury, THC, D/F, or opacity emissions limit prior to September 9, 2010, must continue to meet the limits as shown in Table 2 until September 9, 2015.

Table 2—Emissions Limits in Effect Prior to September 9, 2010, For Kilns (Rows 1-4), Clinker Coolers (Row 5), and Raw Material Dryers (Rows 6-9)

If your source is	and	And if it is located at	Your emissions limits are:[1]	And the units of the emissions limit are:
1. An existing kiln	it commenced construction or reconstruction on or prior to December 2, 2005	A major source	PM-0.3 Opacity-20 D/F-0.2[2] THC-50[34]	lb/ton feed percent ng/dscm (TEQ) ppmvd.

If your source is	and	And if it is located at	Your emissions limits are:[1]	And the units of the emissions limit are:
2. An existing kiln	it commenced construction or reconstruction after December 2, 2005	A major source	PM-0.3 Opacity-20 D/F-0.2[2] THC-20[3][5] Mercury-41[6]	lb/ton feed percent ng/dscm (TEQ) ppmvd ug/dscm.
3. An existing kiln	it commenced construction or reconstruction on or prior to December 2, 2005	An area source	D/F-0.2[2] THC-50[3][4]	ng/dscm (TEQ) ppmvd.
4. An existing kiln	it commenced construction or reconstruction after December 2, 2005	An area source	D/F-0.2[2] THC-20[3][5] Mercury-41[6]	ng/dscm (TEQ) ppmvd ug/dscm.
5. An existing clinker cooler	NA	A major source	PM-0.1 Opacity-10	lb/ton feed percent.
6. An Existing raw material dryer	it commenced construction or reconstruction on or prior to December 2, 2005	A major source	THC-50[3][4] Opacity-10	ppmvd Percent.
7. An Existing raw material dryer	it commenced construction or reconstruction after December 2, 2005	A major source	THC-20[3][5] Opacity-10	ppmvd percent.
8. An Existing raw material dryer	it commenced construction or reconstruction on or prior to December 2, 2005	An area source	THC-50[3][4]	ppmvd.
9. An Existing raw material dryer	it commenced construction or reconstruction after December 2, 2005	An area source	THC-20[3][5]	ppmvd.

[1]All emission limits expressed as a concentration basis (ppmvd, ng/dscm) are corrected to seven percent oxygen.

[2]If the average temperature at the inlet to the first particulate matter control device (fabric filter or electrostatic precipitator) during the D/F performance test is 400 °F or less, this limit is changed to 0.4 ng/dscm (TEQ).

[3]Measured as propane.

[4]Only applies to Greenfield kilns or raw material dryers.

[5]As an alternative, a source may demonstrate a 98 percent reduction in THC emissions from the exit of the kiln or raw material dryer to discharge to the atmosphere. Inline raw mills are considered to be an integral part of the kiln.

[6]As an alternative, a source may route the emissions through a packed bed or spray tower wet scrubber with a liquid-to-gas ratio of 30 gallons per 1000 actual cubic feet per minute or more and meet a site-specific emission limit based on the measured performance of the wet scrubber.

[78 FR 10037, Feb. 12, 2013, as amended at 80 FR 44779, July 27, 2015]

§63.1344 [Reserved]

§63.1345 Emissions limits for affected sources other than kilns; clinker coolers; new and reconstructed raw material dryers.

The owner or operator of each new or existing raw material, clinker, or finished product storage bin; conveying system transfer point; bagging system; bulk loading or unloading system; raw and finish mills; and each existing raw material dryer, at a facility which is a major source subject to the provisions of this subpart must not cause to be discharged any gases from these affected sources which exhibit opacity in excess of 10 percent.

[78 FR 10039, Feb. 12, 2013]

§63.1346 Operating limits for kilns.

(a) The owner or operator of a kiln subject to a D/F emissions limitation under §63.1343 must operate the kiln such that the temperature of the gas at the inlet to the kiln PM control device (PMCD) and alkali bypass PMCD, if applicable, does not exceed the applicable temperature limit specified in paragraph (b) of this section. The owner or operator of an in-line kiln/raw mill subject to a D/F emissions limitation under §63.1343 must operate the in-line kiln/raw mill, such that:

(1) When the raw mill of the in-line kiln/raw mill is operating, the applicable temperature limit for the main in-line kiln/raw mill exhaust, specified in paragraph (b) of this section and established during the performance test when the raw mill was operating, is not exceeded, except during periods of startup and shutdown when the temperature limit may be exceeded by no more than 10 percent.

(2) When the raw mill of the in-line kiln/raw mill is not operating, the applicable temperature limit for the main in-line kiln/raw mill exhaust, specified in paragraph (b) of this section and established during the performance test when the raw mill was not operating, is not exceeded, except during periods of startup/shutdown when the temperature limit may be exceeded by no more than 10 percent.

(3) If the in-line kiln/raw mill is equipped with an alkali bypass, the applicable temperature limit for the alkali bypass specified in paragraph (b) of this section and established during the performance test, with or without the raw mill operating, is not exceeded, except during periods of startup/shutdown when the temperature limit may be exceeded by no more than 10 percent.

(b) The temperature limit for affected sources meeting the limits of paragraph (a) of this section or paragraphs (a)(1) through (a)(3) of this section is determined in accordance with §63.1349(b)(3)(iv).

(c) For an affected source subject to a D/F emissions limitation under §63.1343 that employs sorbent injection as an emission control technique for D/F control, you must operate the sorbent injection system in accordance with paragraphs (c)(1) and (2) of this section.

(1) The rolling three-hour average activated sorbent injection rate must be equal to or greater than the sorbent injection rate determined in accordance with §63.1349(b)(3)(vi).

(2) You must either:

(i) Maintain the minimum activated carbon injection carrier gas flow rate, as a rolling three-hour average, based on the manufacturer's specifications. These specifications must be documented in the test plan developed in accordance with §63.7(c), or

(ii) Maintain the minimum activated carbon injection carrier gas pressure drop, as a rolling three-hour average, based on the manufacturer's specifications. These specifications must be documented in the test plan developed in accordance with §63.7(c).

(d) Except as provided in paragraph (e) of this section, for an affected source subject to a D/F emissions limitation under §63.1343 that employs carbon injection as an emission control technique you must specify and use the brand

and type of sorbent used during the performance test until a subsequent performance test is conducted, unless the site-specific performance test plan contains documentation of key parameters that affect adsorption and the owner or operator establishes limits based on those parameters, and the limits on these parameters are maintained.

(e) For an affected source subject to a D/F emissions limitation under §63.1343 that employs carbon injection as an emission control technique you may substitute, at any time, a different brand or type of sorbent provided that the replacement has equivalent or improved properties compared to the sorbent specified in the site-specific performance test plan and used in the performance test. The owner or operator must maintain documentation that the substitute sorbent will provide the same or better level of control as the original sorbent.

(f) No kiln may use as a raw material or fuel any fly ash where the mercury content of the fly ash has been increased through the use of activated carbon, or any other sorbent, unless the facility can demonstrate that the use of that fly ash will not result in an increase in mercury emissions over baseline emissions (i.e., emissions not using the fly ash). The facility has the burden of proving there has been no emissions increase over baseline. Once the kiln is in compliance with a mercury emissions limit specified in §63.1343, this paragraph no longer applies.

(g) During periods of startup and shutdown you must meet the requirements listed in (g)(1) through (4) of this section.

(1) During startup you must use any one or combination of the following clean fuels: natural gas, synthetic natural gas, propane, distillate oil, synthesis gas (syngas), and ultra-low sulfur diesel (ULSD) until the kiln reaches a temperature of 1200 degrees Fahrenheit.

(2) Combustion of the primary kiln fuel may commence once the kiln temperature reaches 1200 degrees Fahrenheit.

(3) All dry sorbent and activated carbon systems that control hazardous air pollutants must be turned on and operating at the time the gas stream at the inlet to the baghouse or ESP reaches 300 degrees Fahrenheit (five minute average) during startup. Temperature of the gas stream is to be measured at the inlet of the baghouse or ESP every minute. Such injection systems can be turned off during shutdown. Particulate control and all remaining devices that control hazardous air pollutants should be operational during startup and shutdown.

(4) You must keep records as specified in §63.1355 during periods of startup and shutdown.

[75 FR 55054, Sept. 9, 2010, as amended at 78 FR 10039, Feb. 12, 2013; 80 FR 44781, July 27, 2015]

§63.1347 Operation and maintenance plan requirements.

(a) You must prepare, for each affected source subject to the provisions of this subpart, a written operations and maintenance plan. The plan must be submitted to the Administrator for review and approval as part of the application for a part 70 permit and must include the following information:

(1) Procedures for proper operation and maintenance of the affected source and air pollution control devices in order to meet the emissions limits and operating limits, including fugitive dust control measures for open clinker piles of §§63.1343, 63.1345, and 63.1346. Your operations and maintenance plan must address periods of startup and shutdown.

(2) Corrective actions to be taken when required by paragraph §63.1350(f)(3);

(3) Procedures to be used during an inspection of the components of the combustion system of each kiln and each in-line kiln raw mill located at the facility at least once per year.

(b) Failure to comply with any provision of the operations and maintenance plan developed in accordance with this section is a violation of the standard.

[75 FR 55054, Sept. 9, 2010, as amended at 78 FR 10040, Feb. 12, 2013; 80 FR 44781, July 27, 2015]

§63.1348 Compliance requirements.

(a) *Initial Performance Test Requirements.* For an affected source subject to this subpart, you must demonstrate compliance with the emissions standards and operating limits by using the test methods and procedures in §§63.1349 and 63.7. Any cement kiln that has been subject to the requirements of subpart CCCC or subpart DDDD of 40 CFR Part 60, and is now electing to cease burning nonhazardous solid waste and become subject to this subpart, must meet all the initial compliance testing requirements each time it becomes subject to this subpart, even if it was previously subject to this subpart.

NOTE TO PARAGRAPH (a): The first day of the 30 operating day performance test is the first day after the compliance date following completion of the field testing and data collection that demonstrates that the CPMS or CEMS has satisfied the relevant CPMS performance evaluation or CEMS performance specification (e.g., PS 2, 12A, or 12B) acceptance criteria. The performance test period is complete at the end of the 30th consecutive operating day. See §63.1341 for definition of operating day and §63.1348(b)(1) for the CEMS operating requirements. The source has the option of performing the compliance test earlier then the compliance date if desired.

(1) *PM Compliance.* If you are subject to limitations on PM emissions under §63.1343(b), you must demonstrate compliance with the PM emissions standards by using the test methods and procedures in §63.1349(b)(1).

(2) *Opacity Compliance.* If you are subject to the limitations on opacity under §63.1345, you must demonstrate compliance with the opacity emissions standards by using the performance test methods and procedures in §63.1349(b)(2). Use the maximum 6-minute average opacity exhibited during the performance test period to determine whether the affected source is in compliance with the standard.

(3) *D/F compliance.* (i) If you are subject to limitations on D/F emissions under §63.1343(b), you must demonstrate initial compliance with the D/F emissions standards by using the performance test methods and procedures in §63.1349(b)(3). The owner or operator of a kiln with an in-line raw mill must demonstrate initial compliance by conducting separate performance tests while the raw mill is operating and the raw mill is not operating. The D/F concentration must be determined for each run and the arithmetic average of the concentrations measured for the three runs must be calculated to determine compliance. The owner or operator of a kiln with an in-line raw mill must demonstrate compliance by conducting separate performance tests while the raw mill is operating and while the raw mill is not operating. Determine the D/F TEQ concentration for each run and calculate the arithmetic average of the TEQ concentrations measured for the three runs to determine continuous compliance.

(ii) If you are subject to a D/F emissions limitation under §63.1343(b), you must demonstrate compliance with the temperature operating limits specified in §63.1346 by using the performance test methods and procedures in §63.1349(b)(3)(ii) through (b)(3)(iv). Use the arithmetic average of the temperatures measured during the three runs to determine the applicable temperature limit.

(iii) If activated carbon injection is used and you are subject to a D/F emissions limitation under §63.1343(b), you must demonstrate compliance with the activated carbon injection rate operating limits specified in §63.1346 by using the performance test methods and procedures in §63.1349(b)(3)(v).

(iv) If activated carbon injection is used, you must also develop a carrier gas parameter (either the carrier gas flow rate or the carrier gas pressure drop) during the initial performance test and updated during any subsequent performance test conducted under §63.1349(b)(3) that meets the requirements of §63.1349(b)(3)(vi). Compliance is demonstrated if the system is maintained within ±5 percent accuracy during the performance test determined in accordance with the procedures and criteria submitted for review in your monitoring plan required in section 63.1350(p).

(4)(i) *THC Compliance.* If you are subject to limitations on THC emissions under §63.1343(b), you must demonstrate compliance with the THC emissions standards by using the performance test methods and procedures in §63.1349(b)(4)(i). You must use the average THC concentration obtained during the first 30 kiln operating days after the compliance date of this rule to determine initial compliance.

(ii) *Total Organic HAP Emissions Tests.* If you elect to demonstrate compliance with the total organic HAP emissions limit under §63.1343(b) in lieu of the THC emissions limit, you must demonstrate compliance with the total organic HAP emissions standards by using the performance test methods and procedures in §63.1349(b)(7.

(iii) If you are demonstrating initial compliance, you must conduct the separate performance tests as specified in §63.1349(b)(7) while the raw mill of the inline kiln/raw mill is operating and while the raw mill of the inline kiln/raw mill is not operating.

(iv) The time weighted average total organic HAP concentration measured during the separate initial performance test specified by §63.1349(b)(7) must be used to determine initial compliance.

(v) The time weighted average THC concentration measured during the initial performance test specified by §63.1349(b)(4) must be used to determine the site-specific THC limit. Using the fraction of time the inline kiln/raw mill is on and the fraction of time that the inline kiln/raw mill is off, calculate this limit as a time weighted average of the THC levels measured during raw mill on and raw mill off testing using one of the two approaches in §63.1349(b)(7)(vii) or (viii) depending on the level of organic HAP measured during the compliance test.

(5) *Mercury Compliance.* If you are subject to limitations on mercury emissions in §63.1343(b), you must demonstrate compliance with the mercury standards by using the performance test methods and procedures in §63.1349(b)(5). You must demonstrate compliance by operating a mercury CEMS or a sorbent trap based CEMS. Compliance with the mercury emissions standard must be determined based on the first 30 operating days you operate a mercury CEMS or sorbent trap monitoring system after the compliance date of this rule.

(i) In calculating a 30 operating day emissions value using an integrating sorbent trap CEMS, assign the average Hg emissions concentration determined for an integrating period (e.g., 7 day sorbent trap monitoring system sample) to each relevant hour of the kiln operating days spanned by each integrated sample. Calculate the 30 kiln operating day emissions rate value using the assigned hourly Hg emissions concentrations and the respective flow and production rate values collected during the 30 kiln operating day performance test period. Depending on the duration of each integrated sampling period, you may not be able to calculate the 30 kiln operating day emissions value until several days after the end of the 30 kiln operating day performance test period.

(ii) For example, a sorbent trap monitoring system producing an integrated 7-day sample will provide Hg concentration data for each hour of the first 28 kiln operating days (i.e., four values spanning 7 days each) of a 30 operating day period. The Hg concentration values for the hours of the last 2 days of the 30 operating day period will not be available for calculating the emissions for the performance test period until at least five days after the end of the subject period.

(6) *HCl Compliance.* If you are subject to limitations on HCl emissions under §63.1343(b), you must demonstrate initial compliance with the HCl standards by using the performance test methods and procedures in §63.1349(b)(6).

(i) For an affected source that is equipped with a wet scrubber, tray tower or dry scrubber, you may demonstrate initial compliance by conducting a performance test as specified in §63.1349(b)(6)(i). You must determine the HCl concentration for each run and calculate the arithmetic average of the concentrations measured for the three runs to determine compliance. You must also establish appropriate site-specific operational parameter limits.

(ii) For an affected source that is not equipped with a wet scrubber, tray tower or dry scrubber, you must demonstrate initial compliance by operating a CEMS as specified in §63.1349(b)(6)(ii). You must use the average of the hourly HCl values obtained during the first 30 kiln operating days that occur after the compliance date of this rule to determine initial compliance.

(7) *Commingled Exhaust Requirements.* If the coal mill exhaust is commingled with kiln exhaust in a single stack, you may demonstrate compliance with the kiln emission limits by either:

(i) Performing required emissions monitoring and testing on the commingled coal mill and kiln exhaust, or

(ii) Perform required emission monitoring and testing of the kiln exhaust prior to the reintroduction of the coal mill exhaust, and also testing the kiln exhaust diverted to the coal mill. All emissions must be added together for all emission points, and must not exceed the limit per each pollutant as listed in S63.1343(b).

(b) *Continuous Monitoring Requirements.* You must demonstrate compliance with the emissions standards and operating limits by using the performance test methods and procedures in §§63.1350 and 63.8 for each affected source.

(1) *General Requirements.* (i) You must monitor and collect data according to §63.1350 and the site-specific monitoring plan required by §63.1350(p).

(ii) Except for periods of startup and shutdown, monitoring system malfunctions, repairs associated with monitoring system malfunctions, and required monitoring system quality assurance or quality control activities (including, as applicable, calibration checks and required zero and span adjustments), you must operate the monitoring system and collect data at all required intervals at all times the affected source is operating.

(iii) You may not use data recorded during monitoring system startup, shutdown or malfunctions or repairs associated with monitoring system malfunctions in calculations used to report emissions or operating levels. A monitoring system malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions. You must use all the data collected during all other periods in assessing the operation of the control device and associated control system.

(iv) *Clinker Production.* If you are subject to limitations on mercury emissions (lb/MM tons of clinker) under §63.1343(b), you must determine the hourly production rate of clinker according to the requirements of §63.1350(d).

(2) *PM Compliance.* If you are subject to limitations on PM emissions under §63.1343(b), you must use the monitoring methods and procedures in §63.1350(b) and (d).

(3) *Opacity Compliance.* If you are subject to the limitations on opacity under §63.1345, you must demonstrate compliance using the monitoring methods and procedures in §63.1350(f) based on the maximum 6-minute average opacity exhibited during the performance test period. You must initiate corrective actions within one hour of detecting visible emissions above the applicable limit.

(i) *COMS.* If you install a COMS in lieu of conducting the daily visible emissions testing, you must demonstrate compliance using a COMS such that it is installed, operated, and maintained in accordance with the requirements of §63.1350(f)(4)(i).

(ii) Bag leak determination system (*BLDS).* If you install a BLDS on a raw mill or finish mill in lieu of conducting the daily visible emissions testing, you must demonstrate compliance using a BLDS that is installed, operated, and maintained in accordance with the requirements of §63.1350(f)(4)(ii).

(4) *D/F Compliance.* If you are subject to a D/F emissions limitation under §63.1343(b), you must demonstrate compliance using a CMS that is installed, operated and maintained to record the temperature of specified gas streams in accordance with the requirements of §63.1350(g).

(5)(i) *Activated Carbon Injection Compliance.* If you use activated carbon injection to comply with the D/F emissions limitation under §63.1343(b), you must demonstrate compliance using a CMS that is installed, operated, and maintained to record the rate of activated carbon injection in accordance with the requirements §63.1350(h)(1).

(ii) If you use activated carbon injection to comply with the D/F emissions limitation under §63.1343(b), you must demonstrate compliance using a CMS that is installed, operated and maintained to record the activated carbon injection system gas parameter in accordance with the requirements of §63.1350(h)(2).

(6) *THC Compliance.* (i) If you are subject to limitations on THC emissions under §63.1343(b), you must demonstrate compliance using the monitoring methods and procedures in §63.1350(i) and (j).

(ii) THC must be measured either upstream of the coal mill or in the coal mill stack.

(7) *Mercury Compliance.* (i) If you are subject to limitations on mercury emissions in §63.1343(b), you must demonstrate compliance using the monitoring methods and procedures in §63.1350(k). If you use an integrated sorbent trap monitoring system to determine ongoing compliance, use the procedures described in §63.1348(a)(5) to assign hourly mercury concentration values and to calculate rolling 30 operating day emissions rates. Since you assign the mercury concentration measured with the sorbent trap to each relevant hour respectively for each operating day of the integrated period, you may schedule the sorbent trap change periods to any time of the day (i.e.,

the sorbent trap replacement need not be scheduled at 12:00 midnight nor must the sorbent trap replacements occur only at integral 24-hour intervals).

(ii) Mercury must be measured either upstream of the coal mill or in the coal mill stack.

(8) *HCl Compliance.* If you are subject to limitations on HCl emissions under §63.1343(b), you must demonstrate compliance using the performance test methods and procedures in §63.1349(b)(6).

(i) For an affected source that is not equipped with a wet scrubber, tray tower or a dry sorbent injection system, you must demonstrate compliance using the monitoring methods and procedures in §63.1350(l)(1).

(ii) For an affected source that is equipped with a wet scrubber, tray tower or a dry sorbent injection system, you may demonstrate compliance using the monitoring methods and procedures in §63.1350(l)(2).

(iii) HCl may be measured either upstream of the coal mill or in the coal mill stack.

(iv) As an alternative to paragraph (b)(8)(ii) of this section, you may use an SO_2 CEMS to establish an SO_2 operating level during your initial and repeat HCl performance tests and monitor the SO_2 level using the procedures in §63.1350(l)(3).

(9) *Startup and Shutdown Compliance.* All dry sorbent and activated carbon systems that control hazardous air pollutants must be turned on and operating at the time the gas stream at the inlet to the baghouse or ESP reaches 300 degrees Fahrenheit (five minute average) during startup. Temperature of the gas stream is to be measured at the inlet of the baghouse or ESP every minute. Such injection systems can be turned off during shutdown. Particulate control and all remaining devices that control hazardous air pollutants should be operational during startup and shutdown.

(c) *Changes in operations.* (1) If you plan to undertake a change in operations that may adversely affect compliance with an applicable standard, operating limit, or parametric monitoring value under this subpart, the source must conduct a performance test as specified in §63.1349(b).

(2) In preparation for and while conducting a performance test required in §63.1349(b), you may operate under the planned operational change conditions for a period not to exceed 360 hours, provided that the conditions in (c)(2)(i) through (c)(2)(iv) of this section are met. You must submit temperature and other monitoring data that are recorded during the pretest operations.

(i) You must provide the Administrator written notice at least 60 days prior to undertaking an operational change that may adversely affect compliance with an applicable standard under this subpart for any source, or as soon as practicable where 60 days advance notice is not feasible. Notice provided under this paragraph must include a description of the planned change, the emissions standards that may be affected by the change, and a schedule for completion of the performance test required under paragraph (c)(1) of this section, including when the planned operational change period would begin.

(ii) The performance test results must be documented in a test report according to §63.1349(a).

(iii) A test plan must be made available to the Administrator prior to performance testing, if requested.

(iv) The performance test must be completed within 360 hours after the planned operational change period begins.

(d) *General duty to minimize emissions.* At all times you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

[75 FR 55055, Sept. 9, 2010, as amended at 78 FR 10040, Feb. 12, 2013; 80 FR 44781, July 27, 2015]

Monitoring and Compliance Provisions

§63.1349 Performance testing requirements.

(a) You must document performance test results in complete test reports that contain the information required by paragraphs (a)(1) through (10) of this section, as well as all other relevant information. As described in §63.7(c)(2)(i), you must make available to the Administrator prior to testing, if requested, the site-specific test plan to be followed during performance testing. For purposes of determining exhaust gas flow rate to the atmosphere from an alkali bypass stack or a coal mill stack, you must either install, operate, calibrate and maintain an instrument for continuously measuring and recording the exhaust gas flow rate according to the requirements in paragraphs §63.1350(n)(1) through (10) of this subpart or use the maximum design exhaust gas flow rate. For purposes of determining the combined emissions from kilns equipped with an alkali bypass or that exhaust kiln gases to a coal mill that exhausts through a separate stack, instead of installing a CEMS on the alkali bypass stack or coal mill stack, you may use the results of the initial and subsequent performance test to demonstrate compliance with the relevant emissions limit.

(1) A brief description of the process and the air pollution control system;

(2) Sampling location description(s);

(3) A description of sampling and analytical procedures and any modifications to standard procedures;

(4) Test results;

(5) Quality assurance procedures and results;

(6) Records of operating conditions during the performance test, preparation of standards, and calibration procedures;

(7) Raw data sheets for field sampling and field and laboratory analyses;

(8) Documentation of calculations;

(9) All data recorded and used to establish parameters for monitoring; and

(10) Any other information required by the performance test method.

(b)(1) *PM emissions tests.* The owner or operator of a kiln and clinker cooler subject to limitations on PM emissions shall demonstrate initial compliance by conducting a performance test using Method 5 or Method 5I at appendix A-3 to part 60 of this chapter. You must also monitor continuous performance through use of a PM continuous parametric monitoring system (PM CPMS).

(i) For your PM CPMS, you will establish a site-specific operating limit. If your PM performance test demonstrates your PM emission levels to be below 75 percent of your emission limit you will use the average PM CPMS value recorded during the PM compliance test, the milliamp or digital equivalent of zero output from your PM CPMS, and the average PM result of your compliance test to establish your operating limit. If your PM compliance test demonstrates your PM emission levels to be at or above 75 percent of your emission limit you will use the average PM CPMS value recorded during the PM compliance test to establish your operating limit. You will use the PM CPMS to demonstrate continuous compliance with your operating limit. You must repeat the performance test annually and reassess and adjust the site-specific operating limit in accordance with the results of the performance test.

(A) Your PM CPMS must provide a 4-20 milliamp or digital signal output and the establishment of its relationship to manual reference method measurements must be determined in units of milliamps or the monitors digital equivalent.

(B) Your PM CPMS operating range must be capable of reading PM concentrations from zero to a level equivalent to three times your allowable emission limit. If your PM CPMS is an auto-ranging instrument capable of multiple scales,

the primary range of the instrument must be capable of reading PM concentration from zero to a level equivalent to three times your allowable emission limit.

(C) During the initial performance test or any such subsequent performance test that demonstrates compliance with the PM limit, record and average all milliamp or digital output values from the PM CPMS for the periods corresponding to the compliance test runs (*e.g.,* average all your PM CPMS output values for three corresponding Method 5I test runs).

(ii) Determine your operating limit as specified in paragraphs (b)(1)(iii) through (iv) of this section. If your PM performance test demonstrates your PM emission levels to be below 75 percent of your emission limit you will use the average PM CPMS value recorded during the PM compliance test, the milliamp or digital equivalent of zero output from your PM CPMS, and the average PM result of your compliance test to establish your operating limit. If your PM compliance test demonstrates your PM emission levels to be at or above 75 percent of your emission limit you will use the average PM CPMS value recorded during the PM compliance test to establish your operating limit. You must verify an existing or establish a new operating limit after each repeated performance test. You must repeat the performance test at least annually and reassess and adjust the site-specific operating limit in accordance with the results of the performance test.

(iii) If the average of your three Method 5 or 5I compliance test runs is below 75 percent of your PM emission limit, you must calculate an operating limit by establishing a relationship of PM CPMS signal to PM concentration using the PM CPMS instrument zero, the average PM CPMS values corresponding to the three compliance test runs, and the average PM concentration from the Method 5 or 5I compliance test with the procedures in (b)(1)(iii)(A) through (D) of this section.

(A) Determine your PM CPMS instrument zero output with one of the following procedures:

(*1*) Zero point data for in-situ instruments should be obtained by removing the instrument from the stack and monitoring ambient air on a test bench.

(*2*) Zero point data for extractive instruments should be obtained by removing the extractive probe from the stack and drawing in clean ambient air.

(*3*) The zero point may also be established by performing manual reference method measurements when the flue gas is free of PM emissions or contains very low PM concentrations (*e.g.,* when your process is not operating, but the fans are operating or your source is combusting only natural gas) and plotting these with the compliance data to find the zero intercept.

(*4*) If none of the steps in paragraphs (b)(1)(iii)(A)(*1*) through (*3*) of this section are possible, you must use a zero output value provided by the manufacturer.

(B) Determine your PM CPMS instrument average in milliamps or digital equivalent, and the average of your corresponding three PM compliance test runs, using equation 3.

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} X_1 \,, \bar{y} = \frac{1}{n}\sum_{i=1}^{n} Y_1 \qquad \text{(Eq. 3)}$$

Where:

X_1 = The PM CPMS data points for the three runs constituting the performance test.

Y_1 = The PM concentration value for the three runs constituting the performance test.

n = The number of data points.

(C) With your instrument zero expressed in milliamps or a digital value, your three run average PM CPMS milliamp or digital signal value, and your three run PM compliance test average, determine a relationship of lb/ton-clinker per milliamp or digital signal value with Equation 4.

$$R = \frac{Y_1}{(X_1 - z)} \qquad \text{(Eq. 4)}$$

Where:

R = The relative lb/ton-clinker per milliamp or digital equivalent for your PM CPMS.

Y_1 = The three run average lb/ton-clinker PM concentration.

X_1 = The three run average milliamp or digital equivalent output from your PM CPMS.

z = The milliamp or digital equivalent of your instrument zero determined from (b)(1)(iii)(A).

(D) Determine your source specific 30-day rolling average operating limit using the lb/ton-clinker per milliamp or digital signal value from Equation 4 in Equation 5, below. This sets your operating limit at the PM CPMS output value corresponding to 75 percent of your emission limit.

$$O_1 = z + \frac{0.75(L)}{R} \qquad \text{(Eq. 5)}$$

Where:

O_l = The operating limit for your PM CPMS on a 30-day rolling average, in milliamps or the digital equivalent.

L = Your source emission limit expressed in lb/ton clinker.

z = Your instrument zero in milliamps, or digital equivalent, determined from (b)(1)(iii)(A).

R = The relative lb/ton-clinker per milliamp, or digital equivalent, for your PM CPMS, from Equation 4.

(iv) If the average of your three PM compliance test runs is at or above 75 percent of your PM emission limit you must determine your operating limit by averaging the PM CPMS milliamp or digital equivalent output corresponding to your three PM performance test runs that demonstrate compliance with the emission limit using Equation 6.

$$O_h = \frac{1}{n}\sum_{i=1}^{n} x_i \qquad \text{(Eq. 6)}$$

Where:

X_1 = The PM CPMS data points for all runs i.

n = The number of data points.

O_h = Your site specific operating limit, in milliamps or the digital equivalent.

(v) To determine continuous operating compliance, you must record the PM CPMS output data for all periods when the process is operating, and use all the PM CPMS data for calculations when the source is not out-of-control. You must demonstrate continuous compliance by using all quality-assured hourly average data collected by the PM CPMS for all operating hours to calculate the arithmetic average operating parameter in units of the operating limit (milliamps or the digital equivalent) on a 30 operating day rolling average basis, updated at the end of each new kiln operating day. Use Equation 7 to determine the 30 kiln operating day average.

$$30\text{kiln operating day} = \frac{\sum_{i=1}^{n} Hpvi}{n} \quad \text{(Eq. 7)}$$

Where:

Hpvi = The hourly parameter value for hour i.

n = The number of valid hourly parameter values collected over 30 kiln operating days.

(vi) For each performance test, conduct at least three separate test runs each while the mill is on and the mill is off, under the conditions that exist when the affected source is operating at the level reasonably expected to occur. Conduct each test run to collect a minimum sample volume of 2 dscm for determining compliance with a new source limit and 1 dscm for determining compliance with an existing source limit. Calculate the time weighted average of the results from three consecutive runs, including applicable sources as required by (b)(1)(viii), to determine compliance. You need not determine the particulate matter collected in the impingers ("back half") of the Method 5 or Method 5I particulate sampling train to demonstrate compliance with the PM standards of this subpart. This shall not preclude the permitting authority from requiring a determination of the "back half" for other purposes.

(vii) For PM performance test reports used to set a PM CPMS operating limit, the electronic submission of the test report must also include the make and model of the PM CPMS instrument, serial number of the instrument, analytical principle of the instrument (*e.g.* beta attenuation), span of the instruments primary analytical range, milliamp value or digital equivalent to the instrument zero output, technique by which this zero value was determined, and the average milliamp or digital equivalent signals corresponding to each PM compliance test run.

(viii) When there is an alkali bypass and/or an inline coal mill with a separate stack associated with a kiln, the main exhaust and alkali bypass and/or inline coal mill must be tested simultaneously and the combined emission rate of PM from the kiln and alkali bypass and/or inline coal mill must be computed for each run using Equation 8 of this section.

$$E_{Cm} = \frac{E_K + E_B + E_C}{P} \quad \text{(Eq. 8)}$$

Where:

E_{Cm} = Combined hourly emission rate of PM from the kiln and bypass stack and/or inline coal mill, lb/ton of kiln clinker production.

E_K = Hourly emissions of PM emissions from the kiln, lb.

E_B = Hourly PM emissions from the alkali bypass stack, lb.

E_C = Hourly PM emissions from the inline coal mill stack, lb.

P = Hourly clinker production, tons.

(ix) The owner or operator of a kiln with an in-line raw mill and subject to limitations on PM emissions shall demonstrate initial compliance by conducting separate performance tests while the raw mill is under normal operating conditions and while the raw mill is not operating, and calculate the time weighted average emissions. The operating limit will then be determined using 63.1349(b)(1)(i) of this section.

(2) *Opacity tests.* If you are subject to limitations on opacity under this subpart, you must conduct opacity tests in accordance with Method 9 of appendix A-4 to part 60 of this chapter. The duration of the Method 9 performance test must be 3 hours (30 6-minute averages), except that the duration of the Method 9 performance test may be reduced to 1 hour if the conditions of paragraphs (b)(2)(i) and (ii) of this section apply. For batch processes that are not run for 3-hour periods or longer, compile observations totaling 3 hours when the unit is operating.

(i) There are no individual readings greater than 10 percent opacity;

(ii) There are no more than three readings of 10 percent for the first 1-hour period.

(3) *D/F Emissions Tests.* If you are subject to limitations on D/F emissions under this subpart, you must conduct a performance test using Method 23 of appendix A-7 to part 60 of this chapter. If your kiln or in-line kiln/raw mill is equipped with an alkali bypass, you must conduct simultaneous performance tests of the kiln or in-line kiln/raw mill exhaust and the alkali bypass. You may conduct a performance test of the alkali bypass exhaust when the raw mill of the in-line kiln/raw mill is operating or not operating.

(i) Each performance test must consist of three separate runs conducted under representative conditions. The duration of each run must be at least 3 hours, and the sample volume for each run must be at least 2.5 dscm (90 dscf).

(ii) The temperature at the inlet to the kiln or in-line kiln/raw mill PMCD, and, where applicable, the temperature at the inlet to the alkali bypass PMCD must be continuously recorded during the period of the Method 23 test, and the continuous temperature record(s) must be included in the performance test report.

(iii) Average temperatures must be calculated for each run of the performance test.

(iv) The run average temperature must be calculated for each run, and the average of the run average temperatures must be determined and included in the performance test report and will determine the applicable temperature limit in accordance with §63.1346(b), footnote 2.

(v)(A) If sorbent injection is used for D/F control, you must record the rate of sorbent injection to the kiln exhaust, and where applicable, the rate of sorbent injection to the alkali bypass exhaust, continuously during the period of the Method 23 test in accordance with the conditions in §63.1350(m)(9), and include the continuous injection rate record(s) in the performance test report. Determine the sorbent injection rate parameters in accordance with paragraph (b)(3)(vi) of this section.

(B) Include the brand and type of sorbent used during the performance test in the performance test report.

(C) Maintain a continuous record of either the carrier gas flow rate or the carrier gas pressure drop for the duration of the performance test. If the carrier gas flow rate is used, determine, record, and maintain a record of the accuracy of the carrier gas flow rate monitoring system according to the procedures in appendix A to part 75 of this chapter. If the carrier gas pressure drop is used, determine, record, and maintain a record of the accuracy of the carrier gas pressure drop monitoring system according to the procedures in §63.1350(m)(6).

(vi) Calculate the run average sorbent injection rate for each run and determine and include the average of the run average injection rates in the performance test report and determine the applicable injection rate limit in accordance with §63.1346(c)(1).

(4) *THC emissions test.* (i) If you are subject to limitations on THC emissions, you must operate a CEMS in accordance with the requirements in §63.1350(i). For the purposes of conducting the accuracy and quality assurance evaluations for CEMS, the THC span value (as propane) is 50 ppmvw and the reference method (RM) is Method 25A of appendix A to part 60 of this chapter.

(ii) Use the THC CEMS to conduct the initial compliance test for the first 30 kiln operating days of kiln operation after the compliance date of the rule. See §63.1348(a).

(iii) If kiln gases are diverted through an alkali bypass or to a coal mill and exhausted through a separate stack, you must calculate a kiln-specific THC limit using Equation 9:

$$Cks = \frac{(MACT\ Limit\ x\ (Qab+Qcm+Qks))-(Qab\ x\ Cab)-(Qcm\ x\ Ccm)}{Qks} \quad \text{(Eq. 9)}$$

Where:

Cks = Kiln stack concentration (ppmvd).

Qab = Alkali bypass flow rate (volume/hr).

Cab = Alkali bypass concentration (ppmvd).

Qcm = Coal mill flow rate (volume/hr).

Ccm = Coal mill concentration (ppmvd).

Qks = Kiln stack flow rate (volume/hr).

(iv) THC must be measured either upstream of the coal mill or the coal mill stack.

(v) Instead of conducting the performance test specified in paragraph (b)(4)of this section, you may conduct a performance test to determine emissions of total organic HAP by following the procedures in paragraph (b)(7) of this section.

(5) *Mercury Emissions Tests.* If you are subject to limitations on mercury emissions, you must operate a mercury CEMS or a sorbent trap monitoring system in accordance with the requirements of §63.1350(k). The initial compliance test must be based on the first 30 kiln operating days in which the affected source operates using a mercury CEMS or a sorbent trap monitoring system after the compliance date of the rule. See §63.1348(a).

(i) If you are using a mercury CEMS or a sorbent trap monitoring system, you must install, operate, calibrate, and maintain an instrument for continuously measuring and recording the exhaust gas flow rate to the atmosphere according to the requirements in §63.1350(k)(5).

(ii) Calculate the emission rate using Equation 10 of this section:

$$E_{30D} = k \frac{\sum_{i=1}^{n} C_i Q_i}{P} \quad \text{(Eq. 10)}$$

Where:

E_{30D} = 30-day rolling emission rate of mercury, lb/MM tons clinker.

C_i = Concentration of mercury for operating hour i, µg/scm.

Q_i = Volumetric flow rate of effluent gas for operating hour i, where C_i and Q_i are on the same basis (either wet or dry), scm/hr.

k = Conversion factor, 1 lb/454,000,000 µg.

n = Number of kiln operating hours in the previous 30 kiln operating day period where both C and Qi qualified data are available.

P = Total runs from the previous 30 days of clinker production during the same time period as the mercury emissions measured, million tons.

(6) *HCl emissions tests.* For a source subject to limitations on HCl emissions you must conduct performance testing by one of the following methods:

(i)(A) If the source is equipped with a wet scrubber, tray tower or dry scrubber, you must conduct performance testing using Method 321 of appendix A to this part unless you have installed a CEMS that meets the requirements

§63.1350(l)(1). For kilns with inline raw mills, testing should be conducted for the raw mill on and raw mill off conditions.

(B) You must establish site specific parameter limits by using the CPMS required in §63.1350(l)(1). For a wet scrubber or tray tower, measure and record the pressure drop across the scrubber and/or liquid flow rate and pH in intervals of no more than 15 minutes during the HCl test. Compute and record the 24-hour average pressure drop, pH, and average scrubber water flow rate for each sampling run in which the applicable emissions limit is met. For a dry scrubber, measure and record the sorbent injection rate in intervals of no more than 15 minutes during the HCl test. Compute and record the 24-hour average sorbent injection rate and average sorbent injection rate for each sampling run in which the applicable emissions limit is met.

(ii)(A) If the source is not controlled by a wet scrubber, tray tower or dry sorbent injection system, you must operate a CEMS in accordance with the requirements of §63.1350(l)(1). See §63.1348(a).

(B) The initial compliance test must be based on the 30 kiln operating days that occur after the compliance date of this rule in which the affected source operates using an HCl CEMS. Hourly HCl concentration data must be obtained according to §63.1350(l).

(iii) As an alternative to paragraph (b)(6)(i)(B) of this section, you may choose to monitor SO_2 emissions using a CEMS in accordance with the requirements of §63.1350(l)(3). You must establish an SO_2 operating limit equal to the average recorded during the HCl stack test where the HCl stack test run result demonstrates compliance with the emission limit. This operating limit will apply only for demonstrating HCl compliance.

(iv) If kiln gases are diverted through an alkali bypass or to a coal mill and exhausted through a separate stack, you must calculate a kiln-specific HCl limit using Equation 11:

$$Cks = \frac{(MACT\ Limit\ x\ (Qab+Qcm+Qks))-(Qab\ x\ Cab)-(Qcm\ x\ Ccm)}{Qks} \quad \text{(Eq. 11)}$$

Where:

Cks = Kiln stack concentration (ppmvd).

Qab = Alkali bypass flow rate (volume/hr).

Cab = Alkali bypass concentration (ppmvd).

Qcm = Coal mill flow rate (volume/hr).

Ccm = Coal mill concentration (ppmvd).

Qks = Kiln stack flow rate (volume/hr).

(7) *Total Organic HAP Emissions Tests.* Instead of conducting the performance test specified in paragraph (b)(4) of this section, you may conduct a performance test to determine emissions of total organic HAP by following the procedures in paragraphs (b)(7)(i) through (v) of this section.

(i) Use Method 320 of appendix A to this part, Method 18 of Appendix A of part 60, ASTM D6348-03 or a combination to determine emissions of total organic HAP. Each performance test must consist of three separate runs under the conditions that exist when the affected source is operating at the representative performance conditions in accordance with §63.7(e). Each run must be conducted for at least 1 hour.

(ii) At the same time that you are conducting the performance test for total organic HAP, you must also determine a site-specific THC emissions limit by operating a THC CEMS in accordance with the requirements of §63.1350(j). The duration of the performance test must be at least 3 hours and the average THC concentration (as calculated from the recorded output) during the 3-hour test must be calculated. You must establish your THC operating limit and determine compliance with it according to paragraphs (b)(7)(vii) and (viii) of this section. It is permissible to extend the

testing time of the organic HAP performance test if you believe extended testing is required to adequately capture organic HAP and/or THC variability over time.

(iii) If your source has an in-line kiln/raw mill you must use the fraction of time the raw mill is on and the fraction of time that the raw mill is off and calculate this limit as a weighted average of the THC levels measured during three raw mill on and three raw mill off tests.

(iv) If your organic HAP emissions are below 75 percent of the organic HAP standard and you determine your operating limit with paragraph (b)(7)(vii) of this section your THC CEMS must be calibrated and operated on a measurement scale no greater than 180 ppmvw, as carbon, or 60 ppmvw as propane.

(v) If your kiln has an inline coal mill and/or an alkali bypass with separate stacks, you are required to measure and account for oHAP emissions from their separate stacks. You are required to measure oHAP at the coal mill inlet or outlet and you must also measure oHAP at the alkali bypass outlet. You must then calculate a flow weighted average oHAP concentration for all emission sources including the inline coal mill and the alkali bypass.

(vi) Your THC CEMS measurement scale must be capable of reading THC concentrations from zero to a level equivalent to two times your highest THC emissions average determined during your performance test, including mill on or mill off operation. **Note:** This may require the use of a dual range instrument to meet this requirement and paragraph (b)(7)(iv) of this section.

(vii) Determine your operating limit as specified in paragraphs (b)(7)(viii) and (ix) of this section. If your organic HAP performance test demonstrates your average organic HAP emission levels are below 75 percent of your emission limit (9 ppmv) you will use the average THC value recorded during the organic HAP performance test, and the average total organic HAP result of your performance test to establish your operating limit. If your organic HAP compliance test results demonstrate that your average organic HAP emission levels are at or above 75 percent of your emission limit, your operating limit is established as the average THC value recorded during the organic HAP performance test. You must establish a new operating limit after each performance test. You must repeat the performance test no later than 30 months following your last performance test and reassess and adjust the site-specific operating limit in accordance with the results of the performance test.

(viii) If the average organic HAP results for your three Method 18 and/or Method 320 performance test runs are below 75 percent of your organic HAP emission limit, you must calculate an operating limit by establishing a relationship of THC CEMS signal to the organic HAP concentration using the average THC CEMS value corresponding to the three organic HAP compliance test runs and the average organic HAP total concentration from the Method 18 and/or Method 320 performance test runs with the procedures in (b)(7)(viii)(A) and (B) of this section.

(A) Determine the THC CEMS average values in ppmvw, and the average of your corresponding three total organic HAP compliance test runs, using Equation 12.

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} X_1 \,, \bar{y} = \frac{1}{n}\sum_{i=1}^{n} Y_1 \qquad \text{(Eq. 12)}$$

Where:

$\bar{x}$ = The THC CEMS average values in ppmvw.

X_i = The THC CEMS data points for all three runs i.

Y_i = The sum of organic HAP concentrations for test runs i. and

n = The number of data points.

(B) You must use your three run average THC CEMS value and your three run average organic HAP concentration from your three Method 18 and/or Method 320 compliance tests to determine the operating limit. Use equation 13 to determine your operating limit in units of ppmvw THC, as propane.

$$T_l = \left(\frac{Y_1}{X_1}\right) * X_1 \qquad \text{(Eq. 13)}$$

Where:

T_l = The 30-day operating limit for your THC CEMS, ppmvw.

Y_1 = The average organic HAP concentration from Eq. 12, ppmvd.

X_1 = The average THC CEMS concentration from Eq. 12, ppmvw.

(ix) If the average of your three organic HAP performance test runs is at or above 75 percent of your organic HAP emission limit, you must determine your operating limit using Equation 14 by averaging the THC CEMS output values corresponding to your three organic HAP performance test runs that demonstrate compliance with the emission limit. If your new THC CEMS value is below your current operating limit, you may opt to retain your current operating limit, but you must still submit all performance test and THC CEMS data according to the reporting requirements in paragraph (d)(1) of this section.

$$T_h = \frac{1}{n}\sum_{i=1}^{n} X_1 . \qquad \text{(Eq. 14)}$$

Where:

X_1 = The THC CEMS data points for all runs i.

n = The number of data points.

T_h = Your site specific operating limit, in ppmvw THC.

(x) If your kiln has an inline kiln/raw mill, you must conduct separate performance tests while the raw mill is operating (“mill on”) and while the raw mill is not operating (“mill off”). Using the fraction of time the raw mill is on and the fraction of time that the raw mill is off, calculate this limit as a weighted average of the THC levels measured during raw mill on and raw mill off compliance testing with Equation 15.

$$R=(y*t)+(x*(1-t)) \qquad \text{(Eq.15)}$$

Where:

R = Operating limit as THC, ppmvw.

y = Average THC CEMS value during mill on operations, ppmvw.

t = Percentage of operating time with mill on.

x = Average THC CEMS value during mill off operations, ppmvw.

(1-t) = Percentage of operating time with mill off.

(xi) To determine continuous compliance with the THC operating limit, you must record the THC CEMS output data for all periods when the process is operating and the THC CEMS is not out-of-control. You must demonstrate continuous compliance by using all quality-assured hourly average data collected by the THC CEMS for all operating hours to calculate the arithmetic average operating parameter in units of the operating limit (ppmvw) on a 30 operating day rolling average basis, updated at the end of each new kiln operating day. Use Equation 16 to determine the 30 kiln operating day average.

$$30\text{kiln operating day} = \frac{\sum_{i=1}^{n} Hpv_i}{n} \qquad \text{(Eq. 16)}$$

Where:

Hpvi = The hourly parameter value for hour i, ppmvw.

n = The number of valid hourly parameter values collected over 30 kiln operating days.

(xii) Use EPA Method 18 or Method 320 of appendix A to part 60 of this chapter to determine organic HAP emissions. For each performance test, conduct at least three separate runs under the conditions that exist when the affected source is operating at the level reasonably expected to occur. If your source has an in-line kiln/raw mill you must conduct three separate test runs with the raw mill on, and three separate runs under the conditions that exist when the affected source is operating at the level reasonably expected to occur with the mill off. Conduct each Method 18 test run to collect a minimum target sample equivalent to three times the method detection limit. Calculate the average of the results from three runs to determine compliance.

(xiii) If the THC level exceeds by 10 percent or more your site-specific THC emissions limit, you must

(A) As soon as possible but no later than 30 days after the exceedance, conduct an inspection and take corrective action to return the THC CEMS measurements to within the established value; and

(B) Within 90 days of the exceedance or at the time of the 30 month compliance test, whichever comes first, conduct another performance test to determine compliance with the organic HAP limit and to verify or re-establish your site-specific THC emissions limit.

(8) HCl Emissions Tests with SO_2 Monitoring. If you choose to monitor SO_2 emissions using a CEMS to demonstrate HCl compliance, follow the procedures in (b)(8)(i) through (ix) of this section and in accordance with the requirements of §63.1350(l)(3). You must establish an SO_2 operating limit equal to the average recorded during the HCl stack test. This operating limit will apply only for demonstrating HCl compliance.

(i) Use Method 321 of appendix A to this part to determine emissions of HCl. Each performance test must consist of three separate runs under the conditions that exist when the affected source is operating at the representative performance conditions in accordance with §63.7(e). Each run must be conducted for at least one hour.

(ii) At the same time that you are conducting the performance test for HCl, you must also determine a site-specific SO_2 emissions limit by operating an SO_2 CEMS in accordance with the requirements of §63.1350(l). The duration of the performance test must be three hours and the average SO_2 concentration (as calculated from the average output) during the 3-hour test must be calculated. You must establish your SO_2 operating limit and determine compliance with it according to paragraphs (b)(8)(vii) and (viii) of this section.

(iii) If your source has an in-line kiln/raw mill you must use the fraction of time the raw mill is on and the fraction of time that the raw mill is off and calculate this limit as a weighted average of the SO_2 levels measured during raw mill on and raw mill off testing.

(iv) Your SO_2 CEMS must be calibrated and operated according to the requirements of §60.63(f).

(v) Your SO_2 CEMS measurement scale must be capable of reading SO_2 concentrations consistent with the requirements of §60.63(f), including mill on or mill off operation.

(vi) If your kiln has an inline kiln/raw mill, you must conduct separate performance tests while the raw mill is operating (“mill on”) and while the raw mill is not operating (“mill off”). Using the fraction of time the raw mill is on and the fraction of time that the raw mill is off, calculate this limit as a weighted average of the HCl levels measured during raw mill on and raw mill off compliance testing with Equation 17.

$$R=(y*t)+x*(L-1) \qquad \text{(Eq. 17)}$$

Where:

R = Operating limit as SO_2, ppmvw.

y = Average SO_2 CEMS value during mill on operations, ppmvw.

t = Percentage of operating time with mill on, expressed as a decimal.

x = Average SO_2 CEMS value during mill off operations, ppmvw.

t−1 = Percentage of operating time with mill off, expressed as a decimal.

(vii) If the average of your three HCl compliance test runs is below 75 percent of your HCl emission limit, you may as a compliance alternative, calculate an operating limit by establishing a relationship of SO_2 CEMS signal to your HCl concentration corrected to 7 percent O_2 by using the SO_2 CEMS instrument zero, the average SO_2 CEMS values corresponding to the three compliance test runs, and the average HCl concentration from the HCl compliance test with the procedures in (b)(8)(vii)(A) through (D) of this section.

(A) Determine your SO_2 CEMS instrument zero output with one of the following procedures:

(*1*) Zero point data for in-situ instruments should be obtained by removing the instrument from the stack and monitoring ambient air on a test bench.

(*2*) Zero point data for extractive instruments may be obtained by removing the extractive probe from the stack and drawing in clean ambient air.

(*3*) The zero point may also be established by performing probe-flood introduction of high purity nitrogen or certified zero air free of SO_2.

(*4*) If none of the steps in paragraphs (b)(8)(vii)(A)(*1*) through (*3*) of this section are possible, you must use a zero output value provided by the manufacturer.

(B) Determine your SO_2 CEMS instrument average ppm, and the average of your corresponding three HCl compliance test runs, using equation 18.

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} X_1 \,, \bar{y} = \frac{1}{n}\sum_{i=1}^{n} Y_1 \qquad \text{(Eq. 18)}$$

Where:

X_1 = The SO_2 CEMS data points for the three runs constituting the performance test.

Y_1 = The HCl emission concentration expressed as ppmv corrected to 7 percent O_2 for the three runs constituting the performance test.

n = The number of data points.

(C) With your instrument zero expressed in ppmv, your three run average SO_2 CEMS expressed in ppmv, and your three run HCl compliance test average in ppm corrected to 7 percent O_2, determine a relationship of ppm HCl corrected to 7 percent O_2 per ppm SO_2 with Equation 19.

$$R = \frac{Y_1}{(X_1 - z)} \qquad \text{(Eq. 19)}$$

Where:

R = The relative HCl ppmv corrected to 7 percent O_2 per ppm SO_2 for your SO_2 CEMS.

Y_1 = The three run average HCl concentration corrected to 7 percent O_2.

X_1 = The three run average ppm recorded by your SO_2 CEMS.

z = The instrument zero output ppm value.

(D) Determine your source specific 30-day rolling average operating limit using ppm HCl corrected to 7 percent O_2 per ppm SO_2 value from Equation 19 in Equation 20, below. This sets your operating limit at the SO_2 CEMS ppm value corresponding to 75 percent of your emission limit.

$$O_1 = z + \frac{0.75(L)}{R} \qquad \text{(Eq. 20)}$$

Where:

O_l = The operating limit for your SO_2 CEMS on a 30-day rolling average, in ppmv.

L = Your source HCl emission limit expressed in ppmv corrected to 7 percent O_2.

z = Your instrument zero in ppmv, determined from (1)(i).

R = The relative oxygen corrected ppmv HCl per ppmv SO_2, for your SO_2 CEMS, from Equation 19.

(viii) To determine continuous compliance with the SO_2 operating limit, you must record the SO_2 CEMS output data for all periods when the process is operating and the SO_2 CEMS is not out-of-control. You must demonstrate continuous compliance by using all quality-assured hourly average data collected by the SO_2 CEMS for all operating hours to calculate the arithmetic average operating parameter in units of the operating limit (ppmvw) on a 30 operating day rolling average basis, updated at the end of each new kiln operating day. Use Equation 21 to determine the 30 kiln operating day average.

$$30 kiln\ operating\ day = \frac{\sum_{i=1}^{n} Hpvi}{n} \qquad \text{(Eq. 21)}$$

Where:

Hpvi = The hourly parameter value for hour i, ppmvw.

n = The number of valid hourly parameter values collected over 30 kiln operating days.

(ix) Use EPA Method 321 of appendix A to part 60 of this chapter to determine HCl emissions. For each performance test, conduct at least three separate runs under the conditions that exist when the affected source is operating at the level reasonably expected to occur. If your source has an in-line kiln/raw mill you must conduct three separate test runs with the raw mill on, and three separate runs under the conditions that exist when the affected source is operating at the level reasonably expected to occur with the mill off.

(x) If the SO_2 level exceeds by 10 percent or more your site-specific SO_2 emissions limit, you must:

(A) As soon as possible but no later than 30 days after the exceedance, conduct an inspection and take corrective action to return the SO_2 CEMS measurements to within the established value;

(B) Within 90 days of the exceedance or at the time of the periodic compliance test, whichever comes first, conduct another performance test to determine compliance with the HCl limit and to verify or re-establish your site-specific SO_2 emissions limit.

(c) *Performance test frequency.* Except as provided in §63.1348(b), performance tests are required at regular intervals for affected sources that are subject to a dioxin, organic HAP or HCl emissions limit. Performance tests required every 30 months must be completed no more than 31 calendar months after the previous performance test except where that specific pollutant is monitored using CEMS; performance tests required every 12 months must be completed no more than 13 calendar months after the previous performance test.

(d) *Performance Test Reporting Requirements.* (1) You must submit the information specified in paragraphs (d)(1) and (2) of this section no later than 60 days following the initial performance test. All reports must be signed by a responsible official.

(i) The initial performance test data as recorded under paragraph (b) of this section.

(ii) The values for the site-specific operating limits or parameters established pursuant to paragraphs (b)(1), (3), (6), (7), and (8) of this section, as applicable, and a description, including sample calculations, of how the operating parameters were established during the initial performance test.

(2) As of December 31, 2011 and within 60 days after the date of completing each performance evaluation or test, as defined in §63.2, conducted to demonstrate compliance with any standard covered by this subpart, you must submit the relative accuracy test audit data and performance test data, except opacity data, to the EPA by successfully submitting the data electronically to the EPA's Central Data Exchange (CDX) by using the Electronic Reporting Tool(ERT) (see *http://www.epa.gov/ttn/chief/ert/ert_tool.html/*).

(e) *Conditions of performance tests.* Conduct performance tests under such conditions as the Administrator specifies to the owner or operator based on representative performance of the affected source for the period being tested. Upon request, you must make available to the Administrator such records as may be necessary to determine the conditions of performance tests.

[75 FR 55057, Sept. 9, 2010, as amended at 78 FR 10040, Feb. 12, 2013; 80 FR 44781, July 27, 2015; 80 FR 54729, Sept. 11, 2015]

§63.1350 Monitoring requirements.

(a)(1) Following the compliance date, the owner or operator must demonstrate compliance with this subpart on a continuous basis by meeting the requirements of this section.

(2) [Reserved]

(3) For each existing unit that is equipped with a CMS, maintain the average emissions or the operating parameter values within the operating parameter limits established through performance tests.

(4) Any instance where the owner or operator fails to comply with the continuous monitoring requirements of this section is a violation.

(b) *PM monitoring requirements.* (1)(i) *PM CPMS.* You will use a PM CPMS to establish a site-specific operating limit corresponding to the results of the performance test demonstrating compliance with the PM limit. You will conduct your performance test using Method 5 or Method 5I at appendix A-3 to part 60 of this chapter. You will use the PM CPMS to demonstrate continuous compliance with this operating limit. You must repeat the performance test annually and reassess and adjust the site-specific operating limit in accordance with the results of the performance test using the procedures in §63.1349(b)(1) (i) through (vi) of this subpart. You must also repeat the test if you change the analytical range of the instrument, or if you replace the instrument itself or any principle analytical component of the instrument that would alter the relationship of output signal to in-stack PM concentration.

(ii) To determine continuous compliance, you must use the PM CPMS output data for all periods when the process is operating and the PM CPMS is not out-of-control. You must demonstrate continuous compliance by using all quality-assured hourly average data collected by the PM CPMS for all operating hours to calculate the arithmetic average operating parameter in units of the operating limit (milliamps) on a 30 operating day rolling average basis, updated at the end of each new kiln operating day.

(iii) For any exceedance of the 30 process operating day PM CPMS average value from the established operating parameter limit, you must:

(A) Within 48 hours of the exceedance, visually inspect the APCD;

(B) If inspection of the APCD identifies the cause of the exceedance, take corrective action as soon as possible and return the PM CPMS measurement to within the established value; and

(C) Within 30 days of the exceedance or at the time of the annual compliance test, whichever comes first, conduct a PM emissions compliance test to determine compliance with the PM emissions limit and to verify or re-establish the PM CPMS operating limit within 45 days. You are not required to conduct additional testing for any exceedances that occur between the time of the original exceedance and the PM emissions compliance test required under this paragraph.

(iv) PM CPMS exceedances leading to more than four required performance tests in a 12-month process operating period (rolling monthly) constitute a presumptive violation of this subpart.

(2) [Reserved]

(c) [Reserved]

(d) *Clinker production monitoring requirements.* In order to determine clinker production, you must:

(1) Determine hourly clinker production by one of two methods:

(i) Install, calibrate, maintain, and operate a permanent weigh scale system to measure and record weight rates in tons-mass per hour of the amount of clinker produced. The system of measuring hourly clinker production must be maintained within ±5 percent accuracy, or

(ii) Install, calibrate, maintain, and operate a permanent weigh scale system to measure and record weight rates in tons-mass per hour of the amount of feed to the kiln. The system of measuring feed must be maintained within ±5 percent accuracy. Calculate your hourly clinker production rate using a kiln-specific feed to clinker ratio based on reconciled clinker production determined for accounting purposes and recorded feed rates. Update this ratio monthly. Note that if this ratio changes at clinker reconciliation, you must use the new ratio going forward, but you do not have to retroactively change clinker production rates previously estimated.

(iii) [Reserved]

(2) Determine, record, and maintain a record of the accuracy of the system of measuring hourly clinker production (or feed mass flow if applicable) before initial use (for new sources) or by the effective compliance date of this rule (for existing sources). During each quarter of source operation, you must determine, record, and maintain a record of the ongoing accuracy of the system of measuring hourly clinker production (or feed mass flow).

(3) If you measure clinker production directly, record the daily clinker production rates; if you measure the kiln feed rates and calculate clinker production, record the hourly kiln feed and clinker production rates.

(4) Develop an emissions monitoring plan in accordance with paragraphs (p)(1) through (p)(4) of this section.

(e) [Reserved]

(f) *Opacity monitoring requirements.* If you are subject to a limitation on opacity under §63.1345, you must conduct required opacity monitoring in accordance with the provisions of paragraphs (f)(1)(i) through (vii) of this section and in accordance with your monitoring plan developed under §63.1350(p). You must also develop an opacity monitoring plan in accordance with paragraphs (p)(1) through (4) and paragraph (o)(5), if applicable, of this section.

(1)(i) You must conduct a monthly 10-minute visible emissions test of each affected source in accordance with Method 22 of appendix A-7 to part 60 of this chapter. The performance test must be conducted while the affected source is in operation.

(ii) If no visible emissions are observed in six consecutive monthly tests for any affected source, the owner or operator may decrease the frequency of performance testing from monthly to semi-annually for that affected source. If visible emissions are observed during any semi-annual test, you must resume performance testing of that affected source on a monthly basis and maintain that schedule until no visible emissions are observed in six consecutive monthly tests.

(iii) If no visible emissions are observed during the semi-annual test for any affected source, you may decrease the frequency of performance testing from semi-annually to annually for that affected source. If visible emissions are observed during any annual performance test, the owner or operator must resume performance testing of that affected source on a monthly basis and maintain that schedule until no visible emissions are observed in six consecutive monthly tests.

(iv) If visible emissions are observed during any Method 22 performance test, of appendix A-7 to part 60 of this chapter, you must conduct 30 minutes of opacity observations, recorded at 15-second intervals, in accordance with Method 9 of appendix A-4 to part 60 of this chapter. The Method 9 performance test, of appendix A-4 to part 60 of this chapter, must begin within 1 hour of any observation of visible emissions.

(v) Any totally enclosed conveying system transfer point, regardless of the location of the transfer point is not required to conduct Method 22 visible emissions monitoring under this paragraph. The enclosures for these transfer points must be operated and maintained as total enclosures on a continuing basis in accordance with the facility operations and maintenance plan.

(vi) If any partially enclosed or unenclosed conveying system transfer point is located in a building, you must conduct a Method 22 performance test, of appendix A-7 to part 60 of this chapter, according to the requirements of paragraphs (f)(1)(i) through (iv) of this section for each such conveying system transfer point located within the building, or for the building itself, according to paragraph (f)(1)(vii) of this section.

(vii) If visible emissions from a building are monitored, the requirements of paragraphs (f)(1)(i) through (f)(1)(iv) of this section apply to the monitoring of the building, and you must also test visible emissions from each side, roof, and vent of the building for at least 10 minutes.

(2)(i) For a raw mill or finish mill, you must monitor opacity by conducting daily visible emissions observations of the mill sweep and air separator PM control devices (PMCD) of these affected sources in accordance with the procedures of Method 22 of appendix A-7 to part 60 of this chapter. The duration of the Method 22 performance test must be 6 minutes.

(ii) Within 24 hours of the end of the Method 22 performance test in which visible emissions were observed, the owner or operator must conduct a follow up Method 22 performance test of each stack from which visible emissions were observed during the previous Method 22 performance test.

(iii) If visible emissions are observed during the follow-up Method 22 performance test required by paragraph (f)(2)(ii) of this section from any stack from which visible emissions were observed during the previous Method 22 performance test required by paragraph (f)(2)(i) of the section, you must then conduct an opacity test of each stack from which emissions were observed during the follow up Method 22 performance test in accordance with Method 9 of appendix A-4 to part 60 of this chapter. The duration of the Method 9 test must be 30 minutes.

(3) If visible emissions are observed during any Method 22 visible emissions test conducted under paragraphs (f)(1) or (2) of this section, you must initiate, within one-hour, the corrective actions specified in your operation and maintenance plan as required in §63.1347.

(4) The requirements under paragraph (f)(2) of this section to conduct daily Method 22 testing do not apply to any specific raw mill or finish mill equipped with a COMS or BLDS.

(i) If the owner or operator chooses to install a COMS in lieu of conducting the daily visible emissions testing required under paragraph (f)(2) of this section, then the COMS must be installed at the outlet of the PM control device of the raw mill or finish mill and the COMS must be installed, maintained, calibrated, and operated as required by the general provisions in subpart A of this part and according to PS-1 of appendix B to part 60 of this chapter.

(ii) If you choose to install a BLDS in lieu of conducting the daily visible emissions testing required under paragraph (f)(2) of this section, the requirements in paragraphs (m)(1) through (m)(4), (m)(10) and (m)(11) of this section apply.

(g) *D/F monitoring requirements.* If you are subject to an emissions limitation on D/F emissions, you must comply with the monitoring requirements of paragraphs (g)(1) through (g)(6) and paragraphs (m)(1) through (m)(4) of this section to demonstrate continuous compliance with the D/F emissions standard. You must also develop an emissions monitoring plan in accordance with paragraphs (p)(1) through (p)(4) of this section.

(1) You must install, calibrate, maintain, and continuously operate a CMS to record the temperature of the exhaust gases from the kiln and alkali bypass, if applicable, at the inlet to, or upstream of, the kiln and/or alkali bypass PMCDs.

(i) The temperature recorder response range must include zero and 1.5 times the average temperature established according to the requirements in §63.1349(b)(3)(iv).

(ii) The calibration reference for the temperature measurement must be a National Institute of Standards and Technology calibrated reference thermocouple-potentiometer system or alternate reference, subject to approval by the Administrator.

(iii) The calibration of all thermocouples and other temperature sensors must be verified at least once every three months.

(2) You must monitor and continuously record the temperature of the exhaust gases from the kiln and alkali bypass, if applicable, at the inlet to the kiln and/or alkali bypass PMCD.

(3) The required minimum data collection frequency must be one minute.

(4) Calculate the rolling three-hour average temperature using the average of 180 successive one-minute average temperatures. See §63.1349(b)(3).

(5) When the operating status of the raw mill of the in-line kiln/raw mill is changed from off to on or from on to off, the calculation of the three-hour rolling average temperature must begin anew, without considering previous recordings.

(h) *Monitoring requirements for sources using sorbent injection.* If you are subject to an operating limit on D/F emissions that employs carbon injection as an emission control technique, you must comply with the additional monitoring requirements of paragraphs (h)(1) and (h)(2) and paragraphs (m)(1) through (m)(4) and (m)(9) of this section. You must also develop an emissions monitoring plan in accordance with paragraphs (p)(1) through (p)(4) of this section.

(1) Install, operate, calibrate, and maintain a continuous monitor to record the rate of activated carbon injection. The accuracy of the rate measurement device must be ±1 percent of the rate being measured.

(i) Verify the calibration of the device at least once every three months.

(ii) Each hour, calculate the three-hour rolling average activated carbon injection rate for the previous three hours of process operation. See §63.1349(b)(3).

(iii) When the operating status of the raw mill of the in-line kiln/raw mill is changed from off to on or from on to off, the calculation of the three-hour rolling average activated carbon injection rate must begin anew, without considering previous recordings.

(2)(i) Install, operate, calibrate, and maintain a continuous monitor to record the activated carbon injection system carrier gas parameter (either the carrier gas flow rate or the carrier gas pressure drop) established during the D/F performance test in accordance with §63.1349(b)(3).

(ii) Each hour, calculate the three-hour rolling average of the selected parameter value for the previous 3 hours of process operation using all of the one-minute data available (*i.e.,* the CMS is not out-of-control.)

(i) *THC Monitoring Requirements.* If you are subject to an emissions limitation on THC emissions, you must comply with the monitoring requirements of paragraphs (i)(1) and (i)(2) and (m)(1) through (m)(4) of this section. You must also develop an emissions monitoring plan in accordance with paragraphs (p)(1) through (p)(4) of this section.

(1) You must install, operate, and maintain a THC continuous emission monitoring system in accordance with Performance Specification 8 or Performance Specification 8A of appendix B to part 60 of this chapter and comply with all of the requirements for continuous monitoring systems found in the general provisions, subpart A of this part. The owner or operator must operate and maintain each CEMS according to the quality assurance requirements in Procedure 1 of appendix F in part 60 of this chapter. For THC continuous emission monitoring systems certified under Performance Specification 8A, conduct the relative accuracy test audits required under Procedure 1 in accordance with Performance Specification 8, Sections 8 and 11 using Method 25A in appendix A to 40 CFR part 60 as the reference method; the relative accuracy must meet the criteria of Performance Specification 8, Section 13.2.

(2) Performance tests on alkali bypass and coal mill stacks must be conducted using Method 25A in appendix A to 40 CFR part 60 and repeated every 30 months.

(j) *Total organic HAP monitoring requirements.* If you are complying with the total organic HAP emissions limits, you must continuously monitor THC according to paragraph (i)(1) and (2) of this section or in accordance with Performance Specification 8 or Performance Specification 8A of appendix B to part 60 of this chapter and comply with all of the requirements for continuous monitoring systems found in the general provisions, subpart A of this part. You must operate and maintain each CEMS according to the quality assurance requirements in Procedure 1 of appendix F in part 60 of this chapter. In addition, your must follow the monitoring requirements in paragraphs (m)(1) through (4) of this section. You must also develop an emissions monitoring plan in accordance with paragraphs (p)(1) through (4) of this section.

(k) *Mercury monitoring requirements.* If you have a kiln subject to an emissions limitation on mercury emissions, you must install and operate a mercury continuous emissions monitoring system (Hg CEMS) in accordance with Performance Specification 12A (PS 12A) of appendix B to part 60 of this chapter or an integrated sorbent trap monitoring system in accordance with Performance Specification 12B (PS 12B) of appendix B to part 60 of this chapter. You must monitor mercury continuously according to paragraphs (k)(1) through (5) of this section. You must also develop an emissions monitoring plan in accordance with paragraphs (p)(1) through (4) of this section.

(1) You must use a span value for any Hg CEMS that represents the mercury concentration corresponding to approximately two times the emissions standard and may be rounded up to the nearest multiple of 5 $\mu g/m^3$ of total mercury or higher level if necessary to include Hg concentrations which may occur (excluding concentrations during in-line raw “mill off” operation). As specified in PS 12A, Section 6.1.1, the data recorder output range must include the full range of expected Hg concentration values which would include those expected during “mill off” conditions. Engineering judgments made and calculations used to determine the corresponding span concentration from the emission standard shall be documented in the site-specific monitoring plan and associated records.

(2) In order to quality assure data measured above the span value, you must use one of the three options in paragraphs (k)(2)(i) through (iii) of this section. Where the options in paragraphs (k)(2)(i) through (iii) are employed while the kiln is operating in a mill-off mode, the “above span” described in paragraph (k)(2)(iii) may substitute for the daily upscale calibration provided the data normalization process in paragraph (k)(2)(iii) are not required. If data normalization is required, the normal daily upscale calibration check must be performed to quality assure the operation of the CEMS for that day. In this particular case, adjustments to CEMS normally required by Procedure 5 when a daily upscale does not meet the 5 percent criterion are not required, unless paragraph (k)(2)(iii) of this section

data normalization is necessary and a subsequent normal daily calibration check demonstrates the need for such adjustment.

(i) Include a second span that encompasses the Hg emission concentrations expected to be encountered during “mill off” conditions. This second span may be rounded to a multiple of 5 µg/m^3 of total mercury. The requirements of PS 12A, shall be followed for this second span with the exception that a RATA with the mill off is not required.

(ii) Quality assure any data above the span value by proving instrument linearity beyond the span value established in paragraph (k)(1) of this section using the following procedure. Conduct a weekly “above span linearity” calibration challenge of the monitoring system using a reference gas with a certified value greater than your highest expected hourly concentration or greater than 75 percent of the highest measured hourly concentration. The “above span” reference gas must meet the requirements of PS 12A, Section 7.1 and must be introduced to the measurement system at the probe. Record and report the results of this procedure as you would for a daily calibration. The “above span linearity” challenge is successful if the value measured by the Hg CEMS falls within 10 percent of the certified value of the reference gas. If the value measured by the Hg CEMS during the above span linearity challenge exceeds ±10 percent of the certified value of the reference gas, the monitoring system must be evaluated and repaired and a new “above span linearity” challenge met before returning the Hg CEMS to service, or data above span from the Hg CEMS must be subject to the quality assurance procedures established in paragraph (k)(2)(iii) of this section. In this manner all hourly average values exceeding the span value measured by the Hg CEMS during the week following the above span linearity challenge when the CEMS response exceeds ±20 percent of the certified value of the reference gas must be normalized using Equation 22.

(iii) Quality assure any data above the span value established in paragraph (k)(1) of this section using the following procedure. Any time two consecutive one-hour average measured concentrations of Hg exceeds the span value you must, within 24 hours before or after, introduce a higher, “above span” Hg reference gas standard to the Hg CEMS. The “above span” reference gas must meet the requirements of PS 12A, Section 7.1, must target a concentration level between 50 and 150 percent of the highest expected hourly concentration measured during the period of measurements above span, and must be introduced at the probe. While this target represents a desired concentration range that is not always achievable in practice, it is expected that the intent to meet this range is demonstrated by the value of the reference gas. Expected values may include “above span” calibrations done before or after the above span measurement period. Record and report the results of this procedure as you would for a daily calibration. The “above span” calibration is successful if the value measured by the Hg CEMS is within 20 percent of the certified value of the reference gas. If the value measured by the Hg CEMS exceeds 20 percent of the certified value of the reference gas, then you must normalize the one-hour average stack gas values measured above the span during the 24-hour period preceding or following the “above span” calibration for reporting based on the Hg CEMS response to the reference gas as shown in equation 22 below. Only one “above span” calibration is needed per 24 hour period.

$$\frac{\textit{Certified reference gas value}}{\textit{Measured value of reference gas}} \; x \; \textit{Measured stack gas result}$$

$$= \textit{Normalized stack gas result} \qquad (Eq.\,22)$$

(3) You must operate and maintain each Hg CEMS or an integrated sorbent trap monitoring system according to the quality assurance requirements in Procedure 5 of appendix F to part 60 of this chapter. During the RATA of integrated sorbent trap monitoring systems required under Procedure 5, you may apply the appropriate exception for sorbent trap section 2 breakthrough in (k)(3)(i) through (iv) of this section:

(i) For stack Hg concentrations >1 µg/dscm, ≤10% of section 1 mass;

(ii) For stack Hg concentrations ≤1 µg/dscm and >0.5 µg/dscm, ≤20% of section 1 mass;

(iii) For stack Hg concentrations ≤0.5 µg/dscm and >0.1 µg/dscm, ≤50% of section 1 mass; and

(iv) For stack Hg concentrations ≤0.1 µg/dscm, no breakthrough criterion assuming all other QA/QC specifications are met.

(4) Relative accuracy testing of mercury monitoring systems under PS 12A, PS 12B, or Procedure 5 must be conducted at normal operating conditions. If a facility has an inline raw mill, the testing must occur with the raw mill on.

(5) If you use a Hg CEMS or an integrated sorbent trap monitoring system, you must install, operate, calibrate, and maintain an instrument for continuously measuring and recording the exhaust gas flow rate to the atmosphere according to the requirements in paragraphs (n)(1) through (10) of this section. If kiln gases are diverted through an alkali bypass or to a coal mill and exhausted through separate stacks, you must account for the mercury emitted from those stacks by following the procedures in (k)(5)(i) through (iv) of this section:

(i) Develop a mercury hourly mass emissions rate by conducting performance tests annually, within 11 to 13 calendar months after the previous performance test, using Method 29, or Method 30B, to measure the concentration of mercury in the gases exhausted from the alkali bypass and coal mill.

(ii) On a continuous basis, determine the mass emissions of mercury in lb/hr from the alkali bypass and coal mill exhausts by using the mercury hourly emissions rate, the exhaust gas flow rate and hourly mercury emission rate to calculate hourly mercury emissions in lb/hr.

(iii) Sum the hourly mercury emissions from the kiln, alkali bypass and coal mill to determine total mercury emissions. Using hourly clinker production, calculate the hourly emissions rate in pounds per ton of clinker to determine your 30 day rolling average.

(iv) If mercury emissions from the coal mill and alkali bypass are below the method detection limit for two consecutive annual performance tests, you may reduce the frequency of the performance tests of coal mills and alkali bypasses to once every 30 months. If the measured mercury concentration exceeds the method detection limit, you must revert to testing annually until two consecutive annual tests are below the method detection limit.

(6) If you operate an integrated sorbent trap monitoring system conforming to PS 12B, you may use a monitoring period at least 24 hours but no longer than 168 hours in length. You should use a monitoring period that is a multiple of 24 hours (except during relative accuracy testing as allowed in PS 12B).

(l) *HCl Monitoring Requirements.* If you are subject to an emissions limitation on HCl emissions in §63.1343, you must monitor HCl emissions continuously according to paragraph (l)(1) or (2) and paragraphs (m)(1) through (4) of this section or, if your kiln is controlled using a wet or dry scrubber or tray tower, you alternatively may parametrically monitor SO_2 emissions continuously according to paragraph (l)(3) of this section. You must also develop an emissions monitoring plan in accordance with paragraphs (p)(1) through (4) of this section.

(1) If you monitor compliance with the HCl emissions limit by operating an HCl CEMS, you must do so in accordance with Performance Specification 15 (PS 15) of appendix B to part 60 of this chapter, or, upon promulgation, in accordance with any other performance specification for HCl CEMS in appendix B to part 60 of this chapter. You must operate, maintain, and quality assure a HCl CEMS installed and certified under PS 15 according to the quality assurance requirements in Procedure 1 of appendix F to part 60 of this chapter except that the Relative Accuracy Test Audit requirements of Procedure 1 must be replaced with the validation requirements and criteria of sections 11.1.1 and 12.0 of PS 15. When promulgated, if you choose to install and operate an HCl CEMS in accordance with PS 18 of appendix B to part 60 of this chapter, you must operate, maintain and quality assure the HCl CEMS using the associated Procedure 6 of appendix F to part 60 of this chapter. For any performance specification that you use, you must use Method 321 of appendix A to part 63 of this chapter as the reference test method for conducting relative accuracy testing. The span value and calibration requirements in paragraphs (l)(1)(i) and (ii) of this section apply to HCl CEMS other than those installed and certified under PS 15.

(i) You must use a measurement span value for any HCl CEMS of 0-10 ppmvw unless the monitor is installed on a kiln without an inline raw mill. Kilns without an inline raw mill may use a higher span value sufficient to quantify all expected emissions concentrations. The HCl CEMS data recorder output range must include the full range of expected HCl concentration values which would include those expected during “mill off” conditions. The corresponding data recorder range shall be documented in the site-specific monitoring plan and associated records.

(ii) In order to quality assure data measured above the span value, you must use one of the three options in paragraphs (l)(1)(ii)(A) through (C) of this section.

(A) Include a second span that encompasses the HCl emission concentrations expected to be encountered during "mill off" conditions. This second span may be rounded to a multiple of 5 ppm of total HCl. The requirements of the appropriate HCl monitor performance specification shall be followed for this second span with the exception that a RATA with the mill off is not required.

(B) Quality assure any data above the span value by proving instrument linearity beyond the span value established in paragraph (l)(1)(i) of this section using the following procedure. Conduct a weekly "above span linearity" calibration challenge of the monitoring system using a reference gas with a certified value greater than your highest expected hourly concentration or greater than 75 percent of the highest measured hourly concentration. The "above span" reference gas must meet the requirements of the applicable performance specification and must be introduced to the measurement system at the probe. Record and report the results of this procedure as you would for a daily calibration. The "above span linearity" challenge is successful if the value measured by the HCl CEMS falls within 10 percent of the certified value of the reference gas. If the value measured by the HCl CEMS during the above span linearity challenge exceeds 10 percent of the certified value of the reference gas, the monitoring system must be evaluated and repaired and a new "above span linearity" challenge met before returning the HCl CEMS to service, or data above span from the HCl CEMS must be subject to the quality assurance procedures established in paragraph (l)(1)(ii)(D) of this section. Any HCl CEMS above span linearity challenge response exceeding ±20 percent of the certified value of the reference gas requires that all above span hourly averages during the week following the above span linearity challenge must be normalized using Equation 23.

(C) Quality assure any data above the span value established in paragraph (l)(1)(i) of this section using the following procedure. Any time two consecutive one-hour average measured concentration of HCl exceeds the span value you must, within 24 hours before or after, introduce a higher, "above span" HCl reference gas standard to the HCl CEMS. The "above span" reference gas must meet the requirements of the applicable performance specification and target a concentration level between 50 and 150 percent of the highest expected hourly concentration measured during the period of measurements above span, and must be introduced at the probe. While this target represents a desired concentration range that is not always achievable in practice, it is expected that the intent to meet this range is demonstrated by the value of the reference gas. Expected values may include above span calibrations done before or after the above-span measurement period. Record and report the results of this procedure as you would for a daily calibration. The "above span" calibration is successful if the value measured by the HCl CEMS is within 20 percent of the certified value of the reference gas. If the value measured by the HCl CEMS is not within 20 percent of the certified value of the reference gas, then you must normalize the stack gas values measured above span as described in paragraph (l)(1)(ii)(D) of this section.

(D) In the event that the "above span" calibration is not successful (*i.e.,* the HCl CEMS measured value is not within 20 percent of the certified value of the reference gas), then you must normalize the one-hour average stack gas values measured above the span during the 24-hour period preceding or following the `above span' calibration for reporting based on the HCl CEMS response to the reference gas as shown in Equation 23:

$$\frac{\textbf{Certified reference gas value}}{\textbf{Measured value of reference gas}} x\ \textbf{Measured stack gas result}$$

$$= \textbf{Normalized stack gas result} \qquad (Eq.\ 23)$$

Only one "above span" calibration is needed per 24-hour period.

(2) Install, operate, and maintain a CMS to monitor wet scrubber or tray tower parameters, as specified in paragraphs (m)(5) and (7) of this section, and dry scrubber, as specified in paragraph (m)(9) of this section.

(3) If the source is equipped with a wet or dry scrubber or tray tower, and you choose to monitor SO_2 emissions, monitor SO_2 emissions continuously according to the requirements of §60.63(e) and (f) of part 60 subpart F of this chapter. If SO_2 levels increase above the 30-day rolling average SO_2 operating limit established during your performance test, you must:

(i) As soon as possible but no later than 48 hours after you exceed the established SO_2 value conduct an inspection and take corrective action to return the SO_2 emissions to within the operating limit; and

(ii) Within 60 days of the exceedance or at the time of the next compliance test, whichever comes first, conduct an HCl emissions compliance test to determine compliance with the HCl emissions limit and to verify or re-establish the SO_2 CEMS operating limit.

(m) *Parameter monitoring requirements.* If you have an operating limit that requires the use of a CMS, you must install, operate, and maintain each continuous parameter monitoring system (CPMS) according to the procedures in paragraphs (m)(1) through (4) of this section by the compliance date specified in §63.1351. You must also meet the applicable specific parameter monitoring requirements in paragraphs (m)(5) through (11) that are applicable to you.

(1) The CMS must complete a minimum of one cycle of operation for each successive 15-minute period. You must have a minimum of four successive cycles of operation to have a valid hour of data.

(2) You must conduct all monitoring in continuous operation at all times that the unit is operating.

(3) Determine the 1-hour block average of all recorded readings.

(4) Record the results of each inspection, calibration, and validation check.

(5) *Liquid flow rate monitoring requirements.* If you have an operating limit that requires the use of a flow measurement device, you must meet the requirements in paragraphs (m)(5)(i) through (iv) of this section.

(i) Locate the flow sensor and other necessary equipment in a position that provides a representative flow.

(ii) Use a flow sensor with a measurement sensitivity of 2 percent of the flow rate.

(iii) Reduce swirling flow or abnormal velocity distributions due to upstream and downstream disturbances.

(iv) Conduct a flow sensor calibration check at least semiannually.

(6) *Specific pressure monitoring requirements.* If you have an operating limit that requires the use of a pressure measurement device, you must meet the requirements in paragraphs (m)(6)(i) through (vi) of this section.

(i) Locate the pressure sensor(s) in a position that provides a representative measurement of the pressure.

(ii) Minimize or eliminate pulsating pressure, vibration, and internal and external corrosion.

(iii) Use a gauge with a minimum tolerance of 1.27 centimeters of water or a transducer with a minimum tolerance of 1 percent of the pressure range.

(iv) Check pressure tap pluggage daily.

(v) Using a manometer, check gauge calibration quarterly and transducer calibration monthly.

(vi) Conduct calibration checks any time the sensor exceeds the manufacturer's specified maximum operating pressure range or install a new pressure sensor.

(7) *Specific pH monitoring requirements.* If you have an operating limit that requires the use of a pH measurement device, you must meet the requirements in paragraphs (m)(7)(i) through (iii) of this section.

(i) Locate the pH sensor in a position that provides a representative measurement of wet scrubber or tray tower effluent pH.

(ii) Ensure the sample is properly mixed and representative of the fluid to be measured.

(iii) Check the pH meter's calibration on at least two points every 8 hours of process operation.

(8) [Reserved]

(9) *Mass flow rate (for sorbent injection) monitoring requirements.* If you have an operating limit that requires the use of equipment to monitor sorbent injection rate (*e.g.,* weigh belt, weigh hopper, or hopper flow measurement device), you must meet the requirements in paragraphs (m)(9)(i) through (iii) of this section. These requirements also apply to the sorbent injection equipment of a dry scrubber.

(i) Locate the device in a position(s) that provides a representative measurement of the total sorbent injection rate.

(ii) Install and calibrate the device in accordance with manufacturer's procedures and specifications.

(iii) At least annually, calibrate the device in accordance with the manufacturer's procedures and specifications.

(10) *Bag leak detection monitoring requirements.* If you elect to use a fabric filter bag leak detection system to comply with the requirements of this subpart, you must install, calibrate, maintain, and continuously operate a BLDS as specified in paragraphs (m)(10)(i) through (viii) of this section.

(i) You must install and operate a BLDS for each exhaust stack of the fabric filter.

(ii) Each BLDS must be installed, operated, calibrated, and maintained in a manner consistent with the manufacturer's written specifications and recommendations and in accordance with the guidance provided in EPA-454/R-98-015, September 1997.

(iii) The BLDS must be certified by the manufacturer to be capable of detecting PM emissions at concentrations of 10 or fewer milligrams per actual cubic meter.

(iv) The BLDS sensor must provide output of relative or absolute PM loadings.

(v) The BLDS must be equipped with a device to continuously record the output signal from the sensor.

(vi) The BLDS must be equipped with an alarm system that will alert an operator automatically when an increase in relative PM emissions over a preset level is detected. The alarm must be located such that the alert is detected and recognized easily by an operator.

(vii) For positive pressure fabric filter systems that do not duct all compartments of cells to a common stack, a BLDS must be installed in each baghouse compartment or cell.

(viii) Where multiple bag leak detectors are required, the system's instrumentation and alarm may be shared among detectors.

(11) For each BLDS, the owner or operator must initiate procedures to determine the cause of every alarm within 8 hours of the alarm. The owner or operator must alleviate the cause of the alarm within 24 hours of the alarm by taking whatever corrective action(s) are necessary. Corrective actions may include, but are not limited to the following:

(i) Inspecting the fabric filter for air leaks, torn or broken bags or filter media, or any other condition that may cause an increase in PM emissions;

(ii) Sealing off defective bags or filter media;

(iii) Replacing defective bags or filter media or otherwise repairing the control device;

(iv) Sealing off a defective fabric filter compartment;

(v) Cleaning the BLDS probe or otherwise repairing the BLDS; or

(vi) Shutting down the process producing the PM emissions.

(n) *Continuous Flow Rate Monitoring System.* You must install, operate, calibrate, and maintain instruments, according to the requirements in paragraphs (n)(1) through (10) of this section, for continuously measuring and recording the stack gas flow rate to allow determination of the pollutant mass emissions rate to the atmosphere from sources subject to an emissions limitation that has a pounds per ton of clinker unit and that is required to be monitored by a CEMS.

(1) You must install each sensor of the flow rate monitoring system in a location that provides representative measurement of the exhaust gas flow rate at the sampling location of the mercury CEMS, taking into account the manufacturer's recommendations. The flow rate sensor is that portion of the system that senses the volumetric flow rate and generates an output proportional to that flow rate.

(2) The flow rate monitoring system must be designed to measure the exhaust flow rate over a range that extends from a value of at least 20 percent less than the lowest expected exhaust flow rate to a value of at least 20 percent greater than the highest expected exhaust flow rate.

(3) [Reserved]

(4) The flow rate monitoring system must be equipped with a data acquisition and recording system that is capable of recording values over the entire range specified in paragraph (n)(2) of this section.

(5) The signal conditioner, wiring, power supply, and data acquisition and recording system for the flow rate monitoring system must be compatible with the output signal of the flow rate sensors used in the monitoring system.

(6) The flow rate monitoring system must be designed to complete a minimum of one cycle of operation for each successive 15-minute period.

(7) The flow rate sensor must have provisions to determine the daily zero and upscale calibration drift (CD) (*see* sections 3.1 and 8.3 of Performance Specification 2 in appendix B to Part 60 of this chapter for a discussion of CD).

(i) Conduct the CD tests at two reference signal levels, zero (e.g., 0 to 20 percent of span) and upscale (e.g., 50 to 70 percent of span).

(ii) The absolute value of the difference between the flow monitor response and the reference signal must be equal to or less than 3 percent of the flow monitor span.

(8) You must perform an initial relative accuracy test of the flow rate monitoring system according to Section 8.2 of Performance Specification 6 of appendix B to part 60 of the chapter with the exceptions in paragraphs (n)(8)(i) and (n)(8)(ii) of this section.

(i) The relative accuracy test is to evaluate the flow rate monitoring system alone rather than a continuous emission rate monitoring system.

(ii) The relative accuracy of the flow rate monitoring system shall be no greater than 10 percent of the mean value of the reference method data.

(9) You must verify the accuracy of the flow rate monitoring system at least once per year by repeating the relative accuracy test specified in paragraph (n)(8).

(10) You must operate the flow rate monitoring system and record data during all periods of operation of the affected facility including periods of startup, shutdown, and malfunction, except for periods of monitoring system malfunctions, repairs associated with monitoring system malfunctions, and required monitoring system quality assurance or quality control activities (including, as applicable, calibration checks and required zero and span adjustments).

(o) *Alternate monitoring requirements approval.* You may submit an application to the Administrator for approval of alternate monitoring requirements to demonstrate compliance with the emission standards of this subpart subject to the provisions of paragraphs (o)(1) through (6) of this section.

(1) The Administrator will not approve averaging periods other than those specified in this section, unless you document, using data or information, that the longer averaging period will ensure that emissions do not exceed levels achieved during the performance test over any increment of time equivalent to the time required to conduct three runs of the performance test.

(2) If the application to use an alternate monitoring requirement is approved, you must continue to use the original monitoring requirement until approval is received to use another monitoring requirement.

(3) You must submit the application for approval of alternate monitoring requirements no later than the notification of performance test. The application must contain the information specified in paragraphs (o)(3)(i) through (iii) of this section:

(i) Data or information justifying the request, such as the technical or economic infeasibility, or the impracticality of using the required approach;

(ii) A description of the proposed alternative monitoring requirement, including the operating parameter to be monitored, the monitoring approach and technique, the averaging period for the limit, and how the limit is to be calculated; and

(iii) Data or information documenting that the alternative monitoring requirement would provide equivalent or better assurance of compliance with the relevant emission standard.

(4) The Administrator will notify you of the approval or denial of the application within 90 calendar days after receipt of the original request, or within 60 calendar days of the receipt of any supplementary information, whichever is later. The Administrator will not approve an alternate monitoring application unless it would provide equivalent or better assurance of compliance with the relevant emission standard. Before disapproving any alternate monitoring application, the Administrator will provide:

(i) Notice of the information and findings upon which the intended disapproval is based; and

(ii) Notice of opportunity for you to present additional supporting information before final action is taken on the application. This notice will specify how much additional time is allowed for you to provide additional supporting information.

(5) You are responsible for submitting any supporting information in a timely manner to enable the Administrator to consider the application prior to the performance test. Neither submittal of an application, nor the Administrator's failure to approve or disapprove the application relieves you of the responsibility to comply with any provision of this subpart.

(6) The Administrator may decide at any time, on a case-by-case basis that additional or alternative operating limits, or alternative approaches to establishing operating limits, are necessary to demonstrate compliance with the emission standards of this subpart.

(p) *Development and submittal (upon request) of monitoring plans.* If you demonstrate compliance with any applicable emissions limit through performance stack testing or other emissions monitoring, you must develop a site-specific monitoring plan according to the requirements in paragraphs (p)(1) through (4) of this section. This requirement also applies to you if you petition the EPA Administrator for alternative monitoring parameters under paragraph (o) of this section and §63.8(f). If you use a BLDS, you must also meet the requirements specified in paragraph (p)(5) of this section.

(1) For each CMS required in this section, you must develop, and submit to the permitting authority for approval upon request, a site-specific monitoring plan that addresses paragraphs (p)(1)(i) through (iii) of this section. You must submit this site-specific monitoring plan, if requested, at least 30 days before your initial performance evaluation of your CMS.

(i) Installation of the CMS sampling probe or other interface at a measurement location relative to each affected process unit such that the measurement is representative of control of the exhaust emissions (e.g., on or downstream of the last control device);

(ii) Performance and equipment specifications for the sample interface, the pollutant concentration or parametric signal analyzer, and the data collection and reduction systems; and

(iii) Performance evaluation procedures and acceptance criteria (e.g., calibrations).

(2) In your site-specific monitoring plan, you must also address paragraphs (p)(2)(i) through (iii) of this section.

(i) Ongoing operation and maintenance procedures in accordance with the general requirements of §63.8(c)(1), (c)(3), and (c)(4)(ii);

(ii) Ongoing data quality assurance procedures in accordance with the general requirements of §63.8(d); and

(iii) Ongoing recordkeeping and reporting procedures in accordance with the general requirements of §63.10(c), (e)(1), and (e)(2)(i).

(3) You must conduct a performance evaluation of each CMS in accordance with your site-specific monitoring plan.

(4) You must operate and maintain the CMS in continuous operation according to the site-specific monitoring plan.

(5) *BLDS monitoring plan.* Each monitoring plan must describe the items in paragraphs (p)(5)(i) through (v) of this section. At a minimum, you must retain records related to the site-specific monitoring plan and information discussed in paragraphs (m)(1) through (4), (m)(10) and (11) of this section for a period of 5 years, with at least the first 2 years on-site;

(i) Installation of the BLDS;

(ii) Initial and periodic adjustment of the BLDS, including how the alarm set-point will be established;

(iii) Operation of the BLDS, including quality assurance procedures;

(iv) How the BLDS will be maintained, including a routine maintenance schedule and spare parts inventory list;

(v) How the BLDS output will be recorded and stored.

[75 FR 55059, Sept. 9, 2010, as amended at 76 FR 2836, Jan. 18, 2011; 78 FR 10048, Feb. 12, 2013; 80 FR 44788, July 27, 2015; 80 FR 54729, Sept. 11, 2015]

§63.1351 Compliance dates.

(a) The compliance date for any affected existing source subject to any rule requirements that were in effect before December 20, 2006, is:

(1) June 14, 2002, for sources that commenced construction before or on March 24, 1998, or

(2) June 14, 1999 or startup for sources that commenced construction after March 24, 1998.

(b) The compliance date for any affected existing source subject to any rule requirements that became effective on December 20, 2006, is:

(1) December 21, 2009, for sources that commenced construction after December 2, 2005 and before or on December 20, 2006, or

(2) Startup for sources that commenced construction after December 20, 2006.

(c) The compliance date for existing sources for all the requirements that became effective on February 12, 2013, except for the open clinker pile requirements will be September 9, 2015.

(d) The compliance date for new sources is February 12, 2013, or startup, whichever is later.

(e) The compliance date for existing sources with the requirements for open clinker storage piles in §63.1343(c) is February 12, 2014.

[76 FR 2836, Jan. 18, 2011, as amended at 78 FR 10053, Feb. 12, 2013]

§63.1352 Additional test methods.

(a) If you are conducting tests to determine the rates of emission of HCl from kilns and associated bypass stacks at portland cement manufacturing facilities, for use in applicability determinations under §63.1340, you may use Method 320 or Method 321 of appendix A of this part.

(b) Owners or operators conducting tests to determine the rates of emission of specific organic HAP from raw material dryers, and kilns at Portland cement manufacturing facilities, solely for use in applicability determinations under §63.1340 of this subpart are permitted to use Method 320 of appendix A to this part, or Method 18 of appendix A to part 60 of this chapter.

[75 FR 55063, Sept. 9, 2010, as amended at 78 FR 10053, Feb. 12, 2013]

Notification, Reporting and Recordkeeping

§63.1353 Notification requirements.

(a) The notification provisions of 40 CFR part 63, subpart A that apply and those that do not apply to owners and operators of affected sources subject to this subpart are listed in Table 1 of this subpart. If any State requires a notice that contains all of the information required in a notification listed in this section, the owner or operator may send the Administrator a copy of the notice sent to the State to satisfy the requirements of this section for that notification.

(b) Each owner or operator subject to the requirements of this subpart shall comply with the notification requirements in §63.9 as follows:

(1) Initial notifications as required by §63.9(b) through (d). For the purposes of this subpart, a Title V or 40 CFR part 70 permit application may be used in lieu of the initial notification required under §63.9(b), provided the same information is contained in the permit application as required by §63.9(b), and the State to which the permit application has been submitted has an approved operating permit program under part 70 of this chapter and has received delegation of authority from the EPA. Permit applications shall be submitted by the same due dates as those specified for the initial notification.

(2) Notification of performance tests, as required by §§63.7 and 63.9(e).

(3) Notification of opacity and visible emission observations required by §63.1349 in accordance with §§63.6(h)(5) and 63.9(f).

(4) Notification, as required by §63.9(g), of the date that the continuous emission monitor performance evaluation required by §63.8(e) is scheduled to begin.

(5) Notification of compliance status, as required by §63.9(h).

(6) Within 48 hours of an exceedance that triggers retesting to establish compliance and new operating limits, notify the appropriate permitting agency of the planned performance tests. The notification requirements of §§63.7(b) and 63.9(e) do not apply to retesting required for exceedances under this subpart.

[64 FR 31925, June 14, 1999, as amended at 78 FR 10053, Feb. 12, 2013]

§63.1354 Reporting requirements.

(a) The reporting provisions of subpart A of this part that apply and those that do not apply to owners or operators of affected sources subject to this subpart are listed in Table 1 of this subpart. If any State requires a report that contains all of the information required in a report listed in this section, the owner or operator may send the Administrator a copy of the report sent to the State to satisfy the requirements of this section for that report.

(b) The owner or operator of an affected source shall comply with the reporting requirements specified in §63.10 of the general provisions of this part 63, subpart A as follows:

(1) As required by §63.10(d)(2), the owner or operator shall report the results of performance tests as part of the notification of compliance status.

(2) As required by §63.10(d)(3), the owner or operator of an affected source shall report the opacity results from tests required by §63.1349.

(3) As required by §63.10(d)(4), the owner or operator of an affected source who is required to submit progress reports as a condition of receiving an extension of compliance under §63.6(i) shall submit such reports by the dates specified in the written extension of compliance.

(4)-(5) [Reserved]

(6) As required by §63.10(e)(2), the owner or operator shall submit a written report of the results of the performance evaluation for the continuous monitoring system required by §63.8(e). The owner or operator shall submit the report simultaneously with the results of the performance test.

(7) As required by §63.10(e)(2), the owner or operator of an affected source using a continuous opacity monitoring system to determine opacity compliance during any performance test required under §63.7 and described in §63.6(d)(6) shall report the results of the continuous opacity monitoring system performance evaluation conducted under §63.8(e).

(8) As required by §63.10(e)(3), the owner or operator of an affected source equipped with a continuous emission monitor shall submit an excess emissions and continuous monitoring system performance report for any event when the continuous monitoring system data indicate the source is not in compliance with the applicable emission limitation or operating parameter limit.

(9) The owner or operator shall submit a summary report semiannually to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI). (CEDRI can be accessed through the EPA's Central Data Exchange (CDX) (*www.epa.gov/cdx*).) You must use the appropriate electronic report in CEDRI for this subpart. Instead of using the electronic report in CEDRI for this subpart, you may submit an alternate electronic file consistent with the extensible markup language (XML) schema listed on the CEDRI Web site (*http://www.epa.gov/ttn/chief/cedri/index.html*), once the XML schema is available. If the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, you must submit the report the Administrator at the appropriate address listed in §63.13. You must begin submitting reports via CEDRI no later than 90 days after the form becomes available in CEDRI. The reports must be submitted by the deadline specified in this subpart, regardless of the method in which the reports are submitted. The report must contain the information specified in §63.10(e)(3)(vi). In addition, the summary report shall include:

(i) All exceedances of maximum control device inlet gas temperature limits specified in §63.1346(a) and (b);

(ii) Notification of any failure to calibrate thermocouples and other temperature sensors as required under §63.1350(g)(1)(iii) of this subpart; and

(iii) Notification of any failure to maintain the activated carbon injection rate, and the activated carbon injection carrier gas flow rate or pressure drop, as applicable, as required under §63.1346(c)(2).

(iv) Notification of failure to conduct any combustion system component inspections conducted within the reporting period as required under §63.1347(a)(3).

(v) Any and all failures to comply with any provision of the operation and maintenance plan developed in accordance with §63.1347(a).

(vi) For each PM CPMS, HCl, Hg, and THC CEMS, D/F temperature monitoring system, or Hg sorbent trap monitoring system, within 60 days after the reporting periods, you must report all of the calculated 30-operating day rolling average values derived from the CPMS, CEMS, CMS, or Hg sorbent trap monitoring systems.

(vii) In response to each violation of an emissions standard or established operating parameter limit, the date, duration and description of each violation and the specific actions taken for each violation including inspections, corrective actions and repeat performance tests and the results of those actions.

(viii) Within 60 days after the date of completing each CEMS performance evaluation test as defined in §63.2, you must submit relative accuracy test audit (RATA) data to the EPA's CDX by using CEDRI in accordance with paragraph (b)(9) of this section. Only RATA pollutants that can be documented with the ERT (as listed on the ERT Web site) are subject to this requirement. For any performance evaluations with no corresponding RATA pollutants listed on the ERT Web site, you must submit the results of the performance evaluation to the Administrator at the appropriate address listed in §63.13.

(ix) For PM performance test reports used to set a PM CPMS operating limit, the electronic submission of the test report must also include the make and model of the PM CPMS instrument, serial number of the instrument, analytical principle of the instrument (*e.g.* beta attenuation), span of the instruments primary analytical range, milliamp value equivalent to the instrument zero output, technique by which this zero value was determined, and the average milliamp signals corresponding to each PM compliance test run.

(x) All reports required by this subpart not subject to the requirements in paragraphs (b)(9) introductory text and (b)(9)(viii) of this section must be sent to the Administrator at the appropriate address listed in §63.13. The Administrator or the delegated authority may request a report in any form suitable for the specific case (*e.g.,* by commonly used electronic media such as Excel spreadsheet, on CD or hard copy). The Administrator retains the right to require submittal of reports subject to paragraph (b)(9) introductory text and (b)(9)(viii) of this section in paper format.

(10) If the total continuous monitoring system downtime for any CEM or any continuous monitoring system (CMS) for the reporting period is ten percent or greater of the total operating time for the reporting period, the owner or operator shall submit an excess emissions and continuous monitoring system performance report along with the summary report.

(c) Reporting a failure to meet a standard due to a malfunction. For each failure to meet a standard or emissions limit caused by a malfunction at an affected source, you must report the failure in the semi-annual compliance report required by §63.1354(b)(9). The report must contain the date, time and duration, and the cause of each event (including unknown cause, if applicable), and a sum of the number of events in the reporting period. The report must list for each event the affected source or equipment, an estimate of the volume of each regulated pollutant emitted over the emission limit for which the source failed to meet a standard, and a description of the method used to estimate the emissions. The report must also include a description of actions taken by an owner or operator during a malfunction of an affected source to minimize emissions in accordance with §63.1348(d), including actions taken to correct a malfunction.

[64 FR 31925, June 14, 1999, as amended at 75 FR 55063, Sept. 9, 2010; 78 FR 10053, Feb. 12, 2013; 80 FR 44790, July 27, 2015]

§63.1355 Recordkeeping requirements.

(a) The owner or operator shall maintain files of all information (including all reports and notifications) required by this section recorded in a form suitable and readily available for inspection and review as required by §63.10(b)(1). The files shall be retained for at least five years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two years of data shall be retained on site. The remaining three years of data may be retained off site. The files may be maintained on microfilm, on a computer, on floppy disks, on magnetic tape, or on microfiche.

(b) The owner or operator shall maintain records for each affected source as required by §63.10(b)(2) and (b)(3) of this part; and

(1) All documentation supporting initial notifications and notifications of compliance status under §63.9;

(2) All records of applicability determination, including supporting analyses; and

(3) If the owner or operator has been granted a waiver under §63.8(f)(6), any information demonstrating whether a source is meeting the requirements for a waiver of recordkeeping or reporting requirements.

(c) In addition to the recordkeeping requirements in paragraph (b) of this section, the owner or operator of an affected source equipped with a continuous monitoring system shall maintain all records required by §63.10(c).

(d) [Reserved]

(f) You must keep records of the date, time and duration of each startup or shutdown period for any affected source that is subject to a standard during startup or shutdown that differs from the standard applicable at other times, and the quantity of feed and fuel used during the startup or shutdown period.

(g)(1) You must keep records of the date, time and duration of each malfunction that causes an affected source to fail to meet an applicable standard; if there was also a monitoring malfunction, the date, time and duration of the monitoring malfunction; the record must list the affected source or equipment, an estimate of the volume of each regulated pollutant emitted over the standard for which the source failed to meet a standard, and a description of the method used to estimate the emissions.

(2) You must keep records of actions taken during periods of malfunction to minimize emissions in accordance with §63.1348(d) including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

(h) For each exceedance from an emissions standard or established operating parameter limit, you must keep records of the date, duration and description of each exceedance and the specific actions taken for each exceedance including inspections, corrective actions and repeat performance tests and the results of those actions.

[64 FR 31925, June 14, 1999, as amended at 71 FR 76552, Dec. 20, 2006; 75 FR 55064, Sept. 9, 2010; 78 FR 10053, Feb. 12, 2013; 80 FR 44791, July 27, 2015]

Other

§63.1356 Sources with multiple emissions limit or monitoring requirements.

If you have an affected source subject to this subpart with a different emissions limit or requirement for the same pollutant under another regulation in title 40 of this chapter, once you are in compliance with the most stringent emissions limit or requirement, you are not subject to the less stringent requirement. Until you are in compliance with the more stringent limit, the less stringent limit continues to apply.

[80 FR 44791, July 27, 2015]

§63.1357 [Reserved]

§63.1358 Implementation and enforcement.

(a) This subpart can be implemented and enforced by the U.S. EPA, or a delegated authority such as the applicable State, local, or Tribal agency. If the U.S. EPA Administrator has delegated authority to a State, local, or Tribal agency, then that agency, in addition to the U.S. EPA, has the authority to implement and enforce this subpart. Contact the applicable U.S. EPA Regional Office to find out if this subpart is delegated to a State, local, or Tribal agency.

(b) In delegating implementation and enforcement authority of this subpart to a State, local, or Tribal agency under subpart E of this part, the authorities contained in paragraph (c) of this section are retained by the Administrator of U.S. EPA and cannot be transferred to the State, local, or Tribal agency.

(c) The authorities that cannot be delegated to State, local, or Tribal agencies are as specified in paragraphs (c)(1) through (4) of this section.

(1) Approval of alternatives to the requirements in §§63.1340, 63.1342 through 63.1348, and 63.1351.

(2) Approval of major alternatives to test methods under §63.7(e)(2)(ii) and (f), as defined in §63.90, and as required in this subpart.

(3) Approval of major alternatives to monitoring under §63.8(f), as defined in §63.90, and as required in this subpart.

(4) Approval of major alternatives to recordkeeping and reporting under §63.10(f), as defined in §63.90, and as required in this subpart.

[68 FR 37359, June 23, 2003]

§63.1359 [Reserved]

Table 1 to Subpart LLL of Part 63—Applicability of General Provisions

Citation	Requirement	Applies to subpart LLL	Explanation
63.1(a)(1)-(4)	Applicability	Yes	
63.1(a)(5)		No	[Reserved].
63.1(a)(6)-(8)	Applicability	Yes	
63.1(a)(9)		No	[Reserved].
63.1(a)(10)-(14)	Applicability	Yes	
63.1(b)(1)	Initial Applicability Determination	No	§63.1340 specifies applicability.
63.1(b)(2)-(3)	Initial Applicability Determination	Yes	
63.1(c)(1)	Applicability After Standard Established	Yes	
63.1(c)(2)	Permit Requirements	Yes	Area sources must obtain Title V permits.
63.1(c)(3)		No	[Reserved].
63.1(c)(4)-(5)	Extensions, Notifications	Yes	
63.1(d)		No	[Reserved].
63.1(e)	Applicability of Permit Program	Yes	

Citation	Requirement	Applies to subpart LLL	Explanation
63.2	Definitions	Yes	Additional definitions in §63.1341.
63.3(a)-(c)	Units and Abbreviations	Yes	
63.4(a)(1)-(3)	Prohibited Activities	Yes	
63.4(a)(4)		No	[Reserved].
63.4(a)(5)	Compliance date	Yes	
63.4(b)-(c)	Circumvention, Severability	Yes	
63.5(a)(1)-(2)	Construction/Reconstruction	Yes	
63.5(b)(1)	Compliance Dates	Yes	
63.5(b)(2)		No	[Reserved].
63.5(b)(3)-(6)	Construction Approval, Applicability	Yes	
63.5(c)		No	[Reserved].
63.5(d)(1)-(4)	Approval of Construction/Reconstruction	Yes	
63.5(e)	Approval of Construction/Reconstruction	Yes	
63.5(f)(1)-(2)	Approval of Construction/Reconstruction	Yes	
63.6(a)	Compliance for Standards and Maintenance	Yes	
63.6(b)(1)-(5)	Compliance Dates	Yes	
63.6(b)(6)		No	[Reserved].
63.6(b)(7)	Compliance Dates	Yes	
63.6(c)(1)-(2)	Compliance Dates	Yes	
63.6(c)(3)-(4)		No	[Reserved].
63.6(c)(5)	Compliance Dates	Yes	
63.6(d)		No	[Reserved].
63.6(e)(1)-(2)	Operation & Maintenance	No	See §63.1348(d) for general duty requirement. Any reference to §63.6(e)(1)(i) in other General Provisions or in this subpart is to be treated as a cross-reference to §63.1348(d).
63.6(e)(3)	Startup, Shutdown Malfunction Plan	No	Your operations and maintenance plan must address periods of startup and shutdown. See §63.1347(a)(1).
63.6(f)(1)	Compliance with Emission Standards	No	Compliance obligations specified in subpart LLL.
63.6(f)(2)-(3)	Compliance with Emission Standards	Yes	
63.6(g)(1)-(3)	Alternative Standard	Yes	

Citation	Requirement	Applies to subpart LLL	Explanation
63.6(h)(1)	Opacity/VE Standards	No	Compliance obligations specified in subpart LLL.
63.6(h)(2)	Opacity/VE Standards	Yes	
63.6(h)(3)		No	[Reserved].
63.6(h)(4)-(h)(5)(i)	Opacity/VE Standards	Yes	
63.6(h)(5)(ii)-(iv)	Opacity/VE Standards	No	Test duration specified in subpart LLL.
63.6(h)(6)	Opacity/VE Standards	Yes	
63.6(h)(7)	Opacity/VE Standards	Yes	
63.6(i)(1)-(14)	Extension of Compliance	Yes	
63.6(i)(15)		No	[Reserved].
63.6(i)(16)	Extension of Compliance	Yes	
63.6(j)	Exemption from Compliance	Yes	
63.7(a)(1)-(3)	Performance Testing Requirements	Yes	§63.1349 has specific requirements.
63.7(b)	Notification period	Yes	Except for repeat performance test caused by an exceedance. See §63.1353(b)(6).
63.7(c)	Quality Assurance/Test Plan	Yes	
63.7(d)	Testing Facilities	Yes	
63.7(e)(1)	Conduct of Tests	No	See §63.1349(e). Any reference to 63.7(e)(1) in other General Provisions or in this subpart is to be treated as a cross-reference to §63.1349(e).
63.7(e)(2)-(4)	Conduct of tests	Yes	
63.7(f)	Alternative Test Method	Yes	
63.7(g)	Data Analysis	Yes	
63.7(h)	Waiver of Tests	Yes	
63.8(a)(1)	Monitoring Requirements	Yes	
63.8(a)(2)	Monitoring	No	§63.1350 includes CEMS requirements.
63.8(a)(3)		No	[Reserved].
63.8(a)(4)	Monitoring	No	Flares not applicable.
63.8(b)(1)-(3)	Conduct of Monitoring	Yes	
63.8(c)(1)-(8)	CMS Operation/Maintenance	Yes	Temperature and activated carbon injection monitoring data reduction requirements given in subpart LLL.
63.8(d)	Quality Control	Yes, except for the reference to the SSM Plan in the last sentence	

Citation	Requirement	Applies to subpart LLL	Explanation
63.8(e)	Performance Evaluation for CMS	Yes	
63.8(f)(1)-(5)	Alternative Monitoring Method	Yes	Additional requirements in §63.1350(l).
63.8(f)(6)	Alternative to RATA Test	Yes	
63.8(g)	Data Reduction	Yes	
63.9(a)	Notification Requirements	Yes	
63.9(b)(1)-(5)	Initial Notifications	Yes	
63.9(c)	Request for Compliance Extension	Yes	
63.9(d)	New Source Notification for Special Compliance Requirements	Yes	
63.9(e)	Notification of performance test	Yes	Except for repeat performance test caused by an exceedance. See §63.1353(b)(6).
63.9(f)	Notification of VE/Opacity Test	Yes	Notification not required for VE/opacity test under §63.1350(e) and (j).
63.9(g)	Additional CMS Notifications	Yes	
63.9(h)(1)-(3)	Notification of Compliance Status	Yes	
63.9(h)(4)		No	[Reserved].
63.9(h)(5)-(6)	Notification of Compliance Status	Yes	
63.9(i)	Adjustment of Deadlines	Yes	
63.9(j)	Change in Previous Information	Yes	
63.10(a)	Recordkeeping/Reporting	Yes	
63.10(b)(1)	General Recordkeeping Requirements	Yes	
63.10(b)(2)(i)-(ii)	General Recordkeeping Requirements	No	See §63.1355(g) and (h).
63.10(b)(2)(iii)	General Recordkeeping Requirements	Yes	
63.10(b)(2)(iv)-(v)	General Recordkeeping Requirements	No	
63.10(b)(2)(vi)-(ix)	General Recordkeeping Requirements	Yes	
63.10(c)(1)	Additional CMS Recordkeeping	Yes	PS-8A supersedes requirements for THC CEMS.
63.10(c)(1)	Additional CMS Recordkeeping	Yes	PS-8A supersedes requirements for THC CEMS.
63.10(c)(2)-(4)		No	[Reserved].
63.10(c)(5)-(8)	Additional CMS Recordkeeping	Yes	PS-8A supersedes requirements for THC CEMS.
63.10(c)(9)		No	[Reserved].

Citation	Requirement	Applies to subpart LLL	Explanation
63.10(c)(10)-(15)	Additional CMS Recordkeeping	Yes	PS-8A supersedes requirements for THC CEMS.
63.10(d)(1)	General Reporting Requirements	Yes	
63.10(d)(2)	Performance Test Results	Yes	
63.10(d)(3)	Opacity or VE Observations	Yes	
63.10(d)(4)	Progress Reports	Yes	
63.10(d)(5)	Startup, Shutdown, Malfunction Reports	No	See §63.1354(c) for reporting requirements. Any reference to §63.10(d)(5) in other General Provisions or in this subpart is to be treated as a cross-reference to §63.1354(c).
63.10(e)(1)-(2)	Additional CMS Reports	Yes	
63.10(e)(3)	Excess Emissions and CMS Performance Reports	Yes	Exceedances are defined in subpart LLL.
63.10(e)(3)(vii) and (viii)	Excess Emissions and CMS Performance Reports	No	Superseded by 63.1354(b)(10).
63.10(f)	Waiver for Recordkeeping/Reporting	Yes	
63.11(a)-(b)	Control Device Requirements	No	Flares not applicable.
63.12(a)-(c)	State Authority and Delegations	Yes	
63.13(a)-(c)	State/Regional Addresses	Yes	
63.14(a)-(b)	Incorporation by Reference	Yes	
63.15(a)-(b)	Availability of Information	Yes	

[80 FR 44791, July 27, 2015]

Indiana Department of Environmental Management
Office of Air Quality

Technical Support Document (TSD) for a
Part 70 Significant Source and Significant Permit Modification

Source Description and Location

Source Name:	Lone Star Industries, Inc. dba Buzzi Unicem USA
Source Location:	3301 S. County Road 150 W, Greencastle, IN 46135
County:	Putnam County, Greencastle Township
SIC Code:	3241 (Hydraulic Cement) 1422 (Crushed and Broken Limestone)
Operation Permit No.:	T133-33667-00002
Operation Permit Issuance Date:	December 23, 2014
Significant Source Modification No.:	133-35865-00002
Significant Permit Modification No.:	133-35884-00002
Permit Reviewer:	David Matousek

Existing Approvals

The source was issued Part 70 Operating Permit No. T133-33667-00002 on December 23, 2014. There have been no subsequent approvals issued.

County Attainment Status

The source is located in Putnam County, Greencastle Township.

Pollutant	Designation
SO_2	Better than national standards.
CO	Unclassifiable or attainment effective November 15, 1990.
O_3	Unclassifiable or attainment effective July 20, 2012, for the 2008 8-hour ozone standard.[1]
$PM_{2.5}$	Unclassifiable or attainment effective April 5, 2005, for the annual $PM_{2.5}$ standard.
$PM_{2.5}$	Unclassifiable or attainment effective December 13, 2009, for the 24-hour $PM_{2.5}$ standard.
PM_{10}	Unclassifiable effective November 15, 1990.
NO_2	Cannot be classified or better than national standards.
Pb	Unclassifiable or attainment effective December 31, 2011.

[1]Unclassifiable or attainment effective October 18, 2000, for the 1-hour ozone standard which was revoked effective June 15, 2005.

(a) Ozone Standards
Volatile organic compounds (VOC) and Nitrogen Oxides (NO_x) are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for ozone. Therefore, VOC and NO_x emissions are considered when evaluating the rule applicability relating to ozone. 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.

(b) $PM_{2.5}$
Putnam County has been classified as attainment for $PM_{2.5}$. Therefore, direct $PM_{2.5}$, SO_2, and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

(c) Other Criteria Pollutants
Putnam County has been classified as attainment or unclassifiable in Indiana for SO2, CO, PM10, NO2 and lead. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

Fugitive Emissions

Since this source is classified as a portland cement plant, it is considered one of the twenty-eight (28) listed source categories, as specified in 326 IAC 2-2, 326 IAC 2-3, or 326 IAC 2-7. Therefore, fugitive emissions are counted toward the determination of PSD, Emission Offset, and Part 70 Permit applicability.

Source Status - Existing Source

The table below summarizes the potential to emit of the entire source, prior to the proposed modification, after consideration of all enforceable limits established in the effective permits:

Pollutant	**Emissions** (ton/yr)
PM	greater than 100
PM_{10}	greater than 100
$PM_{2.5}$	greater than 100
SO_2	greater than 100
NO_X	greater than 100
VOC	greater than 100
CO	greater than 100
Single HAP	greater than 10
Combined HAP	greater than 25

On June 23, 2014, in the case of Utility Air Regulatory Group v. EPA, cause no. 12-1146, (available at http://www.supremecourt.gov/opinions/13pdf/12-1146_4g18.pdf) the United States Supreme Court ruled that the U.S. EPA does not have the authority to treat greenhouse gases (GHGs) as an air pollutant for the purpose of determining operating permit applicability or PSD Major source status. On July 24, 2014, the U.S. EPA issued a memorandum to the Regional Administrators outlining next steps in permitting decisions in light of the Supreme Court's decision. U.S. EPA's guidance states that U.S. EPA will no longer require PSD or Title V permits for sources "previously classified as 'Major' based solely on greenhouse gas emissions."

The Indiana Environmental Rules Board adopted the GHG regulations required by U.S. EPA at 326 IAC 2-2-1(zz), pursuant to Ind. Code § 13-14-9-8(h) (Section 8 rulemaking). A rule, or part of a rule, adopted under Section 8 is automatically invalidated when the corresponding federal rule, or part of the rule, is invalidated. Due to the United States Supreme Court Ruling, IDEM, OAQ cannot consider GHGs emissions to determine operating permit applicability or PSD applicability to a source or modification.

(a) This existing source is a major stationary source, under PSD (326 IAC 2-2), because a PSD regulated pollutant, excluding GHGs, is emitted at a rate of 100 tons per year or more, and it is one of the twenty-eight (28) listed source categories, as specified in 326 IAC 2-2-1(ff)(1).

(b) These emissions are based upon Appendix A to the Technical Support Document (TSD) for Part 70 Operating Permit Renewal No. T133-33667-00002.

(c) This existing source is a major source of HAPs, as defined in 40 CFR 63.2, because HAP emissions are greater than ten (10) tons per year for a single HAP and greater than twenty-five (25) tons per year for a combination of HAPs. Therefore, this source is a major source under Section 112 of the Clean Air Act (CAA).

Description of Proposed Modification

The Office of Air Quality (OAQ) has reviewed a modification application, submitted by Lone Star Industries, Inc. dba Buzzi Unicem USA on May 26, 2015, relating to the addition of a new bulk solids handling operation consisting of a hydrapulper mixer and two slurry mix tanks used to blend liquid hazardous waste for combustion in the kiln. The following is a list of the proposed and existing emission units and pollution control devices contained in the bulk solids handling system:

(a) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S 001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001. The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(1) One (1) hydrapulper, approved in 2016 for construction, identified as HP-02, with a nominal vessel volume of 2,500 gallons, and process volume of 2,250 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(i) One (1) waste feed hopper loaded from roll-off bulk containers, approved in 2016 for construction, identified as HP-01, with a nominal storage capacity of 25 yd^3 or 5,000 gallons of solids. Solids are transferred out of the hopper by an enclosed feed auger with a nominal capacity of 800 cubic feet of solids per hour. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Two (2) organic liquid slurry mix tanks, approved in 2016 for construction, identified as tank T12 and tank T13, each with a nominal storage capacity of 10,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(2) One (1) process permitted to blend solids in containers on loadout pads A or B, with hydraulic drives and agitators installed in 2012, identified as blend box, with a nominal vessel volume of 25 yd^3 (5,714 gallons), and a batch volume of 3,910 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(3) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(4) Three (3) liquid organic loadout areas consisting of three concrete pads, identified as Pad A and Pad B, both constructed in 1986, and Pad C, constructed in 1994.

(5) Fugitive VOC and HAP emissions from waste receiving, pumps, valves, connectors. [40 CFR 61, Subpart V]

While IDEM, OAQ was reviewing the application for the bulk solids off-loading and blending system project described above, a new application from Lone Star Industries, Inc. was received on December 9, 2015. This application requested the replacement of the fan housing of baghouse 210L, the removal of baghouse 500L with emissions from the bucket elevator identified as Point 3-22 (500V) now controlled by existing baghouse 503L and existing baghouse 503L1, the addition of a new dust collector 828L, and the revision of the normal pressure drop operating range of baghouse 606L. This project is unrelated to the bulk solids project. However, IDEM, OAQ combined the applications into a single permit action.

Enforcement Issues

There are no pending enforcement actions related to this modification.

Emission Calculations

See Appendix A of this Technical Support Document for detailed emission calculations.

Permit Level Determination – Part 70 Modification to an Existing Source

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source or emission unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, IDEM, or the appropriate local air pollution control agency.”

The following table is used to determine the appropriate permit level under 326 IAC 2-7-10.5. This table reflects the PTE before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit. If the control equipment has been determined to be integral, the table reflects the PTE after consideration of the integral control device.

Increase in PTE Before Controls of the Modification	
Pollutant	**Potential To Emit (ton/yr)**
PM	5.18
PM10	1.04
PM2.5	0.25
SO2	0.00
VOC	127.53
CO	0.00
NOx	0.00

Appendix A of this TSD reflects the unrestricted potential emissions of the modification. This source modification is subject to 326IAC 2-7-10.5(g)(4)(D), because the potential to emit VOC of the modification is greater than or equal to twenty-five (25) tons per year. Additionally, the modification will be incorporated into the Part 70 Operating Permit through a significant permit modification issued pursuant to 326 IAC 2-7-12(d)(1), because the modification does not qualify as a minor permit modification or as an administrative amendment due to a case-by-case determination of an emission limitation.

Permit Level Determination – PSD

The table below summarizes the potential to emit, reflecting all limits, of the emission units. Any control equipment is considered federally enforceable only after issuance of this Part 70 source and permit modification, and only to the extent that the effect of the control equipment is made practically enforceable in the permit.

Potential to Emit of the Modification (TPY)								
Emission Unit	**PM**	**PM_{10}**	**Direct $PM_{2.5}$**	**SO_2**	**VOC**	**CO**	**NO_x**	**GHGs as CO_2e**
Hydrapulper	neglig.	neglig.	neglig.	0.00	2.94	0.00	0.00	0.00
Hydrapulper Fugitive	neglig.	neglig.	neglig.	0.00	0.73	0.00	0.00	0.00
Blend Box	neglig.	neglig.	neglig.	0.00	5.62	0.00	0.00	0.00
Blend Box Fugitive	neglig.	neglig.	neglig.	0.00	0.42	0.00	0.00	0.00
Tank T2	0.00	0.00	0.00	0.00	3.95	0.00	0.00	0.00
Tank T1	0.00	0.00	0.00	0.00	11.02	0.00	0.00	0.00
Tank T3	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T4	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T5	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T6	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T7	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T8	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T12	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T13	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T10	0.00	0.00	0.00	0.00	5.21	0.00	0.00	0.00
Tank T11	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Truck Wash Ops.	0.00	0.00	0.00	0.00	3.72	0.00	0.00	0.00
Truck Wash Fugitive	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00
Fitting - Hydrapulper	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00
Fitting - Blend Box	0.00	0.00	0.00	0.00	5.13	0.00	0.00	0.00
Paved Roads	2.59	0.52	0.13	0.00	0.00	0.00	0.00	0.00
Total for Modification	2.59	0.52	0.13	0.00	39.96	0.00	0.00	0.00
PSD Significant Levels	25	15	10	40	40	100	40	75,000

Neglig. = negligible emissions

On June 23, 2014, in the case of Utility Air Regulatory Group v. EPA, cause no. 12-1146, (available at http://www.supremecourt.gov/opinions/13pdf/12-1146_4g18.pdf) the United States Supreme Court ruled that the U.S. EPA does not have the authority to treat greenhouse gases (GHGs) as an air pollutant for the purpose of determining operating permit applicability or PSD Major source status. On July 24, 2014, the U.S. EPA issued a memorandum to the Regional Administrators outlining next steps in permitting decisions in light of the Supreme Court's decision. U.S. EPA's guidance states that U.S. EPA will no longer require PSD or Title V permits for sources "previously classified as 'Major' based solely on greenhouse gas emissions."

The Indiana Environmental Rules Board adopted the GHG regulations required by U.S. EPA at 326 IAC 2-2-1(zz), pursuant to Ind. Code § 13-14-9-8(h) (Section 8 rulemaking). A rule, or part of a rule, adopted under Section 8 is automatically invalidated when the corresponding federal rule, or part of the rule, is invalidated. Due to the United States Supreme Court Ruling, IDEM, OAQ cannot consider GHGs emissions to determine operating permit applicability or PSD applicability to a source or modification.

When a major source for Prevention of Significant Deterioration (PSD) submits an application for a source modification, IDEM, OAQ reviews the application history of the source. This source was issued Part 70 Operating Permit Renewal T33-33667-00002 on December 23, 2014 and has not received any approval since issuance of the renewal.

A source modification related to the current project was issued on March 29, 2012, IDEM, OAQ issued minor source modification 133-30661-00002 to revise the emission unit description of the calciner, kiln, and storage tanks T1 through T10 to allow storage and combustion of hazardous waste fuel. In addition, construction of a blending operation for bulk viscous or solid materials was approved. The emission unit added is described below:

(a) Blending operations for bulk hazardous highly viscous or solid materials, such as sludge filter cake or remediation wastes for processing at either of two existing load out pads (A or B). Emissions are controlled by a combination of closed vent vapor balancing between vessels (storage tanks and unloading trucks) and ultimately through the cement kiln or carbon vapor adsorption system through the existing tank farm. Under 40 CFR 61, Subpart FF and 40 CFR Part 63, Subpart DD, this is considered an affected source.

The hydrapulper operation proposed in the current application is similar to the blend box operation approved under minor source modification 133-30661-00002. The hydrapulper operation blends fuels for combustion in the same kiln/calciner and uses the same storage tanks. However, the source did not contemplate construction of the current blending operation when the application for the blend box was submitted on June 24, 2011 and the expansion is a result of a change in demand for disposal of liquid hazardous waste. Therefore, the blend box operation and the hydrapulper projects should not be aggregated for the purposes of PSD.

The current project contains both new emission units and existing emission units. The hydrapulper and both organic liquid slurry mix tanks are new and all other units are already in the permit. The source has elected to include all units at their potential to emit instead of using the actual to projected actual method of determining PTE for the purposes of Prevention of Significant Deterioration (PSD) applicability. The combined project has a potential to emit VOC in excess of the Prevention of Significant Deterioration (PSD) significant threshold. Therefore, the Permittee requested the following emission limitations on the input to the blend box and hydrapulper to ensure this modification is a minor modification under PSD rules:

(1) Pursuant to significant source modification number 133-35865-00002 and in order to render the provisions of 326 IAC 2-2 (Prevention of Significant Deterioration (PSD)) not applicable, the Permittee shall comply with the following:

(a) VOC emissions from the hydrapulper shall not exceed 0.58 pounds per batch before control;

(b) Throughput of the hydrapulper shall not exceed 10,084 batches per twelve (12) consecutive month period, with compliance determined at the end of each month;

(c) VOC emissions from the blend box shall not exceed 2.20 pounds per batch before control;

(d) Throughput of the blend box shall not exceed 5,090 batches per twelve (12) consecutive month period, with compliance determined at the end of each month.

This modification to an existing major PSD stationary source is not major because:

(a) The emissions increase of each PSD regulated pollutant, excluding GHGs, are less than the PSD significant thresholds; and

(b) The emissions increase of GHGs from this modification to an existing major PSD source are less than seventy-five thousand (75,000) tons of CO_2 equivalent (CO_2e) emissions per year.

Therefore, pursuant to 326 IAC 2-2, the PSD requirements do not apply.

Federal Rule Applicability Determination

The following federal rules are applicable to the source due to this modification:

(a) Pursuant to 40 CFR 64.2, Compliance Assurance Monitoring (CAM) is applicable to new or modified emission units that involve a pollutant-specific emission unit and meet the following criteria:

(1) has a potential to emit before controls equal to or greater than the Part 70 major source threshold for the pollutant involved;

(2) is subject to an emission limitation or standard for that pollutant; and

(3) uses a control device, as defined in 40 CFR 64.1, to comply with that emission limitation or standard.

The following table is used to identify the applicability of each of the criteria, under 40 CFR 64.1, to each new or modified emission unit involved:

CAM Applicability Analysis

Emission Unit	Control Device Used	Emission Limitations (Y/N)	Uncontrolled PTE (ton/yr)	Controlled PTE (ton/yr)	Part 70 Major Source Threshold (ton/yr)	CAM Applicable (Y/N)	Large Unit (Y/N)
Hydrapulper	Y	VOC - Y	8.91	0.45	100	N	N
		Single HAP - Y	1.41	0.07	10	N	N
		Combined HAP - Y	5.80	0.29	25	N	N

CAM Applicability Analysis							
Emission Unit	**Control Device Used**	**Emission Limitations (Y/N)**	**Uncontrolled PTE (ton/yr)**	**Controlled PTE (ton/yr)**	**Part 70 Major Source Threshold (ton/yr)**	**CAM Applicable (Y/N)**	**Large Unit (Y/N)**
Blend Box	Y	VOC - Y	19.41	0.97	100	N	N
		Single HAP - Y	3.10	0.15	10	N	N
		Combined HAP - Y	12.64	0.63	25	N	N
Tank T2	Y	VOC - Y	3.95	0.20	100	N	N
		Single HAP - Y	0.68	0.03	10	N	N
		Combined HAP - Y	2.62	0.13	25	N	N
T1, T3, T5, T6, T7, T8, T12, and T13	Y	VOC - Y	11.02	0.55	100	N	N
		Single HAP - Y	1.87	0.09	10	N	N
		Combined HAP - Y	7.22	0.36	25	N	N
T10 and T11	Y	VOC - Y	5.21	0.26	100	N	N
		Single HAP - Y	0.90	0.04	10	N	N
		Combined HAP - Y	3.46	0.17	25	N	N
Truck Wash	Y	VOC - Y	3.72	0.19	100	N	N
		Single HAP - Y	0.61	0.03	10	N	N
		Combined HAP - Y	2.41	0.12	25	N	N

Based on this evaluation, the requirements of 40 CFR Part 64, CAM are not applicable to any of the new or modified units as part of this modification.

NSPS:

(b) **40 CFR 60, Subpart F (Standards of Performance for Portland Cement Plants) (326 IAC 12):** The provisions of this subpart are applicable to the following affected facilities in portland cement plants, that commenced construction or modification after August 17, 1971: kiln, clinker cooler, raw mill system, finish mill system, raw mill dryer, raw material storage, clinker storage, finished product storage, conveyor transfer points, bagging and bulk loading and unloading systems. Pursuant to 40 CFR 60.62(d), if an affected source subject to more than one emission limit under more than one 40 CFR 60 subparts for a single pollutant, the source must comply with the most restrictive emission limit. Lone Star Industries, Inc. is a portland cement plant and is subject to the provisions of 40 CFR 60, Subpart F. This modification contains storage tanks but they are not raw material, clinker or finished product storage tanks. They are alternative fuel storage tanks. Therefore, the provisions of 40 CFR 60, Subpart F are not included in the permit for the emission units contained in this project. The provisions of 40 CFR 60, Subpart F are included in the current permit for other emission units.

(c) **40 CFR 60, Subpart K (Standards of Performance for Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced after June 11, 1973, and Prior to May 19, 1978) (326 IAC 12):** This subpart applies to each petroleum liquid storage vessel with a storage capacity greater than 40,000 gallons (151,412 liters) but not exceeding 65,000 gallons (246,052 liters), which was constructed after March 8, 1974 and prior to May 19, 1978, or has a capacity greater than 65,000 gallons, which commenced construction after June 11, 1973, and prior to May 19, 1978. 40 CFR 60, Subpart K does not apply to storage vessels for petroleum or condensate stored, processed, and/or treated at a drilling and production facility prior to custody transfer. Petroleum is defined in the rule as the crude oil removed from the earth and the oils derived from tar sands, shale, and coal. A petroleum liquid means petroleum, condensate, and any finished or intermediate products manufactured in a petroleum refinery, but does not mean No. 2 through No. 6 fuel oils, gas turbine fuel oils No. 2-GT through No. 4-GT, or diesel fuels No. 2-D and 4-D.

The table below summarizes the storage tanks contained in this modification:

Summary of Storage Tanks Contained in the Modification			
Emission Unit	**Construction Date**	**Volume (gallons)**	**Contents**
Tank T1	1988	25,000	liquid organic waste
Tank T2	1988	25,000	liquid organic waste
Tank T3	2015	25,000	liquid organic waste
Tank T4	2015	25,000	liquid organic waste
Tank T5	2015	25,000	liquid organic waste
Tank T6	2015	25,000	liquid organic waste
Tank T7	2012	150,000	liquid organic waste
Tank T8	1999	100,000	liquid organic waste
Tank T10	2009	150,000	liquid organic waste
Tank T11	2009	150,000	liquid organic waste
Tank T12	Proposed	10,000	liquid organic waste
Tank T13	Proposed	10,000	liquid organic waste

None of the storage tanks contain petroleum liquid and all were constructed after May 19, 1978. Therefore, the provisions of 40 CFR 60, Subpart K are not included in the permit.

(d) **40 CFR 60, Subpart Ka (Standards of Performance for Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced after May 18, 1978, and Prior to July 23, 1984) (326 IAC 12):** The affected facility to which 40 CFR 60, Subpart Ka applies is each petroleum liquid storage vessel with a capacity greater than 40,000 gallons (151,416 liters) for which construction commenced after May 18, 1978 and prior to July 23, 1984. Petroleum liquid storage vessels with a capacity of less than 420,000 gallons used to store petroleum or condensate stored, processed, or treated prior to custody transfer is not an affected facility. Petroleum is defined in the rule as the crude oil removed from the earth and the oils derived from tar sands, shale, and coal. A petroleum liquid means petroleum, condensate, and any finished or intermediate products manufactured in a petroleum refinery, but does not mean No. 2 through No. 6 fuel oils, gas turbine fuel oils No. 2-GT through No. 4-GT, or diesel fuels No. 2-D and 4-D.

None of the storage tanks contain petroleum liquid and all were constructed after July 23, 1984. Therefore, the provisions of 40 CFR 60, Subpart Ka are not included in the permit.

(e) **40 CFR 60, Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984) (326 IAC 12):** The affected facility to which 40 CFR 60, Subpart Kb applies is each storage vessel with a capacity greater than or equal to 19,812.90 gallons (75 cubic meters) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984. Storage vessels with a capacity greater than 39,890 gallons (151 cubic meters) storing a liquid with a maximum true vapor pressure less than 0.5076 psi (3.5 kPa), or with a capacity greater than or equal to 19,812.90 gallons but less than 39,890 gallons storing a liquid with a maximum true vapor pressure less than 2.18 psi (15 kPa) are not subject to 40 CFR 60, Subpart Kb. 40 CFR 60, Subpart Kb does not apply to the following:

(1) Vessels at coke oven by-product plants

(2) Pressure vessels designed to operate in excess of 29.7 psi (204.9 kPa)

(3) Vessels permanently attached to mobile vehicles

(4) Vessels with a design capacity less than or equal to 420,000 gallons (1,589.874 cubic meters) used for petroleum or condensate stored, processed, or treated prior to custody transfer

(5) Vessels located at bulk gasoline plants

(6) Storage vessels located at gasoline service stations

(7) Vessels used to store beverage alcohol

(8) Vessels subject to 40 CFR 63, Subpart GGGG.

The storage tanks contained in this modification were all constructed after July 23, 1984 and contain a volatile organic liquid. The table below is a summary of the contents of the volatile organic storage tanks:

Summary of Storage Tanks Contained in the Modification			
Emission Unit	**Construction Date**	**Volume (gallons / m^3)**	**VOC Maximum True Vapor Pressure* (psi)**
Tank T1	1988	25,000 / 94.64	Methyl Tert Butyl Ether (MTBE) 5.84 psi 40.27 KPa
Tank T2	1988	25,000 / 94.64	
Tank T3	2015	25,000 / 94.64	
Tank T4	2015	25,000 / 94.64	
Tank T5	2015	25,000 / 94.64	
Tank T6	2015	25,000 / 94.64	
Tank T7	2012	150,000 / 567.81	
Tank T8	1999	100,000 / 378.54	
Tank T10	2009	150,000 / 567.81	
Tank T11	2009	150,000 / 567.81	
Tank T12	Proposed	10,000 / 37.85	
Tank T13	Proposed	10,000 / 37.85	

* The maximum true vapor pressure was determined at the maximum local monthly average temperature in Indianapolis, Indiana. See AP-42, Chapter 7.1, November 2006, Table 7.1-7, 85.2 ˚F (29.56 ˚C).

Tanks T1 through T6 have a storage capacity of greater than 75 cubic meters and less than 151 cubic meters and store a VOL with a maximum true vapor pressure greater than 2.18 psi. Therefore, Tanks T1 through T6 are subject to 40 CFR 60, Subpart Kb. Tanks T7, T8, T10 and T11 each have a storage capacity of greater than 151 cubic meters and store a VOL with a maximum true vapor pressure greater than 0.0576 psi. Therefore, tanks T7, T8, T10, and T11 are subject to 40 CFR 60, Subpart Kb. Tanks T12 and T13 contain a VOL and will be constructed after July 23, 1984; however, tanks T12 and T13 have a storage volume of less than 75 cubic meters. Therefore, the provisions of 40 CFR 60, Subpart Kb are not included in the permit for tanks T12 and T13. Tanks T1 through T11 are controlled by a vapor balance system into a closed vent system vented to either an activated carbon control system or the kiln/calciner.

VOL storage tanks T1 through T8 and T10 and T11 are still subject to the Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced

after July 23, 1984 (40 CFR 60.110b, Subpart Kb), which is incorporated as 326 IAC 12, and included as Attachment D to the permit. The emission units subject to 40 CFR 60, Subpart Kb include:

Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(1) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(2) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(3) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(4) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(5) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

Nonapplicable portions of 40 CFR 60, Subpart Kb will not be included in the permit. VOL storage tanks T1 through T8, T10, and T11, storing a VOC with a maximum true vapor pressure of 40.27 KPa, are subject to the following portions of 40 CFR 60, Subpart Kb:

(1) 40 CFR 60.110b(a);
(2) 40 CFR 60.111b;
(3) 40 CFR 60.112b(a)(3)(ii);
(4) 40 CFR 60.113b(c);
(5) 40 CFR 60.115b(c);
(6) 40 CFR 60.116b(a), (b), (f), and (g); and
(7) 40 CFR 60.117b.

(f) **40 CFR 60, Subpart VV (Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006) (326 IAC 12):** The provisions of 40 CFR 60, Subpart VV applies to affected facilities in the synthetic organic chemicals manufacturing industry. 40 CFR 60, Subpart VV defines the synthetic organic chemical manufacturing industry as the industry that produces, as intermediates or final products, one or more of the chemicals listed in 40 CFR 60.489. Lone Star Industries, Inc. is a portland cement manufacturing facility and does not produce organic chemicals listed in 40 CFR 60.489. Therefore, the provisions of 40 CFR 60, Subpart VV are not included in the permit.

(g) **40 CFR 60, Subpart VVa (Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006) (326 IAC 12):** The provisions of 40 CFR 60, Subpart VVa applies to affected facilities in the synthetic organic chemicals manufacturing industry. 40 CFR 60, Subpart VVa defines the synthetic organic chemical manufacturing industry as the industry that produces, as intermediates or final products, one or more of the chemicals listed in 40 CFR 60.489. Lone Star Industries, Inc. is a portland cement manufacturing facility and does not produce organic chemicals as an intermediate or final products. Therefore, the provisions of 40 CFR 60, Subpart VVa are not included in the permit.

(h) **40 CFR 60, Subpart GGG (Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After January 4, 1983, and on or Before November 7, 2006) (326 IAC 12):** The provisions of 40 CFR 60, Subpart GGG apply to affected facilities located in petroleum refineries. The subpart defines a petroleum refinery as any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through the distillation of petroleum, or through the redistillation, cracking, or reforming of unfinished petroleum derivatives. Lone Star Industries, Inc. does not meet the definition of a petroleum refinery. Therefore, the provisions of 40 CFR 60, Subpart GGG are not included in the permit.

(i) **40 CFR 60, Subpart GGGa (Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After November 7, 2006) (326 IAC 12):** The provisions of 40 CFR 60, Subpart GGGa apply to affected facilities located in petroleum refineries. The subpart defines a petroleum refinery as any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through the distillation of petroleum, or through the redistillation, cracking, or reforming of unfinished petroleum derivatives. Lone Star Industries, Inc. does not meet the definition of a petroleum refinery. Therefore, the provisions of 40 CFR 60, Subpart GGGa are not included in the permit.

(j) There are no other New Source Performance Standards (NSPS) (326 IAC 12 and 40 CFR 60) included in the permit.

NESHAP:

(k) **40 CFR 61, Subpart J (National Emission Standard for Equipment Leaks (Fugitive Emission Sources) of Benzene (326 IAC 14-7):** The provisions of this subpart apply to each of the following sources that are intended to operate in benzene service: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems required by 40 CFR 61, Subpart J. The subpart defines "in benzene service" as a piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 10 percent benzene by weight. The liquid waste blended, stored and ultimately combusted in the kiln/calciner does not contain benzene at a concentration of 10% or more. Therefore, the provisions of 40 CFR 61, Subpart J are not included in the permit.

(l) **40 CFR 61, Subpart V (National Emission Standards for Equipment Leaks (Fugitive Emission Sources) (326 IAC 14-8):** The provisions of 40 CFR 61, Subpart V apply to each of the following sources that are intended to operate in volatile hazardous air pollutant (VHAP) service: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices required by 40 CFR 61, Subpart V. In VHAP service is defined in the rule as a piece of equipment that contains or contacts a liquid or gas that is at least 10 percent by weight of a VHAP regulated under a 40 CFR 61 standard. The blended fuel contains a VHAP. Therefore, the provisions of 40 CFR 61, Subpart V are included in the permit. The emission units listed below are subject to the National Emission Standards for Equipment Leaks (Fugitive Emission Sources), which is incorporated by reference as 326 IAC 14-8, and included as Attachment H to this permit:

(1) Fugitive VOC and HAP emissions from waste receiving, pumps, valves, connectors. [40 CFR 61, Subpart V]

Nonapplicable portions of the 40 CFR 61, Subpart V will not be included in the permit. The facilities listed above are subject to the following portions of 40 CFR 61, Subpart V:

(1) 40 CFR 61.240(a), (b), and (c);
(2) 40 CFR 61.241;
(3) 40 CFR 61.242-1;
(4) 40 CFR 61.242-2(a through g);
(5) 40 CFR 61.242-4;
(6) 40 CFR 61.242-6;
(7) 40 CFR 61.242-7;
(8) 40 CFR 61.242-8;
(9) 40 CFR 61.242-10;
(10) 40 CFR 61.242-11(a), (b), (c), (e), (f)(2), (g) through (m);
(11) 40 CFR 61.243-1;
(12) 40 CFR 61.243-2;
(13) 40 CFR 61.244;
(14) 40 CFR 61.245;
(15) 40 CFR 61.246; and
(16) 40 CFR 61.247(a)(1), (a)(2), (a)(3), (a)(5), (b), (c), (d), and (e).

The provisions of 40 C FR 61, Subpart A – General Provisions, which are incorporated by reference in 326 IAC 14-1, apply to the facilities described in this section except when otherwise specified in 40 CFR 61, Subpart V.

(m) **40 CFR 61, Subpart Y (National Emission Standard for Benzene Emissions From Benzene Storage Vessels):** The source to which 40 CFR 61, Subpart Y applies is each storage vessel that is storing benzene having a specific gravity within the range of specific gravities specified in ASTM D836-84 for Industrial Grade Benzene, ASTM D835-85 for Refined Benzene-485, ASTM D2359-85a or 93 for Refined Benzene-535, and ASTM D4734-87 or 96 for Refined Benzene-545. The emission units included in this modification process or store dilute solutions containing trace amounts of benzene and not refined benzene. Therefore, the provisions of 40 CFR 61, Subpart Y are not included in the permit.

(n) **40 CFR 61, Subpart BB (National Emission Standard for Benzene Emissions From Benzene Transfer Operations):** The affected facility to which 40 CFR 61, Subpart BB applies is the total of all loading racks at which benzene is loaded into tank trucks, railcars, or marine vessels at each benzene production facility and each bulk terminal. However, specifically exempted from this regulation are loading racks at which only the following are loaded: Benzene-laden waste (covered under Subpart FF), gasoline, crude oil, natural gas liquids, petroleum distillates (e.g., fuel oil, diesel, or kerosene), or benzene-laden liquid from coke by-product recovery plants. 40 CFR 61, Subpart BB defines a bulk terminal as any facility which receives liquid product containing benzene by pipelines, marine vessels, tank trucks, or railcars, and loads the product for further distribution into tank trucks, railcars, or marine vessels. Lone Star Industries, Inc. receives a liquid waste containing benzene subject to 40 CFR 61, Subpart FF and does not produce benzene. Therefore, the provisions of 40 CFR 61, Subpart BB are not included in the permit.

(o) **40 CFR 61, Subpart FF (National Emission Standards for Benzene Waste Operations):** The provisions of 40 CFR 61, Subpart FF apply to owners and operators of chemical manufacturing plants, coke by-product recovery plants, and petroleum refineries. 40 CFR 61, Subpart FF also applies to owners and operators of hazardous waste treatment, storage, and disposal facilities that treat, store, or dispose of hazardous waste generated by chemical manufacturing plants, coke by-product recovery plants, and petroleum refineries. The waste streams at hazardous waste treatment, storage, and disposal facilities subject to the provisions of this subpart are the benzene-containing hazardous waste from any chemical manufacturing plant, coke by-product recovery plant,

and petroleum refinery. A hazardous waste treatment, storage, and disposal facility is a facility that must obtain a hazardous waste management permit under subtitle C of the Solid Waste Disposal Act. Lone Star Industries, Inc. is a hazardous waste treatment, storage, and disposal facility receiving hazardous waste from sources described in 40 CFR 61, Subpart FF. This source remains subject to the National Emission Standards for Benzene Waste Operations (40 CFR 61, Subpart FF), which is included as Attachment G to the permit. The emission units listed below are subject to the National Emission Standards for Benzene Waste Operations (40 CF 61, Subpart FF):

(1) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001**.** The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(A) One (1) hydrapulper, approved in 2016 for construction, identified as HP-02, with a nominal vessel volume of 2,500 gallons, and process volume of 2,250 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(i) One (1) waste feed hopper loaded from roll-off bulk containers, approved in 2016 for construction, identified as HP-01, with a nominal storage capacity of 25 yd^3 or 5,000 gallons of solids. Solids are transferred out of the hopper by an enclosed feed auger with a nominal capacity of 800 cubic feet of solids per hour. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Two (2) organic liquid slurry mix tanks, approved in 2016 for construction, identified as tank T12 and tank T13, each with a nominal storage capacity of 10,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(B) One (1) process permitted to blend solids in containers on loadout pads A or B, with hydraulic drives and agitators installed in 2012, identified as blend box, with a nominal vessel volume of 25 yd^3 (5,714 gallons), and a batch volume of 3,910 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(C) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

Nonapplicable portions of the 40 CFR 61, Subpart FF will not be included in the permit. The facilities listed above are subject to the following portions of 40 CFR 61, Subpart FF:

(1) 40 CFR 61.340(b), (c), and (d);
(2) 40 CFR 61.341;
(3) 40 CFR 61.342(b), (c), and (g);
(4) 40 CFR 61.343(a), (c), (d), and (e);
(5) 40 CFR 61.345;
(6) 40 CFR 61.349(a)(1), (a)(2)(i, and ii), (b), (c), (d), (e), (f), (g) and (h);
(7) 40 CFR 61.350;
(8) 40 CFR 61.354(a), (c)(5), (c)(7), (d), (e), and (f);
(9) 40 CFR 61.355(a)(1), (a)(2), (a)(3), (a)(6), (b), (c), (h), (i), and (j);
(10) 40 CFR 61.356(a), (b)(1 and 2), (d), (e), (f)(1), (f)(2)(i)(A, F and G), (g), and (h);
(11) 40 CFR 61.356(i), (j)(1), (j)(2), (j)(3), (j)(4), (j)(9), (j)(10), and (n);
(12) 40 CFR 61.357(a), (d)(1), (d)(2), (d)(6), (d)(7)(iv)(A, D, H, and I), and (d)(7)(v);
(13) 40 CFR 61.358; and
(14) Appendix A, Appendix B, and Appendix C to Part 61.

The provisions of 40 CFR 61, Subpart A – General Provisions, which are incorporated by reference in 326 IAC 14-1, apply to the facilities described in this section except when otherwise specified in 40 CFR 61, Subpart FF.

(p) **40 CFR 63, Subpart DD (National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations) (326 IAC 20-23):** The provisions of 40 CFR 63, Subpart DD establish national emission standards for hazardous air pollutants for off-site waste and recovery operations (OSWRO). 40 CFR 63, Subpart DD applies to owners and operators of a major source of hazardous air pollutants (HAPs) and manage certain wastes, used oil, or used solvents received from off-site locations. Lone Star Industries, Inc. operates an OSWRO receiving wastes, used oil and solvents regulated by 40 CFR 63, Subpart DD. Therefore, the provisions are included in the permit. The following emission units are subject to the National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations (40 CFR 63, Subpart DD), which is incorporated by reference as 326 IAC 20-23, and included as Attachment I to this permit:

(1) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001**.** The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(A) One (1) hydrapulper, approved in 2016 for construction, identified as HP-02, with a nominal vessel volume of 2,500 gallons, and process volume of 2,250 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(i) One (1) waste feed hopper loaded from roll-off bulk containers, approved in 2016 for construction, identified as HP-01, with a nominal storage capacity of 25 yd^3 or 5,000 gallons of solids. Solids are transferred out of the hopper by an enclosed feed auger with a nominal capacity of 800 cubic feet of solids per hour. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Two (2) organic liquid slurry mix tanks, approved in 2016 for construction, identified as tank T12 and tank T13, each with a nominal storage capacity of 10,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(B) One (1) process permitted to blend solids in containers on loadout pads A or B, with hydraulic drives and agitators installed in 2012, identified as blend box, with a nominal vessel volume of 25 yd^3 (5,714 gallons), and a batch volume of 3,910 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(C) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

Nonapplicable portions of the 40 CFR 63, Subpart DD will not be included in the permit. The facilities listed above are subject to the following portions of 40 CFR 63, Subpart DD:

(1) 40 CFR 63.680(a)(1), (a)(2)(i), (b), (c)(1), (c)(3), (e)(2), (f), and (g);
(2) 40 CFR 63.681;
(3) 40 CFR 63.683(a), (b), (d), (e), and (f);
(4) 40 CFR 63.685(a), (b)(2), (d)(3), (d)(5), (g), and (i);
(5) 40 CFR 63.688(a), and (b)(3)(i);
(6) 40 CFR 63.691(a), (b)(1)(i), (c);
(7) 40 CFR 63.693(a), (b), (c)(1, 2, and 3), (c)(4)(i),(c)(5, 6, 7, and 8);
(8) 40 CFR 63.693(c), (d)(1), (d)(2)(ii), (d)(3), (d)(4), (e)(1), (e)(2)(ii), (e)(3) and (g);
(9) 40 CFR 63.694;

(10) 40 CFR 63.695(a), (b)(3), (b)(4), (c), (e), and (f);
(11) 40 CFR 63.696(a), (b), (e), (f), (g), (h), and (i);
(12) 40 CFR 63.697(a), and (b)(1 through 5);
(13) 40 CFR 63.698; and
(14) Table 1, Table 2, and Table 5.

The provisions of 40 CFR 63, Subpart A – General Provisions, which are incorporated by reference in 326 IAC 20-1, apply to the facilities described in this section except when otherwise specified in 40 CFR 63, Subpart DD.

(q) **40 CFR 63, Subpart YY (National Emission Standards for Hazardous Air Pollutants for Source Categories: Generic Maximum Achievable Control Technology Standards) (326 IAC 20-44):** This subpart applies to the following source categories and affected sources: acetal resins production, acrylic and modacrylic fibers production, carbon black production, cyanide chemicals manufacturing, ethylene production, hydrogen fluoride production, and spandex production. This source is not engaged in any of the activities regulated by 40 CFR 63, Subpart YY. Therefore, the requirements of 40 CFR 63, Subpart YY are not included in the permit.

(r) **40 CFR 63, Subpart EEE (National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors) (326 IAC 20-83):** The provisions of this subpart apply to all hazardous waste combustors: hazardous waste incinerators, hazardous waste cement kilns, hazardous waste lightweight aggregate kilns, hazardous waste solid fuel boilers, hazardous waste liquid fuel boilers, and hazardous waste hydrochloric acid production furnaces. Hazardous waste combustors are also subject to applicable requirements under parts 260 through 270 of this chapter. A hazardous waste combustor means a hazardous waste incinerator, hazardous waste burning cement kiln, hazardous waste burning lightweight aggregate kiln, hazardous waste liquid fuel boiler, hazardous waste solid fuel boiler, or hazardous waste hydrochloric acid production furnace. This source contains a hazardous waste burning cement kiln and the provisions of 40 CFR 63, Subpart EEE are already included in the permit.

(s) **40 CFR 63, Subpart LLL (National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry) (326 IAC 20-27):** The provisions of 40 CFR 63, Subpart LLL apply to each new and existing portland cement plant which is a major or area source of hazardous air pollutants as defined in 40 CFR 63.2. Lone Star Industries, Inc. is a portland cement plant that is a major source of hazardous air pollutants. Therefore, this source remains subject to the requirements of the National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry (40 CFR 63, Subpart LLL), which is incorporated by reference as 326 IAC 20-27, and included as Attachment E to this permit. The following emission units are subject to the provisions of 40 CFR 63, Subpart LLL:

(1) One (1) gypsum material handling process, constructed in 2002 and modified in 2009, with a nominal production of 150 tons per hour of the blended synthetic gypsum material or rock gypsum, including the following units:

(a) One (1) synthetic gypsum transporting system, identified as 1-47. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(b) Two (2) outdoor synthetic gypsum storage piles, identified as 62 and 64, with a nominal throughput of 268,056 tons per year, using wet suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(c) Three (3) synthetic gypsum hoppers, identified as 508120, 508140 and 508165; three (3) sets of screw conveyors (4 in each set), identified as 508130, 508150 and 508175; three (3) weigh belts, identified as 508125, 508145 and 508170; and four belt conveyors, identified as 661BC (508136 to mill #3) constructed in 2012, 604BC, 605BC (GC508156 and GC508157 to mill #1) and 602BC1 (GC508176 to mill #2), constructed in 2014, with a nominal throughput of 10.2 tons per hour each, using wet suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(d) One (1) rock gypsum and limestone material hopper (234F) and two (2) conveyor belts (234V, 234FV), identified as 1-38, with a nominal throughput of 150 tons per hour, constructed in 2002, using wet suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(2) Raw Material Ball Mill Operation, with a nominal capacity of 400 tons of raw material per hour, including the following units:

(a) Raw material ball mill transfer equipment including four (4) belt conveyors, identified as Point 1-17A (252V-255V); four (4) raw material bins, identified as Point 1-17B (350F-353F); all constructed on April 1, 2000, with a nominal capacity of 525 tons per hour, equipped with one (1) fabric filter system (FF 1-17, baghouse 350L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(b) Two (2) weigh feeders, identified as Point 1-18A (352V-353V); one (1) conveyor belt, identified as Point 1-18B (358V); two (2) apron feeders, identified as Point 1-18C; and two (2) scavenger conveyors, identified as Point 1 18D (350V2, 351V2); all constructed on April 1, 2000, with a nominal capacity of 400 tons per hour; all utilizing a building enclosure to control particulate emissions. Two (2) weigh feeders (350V, 351V); equipped with one (1) fabric filter system (FF-18, baghouse 352L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(3) Fly Ash Storage and Additive Activities, including the following units:

(a) Two (2) rotary feeders (270V2, 271V2), one (1) weigh screw (275V), one (1) Pfister rotary feeder (276V), and one (1) weigh bin (273F) constructed March 2009; two screw conveyors, identified as Point 1-19A (273V, 274V); one (1) fly ash hopper, identified as Point 1-19B (273FA); and one (1) FK pump (273JA); all constructed on April 1, 2000, and modified February 8, 2002, with exception of 273FA and 273JA which were constructed in 2003, each with a nominal capacity of 20 tons per hour, equipped with one (1) fabric filter system (FF 1-7, 273L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(b) One (1) fly ash silo, identified as Point 1-39 (270F), constructed on April 1, 2000, with a nominal capacity of 1,250 tons, equipped with two (2) fabric filter systems (FF 1-39, 270L, and baghouse 274L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(c) One (1) fly ash silo, identified as Point 1-40 (271F), constructed on April 1, 2000, with a nominal capacity of 1,250 tons, equipped with two (2) fabric filter systems (FF 1-40, 271L, and baghouse 274L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(d) Two (2) additive silos, identified as Point 1-21A (318F, 328F), each with a nominal capacity of 500 tons, four (4) rotary feeders, identified as Point 1-21B (318V, 318VV, 328V, 328VV), with a nominal capacity of 30 tons per hour each; all constructed on May 17, 1996, equipped with one (1) fabric filter system (FF 1-21, baghouse 319L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(e) One (1) additive feed bin, identified as Point 1-22 (308F), constructed after August 17, 1971 and before May 17, 1996, with a nominal capacity of 200 tons, covered by a building enclosure (BE 1-22) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(f) One (1) rotary feeder, identified as Point 1-23A (308V), constructed in 1996; and one (1) weigh belt, identified as Point 1-23B (309V), constructed after August 17, 1971; each with a nominal capacity of 30 tons per hour, covered by a building enclosure (BE 1-23) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(4) One (1) alternate raw material feed system, constructed in 2007, operating at a maximum capacity of 20 tons per hour each, and consisting of the following pieces of equipment:

(a) Slag pile, identified as one of the materials identified in Point 1-13, controlled with water mist spray as needed. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(b) One (1) slag hopper, identified as 301132.01, with emissions uncontrolled. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(c) One (1) weight feeder, identified as 289V, with emissions uncontrolled. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(d) One (1) covered belt conveyor, identified as GC301132.05, and one (1) screw conveyor identified as 301132.08. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(e) One (1) bucket elevator, identified as 292V. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(f) Paved delivery roads with particulate emissions controlled by vacuum sweeping.

(g) One (1) non-hazardous alternate raw materials storage building. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(5) Kiln Operation, with a nominal capacity of 360 tons of dry raw feed per hour and 208 tons clinker per hour. Stack 3-1 includes a SO_2, NOx and CO_2 continuous emissions monitor (CEMS), particulate matter detection system (PMDS) and a continuous opacity monitoring system (COMS). This operation consists of the following:

(a) One (1) return dust bin, identified as Point 3-3A (405F), constructed before 1971 and modified in 1999, with a nominal capacity of 100 tons; one (1) waste dust bin, identified as Point 3-3F (404F), constructed before 1971 and modified in 1999, with a nominal capacity of 75 tons; one (1) hopper, identified as Point 3-3C (445F), constructed on May 1, 2000, with a nominal capacity of 60 tons per hour; two (2) bucket elevators, identified as Point 3-3G (411V, 413V), constructed before August 17, 1971, with a nominal capacity of 60 tons per hour; and two (2) rotary feeders, identified as Point 3-3H (405FVV, 305286); one (1) screw conveyor, identified as Point 3-3I (405FVV1), constructed in 2003 except 305286 constructed in 2008 each with a nominal capacity of 60 tons per hour; and two (2) screw conveyors, identified as 305287 and 305288; all equipped with one fabric filter system (FF 3-3, baghouse 403L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(b) One (1) non-routine raw material dust truck loading station, constructed before 1971 and modified in 1999, covered by a building enclosure (BE 3-25) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(c) One (1) reject dust bin for cement kiln dust, identified as Point 3-7A (481F), with a nominal capacity of 150 tons, constructed on May 1, 2000, equipped with one (1) fabric filter system (FF 3-7, baghouse 483L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(d) One (1) alkali bypass system cement kiln dust truck loading station, identified as Point 3-8, constructed in 2000, utilizing mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(e) One (1) pneumatic dust pump, identified as FK Pump 485J and in-line diverter valve, installed in 2011. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(6) Clinker Cooler Operations, with a nominal capacity of 208 tons of clinker per hour:

(a) One (1) clinker cooler, identified as Point 3-9A (401C), constructed before August 17, 1971 and modified in 2000, with a nominal capacity of 208 tons per hour; one (1) clinker breaker, identified as Point 3-9B (401CG), constructed on January 1, 1969 and modified in 2000, with a nominal capacity of 208 tons per hour; one (1) dropout chamber, identified as Point 3-9C (401CL), constructed January 1, 1969, with a nominal capacity of 20 tons per hour; two (2) vibrating feeders, identified as Point 3-9F (427V, 428V), constructed before August 17, 1971 and modified in 2000, with a nominal capacity of 208 tons per hour each; and one (1) drag conveyor, identified as Point 3-9G (401CV), and eight (8) screw conveyors (422V, 470CV2, 470CV3, 470CV9, 470CV10, 474V-476V), nine (9) rotary feeders (401CV1 and 471CLV1-8), all constructed before August 17, 1971 and modified in 2001, each with a nominal capacity of ten (10) tons per hour; all equipped with one (1) fabric filter

system (FF 3-9, baghouse 471-CL) to control particulate emissions, exhausting to stack 3-2. Stack 3-2 has a continuous opacity monitoring system (COMS) and PM continuous parametric monitoring system (CPMS). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(b) Two (2) belt conveyors, identified as Point 3-11A (421V, 509V); and two (2) bucket elevators, identified as Point 3-11B (418V, 419V); all constructed before 1971 and modified in 2000, with a nominal capacity of 208 tons per hour each (note that belt conveyor (421V) is a non-routine belt; all equipped with one (1) fabric filter system (FF 3-11, baghouse 406L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(c) One (1) non-routine outdoor clinker pile, identified as Point 3-13, modified in 1999, utilizing water mist suppression or equivalent dust suppression to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(d) One (1) belt conveyor (turning tower), identified as Point 3-12 (510V), constructed before 1971 and modified in 2000, with a nominal capacity of 208 tons per hour, equipped with one (1) fabric filter system (FF 3-12, baghouse 506L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(e) One (1) bucket elevator, identified as Point 3-22 (500V), constructed on October 1, 1999, with a nominal capacity of 250 tons per hour, equipped with one (1) fabric filter system (FF 3-22, baghouse 500L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(f) Two (2) feeders, identified as Point 3-24A (207F, 208F); and one (1) belt conveyor, identified as Point 3-24B (219V); each constructed before August 17, 1971, with a nominal capacity of 300 tons per hour each, equipped with one (1) fabric filter system (FF 3-24, baghouse 220L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(g) Seven (7) clinker silos, identified as Point 3-14 (501A-507A), constructed before 1971 and modified in 1999, each with a nominal capacity of 5000 tons, equipped with two (2) fabric filter system (FF 3-14, baghouses 503L and 503L1) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(h) One (1) belt conveyor, identified as Point 3-21 (220V), constructed before August 17, 1971, equipped with one (1) fabric filter system (FF 3-21, baghouse 221L) which was installed in 2001 to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(7) Finish Mill Operations:

(a) Four (4) vibrating feeders, identified as Point 3-15 (504V-507V), constructed before 1971 and modified in 1999, with a nominal capacity of 250 tons per hour each, equipped with one (1) fabric filter system (FF 3-15, baghouse 505L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(b) Four (4) vibrating feeders, identified as Point 3-17A (501V-503V, 508V); and one (1) belt conveyor, identified as Point 3-17B (221V); with a nominal capacity of 250 tons per hour each; all constructed before 1971 and modified in 1999, equipped with one (1) fabric filter system (FF 3-17, baghouse 504L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(c) Two (2) belt conveyors, identified as Point 3-20B (514V, 511V), constructed before August 17, 1971; one (1) bucket elevator, identified as Point 3-20A (513V), constructed on June 1, 2000; and one (1) belt conveyor, identified as 511V2, constructed in 2003; each with a nominal capacity of 250 tons per hour, 514V, 511V, and 513V are equipped with one (1) fabric filter system (FF 3-20, baghouse 513L) to control particulate emissions. 511V2 is equipped with baghouse 507L to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(d) One (1) belt conveyor, identified as Point 4-13A (515V), constructed in 1969 and modified in 2000, with a nominal capacity of 250 tons per hour; and four (4) silos, identified as Point 4-13B; 652A, constructed on January 1, 1969, with a nominal capacity of 2,260 tons, equipped with one (1) fabric filter system (FF 4-13, baghouse 515L) to control particulate emissions. 650A, 651A, and 653A, constructed on January 1, 1969 with a nominal capacity of 2,440; 2,315; and 200 tons, respectively, and controlled by baghouses 670L, 671L, and 672L, respectfully, (constructed in 2006) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(e) One (1) belt conveyor, identified as Point 4-14 (516V), constructed on January 1, 1969, with a nominal capacity of 250 tons per hour, equipped with one (1) fabric filter system (FF 4-14, baghouse 516L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(f) No. 1 Finish Mill, modified in 1993, with a nominal capacity of 70 tons of clinker per hour:

(A) Two (2) belt conveyors, identified as Point 4-1A (639V, 640V), constructed in 1971 and modified in 1999, with a nominal capacity of 250 tons per hour each; one (1) clinker bin, identified as Point 4-1B (601F), constructed before 1971 and modified in 1999, with a nominal capacity of 260 tons; one (1) gypsum bin, identified as Point 4-1C (603F), constructed before 1971 and modified in 1999, with a nominal capacity of 240 tons per hour; one (1) spill screw, identified as Point 4-1D (646V), constructed in 2002, with a nominal capacity of five (5) tons per hour; and one (1) belt conveyor, identified as 614V, modified in 2003, with a maximum capacity of 250 tons of clinker per hour; all equipped with one (1) fabric filter system (FF 4-1, baghouse 617L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(B) One (1) No. 1 finish mill, identified as Point 4-2A (603G), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; one (1) elevator, identified as Point 4-2B (626V), constructed before 1971 and modified in 1999, with a nominal capacity of 200 tons per hour; and one (1) spill screw, identified as Point 4-2D (642V), constructed 1969

and modified in 1999, with a nominal capacity of five (5) tons per hour; all equipped with one (1) fabric filter system (FF 4-2, baghouse 613L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(C) One (1) air separator, identified as Point 4-3A (605G), constructed in 1994 and modified in 1999, with a nominal capacity of 200 tons per hour; one (1) tailing screw, identified as Point 4-3D (613V), constructed in 1969 and modified in 1999, with a nominal capacity of 200 tons per hour; two (2) cement coolers, identified as Point 4-3E (603C, 604C), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour each; one (1) F.K. pump hopper, identified as Point 4-3G (611F), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; one (1) mill feed belt, identified as Point 4-3H (641V), constructed in 1974 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; and one (1) clinker F.O.W. belt, identified as Point 4-3I (601V), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons per hour; equipped with one (1) fabric filter system (FF 4-3, baghouse 606L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(D) One (1) fringe bin for off-specification cement and cement kiln dust, identified as Point 4-16A (604F), constructed before August 17, 1971, with a nominal capacity of 66 tons; and two (2) screw feeders, identified as Point 4-16B (611V, 604F1V), constructed on January 1, 1969, with a nominal capacity of 20 tons per hour each; equipped with one (1) fabric filter system (FF 4-16, baghouse 605L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(E) One (1) weigh belt, identified as Point 4-15A (605V), and one (1) belt conveyor, identified as Point 4-15B (616V), constructed before 1974, covered by a building enclosure to control particulate matter. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(g) No. 2 Finish Mill, with a capacity of 70 tons of clinker per hour:

(A) Two (2) conveyor belts, identified as Point 4-4A (639V, 640V), constructed 1969 and modified in 1999, with a nominal capacity of 250 tons per hour; one (1) clinker bin, identified as Point 4-4B (602F), constructed before 1971 and modified in 1999, with a nominal capacity of 260 tons; one (1) gypsum bin, identified as Point 4-4C (603F), constructed before 1971 and modified in 1999, with a nominal capacity of 240 tons; one (1) clinker F.O.W. belt, identified as Point 4-4D, (602V), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons per hour; and one (1) feed belt, identified as Point 4-4E (644V), constructed in 1975 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; all equipped with one (1) fabric filter system (FF 4-4, baghouse 636L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(B) One (1) No. 2 finish mill, identified as Point 4-5A (602G), constructed before 1971 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; and one (1) spill screw, identified as Point 4-5B (645V), constructed in 1969 and modified in 1999, with a nominal capacity of 5 tons per hour; all equipped with one (1) fabric filter system (FF 4-5, baghouse 603L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(C) One (1) air separator, identified as Point 4-6A (604G), constructed before 1971 and modified in 1999, with a nominal capacity of 200 tons per hour; one (1) elevator, identified as Point 4-6B (621V), constructed before 1971 and modified in 1999, with a nominal capacity of 200 tons per hour; one (1) tailing screw, identified as Point 4-6D (612V), constructed in 1969 and modified in 1999, with a nominal capacity of 200 tons per hour; two (2) cement coolers, identified as Point 4-6E (601C, 602C), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour each; one (1) F.K. pump hopper, identified as Point 4-6F (610F), constructed in 1969 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; and one (1) mill feed belt, identified as Point 4-6G (644V), constructed in 1975 and modified in 1999, with a nominal capacity of 70 tons of clinker per hour; all equipped with one (1) fabric filter system (FF 4-6, baghouse 602L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(h) No. 3 Finish Mill, with a nominal capacity of 95 tons of clinker per hour:

(A) One (1) No. 3 finish mill, identified as Point 4-9 (660G), constructed on June 1, 2000, with a nominal capacity of 95 tons of clinker per hour, equipped with one (1) fabric filter system (FF 4-9, baghouse 660L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(B) One (1) hopper, identified as Point 4-10C (667F), with a nominal capacity of 95 tons of clinker per hour; one (1) cooler, identified as Point 4-10D (664C), with a nominal capacity of 95 tons of clinker per hour; and one (1) feed belt, identified as Point 4-10E (654V), with a nominal capacity of 95 tons of clinker per hour; all constructed on June 1, 2000, equipped with one (1) fabric filter system (FF 4-10, baghouse 661L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(C) One (1) fringe bin for off-specification cement and cement kiln dust, identified as Point 4-11B (665F), with a nominal capacity of 80 tons; one (1) elevator, identified as Point 4-11C (661V), with a nominal capacity of 230 tons per hour equipped with one (1) clean-up hopper and one (1) clean-up screw 509530; and one (1) rotary feeder, identified as Point 4-11D (665FV), with a nominal capacity of 50 tons per hour; all constructed on June 1, 2000 and cleanup screw 1201V and hopper, constructed in 2007 with a nominal capacity of 10 tons per hour; all equipped with one (1) fabric filter system (FF 4-11, baghouse 665L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(D) One (1) air separator, identified as Point 4-12A (664G), constructed on June 1, 2000, with a nominal capacity of 230 tons per hour, and equipped with one (1) fabric filter system (FF 4-12, baghouse 664L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(E) Two (2) weigh feeders, identified as Point 4-17 (652V, 653V), constructed on January 1, 1969; and two (2) weigh feeders (650V, 651V), constructed on January 1, 1969, equipped with two (2) dust collectors (650L, 651L), installed in 2000, venting indoors; with a nominal capacity of 40 tons per hour each, covered by a building enclosure (BE 4-17) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(8) Cement Storage, Loading, and Packaging Activities:

(a) Three (3) Group 5 silos, identified as Point 5-1 (705A, 707A, 709A), constructed before 1971 and modified in 1999, with a nominal storage capacity of 10,000 tons each, with particulate emission controlled by one (1) fabric filter system (FF 5-1, baghouse 757L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(b) Three (3) Group 5 silos, identified as Point 5-2 (706A, 708A, 710A), constructed before 1971 and modified in 1999, with a nominal storage capacity of 10,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-2, baghouse 758L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(c) Two (2) Group 4 silos, identified as Point 5-3 (702A, 704A), constructed in 1967 and modified in 1999, with a nominal storage capacity of 5,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-3, baghouse 702L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(d) Two (2) Group 4 silos, identified as Point 5-4 (701A, 703A), constructed in 1967 and modified in 1999, with a nominal storage capacity of 5,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-4, baghouse 701L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(e) Two (2) silos, identified as Point 5-29 (711A, 712A), constructed on January 1, 1969, with a nominal storage capacity of 5,000 tons each, with particulate emissions controlled by one (1) fabric filter system (FF 5-29, baghouse 713L). Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(f) One (1) screen, identified as Point 5-5C (701G), constructed before 1971 and modified in 1999; and one (1) truck loader, identified as Point 5-5D (708L), constructed before 1971 and modified in 1999; each with a nominal capacity of 500 tons per hour, equipped with one (1) fabric filter system (FF 5-5, baghouse 703L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(g) One (1) screen, identified as Point 5-6B (702G), constructed before 1971 and modified in 1999; and one (1) railcar/truck loader, identified as Point 5-6C (709L), constructed before 1971 and modified in 1999; each with a nominal capacity of 500 tons per hour, equipped with one (1) fabric filter system (FF 5-6, baghouse 706L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(h) One (1) hopper, identified as Point 5-7B (701F), constructed before 1971 and modified in 1999, with a nominal capacity of 40 tons per hour, equipped with one (1) fabric filter system (FF 5-7, baghouse 710L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(i) One (1) hopper, identified as Point 5-8 (730F), constructed before 1971 and modified in 1999, with a nominal capacity of 40 tons per hour, equipped with one (1) fabric filter system (FF 5-8, baghouse 715L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(j) Three (3) screw conveyors, identified as Point 5-9A (809V, 809V1, 809V2), constructed before 1971, with a nominal capacity of 40 tons per hour each; one (1) alleviator, identified as Point 5-9C, constructed before 1971, with a nominal capacity of 40 tons per hour; and fourteen (14) Group 2 silos, identified as Point 5-9B (2S-7S, 9S, 11S-17S), constructed in 1924, with a combined nominal capacity of 24,842 tons; all equipped with one (1) fabric filter (FF 5-9, baghouse 808L) to control particulate matter. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(k) One (1) silo, identified as Point 5-10 (8S), constructed in 1924 and modified in 1999, with a nominal capacity of 5420 tons, equipped with one (1) fabric filter system (FF 5-10, baghouse 807L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(l) One (1) silo, identified as Point 5-11 (10S), constructed in 1924 and modified in 1999, with a nominal capacity of 5420 tons, equipped with one (1) fabric filter system (FF 5-11, baghouse 810L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(m) Four (4) Group 3 silos, identified as Point 5-13 (26S, 27S, 28S, and 29S), constructed in 1924 and modified in 1999, with a nominal capacity of 2,736 tons each, equipped with one (1) fabric filter system (FF 5-13, baghouse 27DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(n) Three (3) Group 3 silos, identified as Point 5-14 (18S, 20S, 22S), constructed in 1924 and modified in 1999, with a nominal capacity of 3,112 tons each, equipped with one (1) fabric filter system (FF 5-14, baghouse 22DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(o) Two (2) Group 3 silos, identified as Point 5-15 (24S, 30S), constructed in 1924 and modified in 1999, with a nominal capacity of 2,780 tons each, equipped with one (1) fabric filter system (FF 5-15, baghouse 24DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(p) Four (4) Group 3 silos, identified as Point 5-17 (19S, 21S, 23S, 25S), constructed in 1924 and modified in 1999, with a nominal capacity of 2,736 tons each, equipped with one (1) fabric filter system (FF 5-17, baghouse 25DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(q) One (1) screen elevator, identified as Point 5-18 (829V2), constructed before 1971, with a nominal capacity of 40 tons per hour, covered by a building enclosure (BE 5-18) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(r) One (1) elevator, identified as Point 5-19 (829V1), constructed before 1971, with a nominal capacity of 40 tons per hour, covered by a building enclosure (BE 5-19) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(s) Two (2) bulk tanks, identified as Point 5-23A (831F, 833F), with a nominal capacity of 20 tons each; and one (1) truck loader, identified as Point 5-23C, with a nominal capacity of 40 tons per hour; all constructed before 1971 and modified in 1999, except for 831V2 which was constructed in 2003, and equipped with one (1) fabric filter system (FF 5-23, baghouse 833L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(t) Three (3) bulk tanks, identified as Point 5-24A (832F, 834F, 835F), with a nominal capacity of 20 tons each, constructed before 1950 and modified in 1999, and equipped with one (1) fabric filter system (FF 5-24, baghouse 835L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(u) One (1) silo, identified as Point 5-26A (782F), with a nominal capacity of 2,430 tons; and one (1) bucket elevator, identified as Point 5-26B (781V), with a nominal capacity of 500 tons per hour; all constructed on December 1, 2000, and equipped with one (1) fabric filter system (FF 5-26, baghouse 782L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(v) One (1) lump breaker, identified as Point 5-27B (783V3); one (1) spout, identified as Point 5-27C (785L); and one (1) truck loader, identified as Point 5-27D; all constructed on December 1, 2000, with a nominal capacity of 500 tons per hour each, and equipped with one (1) fabric filter system (FF 5-27, baghouse 783L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(w) One (1) lump breaker, identified as Point 5-28B (784V3); one (1) spout, identified as Point 5-28C (786L); and one (1) truck loader, identified as Point 5-28D; all constructed on December 1, 2000, with a nominal capacity of 500 tons per hour each, and equipped with one (1) fabric filter system (FF 5-28, baghouse 784L) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(x) Five (5) screw conveyors, identified as Point 5-30B (755V, 759V-762V), constructed in 1978; six (6) rotary feeders, identified as Point 5-30C (755M-760M), constructed in 1978; and one (1) hopper, identified as Point 5-30D (750F), constructed before August 17, 1971; with a nominal capacity of 40 tons per hour each, covered by a building enclosure (BE 5-30) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(y) Nineteen (19) screw conveyors, identified as Point 5-33A (818V1-825V1, 818V2-825V2, 828V1, 828V2, 830V); and three (3) screen screws, identified as Point 5-33B (806V, 829V4, 830V1); all constructed before 1950, with a nominal capacity of 40 tons per hour each, and covered by a building enclosure (BE 5-33) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(9) One (1) blend facility, consisting of the following units:

(a) Five (5) screw conveyors, identified as Point 5-35A (22SC, 24SCG, 24SC, 30SC, 31SC), all constructed in 1989, with a nominal capacity of 40 tons per hour each, covered by a building enclosure (BE 5-35) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(b) One (1) transfer pod, identified as Point 5-36 (22) constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-36, filter 22-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(c) One (1) transfer pod, identified as Point 5-37 (24-G), constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-37, filter 24-PVDC-G) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(d) One (1) transfer pod, identified as Point 5-38 (24), constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-38, filter 24-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(e) One (1) transfer pod, identified as Point 5-39 (30), constructed in August 1989, with a nominal area of 25 cubic feet, equipped with one (1) fabric filter system (FF 5-39, filter 30-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(f) One (1) receiving tank, identified as Point 5-40, constructed in August 1989, with a nominal capacity of 20 tons, equipped with one (1) fabric filter system (FF 5-40, baghouse 40-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(g) One (1) blending tank, identified as Point 5-41A, with a nominal capacity of 20 tons; and one (1) blending pod, identified as Point 5-41C, with a nominal capacity of 25 cubic feet; all constructed in August 1989, equipped with one (1) fabric filter system (FF 5-41, baghouse 41-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(h) Two (2) silos, identified as Point 5-42 (50S, 51S), constructed August 1989, with a nominal capacity of 175 tons each, equipped with one (1) fabric filter system (FF 5-42, baghouse 50-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(i) Two (2) silos, identified as Point 5-43 (52S, 53S), constructed August 1989, with a nominal capacity of 175 tons each, equipped with one (1) fabric filter system (FF 5-43, baghouse 53-DC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(j) One (1) transfer pod, identified as Point 5-44B (50PV), constructed in August 1989, with a nominal capacity of 40 tons per hour, equipped with one (1) fabric filter system (FF 5-44, filter 50-PVDC) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(10) Packhouse operations consisting of the following:

(a) One (1) elevator, identified as Point 6-1A (838V), constructed in 1945; one (1) packer bin, identified as Point 6-1B (Bin #1), constructed in 1946; one (1) packing machine, identified as Point 6-1C (842LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-1D (842F, 842FA), constructed in 1946; two (2) rotary feeders, identified as Point 6-1E (842M, 842MA), constructed in 1946; and four (4) screw conveyors, identified as Point 6-1F (842LV1, 837V, 837V1, 831V2), constructed in 1945; all modified in 1999, with a nominal capacity of 34 tons per hour each, and equipped with one (1) fabric filter system (FF 6-1, baghouse 842L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(b) One (1) elevator, identified as Point 6-2A (838V1), constructed in 1945; one (1) packer bin, identified as Point 6-2B (Bin #2), constructed in 1946; one (1) packing machine, identified as Point 6-2C (843LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-2D (843F, 843FA), constructed in 1945; two (2) rotary feeders, identified as Point 6-2E (843M, 843MA), constructed before 1971; and four (4) screw conveyors (843LV1, 817V1, 817V3, 817V7), identified as Point 6-2G; constructed in 1945; all modified in 1999, with a nominal capacity of 46 tons per hour each, and equipped with one (1) fabric filter system (FF 6-2, baghouse 843L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(c) One (1) elevator, identified as Point 6-3A (838V2), constructed in 1945; one (1) packer bin, identified as Point 6-3B (Bin #3), constructed in 1946; one (1) packing machine, identified as Point 6-3C (844LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-3D (844F, 844FA), constructed in 1945; two (2) rotary feeders, identified as Point 6-3E (844M, 844MA), constructed before 1971; and one (1) screw conveyor, identified as Point 6-3F (844LV1), constructed before 1971; all modified in 1999, with a nominal capacity of 65 tons per hour each, and equipped with one (1) fabric filter system (FF 6-3, baghouse 844L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(d) One (1) elevator, identified as Point 6-4A (838V3), constructed in 1945; one (1) packer bin, identified as Point 6-4B (Bin #4), constructed in 1946; one (1) packing machine, identified as Point 6-4C (845LF), constructed in 1945; two (2) circulating tanks, identified as Point 6-4D (845F, 845FA), constructed in 1945; two (2) rotary feeders, identified as Point 6-4E (845M, 845MA), constructed before 1971; and one (1) screw conveyor, identified as Point 6-4F (845LV1), constructed before 1971; all modified in 1999, with a nominal capacity of 40 tons per hour each, and equipped with one (1) fabric filter system (FF 6-4, baghouse

845L) for particulate control. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(e) Fourteen (14) conveyors, identified as Point 6-5 (842V-846V, 848V, 845V1, 847V1, 847V2, 848V1, 848V2, 849V1, 849V2, 849V3), constructed before 1971, with a nominal capacity of 185 tons per hour each, covered by a building enclosure (BE 6-5) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(f) Two (2) palletizers, identified as Point 6-6 (900H, 901H), constructed before 1971, with a nominal capacity of 185 tons per hour each, covered by a building enclosure (BE 6-6) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(g) One (1) truck loader, identified as Point 6-7, constructed before 1971, with a nominal capacity of 185 tons per hour, covered by a building enclosure (BE 6 7) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(11) One (1) truck unloading silo, identified as Tank 9 (240F), constructed in 2007, for unloading and pneumatically conveying alternative fuel (spent pot liner) to a silo, with a maximum throughput capacity of 33 tons per hour, with a maximum storage capacity of 700 tons, with particulate emissions controlled by a dust collector (identified as 240L), and exhausting to stack 240L. This is an affected facility under 40 CFR 63, Subpart LLL.

(12) One (1) enclosed pneumatic conveyance system, identified as 241F, constructed in 2007, for pneumatically conveying alternative fuel (spent pot liner) from the silo to the cement kiln, with a maximum throughput capacity of four (4) tons per hour, with particulate emissions controlled by a bin vent filter (identified as 241L), and exhausting to stack 241L. This is an affected facility under 40 CFR 63, Subpart LLL.

(13) One (1) portable screen and conveyor unit for the sizing of plant materials with a nominal throughput of 100 tons per hour, including reclamation of partially formatted clinker product, including the following units:

(a) One (1) vibrating feeder (F3-33)
(b) One (1) portable vibrating screen (S3-34)
(c) One (1) conveyor belt (S3-34)
(d) Hauling (F3-32)
(e) Handling (F3-32a)

Under 40 CFR 60, Subpart OOO, this is considered an affected facility. Under 40 CFR 63, Subpart LLL, the portable screen and conveyor units are considered affected facilities while the units are reworking partially formatted clinker.

(14) One (1) portable impact crushing plant, for the reclamation of partially formatted clinker and the resizing of aggregate prior to the raw material pile feeding the raw mill system, approved in 2014 for construction, with a nominal throughput of 100 tons per hour, bottlenecked by the raw material feed system, particulate matter and opacity controlled by water mist spray, containing the following processes:

(a) Handling (PF3-37a);
(b) One (1) vibrating feeder (PF3-38);
(c) One (1) optional screen;
(d) One (1) portable crusher (PC3-38);

(e) Two (2) conveyor belts (PS3-39) consisting of one main conveyor and one side conveyor;
(f) Two (2) open reclaimed clinker storage piles; and
(g) Two (2) open resized aggregate storage piles.

Under 40 CFR 63, Subpart LLL, the open reclaimed clinker storage piles are considered affected facilities while the units are reworking partially formatted clinker.

Under 40 CFR 60, Subpart OOO, the following portions of the portable impact crushing plant are affected facilities while resizing aggregate prior to the raw material pile feeding the raw mill system: handling, vibrating feeder, screening, crusher, conveyor transfer points, and aggregate storage piles.

Insignificant Activities

(1) One (1) outdoor clinker storage pile, constructed in 1966, with a throughput of 100 tons of clinker per hour. Under 40 CFR 63, Subpart LLL, this is an affected facility.

Nonapplicable portions of the 40 CFR 63, Subpart LLL will not be included in the permit. The facilities listed above are subject to the following portions of 40 CFR 63, Subpart LLL:

(1) 40 CFR 63.1340(a), (b)(2 through 9), (c), and (d);
(2) 40 CFR 63.1341;
(3) 40 CFR 63.1342;
(4) 40 CFR 63.1343(a), (b)(1), (c), (d)
(5) 40 CFR 63.1345;
(6) 40 CFR 63.1347;
(7) 40 CFR 63.1348(a)(1, 2, and 4), (b)(1, 2, 3, 6, and 9), (c), and (d);
(8) 40 CFR 63.1349(a), (b)(1, 2, 4, and 7), (c), (d), and (e);
(9) 40 CFR 63.1350(a)(1, 3, and 4), (b), (d), (f), (i), and (m);
(10) 40 CFR 63.1351(a)(1), (b), (c), (d), and (e);
(11) 40 CFR 63.1352(b);
(12) 40 CFR 63.1353;
(13) 40 CFR 63.1354(a), (b)(1, 2, 3, 6, 7, 8, 9, and 10), (c);
(14) 40 CFR 63.1355(a), (b), (c), (f), (g), and (h);
(15) 40 CFR 63.1356;
(16) 40 CFR 63.1358; and
(17) Table 1.

The provisions off 40 CFR 63, Subpart A – General Provisions, which are incorporated by reference in 326 IAC 20-1, apply to the facilities described in this section except when otherwise specified in 40 CFR 63, Subpart LLL.

(t) **40 CFR 63, Subpart EEEE (National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline) (326 IAC 20-83):** The provisions of 40 CFR 63, Subpart EEEE apply to an organic liquid distribution operation that is located or is part of a major source of hazardous air pollutants. 40 CFR 63, Subpart EEEE defines an organic liquid distribution operation as the combination of activities and equipment used to store or transfer organic liquids into, out of, or within a plant site regardless of the specific activity being performed. The solids blending operation meets the definition of an organic liquids distribution operation; however, 40 CFR 63, Subpart EEEE excludes hazardous waste from the definition of an organic liquid. Therefore, the provisions of 40 CFR 63, Subpart EEEE are not included in the permit.

State Rule Applicability Determination

The following state rules are applicable to the source due to the modification:

326 IAC 1-5-2 (Emergency Reduction Plans)
This source is subject to 326 IAC 1-5-2.

326 IAC 1-7 (Stack Height Provisions)
This rule applies to all sources having exhaust gas stacks through which a potential of twenty-five (25) tons per year or more of particulate matter (PM) or sulfur dioxide (SO2) are emitted. This source has stacks with potential emissions of particulate matter (PM) and sulfur dioxide (SO2) in excess of twenty-five tons per year. Therefore, the provisions of 326 IAC 1-7 are included in the permit.

326 IAC 2-2 (Prevention of Significant Deterioration (PSD))
PSD applicability is discussed under the Permit Level Determination – PSD section.

326 IAC 2-4.1 (Major Sources of Hazardous Air Pollutants (HAP))
Pursuant to 326 IAC 2-4.1-1(b)(2), the requirements of 326 IAC 2-4.1-1 do not apply to a major source specifically regulated, or exempt from regulation, by a standard issued pursuant to Section 112(d), 112(h), or 112(j) of the CAA. The blend box, hydrapulper, mix tanks T12 and T13, and the tank farm consisiting of T1 through T8, T10, and T11 are subject to 40 CFR 63, Subpart DD (National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations). In addition, the hydrapulper, and mix tanks T12 and T13 do not have have a potential to emit of a single HAP of 10 ten tons per year or more or the potential to emit of a combination of HAP of 25 tons per year or more. Therefore the provisions of 326 IAC 2-4.1 are not included in the permit.

326 IAC 2-6 (Emission Reporting)
This source is subject to 326 IAC 2-6 (Emission Reporting) because it is required to have an operating permit pursuant to 326 IAC 2-7 (Part 70). The potential to emit of PM10 is greater than 250 tons per year, and the potential to emit of CO, NOx, and SO2 are greater than 2,500 tons per year. Therefore, pursuant to 326 IAC 2-6-3(a)(1), annual reporting is required. This determination was made under Part 70 Operating Permit Renewal T133-33667-00002. An emission statement shall be submitted by July 1, 2016, and every year thereafter. The emission statement shall contain, at a minimum, the information specified in 326 IAC 2-6-4.

326 IAC 2-7-6(5) (Annual Compliance Cerification)
The U.S. EPA Federal Register 79 FR 54978 notice does not exempt Title V Permittees from the requirements of 40 CFR 70.6(c)(5)(iv) or 326 IAC 2-7-6(5)(D), but the submittal of the Title V annual compliance certification to IDEM satisfies the requirement to submit the Title V annual compliance certifications to EPA. IDEM does not intend to revise any permits since the requirements of 40 CFR 70.6(c)(5)(iv) or 326 IAC 2-7-6(5)(D) still apply, but Permittees can note on their Title V annual compliance certification that submission to IDEM has satisfied reporting to EPA per Federal Register 79 FR 54978. This only applies to Title V Permittees and Title V compliance certifications.

326 IAC 5-1 (Opacity Limitations)
This source is subject to the opacity limitations specified in 326 IAC 5-1-2(1).

326 IAC 6.5 PM Limitations Except Lake County
This source is not subject to 326 IAC 6.5 because it is not located in one of the following counties: Clark, Dearborn, Dubois, Howard, Marion, St. Joseph, Vanderburgh, Vigo or Wayne.

326 IAC 6.8 PM Limitations for Lake County
This source is not subject to 326 IAC 6.8 because it is not located in Lake County.

326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)
The hydrapulper and blend box have a negligible potential to emit of particulate matter (PM). Pursuant to 326 IAC 6-3-1(b)(14), manufacturing processes with potential emissions of less than 0.551 pound per hour are exempt from the provisions of 326 IAC 6-3-2. Therefore, the provisions of 326 IAC 6-3-2 are not included in the permit for the hydrapulper or the blend box.

326 IAC 6-4 (Fugitive Dust Emissions)
This rule applies to all sources of fugitive dust. Therefore, the requirements of 326 IAC 6-4 are included in the permit. The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions). 326 IAC 6-4-2(4) is not federally enforceable.

326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)
The provisions of 326 IAC 6-5 apply to any source of fugitive particulate matter (PM) emissions located in nonattainment areas for particulate matter, as designated by the Air Pollution Control Board, which has potential fugitive PM emissions of twenty-five (25) tons per year or more, including the areas listed under 326 IAC 6-5(a)(1) and (a)(2). This rule also applies to new sources of fugitive PM emissions, located anywhere in the state, and requiring a permit per 326 IAC 2, which has not received all the necessary preconstruction approvals before December 13, 1985. Lone Star Industries, Inc. received its initial construction permit in 1994 and it has potential fugitive PM emissions of twenty-five tons per year or more. Therefore, the provisions of 326 IAC 6-5 are included in the permit and a fugitive dust control plan is included as Attachment A to the permit.

326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations)
The provisions of 326 IAC 7-1.1 apply to all emission units with a potential to emit twenty-five (25) tons per year or ten (10) pounds per hour of sulfur dioxide. None of the emission units proposed as part of this modification have a potential to emit SO2 of 25 TPY or more. Therefore, the provisions of 326 IAC 7-1.1 are not included in the permit for the new emission units.

326 IAC 8-1-6 (New Facilities, General Reduction Requirements)
The provisions of 326 IAC 8-1-6 are applicable to new facilities as of January 1, 1980, that have potential emissions of twenty-five (25) tons per year or more of VOC, are located anywhere in the state, and are not otherwise regulated by another Article 8 rule, 326 IAC 20-48 (Emission Standards for Hazardous Air Pollutants for Boat Manufacturing), or 326 IAC 20-56 (Reinforced Plastic Composites Production). 326 IAC 8-1-6 requires source subject to the rule to reduce VOC emissions using the Best Available Control Technology (BACT).

The new facilities added to the permit include the hydrapulper and two 10,000 gallon slurry mix tanks. The hydrapulper is a batch process used to mix solids with liquid hazardous waste to create slurry used as a waste fuel in the kilns. The mix tanks are intermediate storage tanks to buffer flow between the hydrapulper and the tank farm. Either tank can be used to store mixed fuel from the hydrapulper to perform quality control checks or cutting liquid from the tank farm to be used in the hydrapulper. The hydrapulper does not have to use the slurry mix tanks and can pump directly to the tank farm. IDEM, OAQ determined the hydrapulper and each slurry mix tank is an individual facility for purposes of 326 IAC 8-1-6 (BACT). Potential VOC emissions before control from each unit are shown below:

Hydrapulper	8.91	TPY
Slurry Tank 1/2	9.58	TPY, each maximum

Potential VOC emissions from the hydrapulper and each slurry mix tank are less than twenty-five (25) tons per year. Therefore, the provisions of 326 IAC 8-1-6 are not included in the permit for the mix tanks or the hydrapulper.

326 IAC 8-4-3 (Petroleum Liquid Storage Facilities)
The provisions of 326 IAC 8-4-3 all to all petroleum liquid storage vessels with capacities greater than one hundred fifty thousand (150,000) liters or thirty-nine thousand (39,000) gallons containing volatile organic compounds whose true vapor pressure is greater than 1.52 psi.
326 IAC 8-9-3 defines "petroleum liquid" as petroleum, condensate, and any finished or intermediate products manufactured in a petroleum refinery. Condensate is defined in 326 IAC 8-4-3 as hydrocarbon liquid separated from natural gas which condenses due to changes in the temperature and/or pressure and remains liquid at standard conditions. This source contains the following storage tanks:

Summary of Storage Tanks Contained in the Modification			
Emission Unit	**Construction Date**	**Volume (gallons)**	**Contents**
Tank T1	1988	25,000	liquid organic waste
Tank T2	1988	25,000	liquid organic waste
Tank T3	2015	25,000	liquid organic waste
Tank T4	2015	25,000	liquid organic waste
Tank T5	2015	25,000	liquid organic waste
Tank T6	2015	25,000	liquid organic waste
Tank T7	2012	150,000	liquid organic waste
Tank T8	1999	100,000	liquid organic waste
Tank T10	2009	150,000	liquid organic waste
Tank T11	2009	150,000	liquid organic waste
Tank T12	Proposed	10,000	liquid organic waste
Tank T13	Proposed	10,000	liquid organic waste

Tanks T7, T8, T10, and T11 have storage capacities greater than 39,000 gallons. However, the tanks contain liquid organic waste and not petroleum liquid. Therefore, the provisions of 326 IAC 8-4-3 are not included in the permit.

326 IAC 8-5 (Miscellaneous Operations)
The provisions of 326 IAC 8-5 are applicable to facilities or sources engaged in asphalt paving, synthesized pharmaceutical manufacturing, pneumatic rubber tire manufacturing, graphic arts operations, and fuel grade ethanol production at dry mills. Lone Star Industries, Inc. is not engaged in any of the activities regulated under 326 IAC 8-5. Therefore, the provisions of 326 IAC 8-5 are not included in the permit.

326 IAC 8-6 (Organic Solvent Emission Limitations)
The provisions of 326 IAC 8-6 apply to existing sources as of January 1, 1980, located in Lake and Marion County, with potential emissions of 100 tons of VOC per year and not limited by another Article 8 rule. This rule also applies to sources commencing operations after October 7, 1974, and prior to January 1, 1980, located anywhere in the state, with potential emissions of 100 tons of VOC per year and not limited by another Article 8 rule. This source is located in Putnam County and was constructed prior to October 7, 1974. Therefore, the provisions of 326 IAC 8-6 are not included in the permit.

326 IAC 8-9 (Volatile Organic Liquid Storage Vessels)
The provisions of 326 IAC 8-9 apply to stationary storage vessels used to store volatile organic liquids (VOL) constructed on and after October 1, 1995, and located in Clark, Floyd, Lake or Porter Counties. This source is located in Putnam County. Therefore, the provisions of 326 IAC 8-9 are not included in the permit.

326 IAC 12 (New Source Performance Standards)
This rule incorporates by reference the requirements of 40 CFR 60. See the Federal Rule Applicability section for the New Source Performance Standards applicable to this facility.

326 IAC 14 (Emission Standards for Hazardous Air Pollutants)
This rule incorporates by reference the requirements of 40 CFR 61. See the Federal Rule Applicability section for the National Emission Standards for Hazardous Air Pollutants (NESHAP) applicable to this facility.

326 IAC 20 (Hazardous Air Pollutants)
This rule incorporates by reference the requirements of 40 CFR 63. See the Federal Rule Applicability section for the National Emission Standards for Hazardous Air Pollutants (NESHAP) applicable to this facility.

Compliance Determination and Monitoring Requirements

Permits issued under 326 IAC 2-7 are required to ensure that sources can demonstrate compliance with all applicable state and federal rules on a continuous basis. All state and federal rules contain compliance provisions; however, these provisions do not always fulfill the requirement for a continuous demonstration. When this occurs, IDEM, OAQ, in conjunction with the source, must develop specific conditions to satisfy 326 IAC 2-7-5. As a result, Compliance Determination Requirements are included in the permit. The Compliance Determination Requirements in Section D of the permit are those conditions that are found directly within state and federal rules and the violation of which serves as grounds for enforcement action.

If the Compliance Determination Requirements are not sufficient to demonstrate continuous compliance, they will be supplemented with Compliance Monitoring Requirements, also in Section D of the permit. Unlike Compliance Determination Requirements, failure to meet Compliance Monitoring conditions would serve as a trigger for corrective actions and not grounds for enforcement action. However, a violation in relation to a compliance monitoring condition will arise through a source's failure to take the appropriate corrective actions within a specific time period.

The bulk solids off-loading and blending systems are subject to compliance monitoring and compliance determination requirements under 40 CFR 63, Subpart DD and 40 CFR 61, Subpart V. The Permittee has accepted a PSD minor limit to limit VOC input to the bulk solids off-loading and blending systems that demonstrates the potential to emit VOC of the modification is less than 40 tons per year before controls. Therefore, IDEM, OAQ has not included any supplemental compliance monitoring or compliance determination requirements other than those contained in the NESHAP.

Proposed Changes

The changes listed below have been made to Part 70 Operating Permit No. T133-33667-00002. Deleted language appears as ~~strikethroughs~~ and new language appears in **bold**:

Modification #1

Baghouse 500 L Modification
Lone Star Industries requested the removal of baghouse 500L controlling the bucket elevator in the clinker cooler operation (Point 3-22 (500V)). This bucket elevator feeds outside clinker to the clinker storage silos 501A through 507A. The silos are under negative pressure and dust from the bucket elevator is naturally drawn into the silos which are controlled by baghouse 503L and 503L1. The bucket elevator is subject to a PSD BACT limitation in Condition D.1.1(a) and a PM emission limitation under 326 IAC 6-3-2 in Condition D.1.3 as are the clinker storage silos 501A through 507A. The bucket elevator remains subject to the 326 IAC 2-2 (PSD BACT) limit, which was determined to be control by baghouse to achieve a PM emission limit of 0.28 lb/hr (0.010 gr/dscf) and a PM10 emission limitation of 0.28 lb/hr (0.010 gr/dscf). IDEM, OAQ is revising the control device identifier from baghouse 500L to baghouse 503L and 503L1. Revisions to the permit to accommodate this change are shown below:

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(14)]

This stationary source consists of the following emission units and pollution control devices:

****

(i) Clinker Cooler Operations, with a nominal capacity of 208 tons of clinker per hour:

****

(5) One (1) bucket elevator, identified as Point 3-22 (500V), constructed on October 1, 1999, with a nominal capacity of 250 tons per hour, equipped with one (1) fabric filter system (FF 3-**14**~~22~~, baghouse**s 503L and 503L1**~~500L~~) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source. **********

SECTION D.1 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description: **********

(i) Clinker Cooler Operations, with a nominal capacity of 208 tons of clinker per hour:

****

(5) One (1) bucket elevator, identified as Point 3-22 (500V), constructed on October 1, 1999, with a nominal capacity of 250 tons per hour, equipped with one (1) fabric filter system (FF 3-**14**~~22~~, baghouse**s 503L and 503L1**~~500L~~) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

****

D.1.1 PSD BACT Limit [326 IAC 2-2-3]

(a) Pursuant to CP133-10159-00002, issued on April 16, 1999, T113-6927-00002, issued April 14, 2004, and 326 IAC 2-2-3 (Prevention of Significant Deterioration BACT), the following limitations apply: **********

Operation	Units	Emission Point	Filterable PM Limits	Filterable PM10 Limits
Clinker Cooler	**********	**********	**********	**********
	**********	**********	**********	**********
	**********	**********	**********	**********
	**********	**********	**********	**********
	one (1) bucket elevator (500V)	FF 3-**14**~~22~~ (~~500L~~**503L and 503L1**)	0.010 gr/dscf 0.28 lbs/hr	0.010 gr/dscf 0.28 lbs/hr

****

D.1.3 Particulate Emission Limitations [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the following facilities shall be limited as follows when operating at the listed process weight rate: **********

Operations	Process Weight Rate (ton/hr) (P)	Allowable Emissions For All Units Combined (lbs/hour) (E)
**********	**********	**********
Clinker Cooler Operations, excluding the units venting through baghouses 471CL, 406L, 506L, ~~500L,~~ 503L, and 503L1	208	58.9
**********	**********	**********

****

D.1.21 Visible Emissions Notations [40 CFR 64]

(a) Visible emission notations of raw material baghouse/dust collector exhausts (208L, 208L1, 209L, 210L, 202320, 202345, and 202380), raw material ball mill operation (350L, 352L), the fly ash storage activities (274L, 270L, 271L, 273L and 319L), coal mill operation stack exhausts (420L1, 420L2, 435L, 436L, 438L), the kiln operations (403L, 483L, 480L), excluding the kiln exhaust stack (3-1), clinker cooler operation stack exhausts (406L, 506L, ~~500L,~~ 220L, 503L, 503L1, and 221L), the finish mill operations, the cement storage, loading, and packaging activities, the blend facility, and the packhouse operations stack exhausts shall be performed once per day during normal daylight operations. **********

D.1.22 Parametric Monitoring [40 CFR 64]

(a) The Permittee shall record the pressure drop across the baghouses used in conjunction with the operations listed below at least once per day when those processes are in operation. When for any one reading, the pressure drop across a baghouse is outside the normal range listed below~~,~~**:**

Emission Unit	Control	Range
**********	**********	**********
Clinker cooler	406L, 506L, ~~500L,~~ 471-CL, 220L, 503L, 503L1, 221L	1.0 to 8.0 inches
**********	**********	**********

SECTION E.4 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **********

(i) Clinker Cooler Operations, with a nominal capacity of 208 tons of clinker per hour:

****

(5) One (1) bucket elevator, identified as Point 3-22 (500V), constructed on October 1, 1999, with a nominal capacity of 250 tons per hour, equipped with one (1) fabric filter system (FF 3-**14**~~22~~, baghouse**s 503L and 503L1**~~500L~~) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source. **********

Modification #2

Baghouse 828L Addition
Lone Star Industries, Inc. requested the addition of a new dust collector to control particulate emissions from a previously uncontrolled emission unit. The Cement Storage, Loading, and Packaging area is now controlled by dust collector 828L. Revisions to the permit as a result of this request are shown below:

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(14)]

This stationary source consists of the following emission units and pollution control devices:

****

(k) Cement Storage, Loading, and Packaging Activities: **********

(17) One (1) screen elevator, identified as Point 5-18**A** (829V2), constructed before 1971, with a nominal capacity of 40 tons per hour, ~~covered by a building enclosure (BE 5-18) to control~~ particulate emissions **controlled by dust collector 828L**. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(18) One (1) elevator, identified as Point 5-19**B** (829V1), constructed before 1971, with a nominal capacity of 40 tons per hour, ~~covered by a building enclosure (BE 5-18) to control~~ particulate emissions **controlled by dust collector 828L**. Under 40 CFR 63, Subpart LLL, this is considered an affected source. **********

(25) **Seventeen (17)**~~Nineteen (19)~~ screw conveyors, identified as Point 5-33A (818V1-825V1, 818V2-825V2, ~~828V1, 828V2,~~ 830V) **covered by a building enclosure (BE 5-33) to control particulate emissions**; **Two (2) screw conveyors, identified as Point 5-18C (828V1, 828V2), particulate emissions controlled by a dust collector 828L;** **********

SECTION D.1 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description: **********

(k) Cement Storage, Loading, and Packaging Activities: **********

(17) One (1) screen elevator, identified as Point 5-18**A** (829V2), constructed before 1971, with a nominal capacity of 40 tons per hour, ~~covered by a building enclosure (BE 5-18) to control~~ particulate emissions **controlled by dust collector 828L**. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(18) One (1) elevator, identified as Point 5-19**B** (829V1), constructed before 1971, with a nominal capacity of 40 tons per hour, ~~covered by a building enclosure (BE 5-18) to control~~ particulate emissions **controlled by dust collector 828L**. Under 40 CFR 63, Subpart LLL, this is considered an affected source. **********

(25) **Seventeen (17)**~~Nineteen (19)~~ screw conveyors, identified as Point 5-33A (818V1-825V1, 818V2-825V2, ~~828V1, 828V2,~~ 830V) **covered by a building enclosure (BE 5-33) to control particulate emissions**; **Two (2) screw conveyors, identified as Point 5-18C (828V1, 828V2), particulate emissions controlled by a dust collector 828L;** **********

SECTION E.4 FACILITY OPERATION CONDITIONS

Emissions Unit Description: **********

(k) Cement Storage, Loading, and Packaging Activities: **********

(17) One (1) screen elevator, identified as Point 5-18**A** (829V2), constructed before 1971, with a nominal capacity of 40 tons per hour, ~~covered by a building enclosure (BE 5-18) to control~~ particulate emissions **controlled by dust collector 828L**. Under 40 CFR 63, Subpart LLL, this is considered an affected source.

(18) One (1) elevator, identified as Point 5-19**B** (829V1), constructed before 1971, with a nominal capacity of 40 tons per hour, ~~covered by a building enclosure (BE 5-18) to control~~ particulate emissions **controlled by dust collector 828L**. Under 40 CFR 63, Subpart LLL, this is considered an affected source. **********

(25) **Seventeen (17)**~~Nineteen (19)~~ screw conveyors, identified as Point 5-33A (818V1-825V1, 818V2-825V2, ~~828V1, 828V2,~~ 830V) **covered by a building enclosure (BE 5-33) to control particulate emissions**; **Two (2) screw conveyors, identified as Point 5-18C (828V1, 828V2), particulate emissions controlled by a dust collector 828L;** and three (3) screen screws, identified as Point 5-33B (806V, 829V4, 830V1); all constructed before 1950, with a nominal capacity of 40 tons per hour each, and covered by a building enclosure (BE 5-33) to control particulate emissions. Under 40 CFR 63, Subpart LLL, this is considered an affected source. **********

Modification #3

Baghouse 606L Monitoring
Finally, Lone Star Industries, Inc. requested a modification to the differential pressure range used for parametric monitoring of baghouse 606L. The current permit lists a default pressure range of 1.0 to 8.0 inches of water. The baghouse typically operates between 0.25 and 7.25 inches of water. Revisions are shown below:

D.1.22 Parametric Monitoring [40 CFR 64]

(a) The Permittee shall record the pressure drop across the baghouses used in conjunction with the operations listed below at least once per day when those processes are in operation. When for any one reading, the pressure drop across a baghouse is outside the normal range listed below**:**~~,~~

Emission Unit	Control	Range
**********	**********	**********
Finish Mill	**606L**	**0.25 to 7.25 inches**
	505L, 504L, 507L, 513L, 515L, 670L, 671L, 672L, 516L, 617L, 613L, ~~606L,~~ 605L, 636L, 603L, 602L, 660L, 661L, 665L~~,~~	1.0 to 8.0 inches
	664L	2.0 to 10.0 inches
**********	**********	**********

Modification #4

Emission Unit Descriptions - Section A.2

Original Condition A.2 was revised to add the emission units proposed by this modification. IDEM, OAQ has consolidated all existing emission units associated with the blending of fuel into the solids management description. Revisions are shown below:

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(14)]

This stationary source consists of the following emission units and pollution control devices:

****

~~(n) Above-ground, liquid organic waste tanks, with VOC and HAP emissions controlled by an existing vapor balancing system and a closed vent, carbon adsorption vapor system that exhausts to the existing tank farm stack identified as S-001. Under 40 CFR 60, Subpart Kb, 40 CFR 61, Subpart FF and 40 CFR 63, Subpart DD, these units are each considered affected facilities.~~

~~(1) Tanks 1 and 2, constructed in 1988, each with a nominal storage capacity of 23,689 gallons.~~
~~(2) Tanks 3 through 6, approved in 2014 for construction, each with a nominal storage capacity of 23,689 gallons.~~
~~(3) Tank 7, constructed in 2012, with a nominal storage capacity of 150,000 gallons.~~
~~(4) Tank 8 (Burn Tank #8) constructed in 1999, with a nominal storage capacity of 90,848 gallons.~~
~~(5) Tanks 10 and 11, constructed in 2009, each with a nominal storage capacity of 150,000 gallons.~~

(~~o~~**n**) **********

(~~p~~**o**) **********

(~~q~~**p**) **********

~~(r) Blending operations for bulk hazardous highly viscous or solid materials, such as sludge filter cake or remediation wastes for processing at either of two existing load out pads (A or B). Emissions are controlled by a combination of closed vent vapor balancing between vessels (storage tanks and unloading trucks) and ultimately through the cement kiln or carbon vapor adsorption system through the existing tank farm. Under 40 CFR 61, Subpart FF and 40 CFR Part 63, Subpart DD, this is considered an affected source.~~

(~~s~~**q**) **********

(r) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001. The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(1) One (1) hydrapulper, approved in 2016 for construction, identified as HP-02, with a nominal vessel volume of 2,500 gallons, and process volume of 2,250 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(i) One (1) waste feed hopper loaded from roll-off bulk containers, approved in 2016 for construction, identified as HP-01, with a nominal storage capacity of 25 yd^3 or 5,000 gallons of solids. Solids are transferred out of the hopper by an enclosed feed auger with a nominal capacity of 800 cubic feet of solids per hour. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Two (2) organic liquid slurry mix tanks, approved in 2016 for construction, identified as tank T12 and tank T13, each with a nominal storage capacity of 10,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(2) One (1) process permitted to blend solids in containers on loadout pads A or B, with hydraulic drives and agitators installed in 2012, identified as blend box, with a nominal vessel volume of 25 yd^3 (5,714 gallons), and a batch volume of 3,910 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(3) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(4) Three (3) liquid organic loadout areas consisting of three concrete pads, identified as Pad A and Pad B, both constructed in 1986, and Pad C, constructed in 1994.

(5) Fugitive VOC and HAP emissions from waste receiving, pumps, valves, connectors. [40 CFR 61, Subpart V]

A.3 Specifically Regulated Insignificant Activities [326 IAC 2-7-1(21)] [326 IAC 2-7-4(c)] [326 IAC 2-7-5(14)]

This stationary source also includes the following insignificant activities which are specifically regulated, as defined in 326 IAC 2-7-1(21): **********

(m) ~~Equipment leaks from each of the following equipment at this source, which are intended to operate in volatile hazardous air pollutant (VHAP) service: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems required by this subpart. Under 40 CFR 61, Subpart V, process units with equipment leaks are considered affected facilities.~~

~~(n)~~ One (1) outdoor clinker storage pile, constructed in 1966, with a throughput of 100 tons of clinker per hour. Under 40 CFR 63, Subpart LLL, this is an affected facility.

Modification #5

Emission Unit Descriptions - Section D.1
The emission unit description box in Section D.1 was revised to include the consolidated solids blending operation emission unit description. Revisions are shown below:

SECTION D.1 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description:

****

~~(n)~~ ~~Above-ground, liquid organic waste tanks, with VOC and HAP emissions controlled by an existing vapor balancing system and a closed vent, carbon adsorption vapor system that exhausts to the existing tank farm stack identified as S-001. Under 40 CFR 60, Subpart Kb, 40 CFR 61, Subpart FF and 40 CFR 63, Subpart DD, these units are each considered affected facilities.~~

~~(1) Tanks 1and 2, constructed in 1988, each with a nominal storage capacity of 23,689 gallons.~~
~~(2) Tanks 3 through 6, approved in 2014 for construction, each with a nominal storage capacity of 23,689 gallons.~~
~~(3) Tank 7, constructed in 2012, with a nominal storage capacity of 150,000 gallons.~~
~~(4) Tank 8 (Burn Tank #8) constructed in 1999, with a nominal storage capacity of 90,848 gallons.~~
~~(5) Tanks 10 and 11, constructed in 2009, each with a nominal storage capacity of 150,000 gallons.~~

(~~o~~**n**) **********

(~~p~~**o**) **********

(~~q~~**p**) **********

~~(r) Blending operations for bulk hazardous highly viscous or solid materials, such as sludge filter cake or remediation wastes for processing at either of two existing load out pads (A or B). Emissions are controlled by a combination of closed vent vapor balancing between vessels (storage tanks and unloading trucks) and ultimately through the cement kiln or carbon vapor adsorption system through the existing tank farm. Under 40 CFR 61, Subpart FF and 40 CFR Part 63, Subpart DD, this is considered an affected source.~~

(r) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S 001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001. The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum

14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(1) One (1) hydrapulper, approved in 2016 for construction, identified as HP-02, with a nominal vessel volume of 2,500 gallons, and process volume of 2,250 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(i) One (1) waste feed hopper loaded from roll-off bulk containers, approved in 2016 for construction, identified as HP-01, with a nominal storage capacity of 25 yd^3 or 5,000 gallons of solids. Solids are transferred out of the hopper by an enclosed feed auger with a nominal capacity of 800 cubic feet of solids per hour. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Two (2) organic liquid slurry mix tanks, approved in 2016 for construction, identified as tank T12 and tank T13, each with a nominal storage capacity of 10,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(2) One (1) process permitted to blend solids in containers on loadout pads A or B, with hydraulic drives and agitators installed in 2012, identified as blend box, with a nominal vessel volume of 25 yd^3 (5,714 gallons), and a batch volume of 3,910 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(3) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(4) Three (3) liquid organic loadout areas consisting of three concrete pads, identified as Pad A and Pad B, both constructed in 1986, and Pad C, constructed in 1994.

(5) Fugitive VOC and HAP emissions from waste receiving, pumps, valves, connectors. [40 CFR 61, Subpart V]

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

Modification #6

Emission Unit Descriptions - Section E.3
The emission unit description box in Section E.3 was revised to include the consolidated solids blending operation emission unit description. Revisions are shown below:

SECTION E.3 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

~~(n) Above-ground, liquid organic waste tanks, with VOC and HAP emissions controlled by an existing vapor balancing system and a closed vent, carbon adsorption vapor system that exhausts to the existing tank farm stack identified as S-001. Under 40 CFR 60, Subpart Kb, 40 CFR 61, Subpart FF and 40 CFR 63, Subpart DD, these units are each considered affected facilities.~~

~~(1) Tanks 1and 2, constructed in 1988, each with a nominal storage capacity of 23,689 gallons.~~
~~(2) Tanks 3 through 6, approved in 2014 for construction, each with a nominal storage capacity of 23,689 gallons.~~
~~(3) Tank 7, constructed in 2012, with a nominal storage capacity of 150,000 gallons.~~
~~(4) Tank 8 (Burn Tank #8) constructed in 1999, with a nominal storage capacity of 90,848 gallons.~~
~~(5) Tanks 10 and 11, constructed in 2009, each with a nominal storage capacity of 150,000 gallons.~~

(r) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001. The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(3) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF] ******** **

Modification #7

Emission Unit Descriptions - Section E.6
The emission unit description box in Section E.6 was revised to include the consolidated solids blending operation emission unit description. Revisions are shown below:

SECTION E.6 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

****

~~(n) Above-ground, liquid organic waste tanks, with VOC and HAP emissions controlled by an existing vapor balancing system and a closed vent, carbon adsorption vapor system that exhausts to the existing tank farm stack identified as S-001. Under 40 CFR 60, Subpart Kb, 40 CFR 61, Subpart FF and 40 CFR 63, Subpart DD, these units are each considered affected facilities.~~

~~(1) Tanks 1and 2, constructed in 1988, each with a nominal storage capacity of 23,689 gallons.~~
~~(2) Tanks 3 through 6, approved in 2014 for construction, each with a nominal storage capacity of 23,689 gallons.~~
~~(3) Tank 7, constructed in 2012, with a nominal storage capacity of 150,000 gallons.~~
~~(4) Tank 8 (Burn Tank #8) constructed in 1999, with a nominal storage capacity of 90,848 gallons.~~
~~(5) Tanks 10 and 11, constructed in 2009, each with a nominal storage capacity of 150,000 gallons.~~

~~(r) Blending operations for bulk hazardous highly viscous or solid materials, such as sludge filter cake or remediation wastes for processing at either of two existing load out pads (A or B). Emissions are controlled by a combination of closed vent vapor balancing between vessels (storage tanks and unloading trucks) and ultimately through the cement kiln or carbon vapor adsorption system through the existing tank farm. Under 40 CFR 61, Subpart FF and 40 CFR Part 63, Subpart DD, this is considered an affected source.~~

(r) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001. The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(1) One (1) hydrapulper, approved in 2016 for construction, identified as HP-02, with a nominal vessel volume of 2,500 gallons, and process volume of 2,250 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(i) One (1) waste feed hopper loaded from roll-off bulk containers, approved in 2016 for construction, identified as HP-01, with a nominal storage capacity of 25 yd^3 or 5,000 gallons of solids. Solids are transferred out of the hopper by an enclosed feed auger with a nominal capacity of 800 cubic feet of solids per hour. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Two (2) organic liquid slurry mix tanks, approved in 2016 for construction, identified as tank T12 and tank T13, each with a nominal storage capacity of 10,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(2) One (1) process permitted to blend solids in containers on loadout pads A or B, with hydraulic drives and agitators installed in 2012, identified as blend box, with a nominal vessel volume of 25 yd^3 (5,714 gallons), and a batch volume of 3,910 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(3) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF] ******** **

Modification #8

Emission Unit Descriptions - Section E.7
The emission unit description box in Section E.7 was revised to include the consolidated solids blending operation emission unit description. Revisions are shown below:

SECTION E.7 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

~~(m) Equipment leaks from each of the following equipment at this source, which are intended to operate in volatile hazardous air pollutant (VHAP) service: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems required by this subpart. Under 40 CFR 61, Subpart V, process units with equipment leaks are considered affected facilities.~~

(r) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001. The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel,

with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(5) Fugitive VOC and HAP emissions from waste receiving, pumps, valves, connectors. [40 CFR 61, Subpart V] **********

Modification #9

Emission Unit Descriptions - Section E.8
The emission unit description box in Section E.8 was revised to include the consolidated solids blending operation emission unit description. Revisions are shown below:

SECTION E.8 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **********

~~(n) Above-ground, liquid organic waste tanks, with VOC and HAP emissions controlled by an existing vapor balancing system and a closed vent, carbon adsorption vapor system that exhausts to the existing tank farm stack identified as S-001. Under 40 CFR 60, Subpart Kb, 40 CFR 61, Subpart FF and 40 CFR 63, Subpart DD, these units are each considered affected facilities.~~

~~(1) Tanks 1 and 2, constructed in 1988, each with a nominal storage capacity of 23,689 gallons.~~

~~(2) Tanks 3 through 6, approved in 2014 for construction, each with a nominal storage capacity of 23,689 gallons.~~
~~(3) Tank 7, constructed in 2012, with a nominal storage capacity of 150,000 gallons.~~
~~(4) Tank 8 (Burn Tank #8) constructed in 1999, with a nominal storage capacity of 90,848 gallons.~~
~~(5) Tanks 10 and 11, constructed in 2009, each with a nominal storage capacity of 150,000 gallons.~~

~~(r) Blending operations for bulk hazardous highly viscous or solid materials, such as sludge filter cake or remediation wastes for processing at either of two existing load out pads (A or B). Emissions are controlled by a combination of closed vent vapor balancing between vessels (storage tanks and unloading trucks) and ultimately through the cement kiln or carbon vapor adsorption system through the existing tank farm. Under 40 CFR 61, Subpart FF and 40 CFR Part 63, Subpart DD, this is considered an affected source.~~

(r) Hazardous Waste Derived Fuel (HWDF) bulk liquids and solids off-loading, storage and blending facilities: Emissions are controlled by a combination of vapor balancing between vessels (storage tanks and unloading trucks) and closed-vent carbon adsorption canisters venting to stacks S-001 or S-002. Vapors may also be controlled through the cement kiln/calciner at stack S3-1. The offloading, storage and blend box processing facilities exhaust to stack S-001. The hydrapulper bulk solids facility exhausts to stack S-002. The HWDF system processes a maximum 14,652,153 gallons per year of solids, 68,760,847 gallons per year of blended fuel, with an estimated 105,120,000 gallons per year of recirculated organic fuel and consisting of the following:

(1) One (1) hydrapulper, approved in 2016 for construction, identified as HP-02, with a nominal vessel volume of 2,500 gallons, and process volume of 2,250 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(i) One (1) waste feed hopper loaded from roll-off bulk containers, approved in 2016 for construction, identified as HP-01, with a nominal storage capacity of 25 yd^3 or 5,000 gallons of solids.

Solids are transferred out of the hopper by an enclosed feed auger with a nominal capacity of 800 cubic feet of solids per hour. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Two (2) organic liquid slurry mix tanks, approved in 2016 for construction, identified as tank T12 and tank T13, each with a nominal storage capacity of 10,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(2) One (1) process permitted to blend solids in containers on loadout pads A or B, with hydraulic drives and agitators installed in 2012, identified as blend box, with a nominal vessel volume of 25 yd^3 (5,714 gallons), and a batch volume of 3,910 gallons per batch. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(3) Ten (10) organic hazardous waste storage tanks with integrated mixers, as follows:

(i) Tank T1 and tank T2, both constructed in 1988, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(ii) Tanks T3 through T6, constructed in 2015, each with a nominal storage capacity of 25,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iii) Tank T7, constructed in 2012, with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(iv) Tank T8, constructed in 1999, with a nominal storage capacity of 100,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF]

(v) Tanks T10 and T11 (Blended Fuel Burn Tanks), constructed in 2009, each with a nominal storage capacity of 150,000 gallons. [40 CFR 63, Subpart DD] [40 CFR 61, Subpart FF] ******** **

Modification #10

PSD Minor Limit
Lone Star Industries, Inc. requested the following limit on material throughput to ensure the modification is not significant under PSD without the use of a control device. The proposed limits are shown below:

D.1.2 PSD Minor Limits [326 IAC 2-2]

****

(i) Pursuant to significant source modification number 133-35865-00002 and in order to render the provisions of 326 IAC 2-2 (Prevention of Significant Deterioration (PSD)) not applicable, the Permittee shall comply with the following:

(1) VOC emissions from the hydrapulper shall not exceed 0.58 pounds per batch before control;

(2) Throughput of the hydrapulper shall not exceed 10,084 batches per twelve (12) consecutive month period, with compliance determined at the end of each month;

(3) VOC emissions from the blend box shall not exceed 2.20 pounds per batch before control;

(4) Throughput of the blend box shall not exceed 5,090 batches per twelve (12) consecutive month period, with compliance determined at the end of each month.

Modification #11

Record Keeping Requirements
In order to document compliance with the PSD minor limits for the blend box and hydrapulper, the Permittee must maintain records of throughput in the blend box and hydrapulper. Revisions to existing Condition D.1.24 - Record Keeping Requirements are shown below:

D.1.24 Record Keeping Requirements

(a) **********

(i) In order to document the compliant status with Condition D.1.2(i)(2), the Permittee shall maintain monthly records of the number of batches processed in the hydrapulper.

(j) In order to document the compliant status with Condition D.1.2(i)(4), the Permittee shall maintain monthly records of the number of batches processed in the blend box.

(**k**~~i~~) Section C - General Record Keeping Requirements, of this permit contains the Permittee's obligations with regard to the records required by this condition.

Modification #12

Reporting Requirements
IDEM, OAQ is adding a requirement to report the number of batches processed in the blend box and hydrapulper to document the compliant status with Condition D.1.2 - PSD Minor Limits. Revisions to original Condition D.1.25 - Reporting Requirements and the associated reporting forms are shown below:

D.1.25 Reporting Requirements

(a) Quarterly summaries of the information to document the compliance status with Conditions D.1.1(b), D.1.2(e)(1), **D.1.2(i)(2), D.1.2(i)(4),** D.1.4, D.1.5 and D.1.6 shall be submitted using the reporting forms located at the end of this permit, or their equivalent, not later than thirty (30) days after the end of the quarter being reported. Section C - General Reporting contains the Permittee's obligation with regard to the reporting required by this condition. The reports submitted by the Permittee do require a certification that meets the requirements of 326 IAC 2-7-6(1) by a “responsible official” as defined by 326 IAC 2-7-1(35). **********

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report - Hydrapulper

Source Name:	**Lone Star Industries, Inc. dba Buzzi Unicem USA**
Source Address:	**3301 South County Road 150 West, Greencastle, Indiana 46135**
Part 70 Permit No.:	**T133-33667-00002**
Facility:	**Hydrapulper (Condition D.1.2(i)(2))**

Parameter: **Batches processed**
Limit: **10,084 batches per twelve consecutive month period.**

QUARTER : _____ YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	This Month	Previous 11 Months	12 Month Total

☐ **No deviation occurred in this quarter.**

☐ **Deviation/s occurred in this quarter.**
Deviation has been reported on:

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

Part 70 Quarterly Report - Blend Box

Source Name: **Lone Star Industries, Inc. dba Buzzi Unicem USA**
Source Address: **3301 South County Road 150 West, Greencastle, Indiana 46135**
Part 70 Permit No.: **T133-33667-00002**
Facility: **Blend Box (Condition D.1.2(i)(4))**
Parameter: **Batches processed**
Limit: **5,090 batches per twelve consecutive month period.**

QUARTER : _____ YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	This Month	Previous 11 Months	12 Month Total

☐ **No deviation occurred in this quarter.**

☐ **Deviation/s occurred in this quarter.**
Deviation has been reported on:

Submitted by: _____
Title / Position:_____
Signature:_____
Date: _____
Phone: _____

Modification #13

Reporting Forms - Titles
IDEM, OAQ is adding a title to each quarterly reporting form to clearly indicate the subject of the form. In addition, several quarterly reporting forms were missing a form entry to indicate the year being reported. IDEM, OAQ updated all quarterly reporting forms to indicate quarter and year.

Modification #14

Rule Citation Corrections - Risk Management Plan
IDEM, OAQ is correcting the Indiana Administrative Code reference contained in Original Condition C.14 - Risk Management Plan. The current reference is incorrect. The proposed revision is shown below:

C.14 Risk Management Plan [326 IAC 2-7-5(1**1**~~2~~)] [40 CFR 68]

****

Modification #15

General Clarifications and Corrections
IDEM, OAQ is clarifying the abbreviation QIP. IDEM, OAQ is correcting two typographical errors. The proposed revisions are shown below:

C.15 Response to Excursions or Exceedances [40 CFR 64] [326 IAC 3-8] [326 IAC 2-7-5] [326 IAC 2-7-6]

****

(II) **********

(c) Based on the results of a determination made under paragraph (II)(a)(2) of this condition, the EPA or IDEM, OAQ may require the Permittee to develop and implement a **Quality Improvement Plan (**QIP**)**. The Permittee shall develop and implement a QIP if notified to in writing by the EPA or IDEM, OAQ. **********

(f) Following implementation of a QIP, upon any subsequent determination pursuant to paragraph (II)(**c**~~a)(2~~) of this condition the EPA or the IDEM, OAQ may require that the Permittee make reasonable changes to the QIP if the QIP is found to have: **********

(h) CAM recordkeeping requirements.

(1) The Permittee shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan required pursuant to paragraph (II)(**c**~~a)(2~~) of this condition and any activities undertaken to implement a quality improvement plan, and other supporting information required to be maintained under this condition (such as data used to document the adequacy of monitoring, or records of monitoring maintenance or corrective actions). Section C - General Record Keeping Requirements of this permit contains the Permittee's obligations with regard to the records required by this condition. **********

Modification #16

Format Revisions
IDEM, OAQ is removing the reference to 326 IAC 2-7-5(15) in the facility description box in Section D.2. Also, IDEM, OAQ is revising the format to match the format of the other Section D emission unit description boxes. The proposed revision is shown below:

SECTION D.2 ~~FACILITY~~**EMISSION UNIT** OPERATION CONDITIONS

Emission Unit Description:~~Facility Description [326 IAC 2-7-5(15)]~~: *********

Modification #17

Format Revisions
IDEM, OAQ is revising the format of the facility description boxes in all Section E facility description boxes. Proposed revisions are shown below:

SECTION E.1 ~~SOURCE~~**FACILITY** OPERATION CONDITIONS

Facility Description**:** ~~[326 IAC 2-7-5(15)]~~ *********

SECTION E.2 FACILITY OPERATION CONDITIONS

Facility Description**:** ~~[326 IAC 2-7-5(15)]~~ *********

SECTION E.3 FACILITY OPERATION CONDITIONS

Facility Description**:** ~~[326 IAC 2-7-5(15)]~~ *********

SECTION E.4 FACILITY OPERATION CONDITIONS

Facility Description**:** ~~[326 IAC 2-7-5(15)]~~ *********

SECTION E.5 FACILITY OPERATION CONDITIONS

Facility Description**:** ~~[326 IAC 2-7-5(15)]~~ ~~*********~~

SECTION E.6 FACILITY OPERATION CONDITIONS

Facility Description**:** ~~[326 IAC 2-7-5(15)]~~ ~~*********~~

SECTION E.7 FACILITY OPERATION CONDITIONS

Facility Description**:** ~~[326 IAC 2-7-5(15)]~~ ~~*********~~

SECTION E.8 FACILITY OPERATION CONDITIONS

Facility Description**:** ~~[326 IAC 2-7-5(15)]~~ ~~*********~~

SECTION E.9 FACILITY OPERATION CONDITIONS

Facility Description**:** ~~[326 IAC 2-7-5(15)]~~ ~~*********~~

Modification #18

40 CFR 60, Subpart Kb
IDEM, OAQ is updating the references to 40 CFR 60, Subpart Kb contained in original Section E.3. Proposed revisions are shown below:

E.3.2 Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984 NSPS [326 IAC 12] [40 CFR Part 60, Subpart Kb]

The Permittee who owns/operates storage vessel/s shall comply with the following provisions of 40 CFR Part 60, Subpart Kb which are incorporated by reference as 326 IAC 12, (included as Attachment D of this permit) for Tanks 1 through 8, 10 and 11:

~~(1) 40 CFR 60.110b~~
~~(2) 40 CFR 60.111b~~
~~(3) 40 CFR 60.112b(a) & (b)~~
~~(4) 40 CFR 60.113b(c)~~
~~(5) 40 CFR 60.114b~~
~~(6) 40 CFR 60.115b(c)~~
~~(7) 40 CFR 60.116b~~
~~(8) 40 CFR 60.117b~~
(1) 40 CFR 60.110b(a);
(2) 40 CFR 60.111b;
(3) 40 CFR 60.112b(a)(3)(ii);
(4) 40 CFR 60.113b(c);
(5) 40 CFR 60.115b(c);
(6) 40 CFR 60.116b(a), (b), (f), and (g); and
(7) 40 CFR 60.117b.

Modification #19

40 CFR 63, Subpart LLL
IDEM, OAQ is updating the references to 40 CFR 63, Subpart LLL contained in original Section E.4. Proposed revisions are shown below:

E.4.2 Portland Cement Manufacturing Industry NESHAP [40 CFR Part 63, Subpart LLL] [326 IAC 20-27]

The Permittee which is a portland cement plant shall comply with the following provisions of 40 CFR Part 63, Subpart LLL, which is incorporated by reference as 326 IAC 20-27 (included as Attachment E of this permit).

~~(1) 40 CFR 63.1340~~
~~(2) 40 CFR 63.1341~~
~~(3) 40 CFR 63.1342~~
~~(4) 40 CFR 63.1343 (Table 2 omitted from final rule);~~
~~(5) 40 CFR 63.1344~~
~~(6) 40 CFR 63.1345~~
~~(7) 40 CFR 63.1346~~
~~(8) 40 CFR 63.1347~~
~~(9) 40 CFR 63.1348~~
~~(10) 40 CFR 63.1349~~
~~(11) 40 CFR 63.1350~~
~~(12) 40 CFR 63.1351~~
~~(13) 40 CFR 63.1352~~
~~(14) 40 CFR 63.1353~~
~~(15) 40 CFR 63.1354~~
~~(16) 40 CFR 63.1355~~
~~(17) 40 CFR 63.1356~~
~~(18) 40 CFR 63.1357~~
~~(19) 40 CFR 63.1358~~
~~(20) Table 1~~

~~E.4.3 National Emission Standards for Hazardous Air Pollutants (NESHAP) from the Portland Cement Manufacturing Industry [326 IAC 20-27]~~

~~Pursuant to 40 CFR 63.1343(d) - emission limits in effect prior to September 9, 2010, The Permittee shall meet the emission limitation shown in Table 2 of 40 CFR 63, Subpart LLL until September 9, 2015. The Permittee shall comply with the following summary of the applicable portions of Table 2 shown below:~~

~~Table 2 - Emissions limits in effect prior to September 9, 2010 for Kilns (Rows 1-4), Clinker Coolers (Row 5), and Raw Material Dryers (Rows 6-9)~~

~~ROW~~	~~If your source is…~~	~~And it commenced construction or reconstruction…..~~	~~And is located at…~~	~~Then your emission limits and units are[1]:~~
~~1~~	~~An existing kiln~~	~~On or prior to December 2, 2005~~	~~A major source~~	~~PM - 0.3 lb/ton feed~~ ~~Opacity - 20%~~ ~~D/F - 0.2[2] ng/dscm (TEQ)~~ ~~THC - 50[3,4] ppmvd~~
~~5~~	~~An existing clinker cooler~~	~~NA~~	~~A major source~~	~~PM - 0.1 lb/ton feed~~ ~~Opacity - 10%~~
~~6~~	~~An existing raw material dryer~~	~~On or prior to December 2, 2005~~	~~A major source~~	~~THC - 50[3,4] ppmvd~~ ~~Opacity - 10%~~

~~Footnotes Emissions limits in effect prior to September 9, 2010 table:~~

~~[1] All emission limits expressed as a concentration basis 9ppmvd, ng/dscm) are corrected to seven percent oxygen.~~

~~[2] If the average temperature at the inlet to the first particulate matter control device (fabric filter or electrostatic precipitator) during the D/F performance test is 400 °F or less, this limit is changed to 0.4 ng/dscm (TEQ).~~

~~[3] Reported as propane on a 30 day block average 964 FR 31932)~~

~~[4] Only applies to greenfield kilns or raw material dryers. Note that a new greenfield kiln is a kiln constructed after March 24, 1998 at a site where there are no existing kilns.~~

(1) 40 CFR 63.1340(a), (b)(2 through 9), (c), and (d);
(2) 40 CFR 63.1341;
(3) 40 CFR 63.1342;
(4) 40 CFR 63.1343(a), (b)(1), (c), (d)
(5) 40 CFR 63.1345;
(6) 40 CFR 63.1347;
(7) 40 CFR 63.1348(a)(1, 2, and 4), (b)(1, 2, 3, 6, and 9), (c), and (d);
(8) 40 CFR 63.1349(a), (b)(1, 2, 4, and 7), (c), (d), and (e);
(9) 40 CFR 63.1350(a)(1, 3, and 4), (b), (d), (f), (i), and (m);
(10) 40 CFR 63.1351(a)(1), (b), (c), (d), and (e);
(11) 40 CFR 63.1352(b);
(12) 40 CFR 63.1353;
(13) 40 CFR 63.1354(a), (b)(1, 2, 3, 6, 7, 8, 9, and 10), (c);
(14) 40 CFR 63.1355(a), (b), (c), (f), (g), and (h);
(15) 40 CFR 63.1356;
(16) 40 CFR 63.1358; and
(17) Table 1.

Modification #20

40 CFR 61, Subpart FF
IDEM, OAQ is updating the references to 40 CFR 61, Subpart FF contained in original Section E.6. Proposed revisions are shown below:

E.6.2 Benzene Waste Operations NESHAP [40 CFR Part 61, Subpart FF]

The Permittee which engages benzene waste operations shall comply with the following provisions of 40 CFR Part 61, Subpart FF (included as Attachment G of this permit).

~~(1) 40 CFR 61.340~~
~~(2) 40 CFR 61.341~~
~~(3) 40 CFR 61.342(a), (b), (c), (g), and (h)~~
~~(4) 40 CFR 61.343~~
~~(5) 40 CFR 61.345~~
~~(6) 40 CFR 61.349~~
~~(7) 40 CFR 61.350~~
~~(8) 40 CFR 61.354~~
~~(9) 40 CFR 61.355~~
~~(10) 40 CFR 61.356(a), (b), (d), (f)(1), (g), (j)(1 through 3), (j)(9 and 10), and (k)~~
~~(11) 40 CFR 61.357(a), (c), (d)(1), (d)(2), (d)(6), (e), and (g)~~
~~(12) 40 CFR 61.358~~
(1) 40 CFR 61.340(b), (c), and (d);
(2) 40 CFR 61.341;
(3) 40 CFR 61.342(b), (c), and (g);
(4) 40 CFR 61.343(a), (c), (d), and (e);
(5) 40 CFR 61.345;
(6) 40 CFR 61.349(a)(1), (a)(2)(i, and ii), (b), (c), (d), (e), (f), (g) and (h);
(7) 40 CFR 61.350;
(8) 40 CFR 61.354(a), (c)(5), (c)(7), (d), (e), and (f);
(9) 40 CFR 61.355(a)(1), (a)(2), (a)(3), (a)(6), (b), (c), (h), (i), and (j);

(10) 40 CFR 61.356(a), (b)(1 and 2), (d), (e), (f)(1), (f)(2)(i)(A, F and G), (g), and (h);
(11) 40 CFR 61.356(i), (j)(1), (j)(2), (j)(3), (j)(4), (j)(9), (j)(10), and (n);
(12) 40 CFR 61.357(a), (d)(1), (d)(2), (d)(6), (d)(7)(iv)(A, D, H, and I), and (d)(7)(v);
(13) 40 CFR 61.358; and
(14) Appendix A, Appendix B, and Appendix C to Part 61.

Modification #21

40 CFR 61, Subpart V
IDEM, OAQ is updating the references to 40 CFR 61, Subpart V contained in original Section E.7. Proposed revisions are shown below:

E.7.2 Equipment Leaks (Fugitive Emission Sources) NESHAP [40 CFR Part 61, Subpart V] [326 IAC 14-8]

The Permittee shall comply with the following provisions of 40 CFR Part 61, Subpart V, which are incorporated by reference as 326 IAC 14-8 (included as Attachment H of this permit) for equipment at this sources which is intended to operate in volatile hazardous air pollutant (VHAP) service, such as pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems required by this subpart:

~~(1) 40 CFR 61.240~~
~~(2) 40 CFR 61.241~~
~~(3) 40 CFR 61.242-1~~
~~(4) 40 CFR 61.242-2~~
~~(5) 40 CFR 61.242-4~~
~~(6) 40 CFR 61.242-6~~
~~(7) 40 CFR 61.242-7~~
~~(8) 40 CFR 61.242-8~~
~~(9) 40 CFR 61.242-10~~
~~(10) 40 CFR 61.242-11~~
~~(11) 40 CFR 61.243-1~~
~~(12) 40 CFR 61.243-2~~
~~(13) 40 CFR 61.244~~
~~(14) 40 CFR 61.245~~
~~(15) 40 CFR 61.246~~
~~(16) 40 CFR 61.247~~
(1) 40 CFR 61.240(a), (b), and (c);
(2) 40 CFR 61.241;
(3) 40 CFR 61.242-1;
(4) 40 CFR 61.242-2(a through g);
(5) 40 CFR 61.242-4;
(6) 40 CFR 61.242-6;
(7) 40 CFR 61.242-7;
(8) 40 CFR 61.242-8;
(9) 40 CFR 61.242-10;
(10) 40 CFR 61.242-11(a), (b), (c), (e), (f)(2), (g) through (m);
(11) 40 CFR 61.243-1;
(12) 40 CFR 61.243-2;
(13) 40 CFR 61.244;
(14) 40 CFR 61.245;
(15) 40 CFR 61.246; and
(16) 40 CFR 61.247(a)(1), (a)(2), (a)(3), (a)(5), (b), (c), (d), and (e).

Modification #22

40 CFR 61, Subpart V
IDEM, OAQ is updating the references to 40 CFR 63, Subpart DD contained in original Section E.8. Proposed revisions are shown below:

E.8.2 Offsite Waste and Recovery Operations NESHAP [40 CFR Part 63, Subpart DD] [326 IAC 20-23]

The Permittee which engages benzene waste operations shall comply with the following provisions of 40 CFR Part 63, Subpart DD, which are incorporated by reference as 326 IAC 20-23, (included as Attachment I of this permit).

~~(1) 40 CFR 63.680~~
~~(2) 40 CFR 63.681~~
~~(3) 40 CFR 63.683 (a), (b), (d)~~
~~(4) 40 CFR 63.685~~
~~(5) 40 CFR 63.688~~
~~(6) 40 CFR 63.691~~
~~(7) 40 CFR 63.693~~
~~(8) 40 CFR 63.694~~
~~(9) 40 CFR 63.695~~
~~(10) 40 CFR 63.696~~
~~(11) 40 CFR 63.697(a), (b)~~
~~(12) 40 CFR 63.698~~
~~(13) Table 1~~
~~(14) Table 2~~
(1) 40 CFR 63.680(a)(1), (a)(2)(i), (b), (c)(1), (c)(3), (e)(2), (f), and (g);
(2) 40 CFR 63.681;
(3) 40 CFR 63.683(a), (b), (d), (e), and (f);
(4) 40 CFR 63.685(a), (b)(2), (d)(3), (d)(5), (g), and (i);
(5) 40 CFR 63.688(a), and (b)(3)(i);
(6) 40 CFR 63.691(a), (b)(1)(i), (c);
(7) 40 CFR 63.693(a), (b), (c)(1, 2, and 3), (c)(4)(i),(c)(5, 6, 7, and 8);
(8) 40 CFR 63.693(c), (d)(1), (d)(2)(ii), (d)(3), (d)(4), (e)(1), (e)(2)(ii), (e)(3) and (g);
(9) 40 CFR 63.694;
(10) 40 CFR 63.695(a), (b)(3), (b)(4), (c), (e), and (f);
(11) 40 CFR 63.696(a), (b), (e), (f), (g), (h), and (i);
(12) 40 CFR 63.697(a), and (b)(1 through 5);
(13) 40 CFR 63.698; and
(14) Table 1, Table 2, and Table 5.

Modification #23

Ensure vs. Assure
IDEM, OAQ is clarifying original conditions D.1.13, D.1.14, D.1.15, and D.1.17. In regards to compliance determination requirements, it is more appropriate to state compliance determination requirements assure compliance and do not ensure compliance. The following revisions were made to the permit to reflect this change:

D.1.13 Particulate Control

(a) In order to **assure**~~ensure~~ compliance with Conditions D.1.1, D.1.2, and D.1.3, the baghouses for particulate control associated with the raw material sizing activities, the coal mill operation, the gypsum material handling process, the raw material ball mill operation, clinker cooler operations, the fly ash storage activities and the dust collector and bin vent filter for the truck unloading, pneumatic transfer operations, the finish mill operations, the cement storage, loading, and packing activities, the blend facility, and the packhouse operations shall be in operation and control emissions from the facilities at all times when the facilities are in operation.

(b) In order to **assure**~~ensure~~ compliance with Condition D.1.1, the electrostatic precipitator (ESP) for particulate control shall be in operation and control emissions from all the emission units which vent through kiln stack (Stack 3-1) at all times that these facilities are in operation.

(c) In order to **assure**~~ensure~~ compliance with Condition D.1.1, the baghouses for particulate control shall be in operation and control emissions from kiln operations associated with baghouses 403L and 483L all times that these facilities are in operation. **********

D.1.14 Nitrogen Oxide (NOx) Control

In order to **assure**~~ensure~~ compliance with Conditions D.1.6 and D.1.7, the low-NOx calciner shall be in operation and control emissions from the kiln (3-1A, 401B) at all times that the kiln (3-1A, 401B) is in operation.

D.1.15 Lime Injection Operation

In order to **assure**~~ensure~~ compliance with sulfur dioxide limit in Condition D.1.4, pursuant to CP133-10159-00002, issued April 16, 1999, the lime injection system associated with the conditioning tower (3-5A) shall be operated as necessary.

D.1.17 Sulfur Dioxide Emissions and Sulfur Content [326 IAC 7-2] [326 IAC 2-7-5(3)(A)] [326 IAC 2-7-6]

(a) **********

(b) In order to **assure**~~ensure~~ compliance with Conditions D.1.5(b) and D.1.5(c), the Permittee shall determine the sulfur dioxide (SO_2) emissions from the combustion of oil in the kiln burner, calciner burner, and coal mill fuel oil-fired burner utilizing one (1) of the following options: **********

Conclusion and Recommendation

The construction of this proposed modification shall be subject to the conditions of the attached proposed Part 70 Significant Source Modification No. 133-35865-00002 and Significant Permit Modification No. 133-35884-00002. The staff recommends to the Commissioner that this Part 70 Significant Source and Significant Permit Modification be approved.

IDEM Contact

(a) Questions regarding this proposed permit can be directed to David Matousek at the Indiana Department Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) 232-8253 or toll free at 1-800-451-6027 extension 2-8253.

(b) A copy of the findings is available on the Internet at: http://www.in.gov/ai/appfiles/idem-caats/

(c) For additional information about air permits and how the public and interested parties can participate, refer to the IDEM Permit Guide on the Internet at: http://www.in.gov/idem/5881.htm; and the Citizens' Guide to IDEM on the Internet at: http://www.in.gov/idem/6900.htm.

Appendix A to the Technical Support Document (TSD)
Potential to Emit Summary of the Modification

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Potential to Emit of Project (TPY)								
Emission Unit	**PM**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**	**CO**	**NO_x**	**GHGs as CO_2e**
Hydrapulper	negligible	negligible	negligible	0.00	8.91	0.00	0.00	0.00
Hydrapulper Process Fugitive	0.00	0.00	0.00	0.00	2.23	0.00	0.00	0.00
Blend Box	negligible	negligible	negligible	0.00	19.41	0.00	0.00	0.00
Blend Box Process Fugitive	0.00	0.00	0.00	0.00	1.46	0.00	0.00	0.00
Tank T2 (Truck Wash Waste Storage)	0.00	0.00	0.00	0.00	3.95	0.00	0.00	0.00
Tank T1	0.00	0.00	0.00	0.00	11.02	0.00	0.00	0.00
Tank T3	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T4	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T5	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T6	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T7	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T8	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Hydrapulper Mix Tank T12	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Hydrapulper Mix Tank T13	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Burn Tank T10	0.00	0.00	0.00	0.00	5.21	0.00	0.00	0.00
Burn Tank T11	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Truck Wash Operation	0.00	0.00	0.00	0.00	3.72	0.00	0.00	0.00
Truck Wash Ops. Fugitive	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00
Hydrapulper Fugitive Fittings	0.00	0.00	0.00	0.00	6.71	0.00	0.00	0.00
Tank Farm Fugitive Fittings	0.00	0.00	0.00	0.00	64.64	0.00	0.00	0.00
Fugitive Paved Roads	5.18	1.04	0.25	0.00	0.00	0.00	0.00	0.00
Total for Modification	**5.18**	**1.04**	**0.25**	**0.00**	**127.53**	**0.00**	**0.00**	**0.00**

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit Summary of the Modification

(continued from previous page)

Controlled Potential to Emit of the Modification without PSD Limits (TPY)								
Emission Unit	**PM**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**	**CO**	**NO_x**	**GHGs as CO_2e**
Hydrapulper	negligible	negligible	negligible	0.00	0.45	0.00	0.00	0.00
Hydrapulper Process Fugitive	negligible	negligible	negligible	0.00	2.23	0.00	0.00	0.00
Blend Box	negligible	negligible	negligible	0.00	0.97	0.00	0.00	0.00
Blend Box Process Fugitive	negligible	negligible	negligible	0.00	1.46	0.00	0.00	0.00
Tank T2 (Truck Wash Waste Storage)	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00
Tank T1	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00
Tank T3	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T4	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T5	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T6	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T7	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T8	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Hydrapulper Mix Tank T12	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Hydrapulper Mix Tank T13	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Burn Tank T10	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00
Burn Tank T11	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Truck Wash Operation	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00
Truck Wash Ops. Fugitive	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00
Hydrapulper Fugitive Fittings	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00
Tank Farm Fugitive Fittings	0.00	0.00	0.00	0.00	5.13	0.00	0.00	0.00
Fugitive Paved Roads	2.59	0.52	0.13	0.00	0.00	0.00	0.00	0.00
Controlled PTE of Project	2.59	0.52	0.13	0.00	12.64	0.00	0.00	0.00
PSD Significant Levels	25	15	10	40	40	100	40	75,000
Significant Project	no	no	no	no	no	no	no	no

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit Summary of the Modification

(continued from previous page)

Limited Potential to Emit of the Modification (TPY)								
Emission Unit	**PM**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**	**CO**	**NO_x**	**GHGs as CO_2e**
Hydrapulper	negligible	negligible	negligible	0.00	2.94	0.00	0.00	0.00
Hydrapulper Process Fugitive	negligible	negligible	negligible	0.00	0.73	0.00	0.00	0.00
Blend Box	negligible	negligible	negligible	0.00	5.62	0.00	0.00	0.00
Blend Box Process Fugitive	negligible	negligible	negligible	0.00	0.42	0.00	0.00	0.00
Tank T2 (Truck Wash Waste Storage)	0.00	0.00	0.00	0.00	3.95	0.00	0.00	0.00
Tank T1	0.00	0.00	0.00	0.00	11.02	0.00	0.00	0.00
Tank T3	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T4	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T5	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T6	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T7	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tank T8	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Hydrapulper Mix Tank T12	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Hydrapulper Mix Tank T13	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Burn Tank T10	0.00	0.00	0.00	0.00	5.21	0.00	0.00	0.00
Burn Tank T11	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Truck Wash Operation	0.00	0.00	0.00	0.00	3.72	0.00	0.00	0.00
Truck Wash Ops. Fugitive	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00
Hydrapulper Fugitive Fittings	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00
Tank Farm Fugitive Fittings	0.00	0.00	0.00	0.00	5.13	0.00	0.00	0.00
Fugitive Paved Roads	2.59	0.52	0.13	0.00	0.00	0.00	0.00	0.00
Controlled PTE of Project	2.59	0.52	0.13	0.00	39.96	0.00	0.00	0.00
PSD Significant Levels	25	15	10	40	40	100	40	75,000
Significant Project	no	no	no	no	no	no	no	no

Appendix A to the Technical Support Document
Summary of Hazardous Air Pollutants

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Potential to Emit of Modification (TPY)																						
CAS Number	Hazardous Air Pollutant	Hydrapulper	Hydrapulper Fugitive Process	Blend Box	Blend Box Fugitive Process	T2	T1	T3	T4	T5	T6	T7	T8	T12	T13	T10	T11	Truck Wash	Truck Wash Ops. Fugitive	Hydrapulper Fittings	Tank Farm Fittings	Total HAP
104-51-8	Alkyl Benzenes	0.11	0.03	0.20	0.02	0.02	0.06									0.03		2.1E-02	1.55E-03	1.46	14.09	16.04
71-43-2	Benzene	5.2E-03	1.3E-03	5.6E-03	4.2E-04	8.0E-04	2.21E-03									1.06E-03		9.2E-04	6.93E-05	0.00	0.00	0.02
108-39-4	Cresol-m	5.8E-03	1.5E-03	9.1E-03	6.9E-04	1.1E-05	2.93E-05									1.40E-05		2.6E-04	1.93E-05	0.16	1.52	1.69
100-41-4	Ethyl Benzene	0.06	1.5E-02	0.13	9.4E-03	0.02	0.06									0.03		2.0E-02	1.51E-03	0.14	1.38	1.87
107-21-1	Glycol Ethers	3.3E-03	8.3E-04	5.3E-03	4.0E-04	6.0E-05	1.65E-04									7.90E-05		5.6E-05	4.20E-06	0.09	0.83	0.92
110-54-3	Hexane	0.80	0.20	1.76	0.13	0.38	1.04									0.50		0.35	0.03	0.14	1.31	6.64
67-56-1	Methyl Alcohol	0.78	0.19	1.69	0.13	0.35	0.95									0.46		0.31	0.02	0.16	1.59	6.63
108-10-1	Methyl Isobutyl Ketone	0.05	0.01	0.10	7.4E-03	0.02	0.05									0.02		1.8E-02	1.32E-03	0.06	0.62	0.96
1634-04-4	Methyl t-Butyl Ether	0.66	0.17	1.46	0.11	0.32	0.88									0.42		0.29	0.02	0.06	0.62	5.01
75-09-2	Methylene Chloride	1.41	0.35	3.10	0.23	0.68	1.87									0.90		0.61	0.05	0.08	0.76	10.03
91-20-3	Naphthalene	1.7E-03	4.2E-04	2.6E-03	2.0E-04	3.0E-05	8.37E-05									4.01E-05		1.3E-04	9.80E-06	0.04	0.41	0.46
109-99-9	Tetrahydrofuran	0.29	0.07	0.64	0.05	0.14	0.38									0.18		0.12	0.01	0.04	0.41	2.33
108-88-3	Toluene	1.04	0.26	2.26	0.17	0.46	1.26									0.60		0.40	0.03	0.92	8.91	16.32
71-55-6	Trichloroethane, 1,1,1-	0.14	0.03	0.30	0.02	0.07	0.18									0.09		6.4E-02	4.81E-03	0.03	0.28	1.20
79-01-6	Trichloroethylene	0.05	0.01	0.11	0.01	0.02	0.06									0.03		2.3E-02	1.76E-03	0.02	0.21	0.55
1330-20-7	Xylene (mixed)	0.41	0.10	0.87	0.07	0.15	0.42									0.20		0.18	0.01	1.55	14.92	18.88
	Summary	**5.80**	**1.45**	**12.64**	**0.95**	**2.62**	**7.22**									**3.46**		**2.41**	**0.18**	**4.97**	**47.86**	**89.56**

Single HAP - Xylene **18.88 TPY**

Combined HAP **89.56 TPY**

(continued on next page)

Appendix A to the Technical Support Document
Summary of Hazardous Air Pollutants

(continued from previous page)

Controlled PTE of Modification (TPY)																						
CAS Number	Hazardous Air Pollutant	Hydrapulper	Hydrapulper Fugitive Process	Blend Box	Blend Box Fugitive Process	T2	T1	T3	T4	T5	T6	T7	T8	T12	T13	T10	T11	Truck Wash	Truck Wash Ops. Fugitive	Hydrapulper Fittings	Tank Farm Fittings	Total HAP
104-51-8	Alkyl Benzenes	5.4E-03	2.7E-02	1.0E-02	1.5E-02	1.1E-03	3.11E-03									1.49E-03		1.03E-03	1.5E-03	0.04	1.12	1.23
71-43-2	Benzene	2.6E-04	1.3E-03	2.8E-04	4.2E-04	4.0E-05	1.11E-04									5.30E-05		4.60E-05	6.9E-05	0.00	0.00	0.00
108-39-4	Cresol-m	2.9E-04	1.5E-03	4.6E-04	6.9E-04	5.3E-07	1.47E-06									7.02E-07		1.28E-05	1.9E-05	4.4E-03	0.12	0.13
100-41-4	Ethyl Benzene	3.0E-03	1.5E-02	6.3E-03	9.4E-03	1.2E-03	3.19E-03									1.53E-03		1.00E-03	1.5E-03	4.0E-03	0.11	0.16
107-21-1	Glycol Ethers	1.7E-04	8.3E-04	2.6E-04	4.0E-04	3.0E-06	8.24E-06									3.95E-06		2.79E-06	4.2E-06	2.4E-03	0.07	0.07
110-54-3	Hexane	0.04	0.20	0.09	0.13	1.9E-02	5.19E-02									2.49E-02		0.02	2.7E-02	3.8E-03	0.10	0.71
67-56-1	Methyl Alcohol	0.04	0.19	0.08	0.13	1.7E-02	4.77E-02									2.29E-02		0.02	2.3E-02	4.6E-03	0.13	0.70
108-10-1	Methyl Isobutyl Ketone	2.3E-03	1.1E-02	4.9E-03	7.4E-03	9.4E-04	2.60E-03									1.25E-03		0.00	1.3E-03	1.8E-03	0.05	0.08
1634-04-4	Methyl t-Butyl Ether	0.03	0.17	0.07	0.11	1.6E-02	4.38E-02									2.10E-02		0.01	2.2E-02	1.8E-03	0.05	0.55
75-09-2	Methylene Chloride	0.07	0.35	0.15	0.23	3.4E-02	9.35E-02									4.48E-02		0.03	4.6E-02	2.2E-03	0.06	1.12
91-20-3	Naphthalene	8.3E-05	4.2E-04	1.3E-04	2.0E-04	1.5E-06	4.19E-06									2.01E-06		6.51E-06	9.8E-06	1.2E-03	0.03	0.03
109-99-9	Tetrahydrofuran	0.01	0.07	0.03	0.05	6.8E-03	1.89E-02									9.04E-03		0.01	8.9E-03	1.2E-03	0.03	0.25
108-88-3	Toluene	0.05	0.26	0.11	0.17	2.3E-02	6.30E-02									3.02E-02		0.02	3.0E-02	0.03	0.71	1.49
71-55-6	Trichloroethane, 1,1,1-	6.9E-03	3.4E-02	0.02	0.02	3.3E-03	8.95E-03									4.29E-03		0.00	4.8E-03	7.9E-04	0.02	0.13
79-01-6	Trichloroethylene	2.5E-03	1.2E-02	5.5E-03	8.3E-03	1.1E-03	3.09E-03									1.48E-03		0.00	1.8E-03	5.9E-04	0.02	0.05
1330-20-7	Xylene (mixed)	0.02	0.10	0.04	0.07	7.7E-03	2.11E-02									1.01E-02		0.01	1.4E-02	0.04	1.18	1.52
	Summary	**0.29**	**1.45**	**0.63**	**0.95**	**0.13**	**0.36**									**0.17**		**0.12**	**0.18**	**0.14**	**3.80**	**8.23**

Single HAP - Xylene **1.52** **TPY**

Combined HAP **8.23** **TPY**

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Appendix A to the Technical Support Document
Summary of Hazardous Air Pollutants

(continued from previous page)

Limited PTE of Modification (TPY)																						
CAS Number	Hazardous Air Pollutant	Hydrapulper	Hydrapulper Fugitive Process	Blend Box	Blend Box Fugitive Process	T2	T1	T3	T4	T5	T6	T7	T8	T12	T13	T10	T11	Truck Wash	Truck Wash Ops. Fugitive	Hydrapulper Fittings	Tank Farm Fittings	Total HAP
104-51-8	Alkyl Benzenes	0.04	8.8E-03	0.06	4.4E-03	0.02	0.06									0.03		0.02	1.5E-03	0.20	1.12	1.56
71-43-2	Benzene	1.7E-03	4.2E-04	1.61E-03	1.21E-04	8.03E-04	2.21E-03									1.06E-03		9.21E-04	6.9E-05	0.00	0.00	0.01
108-39-4	Cresol-m	1.9E-03	4.8E-04	2.64E-03	1.99E-04	1.06E-05	2.93E-05									1.40E-05		2.56E-04	1.9E-05	2.2E-02	0.12	0.15
100-41-4	Ethyl Benzene	0.02	4.9E-03	0.04	2.73E-03	2.32E-02	0.06									0.03		0.02	1.5E-03	2.0E-02	0.11	0.33
107-21-1	Glycol Ethers	1.1E-03	2.7E-04	1.53E-03	1.15E-04	5.99E-05	1.65E-04									7.90E-05		5.58E-05	4.2E-06	1.2E-02	6.58E-02	0.08
110-54-3	Hexane	0.26	0.07	0.51	0.04	0.38	1.04									0.50		0.35	0.03	1.9E-02	0.10	3.30
67-56-1	Methyl Alcohol	0.26	0.06	0.49	0.04	0.35	0.95									0.46		0.31	0.02	2.3E-02	0.13	3.09
108-10-1	Methyl Isobutyl Ketone	0.02	3.8E-03	0.03	2.14E-03	0.02	0.05									0.02		0.02	1.3E-03	8.9E-03	4.94E-02	0.22
1634-04-4	Methyl t-Butyl Ether	0.22	0.05	0.42	0.03	0.32	0.88									0.42		0.29	0.02	8.9E-03	4.94E-02	2.71
75-09-2	Methylene Chloride	0.46	0.12	0.90	0.07	0.68	1.87									0.90		0.61	0.05	1.1E-02	6.03E-02	5.72
91-20-3	Naphthalene	5.5E-04	1.4E-04	7.66E-04	5.77E-05	3.04E-05	8.37E-05									4.01E-05		1.30E-04	9.8E-06	5.9E-03	3.29E-02	0.04
109-99-9	Tetrahydrofuran	0.10	0.02	0.18	0.01	0.14	0.38									0.18		0.12	8.9E-03	5.9E-03	3.29E-02	1.18
108-88-3	Toluene	0.34	0.09	0.66	0.05	0.46	1.26									0.60		0.40	0.03	0.13	0.71	4.72
71-55-6	Trichloroethane, 1,1,1-	0.05	1.1E-02	0.09	0.01	0.07	0.18									0.09		0.06	4.8E-03	4.0E-03	2.19E-02	0.58
79-01-6	Trichloroethylene	0.02	4.1E-03	0.03	2.40E-03	0.02	0.06									0.03		0.02	1.8E-03	3.0E-03	1.65E-02	0.21
1330-20-7	Xylene (mixed)	0.14	0.03	0.25	0.02	0.15	0.42									0.20		0.18	0.01	0.21	1.18	2.81
	Summary	**1.92**	**0.48**	**3.66**	**0.28**	**2.62**	**7.22**									**3.46**		**2.41**	**0.18**	**0.69**	**3.80**	**26.71**

Single HAP - Methylene Chloride **5.72 TPY**

Combined HAP **26.71 TPY**

Appendix A to the Technical Support Document (TSD)
Process Volume Estimates

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Composition of As-Fired Fuel

Required Heating Value of As-Fired Fuel =	9,130.00	Btu/lb
Heating Value of Cake =	5,400.00	Btu/lb
Heating Value of Cutter =	10,600.00	Btu/lb

Heating Value of As-Fired Fuel = % Cutter x Heating Value Cutter + % Cake x Heating Value Cake

and

% Cutter = 100% - % Cake

solve for % Cake

$$\% \text{ Cake} = \frac{(\text{Heating Value As-Fired Fuel}) - (\text{Heating Value Cutter})}{(\text{Heating Value Cake}) - (\text{Heating Value Cutter})} = 28.27\%$$

% Cutter =	**71.73%**	**(liquid organic waste to dilute solids)**
% Cake =	**28.27%**	**(solids from roll-offs)**
Slurry =	**mixture of cake and cutter used as fuel**	

Volumes at PTE - All Liquid Fuel Used in Kiln / Calciner

1) Volume of Cake and Cutter Required as Fuel at PTE

Maximum Heat Input Capacity of Kiln / Calciner =	827.00	MMBtu/hr
Minimum Heat Input from Coal	178.78	MMBtu/hr
Maximum Input from Liquid Fuel (RCRA Permit - 1,112 lb/min, 8.5 lb/gallon) =	648.22	MMBtu/hr
Heat Content of Fuel =	9,130.00	Btu/lb
Mass of Fuel (lb/hr) = Heat Input x 1/heat content x 1E06 Btu/MMBtu =	70,999.09	lb fuel/hr
Mass of Fuel (lb/yr) = Mass of Fuel (lb/hr) x 8,760 hr/yr =	621,952,017.17	lb fuel/yr
Mass Cake at 28.27% of total mass =	175,825,835.26	lb cake/yr
Mass Cutter at 71.73% of total mass =	446,126,181.92	lb cutter/yr
Density of Cutter =	8.245	lb/gallon
Density of Cake =	12.00	lb/gallon
Volume of Cutter as Fuel = lb cutter/yr x 1 / density (lb/gallon) =	54,108,693.99	gallon/yr
Volume of Cake as Fuel = lb cake/yr x 1 / density (lb/gallon) =	14,652,152.94	gallon/yr
Volume of Blended Fuel (gallon/yr - 1,112 lb/min at 8.5 lb/gallon) =	**68,760,847**	**gallon/yr**

2) Estimate Number of Batches in Blend Box at PTE

Volume of Blended Fuel Needed at PTE = Cutter Volume + Cake Volume =	68,760,847	gallon/yr
Blend Box Batch Volume =	3,910	gallons/batch
Batches per Year = Slurry Volume / Batch Volume =	**17,586**	**batches per year at PTE**

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Process Volume Estimates
(continued from previous page)

3) Volume of Cutter Needed to Clean Blend Box Between Batches at PTE

Batches of Slurry per Year =	17,586	batches per year at PTE
Volume of Cutter for Cleaning =	1,420	gallons per batch
Volume of Cutter for Cleaning Blend Box =	**24,972,120**	**gallon/yr**

4) Estimate Number of Batches in Hydrapulper at PTE

Volume of Slurry Needed at PTE = Cutter Volume + Cake Volume =	68,760,847	gallon/yr
Hydrapulper Batch Volume (90% of 2,500 gallon) =	2,250	gallons/batch
Batches per Year = Slurry Volume / Batch Volume =	**30,560**	**batches per year at PTE**

5) Maximum Volume Pumped to Burn Tanks then to Kiln / Calciner

Volume of Cutter as Fuel =	54,108,693.99	gallon/yr
Volume of Cake as Fuel =	14,652,152.94	gallon/yr
	68,760,847	**gallon/yr**

6) Estimate of Maximum Recirculation Volume

One 200 GPM recirculation pump at 8,760 hr/yr **105,120,000 gal/yr**

7) Maximum Throughput - Tanks T1, T3, T4, T5, T6 T7, T8, T12, and T13 - Combined

Recirculation Allowance

One Pump at 200 GPM or 105,120,000 gallon/yr

Blended Fuel	68,760,847	gallon/yr
Recirculation Allowance	105,120,000	gallon/yr
	173,880,847	**gallon/yr**

8) Maximum Throughput - Tanks T2, T10 and T11 - No Cross Tank Recirculation

Notes:
1) Tanks T10 and T11 are used as burn tanks. They only see fuel ready for combustion in the kiln.
2) Tank recirculation in T10 and T11 is within the same tank to keep pump discharge line clear.
3) Recirculation in T10 and T11 is self contained. The surface level of the tanks does not change during recirculation.
4) Tank T2 receives waste from the truck wash operation.
5) Tank T2 has not exceeded 4,000,000 gallons per year historically.
6) Tank T2 does not participate in tank recirculation.

Maximum throughput 68,760,847 gallon/yr

9) Control Efficiency

The emission units listed in this modification are subject to 40 CFR 63, Subpart DD and are required to achieve 95% reduction in VOC/HAP.

Enforceable Control Efficiency = 95%

Capture Efficiency								
Emission Unit	**min eff**	**max eff**	**min. days operating**	**max. days operating**		**Worst case capture eff**	Overall capture min. eff	
vapor balance system	93%	100%	365	365		93%	93.0%	if utilized, assumes that the addition of the hoods at truck unloading would affect 1/3 of the volume of fuel managed
side draft hoods at truck loadout	67%	95%	0	0		0%		
hydropulper building	80%	100%	330	365		80%	80.0%	

Notes:
Capture efficiencies were obtained from the following sources
1) vapor balance system: EPA AP-42
2) side draft hoods: EPA Course #345: Emission Capture & Gas Handling System Inspection
3) hydropulper building: negative PSI in building per 40 CFR 52.741 App B; Procedure T - Criteria for verification of Permanent Encl.

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Appendix A to the Technical Support Document (TSD)
Process Volume Estimates

(continued from previous page)

Control Efficiency								
Emission Unit	**min eff**	**max eff**	**min. days operating**	**max. days operating**		**Worst case control eff**	Overall control min. eff	
cement kiln combustion system	99%	99.997%	0	0		0%	88.4%	assumes the minimum regulatory levels are met with the control device and the kiln system operates the minimum days per year
carbon system vapor balance	95%	99%	365	365		95%		
carbon system hydropulper process	95%	99%	365	365		95%	76.0%	

Notes:
Control efficiencies were obtained from the following sources
1) kiln system: min based upon rgulations. Max based upon 2014 CPT Test result
2) vapor balance carbon: min based upon regulation. Max based upon testing of similar systems
3) hydropulper carbon: min based upon regulation. Max based upon testing of similar systems

Appendix A to the Technical Support Document (TSD)
Composition of Blended Fuel

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

1) Maximum Cutter Contribution (Worst Case Fuel Composition)

Maximum Gallons of Cutter	**54,108,694**	**gallons per year**
Density of Cutter	**8.245**	**lb/gallon**
Maximum Mass of Cutter	**223,063.09**	**tons/year**

Cutter Component	CAS Number	VOC	HAP	Mass %	Total Mass (ton/yr)	Mass VOC (ton/yr)	Mass HAP (ton/yr)
Acetone	67-64-1	NO	NO	5.30%	11,822.34		
Aliphatics (non-HAP) (1)	109-89-7	YES	NO	4.30%	9,591.71	9,591.71	
Alkyl Benzenes (2)	104-51-8	YES	NO	20.40%	45,504.87	45,504.87	45,504.9
Butanol	71-36-3	YES	NO	1.40%	3,122.88	3,122.88	
Butyl Acetate	123-86-4	YES	NO	2.70%	6,022.70	6,022.70	
Cresol-m	108-39-4	YES	YES	2.20%	4,907.39	4,907.39	4,907.39
Cyclohexanone	108-94-1	YES	NO	4.40%	9,814.78	9,814.78	
Ethyl Alcohol	64-17-5	YES	NO	1.60%	3,569.01	3,569.01	
Ethyl Benzene	100-41-4	YES	YES	2.00%	4,461.26	4,461.26	4,461.26
Glycol Ethers (3)	107-21-1	YES	YES	1.20%	2,676.76	2,676.76	2,676.76
Hexane	110-54-3	YES	YES	1.90%	4,238.20	4,238.20	4,238.20
Isopropyl Alcohol	67-63-0	YES	NO	8.70%	19,406.49	19,406.49	
Methyl Alcohol	67-56-1	YES	YES	2.30%	5,130.45	5,130.45	5,130.45
Methyl Ethyl Ketone	78-93-3	YES	NO	2.30%	5,130.45	5,130.45	
Methyl Isobutyl Ketone	108-10-1	YES	YES	0.90%	2,007.57	2,007.57	2,007.57
Methyl t-Butyl Ether	1634-04-4	YES	YES	0.90%	2,007.57	2,007.57	2,007.57
Methylene Chloride	75-09-2	NO	YES	1.10%	2,453.69		2,453.69
Naphthalene	91-20-3	YES	YES	0.60%	1,338.38	1,338.38	1,338.38
Tetrahydrofuran	109-99-9	YES	YES	0.60%	1,338.38	1,338.38	1,338.38
Toluene	108-88-3	YES	YES	12.90%	28,775.14	28,775.14	28,775.14
Trichloroethane, 1,1,1-	71-55-6	YES	YES	0.40%	892.25	892.25	892.25
Trichloroethylene	79-01-6	YES	YES	0.30%	669.19	669.19	669.19
Xylene (mixed)	1330-20-7	YES	YES	21.60%	48,181.63	48,181.63	48,181.63
				100.00%	223,063.09	208,787.05	154,582.72

Notes:
(1) Physical Properties Similar to Diethylamine
(2) Physical Properties Similar to Butyl Benzene
(3) Physical Properties Similar to Ethylene Glycol

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Composition of Blended Fuel
(continued from previous page)

2) Maximum Cake Contribution

Maximum Gallons of Cake	**14,652,153**	**gallons per year**
Density of Cake	**12.00**	**lb/gallon**
Maximum Mass of Cake	**87,912.92**	**tons/year**

Cake Composition	CAS Number	VOC	HAP	Volatile Concentration in Solids (ppm)	Total Mass (ton/yr)	Mass VOC (ton/yr)	Mass HAP (ton/yr)
Benzene	71-43-2	YES	YES	600.00	52.75	52.75	52.75
Alkyl Benzenes (1)	104-51-8	YES	NO	756.00	66.46	66.46	
Carbon Tetrachloride	56-23-5	YES	YES	0.05	4.40E-03	4.396E-03	4.396E-03
Chlorobenzene	108-90-7	YES	YES	0.05	4.40E-03	4.396E-03	4.396E-03
Chloroform	67-66-3	YES	YES	0.05	4.40E-03	4.396E-03	4.396E-03
Cresol	108-39-4	YES	YES	0.12	1.05E-02	1.05E-02	1.05E-02
Dichloroethane, 1,2-	107-06-2	YES	YES	0.05	4.40E-03	4.396E-03	4.396E-03
Dichloroethene, 1,1-	75-35-4	YES	YES	0.05	4.40E-03	4.396E-03	4.396E-03
Ethyl Benzene	100-41-4	YES	YES	2,250.00	197.80	197.80	197.80
Methyl Ethyl Ketone	78-93-3	YES	NO	0.05	4.40E-03	4.396E-03	
Methyl Isobutyl Ketone	108-10-1	YES	YES	493.00	43.34	43.34	43.34
Pyridine	110-86-1	YES	NO	0.01	8.79E-04	8.791E-04	
Tetrachlorethylene	127-18-4	YES	YES	0.05	4.40E-03	4.396E-03	4.396E-03
Toluene	108-88-3	YES	YES	2,460.00	216.27	216.27	216.27
Trichloroethylene	79-01-6	YES	YES	0.05	4.40E-03	4.396E-03	4.396E-03
Trimethylbenzene, 1,2,4-	95-63-6	YES	NO	2,860.00	251.43	251.43	
Vinyl Chloride	75-01-4	YES	YES	0.05	4.40E-03	4.396E-03	4.396E-03
Water, Oil, & Dirt (solids)	not applicable	NO	NO	---	86,898.88		
Xylene (Mixed)	1330-20-7	YES	YES	2,115.00	185.94	185.94	185.94
					87,912.92	1,014.04	696.14

Notes:
(1) Physical Properties Similar to Butyl Benzene

Methodology:
(1) Total Mass HAP/VOC (ton/yr) = Mass of Cutter (ton/yr) x Mass %
(2) Total Mass HAP/VOC (ton/yr) = [Sludge Concentration (ppm) x 1 / 1E06] x Mass of Cake (ton/yr)
(3) Maximum Mass of Cake (ton/yr) = Maximum Gallons of Cake (gal/yr) x density (lb/gallon) x 1 ton / 2,000 lb
(4) Mass of HAP/VOC in Blended Fuel (ton/yr) = Mass of HAP/VOC in Cutter + Mass of HAP/VOC in Cake
(5) Liquid Wt% = Mass of Individual HAP/VOC / sum of all individual HAP/VOC

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Composition of Blended Fuel

(continued from previous page)

3) Blended Fuel Composition

Blended Fuel Composition	CAS Number	Mass in Cutter (ton/yr)	Mass in Cake (ton/yr)	Mass in Blended Fuel (ton/yr)	Liquid Wt% in Blended Fuel	VOC	HAP
Acetone	67-64-1	11,822.34		11,822.34	3.802%	NO	NO
Aliphatics (non-HAP) (1)	109-89-7	9,591.71		9,591.71	3.084%	YES	NO
Alkyl Benzenes (2)	104-51-8	45,504.87	66.46	45,571.33	14.654%	YES	NO
Benzene	71-43-2		52.75	52.75	0.017%	YES	YES
Butanol	71-36-3	3,122.88		3,122.88	1.004%	YES	NO
Butyl Acetate	123-86-4	6,022.70		6,022.70	1.937%	YES	NO
Carbon Tetrachloride	56-23-5		4.396E-03	4.396E-03	negligible	negligible	negligible
Chlorobenzene	108-90-7		4.396E-03	4.396E-03	negligible	negligible	negligible
Chloroform	67-66-3		4.396E-03	4.396E-03	negligible	negligible	negligible
Cresol-m	108-39-4	4,907.39	1.055E-02	4,907.40	1.578%	YES	YES
Cyclohexanone	108-94-1	9,814.78		9,814.78	3.156%	YES	NO
Dichloroethane, 1,2-	107-06-2		4.396E-03	4.396E-03	negligible	negligible	negligible
Dichloroethene, 1,1-	75-35-4		4.396E-03	4.396E-03	negligible	negligible	negligible
Ethyl Alcohol	64-17-5	3,569.01		3,569.01	1.148%	YES	NO
Ethyl Benzene	100-41-4	4,461.26	197.80	4,659.07	1.498%	YES	YES
Glycol Ethers (3)	107-21-1	2,676.76		2,676.76	0.861%	YES	YES
Hexane	110-54-3	4,238.20		4,238.20	1.363%	YES	YES
Isopropyl Alcohol	67-63-0	19,406.49		19,406.49	6.241%	YES	NO
Methyl Alcohol	67-56-1	5,130.45		5,130.45	1.650%	YES	YES
Methyl Ethyl Ketone	78-93-3	5,130.45	4.396E-03	5,130.46	1.650%	YES	NO
Methyl Isobutyl Ketone	108-10-1	2,007.57	43.34	2,050.91	0.660%	YES	YES
Methyl t-Butyl Ether	1634-04-4	2,007.57		2,007.57	0.646%	YES	YES
Methylene Chloride	75-09-2	2,453.69		2,453.69	0.789%	NO	YES
Naphthalene	91-20-3	1,338.38		1,338.38	0.430%	YES	YES
Pyridine	110-86-1		8.791E-04	8.791E-04	negligible	negligible	negligible
Tetrachlorethylene	127-18-4		4.396E-03	4.396E-03	negligible	negligible	negligible
Tetrahydrofuran	109-99-9	1,338.38		1,338.38	0.430%	YES	YES
Toluene	108-88-3	28,775.14	216.27	28,991.40	9.323%	YES	YES
Trichloroethane, 1,1,1-	71-55-6	892.25		892.25	0.287%	YES	YES
Trichloroethylene	79-01-6	669.19	4.396E-03	669.19	0.215%	YES	YES
Trimethylbenzene, 1,2,4-	95-63-6		251.43	251.43	0.081%	YES	NO
Vinyl Chloride	75-01-4		4.396E-03	4.396E-03	negligible	negligible	negligible
Water, Oil, & Dirt (inerts)	not applicable		86,898.88	86,898.88	27.944%	NO	NO
Xylene (mixed)	1330-20-7	48,181.63	185.94	48,367.56	15.553%	YES	YES
		223,063.09	87,912.92	310,976.01	100.00%		

Notes:
(1) Physical Properties Similar to Diethylamine
(2) Physical Properties Similar to Butyl Benzene
(3) Physical Properties Similar to Ethylene Glycol

Appendix A to the Technical Support Document (TSD)
Summary of Controlled and Uncontrolled VOC/HAP

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

1) Hydrapulper	**Documented Minimum Capture Efficiency**	**80%**
	NESHAP Required Minimum Control Efficiency	**95%**
	Maximum Batches (batches per year)	**30,560**
	Maximum Throughput (gallons per year)	**68,760,847**
	Minimum Overall Control Efficiency	**76%**

				PTE (TPY)						Controlled PTE (TPY)	
Pollutant	**HAP**	**VOC**	**Uncontrolled Emission Factor (lb/batch)**	**PTE HAP (TPY)**	**PTE VOC (TPY)**	**Non Fugitive HAP (TPY)**	**Non Fugitive VOC (TPY)**	**Fugitive HAP (TPY)**	**Fugitive VOC (TPY)**	**Controlled PTE HAP (TPY)**	**Controlled PTE VOC (TPY)**
Acetone	NO	NO	(not regulated)								
Aliphatics	NO	YES	0.1923		2.94		2.35		0.59		0.12
Alkyl Benzenes	YES	YES	8.77E-03	0.13	0.13	0.11	0.11	0.03	0.03	5.36E-03	5.36E-03
Benzene	YES	YES	4.21E-04	6.44E-03	6.44E-03	5.15E-03	5.15E-03	1.29E-03	1.29E-03	2.58E-04	2.58E-04
Butanol	NO	YES	1.93E-03		0.03		0.02		0.01		1.18E-03
Butyl Acetate	NO	YES	7.58E-03		0.12		0.09		0.02		4.63E-03
Cresol-m	YES	YES	4.76E-04	7.28E-03	7.28E-03	5.82E-03	5.82E-03	1.46E-03	1.46E-03	2.91E-04	2.91E-04
Cyclohexanone	NO	YES	4.28E-03		0.07		0.05		0.01		2.61E-03
Ethyl Alcohol	NO	YES	0.0226		0.35		0.28		0.07		0.01
Ethyl Benzene	YES	YES	4.87E-03	0.07	0.07	0.06	0.06	0.01	0.01	2.98E-03	2.98E-03
Glycol Ethers	YES	YES	2.71E-04	4.14E-03	4.14E-03	3.31E-03	3.31E-03	8.29E-04	8.29E-04	1.66E-04	1.66E-04
Hexane	YES	YES	0.0655	1.00	1.00	0.80	0.80	0.20	0.20	0.04	0.04
Isopropyl Alcohol	NO	YES	0.0943		1.44		1.15		0.29		0.06
Methyl Alcohol	YES	YES	0.0637	0.97	0.97	0.78	0.78	0.19	0.19	0.04	0.04
Methyl Ethyl Ketone	NO	YES	0.0460		0.70		0.56		0.14		0.03
Methyl Isobutyl Ketone	YES	YES	3.74E-03	0.06	0.06	0.05	0.05	0.01	0.01	2.28E-03	2.28E-03
Methyl t-Butyl Ether	YES	YES	0.0542	0.83	0.83	0.66	0.66	0.17	0.17	0.03	0.03
Methylene Chloride	YES	NO	0.1151	1.76		1.41		0.35		0.07	
Naphthalene	YES	YES	1.36E-04	2.08E-03	2.08E-03	1.66E-03	1.66E-03	4.15E-04	4.15E-04	8.30E-05	8.30E-05
Tetrahydrofuran	YES	YES	0.0237	0.36	0.36	0.29	0.29	0.07	0.07	0.01	0.01
Toluene	YES	YES	0.0851	1.30	1.30	1.04	1.04	0.26	0.26	0.05	0.05
Trichloroethane, 1,1,1-	YES	YES	0.0113	0.17	0.17	0.14	0.14	0.03	0.03	6.88E-03	6.88E-03
Trichloroethylene	YES	YES	4.07E-03	0.06	0.06	0.05	0.05	0.01	0.01	2.49E-03	2.49E-03
Trimethylbenzene, 1,2,4	NO	YES	7.83E-05		1.20E-03		9.57E-04		2.39E-04		4.79E-05
Water, Oil, Dirt (solids)	NO	NO	(not regulated)								
Xylene	YES	YES	0.0336	0.51	0.51	0.41	0.41	0.10	0.10	0.02	0.02
			Totals	**7.25**	**11.14**	**5.80**	**8.91**	**1.45**	**2.23**	**0.29**	**0.45**

HAP Summary (TPY)	**Total PTE**	**Non Fugitive**	**Fugitive**	**Controlled**
Single HAP - Methylene Chloride	**1.76**	**1.41**	**0.35**	**0.07**
Combined HAP	**7.25**	**5.80**	**1.45**	**0.29**

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Appendix A to the Technical Support Document (TSD)
Summary of Controlled and Uncontrolled VOC/HAP

(continued from previous page)

2) Blend Box	**Documented Minimum Capture Efficiency**	**93%**
	NESHAP Required Minimum Control Efficiency	**95%**
	Maximum Batches (batches per year)	**17,586**
	Maximum Throughput (gallons per year)	**68,760,847**
	Minimum Overall Control Efficiency	**88.4%**

				PTE (TPY)						Controlled PTE (TPY)	
Pollutant	**HAP**	**VOC**	**Uncontrolled Emission Factor (lb/batch)**	**PTE HAP (TPY)**	**PTE VOC (TPY)**	**Non Fugitive HAP (TPY)**	**Non Fugitive VOC (TPY)**	**Fugitive HAP (TPY)**	**Fugitive VOC (TPY)**	**Controlled PTE HAP (TPY)**	**Controlled PTE VOC (TPY)**
Acetone	NO	NO	(not regulated)								
Aliphatics	NO	YES	0.6313		5.55		5.16		0.39		0.26
Alkyl Benzenes	YES	YES	0.02	0.22	0.22	0.20	0.20	0.02	0.02	1.01E-02	1.01E-02
Benzene	YES	YES	6.80E-04	5.98E-03	0.01	0.01	0.01	4.19E-04	4.19E-04	2.78E-04	2.78E-04
Butanol	NO	YES	6.07E-03		0.05		0.05		3.74E-03		2.48E-03
Butyl Acetate	NO	YES	0.02		0.22		0.20		0.02		1.00E-02
Cresol-m	YES	YES	1.11E-03	9.80E-03	0.01	0.01	0.01	6.86E-04	6.86E-04	4.56E-04	4.56E-04
Cyclohexanone	NO	YES	0.01		0.12		0.11		8.13E-03		5.40E-03
Ethyl Alcohol	NO	YES	7.36E-02		0.65		0.60		0.05		0.03
Ethyl Benzene	YES	YES	1.53E-02	0.13	0.13	0.13	0.13	9.45E-03	9.45E-03	6.28E-03	6.28E-03
Glycol Ethers	YES	YES	6.45E-04	5.67E-03	0.01	0.01	0.01	3.97E-04	3.97E-04	2.64E-04	2.64E-04
Hexane	YES	YES	0.2154	1.89	1.89	1.76	1.76	0.13	0.13	0.09	0.09
Isopropyl Alcohol	NO	YES	0.3073		2.70		2.51		0.19		0.13
Methyl Alcohol	YES	YES	0.2063	1.81	1.81	1.69	1.69	0.13	0.13	0.08	0.08
Methyl Ethyl Ketone	NO	YES	0.1506		1.32		1.23		0.09		0.06
Methyl Isobutyl Ketone	YES	YES	1.20E-02	0.11	0.11	0.10	0.10	0.01	7.40E-03	4.92E-03	4.92E-03
Methyl t-Butyl Ether	YES	YES	0.1785	1.57	1.57	1.46	1.46	0.11	0.11	0.07	0.07
Methylene Chloride	YES	NO	0.3788	3.33		3.10		0.23		0.15	
Naphthalene	YES	YES	3.24E-04	2.85E-03	2.85E-03	2.65E-03	2.65E-03	1.99E-04	1.99E-04	1.32E-04	1.32E-04
Tetrahydrofuran	YES	YES	0.0780	0.69	0.69	0.64	0.64	0.05	0.05	0.03	0.03
Toluene	YES	YES	0.2768	2.43	2.43	2.26	2.26	0.17	0.17	0.11	0.11
Trichloroethane, 1,1,1-	YES	YES	0.0373	0.33	0.33	0.30	0.30	0.02	0.02	0.02	0.02
Trichloroethylene	YES	YES	1.34E-02	0.12	0.12	0.11	0.11	0.01	8.28E-03	0.01	5.50E-03
Trimethylbenzene, 1,2,4	NO	YES	1.44E-04		1.27E-03		1.18E-03		8.86E-05		5.89E-05
Water, Oil, Dirt (solids)	NO	NO	(not regulated)								
Xylene	YES	YES	0.1062	0.93	0.93	0.87	0.87	0.07	0.07	0.04	0.04
			Totals	**13.59**	**20.87**	**12.64**	**19.41**	**0.95**	**1.46**	**0.63**	**0.97**

HAP Summary (TPY)	**Total PTE**	**Non Fugitive**	**Fugitive**	**Controlled**
Single HAP - Methylene Chloride	**3.33**	**3.10**	**0.23**	**0.15**
Combined HAP	**13.59**	**12.64**	**0.95**	**0.63**

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Appendix A to the Technical Support Document (TSD)
Summary of Controlled and Uncontrolled VOC/HAP

(continued from previous page)

3) Tank T2 - Truck Wash Waste Storage

Capture Efficiency	**100%**
NESHAP Required Minimum Control Efficiency	**95%**
Maximum Throughput (gallons per year)	**68,760,847**
Maximum Throughput (kgal/yr)	**68,761**
Overall Control Efficiency	**95.0%**

				PTE (TPY)						Controlled PTE (TPY)	
Pollutant	**HAP**	**VOC**	**Uncontrolled Emission Factor (lb/kgal)**	**PTE HAP (TPY)**	**PTE VOC (TPY)**	**Non Fugitive HAP (TPY)**	**Non Fugitive VOC (TPY)**	**Fugitive HAP (TPY)**	**Fugitive VOC (TPY)**	**Controlled PTE HAP (TPY)**	**Controlled PTE VOC (TPY)**
Acetone	NO	NO	not regulated								
Aliphatics	NO	YES	0.0310		1.07		1.07		0.00		5.33E-02
Alkyl Benzenes	YES	YES	6.56E-04	2.26E-02	2.26E-02	2.26E-02	2.26E-02	0.00	0.00	1.13E-03	1.13E-03
Benzene	YES	YES	2.34E-05	8.03E-04	8.03E-04	8.03E-04	8.03E-04	0.00	0.00	4.01E-05	4.01E-05
Butanol	NO	YES	2.32E-04		7.99E-03		7.99E-03		0.00		3.99E-04
Butyl Acetate	NO	YES	1.11E-03		3.81E-02		3.81E-02		0.00		1.90E-03
Cresol-m	YES	YES	3.09E-07	1.06E-05	1.06E-05	1.06E-05	1.06E-05	0.00	0.00	5.32E-07	5.32E-07
Cyclohexanone	NO	YES	5.19E-04		1.78E-02		1.78E-02		0.00		8.92E-04
Ethyl Alcohol	NO	YES	0.0035		1.21E-01		1.21E-01		0.00		6.05E-03
Ethyl Benzene	YES	YES	6.74E-04	2.32E-02	2.32E-02	2.32E-02	2.32E-02	0.00	0.00	1.16E-03	1.16E-03
Glycol Ethers	YES	YES	1.74E-06	5.99E-05	5.99E-05	5.99E-05	5.99E-05	0.00	0.00	2.99E-06	2.99E-06
Hexane	YES	YES	0.0110	0.38	0.38	0.38	0.38	0.00	0.00	1.89E-02	1.89E-02
Isopropyl Alcohol	NO	YES	0.0144		0.50		0.50		0.00		2.48E-02
Methyl Alcohol	YES	YES	0.0101	0.35	0.35	0.35	0.35	0.00	0.00	1.73E-02	1.73E-02
Methyl Ethyl Ketone	NO	YES	0.0075		0.26		0.26		0.00		1.29E-02
Methyl Isobutyl Ketone	YES	YES	5.49E-04	1.89E-02	1.89E-02	1.89E-02	1.89E-02	0.00	0.00	9.44E-04	9.44E-04
Methyl t-Butyl Ether	YES	YES	0.0093	0.32	0.32	0.32	0.32	0.00	0.00	1.59E-02	1.59E-02
Methylene Chloride	YES	NO	0.0197	0.68		0.68		0.00		3.39E-02	
Naphthalene	YES	YES	8.84E-07	3.04E-05	3.04E-05	3.04E-05	3.04E-05	0.00	0.00	1.52E-06	1.52E-06
Tetrahydrofuran	YES	YES	0.0040	0.14	0.14	0.14	0.14	0.00	0.00	6.85E-03	6.85E-03
Toluene	YES	YES	0.0133	0.46	0.46	0.46	0.46	0.00	0.00	2.29E-02	2.29E-02
Trichloroethane, 1,1,1-	YES	YES	0.0019	0.07	6.50E-02	6.50E-02	6.50E-02	0.00	0.00	3.25E-03	3.25E-03
Trichloroethylene	YES	YES	6.54E-04	2.25E-02	2.25E-02	2.25E-02	2.25E-02	0.00	0.00	1.12E-03	1.12E-03
Trimethylbenzene, 1,2,4	NO	YES	2.89E-06		9.92E-05		9.92E-05		0.00		4.96E-06
Water, Oil, Dirt (solids)	NO	NO	not regulated								
Xylene	YES	YES	0.0045	0.15	0.15	0.15	0.15	0.00	0.00	7.68E-03	7.68E-03
			Totals	**2.62**	**3.95**	**2.62**	**3.95**	**0.00**	**0.00**	**0.13**	**0.20**

HAP Summary (TPY)	**Total PTE**	**Non Fugitive**	**Fugitive**	**Controlled**
Single HAP - Methylene Chloride	**0.68**	**0.68**	**0.00**	**0.03**
Combined HAP	**2.62**	**2.62**	**0.00**	**0.13**

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Appendix A to the Technical Support Document (TSD)
Summary of Controlled and Uncontrolled VOC/HAP

(continued from previous page)

4) Tank Farm - Tanks T1, T3, T4, T5, T6, T7, T8, T12 and T13 (Tanl T7 Worst Case Emissions)

Maximum Throughput Blended Fuel (gallons per year)	**68,760,847**
Maximum Throughput Recycle (gallons/yr)	**105,120,000**
Maximum Tank Farm Throughput (gallons/yr)	**173,880,847**
Maximum Tank Farm Throughput (kgal/yr)	**173,881**
Required NESHAP Control Efficiency	**95%**
Capture Efficiency	**100%**

				PTE (TPY)						Controlled PTE (TPY)	
Pollutant	**HAP**	**VOC**	**Uncontrolled Emission Factor (lb/kgal)**	**PTE HAP (TPY)**	**PTE VOC (TPY)**	**Non Fugitive HAP (TPY)**	**Non Fugitive VOC (TPY)**	**Fugitive HAP (TPY)**	**Fugitive VOC (TPY)**	**Controlled PTE HAP (TPY)**	**Controlled PTE VOC (TPY)**
Acetone	NO	NO	not regulated								
Aliphatics	NO	YES	3.37E-02		2.93		2.93		0.00		0.15
Alkyl Benzenes	YES	YES	7.14E-04	0.06	0.06	0.06	0.06	0.00	0.00	3.11E-03	3.11E-03
Benzene	YES	YES	2.54E-05	2.21E-03	2.21E-03	2.21E-03	2.21E-03	0.00	0.00	1.11E-04	1.11E-04
Butanol	NO	YES	2.53E-04		0.02		0.02		0.00		1.10E-03
Butyl Acetate	NO	YES	1.21E-03		0.10		0.10		0.00		5.24E-03
Cresol-m	YES	YES	3.37E-07	2.93E-05	2.93E-05	2.93E-05	2.93E-05	0.00	0.00	1.47E-06	1.47E-06
Cyclohexanone	NO	YES	5.65E-04		0.05		0.05		0.00		2.46E-03
Ethyl Alcohol	NO	YES	3.83E-03		0.33		0.33		0.00		0.02
Ethyl Benzene	YES	YES	7.35E-04	0.06	0.06	0.06	0.06	0.00	0.00	3.19E-03	3.19E-03
Glycol Ethers	YES	YES	1.90E-06	1.65E-04	1.65E-04	1.65E-04	1.65E-04	0.00	0.00	8.24E-06	8.24E-06
Hexane	YES	YES	1.19E-02	1.04	1.04	1.04	1.04	0.00	0.00	0.05	0.05
Isopropyl Alcohol	NO	YES	1.57E-02		1.36		1.36		0.00		0.07
Methyl Alcohol	YES	YES	1.10E-02	0.95	0.95	0.95	0.95	0.00	0.00	0.05	0.05
Methyl Ethyl Ketone	NO	YES	8.16E-03		0.71		0.71		0.00		0.04
Methyl Isobutyl Ketone	YES	YES	5.98E-04	0.05	0.05	0.05	0.05	0.00	0.00	2.60E-03	2.60E-03
Methyl t-Butyl Ether	YES	YES	1.01E-02	0.88	0.88	0.88	0.88	0.00	0.00	0.04	0.04
Methylene Chloride	YES	NO	2.15E-02	1.87		1.87		0.00		0.09	
Naphthalene	YES	YES	9.63E-07	8.37E-05	8.37E-05	8.37E-05	8.37E-05	0.00	0.00	4.19E-06	4.19E-06
Tetrahydrofuran	YES	YES	4.34E-03	0.38	0.38	0.38	0.38	0.00	0.00	0.02	0.02
Toluene	YES	YES	1.45E-02	1.26	1.26	1.26	1.26	0.00	0.00	0.06	0.06
Trichloroethane, 1,1,1-	YES	YES	2.06E-03	0.18	0.18	0.18	0.18	0.00	0.00	8.95E-03	8.95E-03
Trichloroethylene	YES	YES	7.12E-04	0.06	0.06	0.06	0.06	0.00	0.00	3.09E-03	3.09E-03
Trimethylbenzene, 1,2,4	NO	YES	1.79E-03		0.16		0.16		0.00		7.79E-03
Water, Oil, Dirt (solids)	NO	NO	not regulated								
Xylene	YES	YES	4.87E-03	0.42	0.42	0.42	0.42	0.00	0.00	0.02	0.02
			Totals	**7.22**	**11.02**	**7.22**	**11.02**	**0.00**	**0.00**	**0.36**	**0.55**

HAP Summary (TPY)	**Total PTE**	**Non Fugitive**	**Fugitive**	**Controlled**
Single HAP - Methylene Chloride	**1.87**	**1.87**	**0.00**	**0.09**
Combined HAP	**7.22**	**7.22**	**0.00**	**0.36**

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Summary of Controlled and Uncontrolled VOC/HAP

(continued from previous page)

5) Kiln/Calciner Burn Tanks - Tanks T10 and T11

Maximum Throughput Blended Fuel (gallons per year)	**68,760,847**
Maximum Throughput Recycle (gallons/yr)	**0**
Maximum Tank Farm Throughput (gallons/yr)	**68,760,847**
Maximum Tank Farm Throughput (kgal/yr)	**68,761**
Required NESHAP Control Efficiency	**95%**
Capture Efficiency	**100%**

				PTE (TPY)						Controlled PTE (TPY)	
Pollutant	**HAP**	**VOC**	**Uncontrolled Emission Factor (lb/kgal)**	**PTE HAP (TPY)**	**PTE VOC (TPY)**	**Non Fugitive HAP (TPY)**	**Non Fugitive VOC (TPY)**	**Fugitive HAP (TPY)**	**Fugitive VOC (TPY)**	**Controlled PTE HAP (TPY)**	**Controlled PTE VOC (TPY)**
Acetone	NO	NO	not regulated								
Aliphatics	NO	YES	4.09E-02		1.41		1.41		0.00		7.03E-02
Alkyl Benzenes	YES	YES	8.66E-04	0.03	0.03	0.03	0.03	0.00	0.00	1.49E-03	1.49E-03
Benzene	YES	YES	3.08E-05	1.06E-03	1.06E-03	1.06E-03	1.06E-03	0.00	0.00	5.30E-05	5.30E-05
Butanol	NO	YES	3.07E-04		1.05E-02		1.05E-02		0.00		5.27E-04
Butyl Acetate	NO	YES	1.46E-03		0.05		0.05		0.00		2.51E-03
Cresol-m	YES	YES	4.09E-07	1.40E-05	1.40E-05	1.40E-05	1.40E-05	0.00	0.00	7.02E-07	7.02E-07
Cyclohexanone	NO	YES	6.85E-04		0.02		0.02		0.00		1.18E-03
Ethyl Alcohol	NO	YES	4.65E-03		0.16		0.16		0.00		7.99E-03
Ethyl Benzene	YES	YES	8.90E-04	0.03	0.03	0.03	0.03	0.00	0.00	1.53E-03	1.53E-03
Glycol Ethers	YES	YES	2.30E-06	7.90E-05	7.90E-05	7.90E-05	7.90E-05	0.00	0.00	3.95E-06	3.95E-06
Hexane	YES	YES	1.45E-02	0.50	0.50	0.50	0.50	0.00	0.00	2.49E-02	2.49E-02
Isopropyl Alcohol	NO	YES	1.90E-02		0.65		0.65		0.00		3.27E-02
Methyl Alcohol	YES	YES	1.33E-02	0.46	0.46	0.46	0.46	0.00	0.00	2.29E-02	2.29E-02
Methyl Ethyl Ketone	NO	YES	9.89E-03		0.34		0.34		0.00		1.70E-02
Methyl Isobutyl Ketone	YES	YES	7.25E-04	0.02	0.02	0.02	0.02	0.00	0.00	1.25E-03	1.25E-03
Methyl t-Butyl Ether	YES	YES	1.22E-02	0.42	0.42	0.42	0.42	0.00	0.00	2.10E-02	2.10E-02
Methylene Chloride	YES	NO	2.61E-02	0.90		0.90		0.00		4.48E-02	
Naphthalene	YES	YES	1.17E-06	4.01E-05	4.01E-05	4.01E-05	4.01E-05	0.00	0.00	2.01E-06	2.01E-06
Tetrahydrofuran	YES	YES	5.26E-03	0.18	0.18	0.18	0.18	0.00	0.00	9.04E-03	9.04E-03
Toluene	YES	YES	1.76E-02	0.60	0.60	0.60	0.60	0.00	0.00	3.02E-02	3.02E-02
Trichloroethane, 1,1,1	YES	YES	2.50E-03	0.09	0.09	0.09	0.09	0.00	0.00	4.29E-03	4.29E-03
Trichloroethylene	YES	YES	8.63E-04	0.03	0.03	0.03	0.03	0.00	0.00	1.48E-03	1.48E-03
Trimethylbenzene, 1,2,4	NO	YES	3.81E-06		1.31E-04		1.31E-04		0.00		6.55E-06
Water, Oil, Dirt (solids)	NO	NO	not regulated								
Xylene	YES	YES	5.90E-03	0.20	0.20	0.20	0.20	0.00	0.00	1.01E-02	1.01E-02
			Totals	**3.46**	**5.21**	**3.46**	**5.21**	**0.00**	**0.00**	**0.17**	**0.26**

HAP Summary (TPY)	**Total PTE**	**Non Fugitive**	**Fugitive**	**Controlled**
Single HAP - Methylene Chloride	**0.90**	**0.90**	**0.00**	**0.04**
Combined HAP	**3.46**	**3.46**	**0.00**	**0.17**

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Appendix A to the Technical Support Document (TSD)
Summary of Controlled and Uncontrolled VOC/HAP

(continued from previous page)

6) Truck Wash Operation - Wash Truck Interior and Pump Waste to Tank T2

Maximum Throughput (gallons per year)	**68,760,847**
Maximum Throughput (kgal/yr)	**68,761**
NESHAP Required Minimum Control Efficiency	**95%**
Minimum Documented Capture Efficiency	**93%**
Minimum Overall Control Efficiency	**88.35%**

				PTE (TPY)						Controlled PTE (TPY)	
Pollutant	**HAP**	**VOC**	**Uncontrolled Emission Factor (lb/kgal)**	**PTE HAP (TPY)**	**PTE VOC (TPY)**	**Non Fugitive HAP (TPY)**	**Non Fugitive VOC (TPY)**	**Fugitive HAP (TPY)**	**Fugitive VOC (TPY)**	**Controlled PTE HAP (TPY)**	**Controlled PTE VOC (TPY)**
Acetone	NO	NO	0.0473								
Aliphatics	NO	YES	0.0359		1.23		1.15		0.09		0.06
Alkyl Benzenes	YES	YES	6.43E-04	2.21E-02	2.21E-02	2.06E-02	2.06E-02	1.55E-03	1.55E-03	1.03E-03	1.03E-03
Benzene	YES	YES	2.88E-05	9.90E-04	9.90E-04	9.21E-04	9.21E-04	6.93E-05	6.93E-05	4.60E-05	4.60E-05
Butanol	NO	YES	2.13E-04		7.32E-03		6.81E-03		5.12E-04		3.40E-04
Butyl Acetate	NO	YES	0.0010		3.31E-02		3.08E-02		2.32E-03		1.54E-03
Cresol-m	YES	YES	8.00E-06	2.75E-04	2.75E-04	2.56E-04	2.56E-04	1.93E-05	1.93E-05	1.28E-05	1.28E-05
Cyclohexanone	NO	YES	6.95E-04		2.39E-02		2.22E-02		1.67E-03		1.11E-03
Ethyl Alcohol	NO	YES	0.0030		1.05E-01		9.74E-02		7.33E-03		4.87E-03
Ethyl Benzene	YES	YES	6.26E-04	2.15E-02	2.15E-02	2.00E-02	2.00E-02	1.51E-03	1.51E-03	1.00E-03	1.00E-03
Glycol Ethers	YES	YES	1.75E-06	6.00E-05	6.00E-05	5.58E-05	5.58E-05	4.20E-06	4.20E-06	2.79E-06	2.79E-06
Hexane	YES	YES	0.0111	0.38	0.38	0.35	0.35	0.03	0.03	0.02	0.02
Isopropyl Alcohol	NO	YES	0.0119		0.41		0.38		0.03		0.02
Methyl Alcohol	YES	YES	0.0098	0.34	0.34	0.31	0.31	0.02	0.02	0.02	0.02
Methyl Ethyl Ketone	NO	YES	0.0074		0.26		0.24		0.02		1.19E-02
Methyl Isobutyl Ketone	YES	YES	5.50E-04	1.89E-02	1.89E-02	1.76E-02	1.76E-02	1.32E-03	1.32E-03	8.80E-04	8.80E-04
Methyl t-Butyl Ether	YES	YES	8.94E-03	0.31	0.31	0.29	0.29	0.02	0.02	1.43E-02	1.43E-02
Methylene Chloride	YES	NO	0.0191	0.66		0.61		0.05		0.03	
Naphthalene	YES	YES	4.07E-06	1.40E-04	1.40E-04	1.30E-04	1.30E-04	9.80E-06	9.80E-06	6.51E-06	6.51E-06
Tetrahydrofuran	YES	YES	0.0037	0.13	0.13	0.12	0.12	8.94E-03	8.94E-03	5.94E-03	5.94E-03
Toluene	YES	YES	0.0126	0.43	0.43	0.40	0.40	0.03	0.03	0.02	0.02
Trichloroethane, 1,1,1-	YES	YES	0.0020	0.07	6.88E-02	6.40E-02	6.40E-02	4.81E-03	4.81E-03	3.20E-03	3.20E-03
Trichloroethylene	YES	YES	7.29E-04	2.51E-02	2.51E-02	2.33E-02	2.33E-02	1.76E-03	1.76E-03	1.17E-03	1.17E-03
Trimethylbenzene, 1,2,4	NO	YES	2.18E-06		7.50E-05		6.98E-05		5.25E-06		3.49E-06
Water, Oil, Dirt (solids)	NO	NO	9.86E-03								
Xylene	YES	YES	5.62E-03	0.19	0.19	0.18	0.18	1.35E-02	1.35E-02	8.98E-03	8.98E-03
			Totals	**2.59**	**4.00**	**2.41**	**3.72**	**0.18**	**0.28**	**0.12**	**0.19**

HAP Summary (TPY)	**Total PTE**	**Non Fugitive**	**Fugitive**	**Controlled**
Single HAP - Methylene Chloride	**0.66**	**0.61**	**0.05**	**0.03**
Combined HAP	**2.59**	**2.41**	**0.18**	**0.12**

Appendix A to the Technical Support Document (TSD)
Proposed PSD Minor Limits

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

1) Hydrapulper

Limited Batches (Batch = Fill + Mix + N2 Purge)		10,084	batch/year
Batch Volume		2,250	gallons/batch
Throughput		22,689,000	gallons/year
Capture Efficiency	80%	Control Efficiency	0%

Pollutant	HAP	VOC	Worst Case Emission Factor (lb/batch)	Fugitive HAP (TPY)	Fugitive VOC (TPY)	Limited HAP (TPY)	Limited VOC (TPY)
Acetone	NO	NO	not regulated				
Aliphatics	NO	YES	0.1923		0.19		0.7757
Alkyl Benzenes	YES	YES	0.0088	0.01	0.01	0.0354	0.0354
Benzene	YES	YES	0.0004	4.25E-04	4.25E-04	0.0017	0.0017
Butanol	NO	YES	0.0019		1.95E-03		0.0078
Butyl Acetate	NO	YES	0.0076		7.64E-03		0.0306
Cresol-m	YES	YES	0.0005	4.80E-04	4.80E-04	0.0019	0.0019
Cyclohexanone	NO	YES	0.0043		4.31E-03		0.0173
Ethyl Alcohol	NO	YES	0.0226		0.02		0.0914
Ethyl Benzene	YES	YES	0.0049	4.91E-03	4.91E-03	0.0196	0.0196
Glycol Ethers	YES	YES	0.0003	2.73E-04	2.73E-04	0.0011	0.0011
Hexane	YES	YES	0.0655	0.07	0.07	0.2641	0.2641
Isopropyl Alcohol	NO	YES	0.0943		0.10		0.3803
Methyl Alcohol	YES	YES	0.0637	0.06	0.06	0.2568	0.2568
Methyl Ethyl Ketone	NO	YES	0.0460		0.05		0.1854
Methyl Isobutyl Ketone	YES	YES	0.0037	3.77E-03	3.77E-03	0.0151	0.0151
Methyl t-Butyl Ether	YES	YES	0.0542	0.05	0.05	0.2187	0.2187
Methylene Chloride	YES	NO	0.1151	0.12		0.4641	
Naphthalene	YES	YES	0.0001	1.37E-04	1.37E-04	0.0005	0.0005
Tetrahydrofuran	YES	YES	0.0237	0.02	0.02	0.0958	0.0958
Toluene	YES	YES	0.0851	0.09	0.09	0.3431	0.3431
Trichloroethane, 1,1,1-	YES	YES	0.0113	1.14E-02	1.14E-02	0.0454	0.0454
Trichloroethylene	YES	YES	0.0041	4.11E-03	4.11E-03	0.0164	0.0164
Trimethylbenzene, 1,2,4	NO	YES	0.0001		7.90E-05		0.0003
Water, Oil, Dirt (solids)	NO	NO	not regulated				
Xylene	YES	YES	0.0336	0.03	0.03	0.1354	0.1354
Totals				**0.48**	**0.73**	**1.92**	**2.94**

VOC Limit

Throughput	**10,084**	**batch/year**
Emission Rate	**0.58**	**lb/batch in Hydrapulper**

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Appendix A to the Technical Support Document (TSD)
Proposed PSD Minor Limits

(continued from previous page)

2) Blend Box

Limited Batches (Batch = Fill + Mix + Clean)	5,090	batch/year
Batch Volume	3,910	gallons/batch
Throughput	19,901,900	gallons/year

Capture Efficiency 93% Control Efficiency 0%

Pollutant	HAP	VOC	Worst Case Emission Factor (lb/batch)	Fugitive HAP (TPY)	Fugitive VOC (TPY)	Limited HAP (TPY)	Limited VOC (TPY)
Acetone	NO	NO	(not regulated)				
Aliphatics	NO	YES	0.6313		0.11		1.4941
Alkyl Benzenes	YES	YES	0.0248	4.41E-03	4.41E-03	0.0586	0.0586
Benzene	YES	YES	0.0007	1.21E-04	1.21E-04	0.0016	0.0016
Butanol	NO	YES	0.0061		1.08E-03		0.0144
Butyl Acetate	NO	YES	0.0245		4.37E-03		0.0580
Cresol-m	YES	YES	0.0011	1.99E-04	1.99E-04	0.0026	0.0026
Cyclohexanone	NO	YES	0.0132		2.35E-03		0.0313
Ethyl Alcohol	NO	YES	0.0736		1.31E-02		0.1742
Ethyl Benzene	YES	YES	0.0153	2.73E-03	2.73E-03	0.0363	0.0363
Glycol Ethers	YES	YES	0.0006	1.15E-04	1.15E-04	0.0015	0.0015
Hexane	YES	YES	0.2154	0.04	0.04	0.5097	0.5097
Isopropyl Alcohol	NO	YES	0.3073		0.05		0.7272
Methyl Alcohol	YES	YES	0.2063	0.04	0.04	0.4882	0.4882
Methyl Ethyl Ketone	NO	YES	0.1506		0.03		0.3564
Methyl Isobutyl Ketone	YES	YES	0.0120	2.14E-03	2.14E-03	0.0285	0.0285
Methyl t-Butyl Ether	YES	YES	0.1785	0.03	0.03	0.4225	0.4225
Methylene Chloride	YES	NO	0.3788	0.07		0.8966	
Naphthalene	YES	YES	0.0003	5.77E-05	5.77E-05	0.0008	0.0008
Tetrahydrofuran	YES	YES	0.0780	1.39E-02	1.39E-02	0.1845	0.1845
Toluene	YES	YES	0.2768	0.05	0.05	0.6552	0.6552
Trichloroethane, 1,1,1-	YES	YES	0.0373	6.64E-03	6.64E-03	0.0882	0.0882
Trichloroethylene	YES	YES	0.0134	2.40E-03	2.40E-03	0.0318	0.0318
Trimethylbenzene, 1,2,4	NO	YES	0.0001		2.56E-05		0.0003
Water, Oil, Dirt (solids)	NO	NO	(not regulated)				
Xylene	YES	YES	0.1062	0.02	0.02	0.2514	0.2514
Totals				**0.28**	**0.42**	**3.66**	**5.62**

VOC Limit

Throughput	**5,090**	**batch/year**
Emission Rate	**2.20**	**lb/batch in Blend Box**

Appendix A to the Technical Support Document
Potential to Emit - Fill Hydrapulper to Make Blended Fuel

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

System Pressure	**14.70 psi**		
Temperature	**521.67 ˚R**	**62 ˚F**	**(annual average high temperature for Indianapolis, Indiana)**
Temperature	**16.67 ˚C**		

Vapor Pressure Calculations

Component	A	B	C	Vapor Pressure (mmHg)	Vapor Pressure (psia)	Liquid Wt %	Molecular Weight	Liquid Mole Fraction	Partial Pressure (psia)
Acetone	7.3141	1315.67	240.479	157.6478	3.0484	3.802%	58.08	2.7543%	0.08396
Aliphatics	6.5570	829.07	170.077	131.0252	2.5336	3.084%	73.14	1.7741%	0.04495
Alkyl Benzenes	7.1847	1720.37	216.413	0.6363	0.0123	14.654%	134.22	4.5936%	5.65E-04
Benzene	6.8140	1090.43	197.146	51.7729	1.0011	0.017%	78.11	0.0092%	9.17E-05
Butanol	7.2906	1282.85	173.247	3.4334	0.0664	1.004%	74.12	0.5699%	3.78E-04
Butyl Acetate	7.2341	1515.76	222.077	7.6771	0.1485	1.937%	116.16	0.7016%	1.04E-03
Cresol-m	6.8749	1303.18	124.000	4.08E-03	7.89E-05	1.578%	108.10	0.6142%	4.85E-07
Cyclohexanone	7.6065	1884.55	243.036	2.2386	0.0433	3.156%	98.20	1.3522%	5.85E-04
Ethyl Alcohol	8.1348	1662.48	238.131	40.7490	0.7880	1.148%	46.07	1.0484%	8.26E-03
Ethyl Benzene	7.1561	1559.55	228.582	6.2671	0.1212	1.498%	106.17	0.5936%	7.19E-04
Glycol Ethers	9.6994	3147.10	264.246	0.0314	6.06E-04	0.861%	62.07	0.5836%	3.54E-06
Hexane	6.9895	1216.92	227.451	101.0522	1.9540	1.363%	86.17	0.6655%	0.01300
Isopropyl Alcohol	7.8306	1483.30	217.413	31.1753	0.6028	6.241%	60.09	4.3699%	0.02634
Methyl Alcohol	8.0913	1582.91	239.096	79.8504	1.5440	1.650%	32.04	2.1668%	0.03346
Methyl Ethyl Ketone	7.2010	1325.15	227.093	58.1745	1.1249	1.65E-02	72.10	0.9629%	0.01083
Methyl Isobutyl Ketone	7.1597	1421.73	216.266	11.3790	0.2200	0.660%	100.20	0.2771%	6.10E-04
Methyl t-Butyl Ether	7.0760	1233.70	238.879	177.1108	3.4248	0.646%	88.15	0.3083%	0.01056
Methylene Chloride	7.1146	1152.41	232.442	307.9582	5.9549	0.789%	84.94	0.3908%	0.02327
Naphthalene	6.8912	1551.48	168.879	0.0338	6.54E-04	0.430%	128.20	0.1411%	9.2350E-07
Tetrahydrofuran	7.1054	1256.68	232.621	115.9517	2.2421	0.430%	72.12	0.2509%	5.62E-03
Toluene	7.1362	1457.29	231.827	18.6946	0.3615	9.323%	92.13	4.2577%	0.01539
Trichloroethane, 1,1,1-	7.0072	1253.20	229.624	82.9663	1.6043	0.287%	133.42	0.0905%	0.00145
Trichloroethylene	6.8798	1157.83	202.580	39.7067	0.7678	0.215%	131.40	0.0688%	5.29E-04
Trimethylbenzene, 1,2,4-	7.2933	1763.35	230.248	1.4182	0.0274	0.081%	120.19	0.0284%	7.78E-06
Water, Oil, Dirt (inerts)	8.0557	1723.64	233.080	14.2615	0.2758	27.944%	18.02	65.2629%	0.17998
Xylene	7.2122	1546.92	217.144	3.9450	0.0763	15.553%	106.17	6.1636%	4.70E-03
						100.00%		100.00%	0.46632

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Appendix A to the Technical Support Document
Potential to Emit - Fill Hydrapulper to Make Blended Fuel

(continued from previous page)

Batches Processed per Year	**30,560**	**batches per year**	**68,760,847**	**gallon/yr**
Volume Displaced per Batch	**300.78**	**cubic feet (2,250 gallons)**		
Ideal Gas Constant	**10.7316**	**FT^3 . PSI / R . LB-MOLE**		
Temperature	**521.67**	**˚R**		

PTE Calculations - Loading Hydrapulper							**Uncontrolled**	
Component	**HAP**	**VOC**	**Partial Pressure (psia)**	**Moles in Vapor (mole/batch)**	**M.W.**	**Emission per Batch (lb/batch)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**
Acetone	NO	NO	0.08396	4.51E-03	58.08	0.2620	not regulated	
Aliphatics	NO	YES	0.04495	2.41E-03	73.14	0.1766	2.70	
Alkyl Benzenes	YES	YES	5.65E-04	3.04E-05	134.22	4.08E-03	0.06	0.06
Benzene	YES	YES	9.17E-05	4.93E-06	78.11	3.85E-04	5.88E-03	5.88E-03
Butanol	NO	YES	3.78E-04	2.03E-05	74.12	1.51E-03	0.02	
Butyl Acetate	NO	YES	1.04E-03	5.60E-05	116.16	6.50E-03	0.10	
Cresol-m	YES	YES	4.85E-07	2.60E-08	108.10	2.81E-06	4.30E-05	4.30E-05
Cyclohexanone	NO	YES	5.85E-04	3.14E-05	98.20	3.09E-03	0.05	
Ethyl Alcohol	NO	YES	8.26E-03	4.44E-04	46.07	0.0204	0.31	
Ethyl Benzene	YES	YES	7.19E-04	3.87E-05	106.17	4.10E-03	0.06	0.06
Glycol Ethers	YES	YES	3.54E-06	1.90E-07	62.07	1.18004E-05	1.80E-04	1.80E-04
Hexane	YES	YES	0.01300	6.99E-04	86.17	0.0602	0.92	0.92
Isopropyl Alcohol	NO	YES	0.02634	1.42E-03	60.09	0.0850	1.30	
Methyl Alcohol	YES	YES	0.03346	1.80E-03	32.04	0.0576	0.88	0.88
Methyl Ethyl Ketone	NO	YES	0.01083	5.82E-04	72.10	0.0420	0.64	
Methyl Isobutyl Ketone	YES	YES	6.10E-04	3.28E-05	100.20	3.28E-03	0.05	0.05
Methyl t-Butyl Ether	YES	YES	0.01056	5.67E-04	88.15	0.0500	0.76	0.76
Methylene Chloride	YES	NO	0.02327	1.25E-03	84.94	0.1062		1.62
Naphthalene	YES	YES	9.23E-07	4.96E-08	128.20	6.36E-06	9.72E-05	9.72E-05
Tetrahydrofuran	YES	YES	5.62E-03	3.02E-04	72.12	0.0218	0.33	0.33
Toluene	YES	YES	0.01539	8.27E-04	92.13	0.0762	1.16	1.16
Trichloroethane, 1,1,1-	YES	YES	1.45E-03	7.80E-05	133.42	0.0104	0.16	0.16
Trichloroethylene	YES	YES	5.29E-04	2.84E-05	131.40	3.73E-03	0.06	0.06
Trimethylbenzene, 1,2,4-	NO	YES	7.78E-06	4.18E-07	120.19	5.02E-05	7.67E-04	7.67E-04
Water, Oil, Dirt (inerts)	NO	NO	0.17998	9.67E-03	18.02	0.1742	not regulated	
Xylene	YES	YES	4.70E-03	2.53E-04	106.17	0.0268	0.41	0.41
							PTE	
							9.99	**6.49**

Methodology:
1) Vapor pressure was calculated using Antoine equation.
2) Vapor Pressure (mmHg) = exp (A - B / (T + C); temperature in Celsius.
3) Partial Pressure (psia) = pure vapor pressure (psia) x liquid mole fraction (%)
4) Moles per Batch (lb-mole) = partial pressure (psia) x Batch (FT3) / (gas constant x Temp in Rankine)
5) Emissions per Batch (TPY) = moles per batch (lb-mole/batch) x M.W. (lb/lb-mole)
6) PTE (TPY) = emissions per batch (lb/batch) x batches per year (batch/yr) x 1 ton/2,000 lb

Single HAP - Methylene Chloride	
Uncontrolled PTE	**1.62**

Appendix A to the Technical Support Document
Potential to Emit - Nitrogen Purge after Mixing

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

System Pressure	**14.70 psi**			**Nitrogen Purge Rate**	**10**	**ACFM**
Temperature	**521.67 ˚R**	**16.67 ˚C**	**62.00 ˚F (avg. high)**	**VP $_{N2}$ = System Pressure - Sum Partial Pressure =**	**14.23**	**psia**

Vapor Pressure and Pollutant Flow Rate Calculations

Component	M.W (lb/lb-mole)	A	B	C	Vapor Pressure (mmHg)	Vapor Pressure (psia)	Liquid Wt %	Molecular Weight	Liquid Mole Fraction	Partial Pressure (psia)	Fi (SCFM)	HAP	VOC
Acetone	58.08	7.31414	1315.67	240.479	157.6478	3.0484	3.802%	58.08	2.7543%	0.08396	0.0574	NO	NO
Aliphatics	73.14	6.55695	829.07	170.077	131.0252	2.5336	3.084%	73.14	1.7741%	0.04495	0.0307	NO	YES
Alkyl Benzenes	134.22	7.18472	1720.37	216.413	0.6363	0.0123	14.654%	134.22	4.5936%	5.65E-04	3.85E-04	YES	YES
Benzene	78.11	6.81404	1090.43	197.146	51.7729	1.0011	0.017%	78.11	0.0092%	9.17E-05	6.24E-05	YES	YES
Butanol	74.12	7.29062	1282.85	173.247	3.4334	0.0664	1.004%	74.12	0.5699%	3.78E-04	2.57E-04	NO	YES
Butyl Acetate	116.16	7.2341	1515.76	222.077	7.6771	0.1485	1.937%	116.16	0.7016%	1.04E-03	7.09E-04	NO	YES
Cresol-m	108.10	6.87492	1303.18	124.000	4.08E-03	7.89E-05	1.578%	108.10	0.6142%	4.85E-07	3.30E-07	YES	YES
Cyclohexanone	98.20	7.60652	1884.55	243.036	2.2386	0.0433	3.156%	98.20	1.3522%	5.85E-04	3.98E-04	NO	YES
Ethyl Alcohol	46.07	8.13484	1662.48	238.131	40.7490	0.7880	1.148%	46.07	1.0484%	8.26E-03	5.62E-03	NO	YES
Ethyl Benzene	106.17	7.1561	1559.55	228.582	6.2671	0.1212	1.498%	106.17	0.5936%	7.19E-04	4.89E-04	YES	YES
Glycol Ethers	62.07	9.69941	3147.10	264.246	0.0314	6.06E-04	0.861%	62.07	0.5836%	3.54E-06	2.41E-06	YES	YES
Hexane	86.17	6.9895	1216.92	227.451	101.0522	1.9540	1.363%	86.17	0.6655%	0.01300	8.85E-03	YES	YES
Isopropyl Alcohol	60.09	7.83056	1483.30	217.413	31.1753	0.6028	6.241%	60.09	4.3699%	0.02634	0.0180	NO	YES
Methyl Alcohol	32.04	8.09126	1582.91	239.096	79.8504	1.5440	1.650%	32.04	2.1668%	3.35E-02	0.0228	YES	YES
Methyl Ethyl Ketone	72.10	7.20103	1325.15	227.093	58.1745	1.1249	1.650%	72.10	0.9629%	1.08E-02	7.37E-03	NO	YES
Methyl Isobutyl Ketone	100.20	7.15972	1421.73	216.266	11.3790	0.2200	0.660%	100.20	0.2771%	6.10E-04	4.15E-04	YES	YES
Methyl t-Butyl Ether	88.15	7.07597	1233.70	238.879	177.1108	3.4248	0.646%	88.15	0.3083%	1.06E-02	7.19E-03	YES	YES
Methylene Chloride	84.94	7.11464	1152.41	232.442	307.9582	5.9549	0.789%	84.94	0.3908%	0.02327	0.0159	YES	NO
Naphthalene	128.20	6.89116	1551.48	168.879	0.0338	6.54E-04	0.430%	128.20	0.1411%	9.23E-07	6.28E-07	YES	YES
Tetrahydrofuran	72.12	7.10537	1256.68	232.621	115.9517	2.2421	0.430%	72.12	0.2509%	5.62E-03	3.83E-03	YES	YES
Toluene	92.13	7.1362	1457.29	231.827	18.6946	0.3615	9.323%	92.13	4.2577%	0.01539	0.0105	YES	YES
Trichloroethane, 1,1,1-	133.42	7.00718	1253.20	229.624	82.9663	1.6043	0.287%	133.42	0.0905%	1.45E-03	9.88E-04	YES	YES
Trichloroethylene	131.40	6.87981	1157.83	202.580	39.7067	0.7678	0.215%	131.40	0.0688%	5.29E-04	3.60E-04	YES	YES
Trimethylbenzene, 1,2,4	120.19	7.29329	1763.35	230.248	1.4182	0.0274	0.081%	120.19	0.0284%	7.78E-06	5.29E-06	NO	YES
Water, Oil, Dirt (inerts)	18.02	8.05573	1723.64	233.080	14.2615	0.2758	27.944%	18.02	65.2629%	0.17998	0.1240	NO	NO
Xylene	106.17	7.21217	1546.92	217.144	3.9450	0.0763	15.553%	106.17	6.1636%	4.70E-03	3.20E-03	YES	YES
							100.00%		Subtotals	0.46632	0.32		

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Appendix A to the Technical Support Document
Potential to Emit - Nitrogen Purge after Mixing
(continued from previous page)

A - Surface Area of Hydrapulper	**7.06858**	**FT ^{2}**		
Ko - Reference Mass Transfer Coefficient - Water	**0.83**	**cm/sec**		
Fnc - Nitrogen Flow Rate	**10.00**	**SCFM**		
System Pressure	**14.70**	**psia**		
System Temperature	**521.67**	**R**		
Minutes Purge per Batch	**6.00**	**minutes per batch**		
PTE Batches	**30,560**	**batches per year**	**183,360**	**minutes per year**
Volume (2,250 gal/batch)	**68,760,847**	**gallon per year**		

Emission Calculations from Purge Operations

Component	Fi (SCFM)	M.W (lb/lb-mole)	Ki (cm/sec)	Ki (ft/min)	Ki * A (ft ^{3} / min)	Si First Guess	Si * Fi (SCFM)	Si Second Iteration	Si * Fi Second (SCFM)	Si Final	Si * Fi Final (SCFM)	Qi (lb/min)	PTE (TPY)
Acetone	0.0574	58.08	0.56388	1.11001	7.84617	0.4269	0.0245	0.4363	0.0251	0.4360	0.0250	3.82E-03	NA
Aliphatics	0.0307	73.14	0.52257	1.02869	7.27136	0.4269	0.0131	0.4177	0.0128	0.4174	0.0128	2.46E-03	0.23
Alkyl Benzenes	3.85E-04	134.22	0.42770	0.84193	5.95123	0.4269	1.64E-04	0.3699	1.42E-04	0.3696	1.42E-04	5.01E-05	4.59E-03
Benzene	6.24E-05	78.11	0.51136	1.00661	7.11530	0.4269	2.66E-05	0.4124	2.57E-05	0.4121	2.57E-05	5.27E-06	4.83E-04
Butanol	2.57E-04	74.12	0.52028	1.02418	7.23949	0.4269	1.10E-04	0.4166	1.07E-04	0.4163	1.07E-04	2.09E-05	1.91E-03
Butyl Acetate	7.09E-04	116.16	0.44859	0.88305	6.24191	0.4269	0.0003	0.3811	2.70E-04	0.3808	2.70E-04	8.23E-05	7.55E-03
Cresol-m	3.30E-07	108.10	0.45936	0.90426	6.39181	0.4269	1.41E-07	0.3867	1.275E-07	0.3864	1.27E-07	3.62E-08	3.31E-06
Cyclohexanone	3.98E-04	98.20	0.47416	0.93338	6.59766	0.4269	1.70E-04	0.3943	1.57E-04	0.3939	1.57E-04	4.05E-05	3.71E-03
Ethyl Alcohol	5.62E-03	46.07	0.60868	1.19819	8.46951	0.4269	2.40E-03	0.4552	2.56E-03	0.4549	2.56E-03	3.09E-04	0.03
Ethyl Benzene	4.89E-04	106.17	0.46210	0.90965	6.42992	0.4269	2.09E-04	0.3881	1.90E-04	0.3878	1.90E-04	5.29E-05	4.85E-03
Glycol Ethers	2.41E-06	62.07	0.55165	1.08593	7.67601	0.4269	1.03E-06	0.4309	1.037E-06	0.4306	1.04E-06	1.69E-07	1.55E-05
Hexane	8.85E-03	86.17	0.49505	0.97451	6.88841	0.4269	3.78E-03	0.4046	3.58E-03	0.4043	3.58E-03	8.10E-04	0.07
Isopropyl Alcohol	0.0180	60.09	0.55759	1.09761	7.75857	0.4269	7.66E-03	0.4336	7.78E-03	0.4332	7.78E-03	1.23E-03	0.11
Methyl Alcohol	0.0228	32.04	0.68618	1.35075	9.54790	0.4269	9.74E-03	0.4851	0.0111	0.4847	0.0111	9.30E-04	0.09
Methyl Ethyl Ketone	0.0074	72.10	0.52505	1.03356	7.30580	0.4269	3.15E-03	0.4189	3.09E-03	0.4185	3.09E-03	5.84E-04	0.05
Methyl Isobutyl Ketone	4.15E-04	100.20	0.47101	0.92719	6.55390	0.4269	1.77E-04	0.3927	1.63E-04	0.3924	1.63E-04	4.28E-05	3.93E-03
Methyl t-Butyl Ether	7.19E-03	88.15	0.49135	0.96723	6.83696	0.4269	3.07E-03	0.4028	2.90E-03	0.4025	2.89E-03	6.70E-04	0.06
Methylene Chloride	0.0159	84.94	0.49741	0.97915	6.92117	0.4269	6.77E-03	0.4058	6.43E-03	0.4054	6.43E-03	1.43E-03	0.13
Naphthalene	6.28E-07	128.20	0.43423	0.85477	6.04204	0.4269	2.68E-07	0.3735	2.346E-07	0.3732	2.34E-07	7.89E-08	7.24E-06
Tetrahydrofuran	3.83E-03	72.12	0.52500	1.03347	7.30513	0.4269	1.63E-03	0.4188	1.60E-03	0.4185	1.60E-03	3.03E-04	0.03
Toluene	0.0105	92.13	0.48425	0.95324	6.73805	0.4269	4.47E-03	0.3993	4.19E-03	0.3990	4.18E-03	1.01E-03	0.09
Trichloroethane, 1,1,1-	9.88E-04	133.42	0.42854	0.84359	5.96298	0.4269	4.22E-04	0.3704	3.66E-04	0.3701	3.66E-04	1.28E-04	1.17E-02
Trichloroethylene	3.60E-04	131.40	0.43071	0.84785	5.99308	0.4269	1.54E-04	0.3716	1.34E-04	0.3713	1.33E-04	4.61E-05	4.22E-03
Trimethylbenzene, 1,2,4-	5.29E-06	120.19	0.44357	0.87316	6.17203	0.4269	2.26E-06	0.3785	2.00E-06	0.3781	2.00E-06	6.31E-07	5.79E-05
Water, Oil, Dirt (inerts)	0.1240	18.02	0.82977	1.63340	11.54582	0.4269	0.0529	0.5325	0.0660	0.5322	0.0660	3.12E-03	NA
Xylene	3.20E-03	106.17	0.46210	0.90965	6.42992	0.4269	1.37E-03	0.3881	1.24E-03	0.3878	1.24E-03	3.46E-04	0.03
						Totals	0.1363		0.1499		0.1498	0.0175	

Methodology:
1) Methodology from "Methods for Estimating Air Emissions from Chemical Manufacturing Facilities, 8/2007, U.S EPA
2) Partial Pressure (psia) = pure vapor pressure (psia) x liquid mole fraction (%) , Raoults Equation
3) Fi (SCFM) = nitrogen flow (SCFM) x partial pressure of component / (14.7 - partial pressure of component), Eq 3-11
4) Ki = Ki water (0.83 cm/sec) x ((MW water / MWi) ^ 1/3), Eq 3-10
5) Si second guess was calculated using Eq. 3-14, Ki x A / (Ki x A + Fnc + sum(Si x Fi)
6) Qi (lb/min) = MWi x Si x Fi x 14.7 / R x T

VOC (TPY)	**0.84**
Combined HAP (TPY)	**0.53**
Single HAP - Methylene Chloride (TPY)	**0.13**

Appendix A to the Technical Support Document (TSD)
VOC and HAP Emissions from Hydrapulper Mixing

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Emission Rate	**0.03**	**lb/batch**			
Batches per Year	**30,560**	**batch/yr**	**or**	**68,760,847**	**gal/yr**
Annual Emissions	**916.8**	**lb/yr**	**0.4584**	**TPY**	

				Uncontrolled		
Pollutant	**Wt%**	**VOC**	**HAP**	**PTE (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**
Acetone	3.802%	NO	NO	34.86		
Aliphatics	3.084%	YES	NO	28.27	0.0141	
Alkyl Benzenes	14.654%	YES	YES	134.35	0.0672	0.0672
Benzene	0.017%	YES	YES	0.16	7.79E-05	7.79E-05
Butanol	1.004%	YES	NO	9.20	4.60E-03	
Butyl Acetate	1.937%	YES	NO	17.76	8.88E-03	
Cresol-m	1.578%	YES	YES	14.47	7.23E-03	7.23E-03
Cyclohexanone	3.156%	YES	NO	28.93	0.0145	
Ethyl Alcohol	1.148%	YES	NO	10.52	5.26E-03	
Ethyl Benzene	1.498%	YES	YES	13.73	6.87E-03	6.87E-03
Glycol Ethers	0.861%	YES	YES	7.89	3.95E-03	3.95E-03
Hexane	1.363%	YES	YES	12.50	6.25E-03	6.25E-03
Isopropyl Alcohol	6.241%	YES	NO	57.22	0.0286	
Methyl Alcohol	1.650%	YES	YES	15.13	7.56E-03	7.56E-03
Methyl Ethyl Ketone	1.650%	YES	NO	15.13	7.56E-03	
Methyl Isobutyl Ketone	0.660%	YES	YES	6.05	3.03E-03	3.03E-03
Methyl t-Butyl Ether	0.646%	YES	YES	5.92	2.96E-03	2.96E-03
Methylene Chloride	0.789%	NO	YES	7.23		3.62E-03
Naphthalene	0.430%	YES	YES	3.94	1.97E-03	1.97E-03
Tetrahydrofuran	0.430%	YES	YES	3.94	1.97E-03	1.97E-03
Toluene	9.323%	YES	YES	85.47	0.0427	0.0427
Trichloroethane, 1,1,1-	0.287%	YES	YES	2.63	1.32E-03	1.32E-03
Trichloroethylene	0.215%	YES	YES	1.97	9.86E-04	9.86E-04
Trimethylbenzene, 1,2,4-	0.081%	YES	NO	0.74	3.71E-04	
Water, Oil, Dirt (inerts)	27.944%	NO	NO	256.19		
Xylene	15.553%	YES	YES	142.59	0.0713	0.0713
	100.00%			916.8	**0.31**	**0.23**

	Uncontrolled PTE	
VOC	**0.31**	**TPY**
Single HAP - Methylene Chloride	**3.62E-03**	**TPY**
Combined HAP	**0.23**	**TPY**

Appendix A to the Technical Support Document (TSD)
Hydrapulper - Process Emission Factors

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Volume at PTE	**68,760,847**	**gallon/yr**	**68,761**	**kgallon/yr**
Batch Volume	**2,250**	**gallon/batch**		
Batches at PTE	**30,560**	**batch/yr**		

						Uncontrolled		
Pollutant	**HAP**	**VOC**	**Filling (TPY)**	**Purge (TPY)**	**Heat of Mixing (TPY)**	**HAP PTE (TPY)**	**VOC PTE (TPY)**	**Emission Factor (lb/batch)**
Acetone	NO	NO	Not Regulated			Not Regulated		
Aliphatics	NO	YES	2.6989	0.2254	0.0141		2.9385	0.1923
Alkyl Benzenes	YES	YES	0.0623	4.59E-03	0.0672	0.1340	0.1340	8.77E-03
Benzene	YES	YES	5.88E-03	4.83E-04	7.79E-05	6.44E-03	6.44E-03	4.21E-04
Butanol	NO	YES	0.0230	1.91E-03	4.60E-03		0.0295	1.93E-03
Butyl Acetate	NO	YES	0.0993	7.55E-03	8.88E-03		0.1157	7.58E-03
Cresol-m	YES	YES	4.30E-05	3.31E-06	7.23E-03	7.28E-03	7.28E-03	4.76E-04
Cyclohexanone	NO	YES	0.0472	3.71E-03	0.0145		0.0654	4.28E-03
Ethyl Alcohol	NO	YES	0.3124	0.0284	5.26E-03		0.3461	0.0226
Ethyl Benzene	YES	YES	0.0627	4.85E-03	6.87E-03	0.0744	0.0744	4.87E-03
Glycol Ethers	YES	YES	1.80E-04	1.55E-05	3.95E-03	4.14E-03	4.14E-03	2.71E-04
Hexane	YES	YES	0.9199	0.0743	6.25E-03	1.0005	1.0005	0.0655
Isopropyl Alcohol	NO	YES	1.2995	0.1125	0.0286		1.4406	0.0943
Methyl Alcohol	YES	YES	0.8800	0.0853	7.56E-03	0.9728	0.9728	0.0637
Methyl Ethyl Ketone	NO	YES	0.6411	0.0536	7.56E-03		0.7022	0.0460
Methyl Isobutyl Ketone	YES	YES	0.0502	3.93E-03	3.03E-03	0.0571	0.0571	3.74E-03
Methyl t-Butyl Ether	YES	YES	0.7642	0.0614	2.96E-03	0.8285	0.8285	0.0542
Methylene Chloride	YES	NO	1.6229	0.1315	3.62E-03	1.7580		0.1151
Naphthalene	YES	YES	9.72E-05	7.24E-06	1.97E-03	2.08E-03	2.08E-03	1.36E-04
Tetrahydrofuran	YES	YES	0.3330	0.0278	1.97E-03	0.3628	0.3628	0.0237
Toluene	YES	YES	1.1641	0.0928	0.0427	1.2996	1.2996	0.0851
Trichloroethane, 1,1,1-	YES	YES	0.1590	0.0117	1.32E-03	0.1721	0.1721	0.0113
Trichloroethylene	YES	YES	0.0570	4.22E-03	9.86E-04	0.0622	0.0622	4.07E-03
Trimethylbenzene, 1,2,4-	NO	YES	7.67E-04	5.79E-05	3.71E-04		1.20E-03	7.83E-05
Water, Oil, Dirt (inerts)	NO	NO	Not Regulated			Not Regulated		
Xylene	YES	YES	0.4098	0.0317	0.0713	0.5128	0.5128	0.0336
						7.25	**11.14**	

	Uncontrolled			
VOC	**11.14**	**TPY**	**0.7288**	**lb/batch**
Single HAP - Methylene Chloride	**1.76**	**TPY**	**0.1151**	**lb/batch**
Combined HAP	**7.25**	**TPY**	**0.4748**	**lb/batch**

Appendix A to the Technical Support Document
Potential to Emit - Fill Blend Box to Make Blended Fuel

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

System Pressure	**14.70 psi**		
Temperature	**521.67 ˚R**	**62 ˚F**	**(annual average high temperature for Indianapolis, Indiana)**
Temperature	**16.67 ˚C**		

Vapor Pressure Calculations

Component	A	B	C	Vapor Pressure (mmHg)	Vapor Pressure (psia)	Liquid Wt %	Molecular Weight	Liquid Mole Fraction	Partial Pressure (psia)
Acetone	7.3141	1315.67	240.479	157.6478	3.0484	3.802%	58.08	2.7543%	0.08396
Aliphatics	6.5570	829.07	170.077	131.0252	2.5336	3.084%	73.14	1.7741%	0.04495
Alkyl Benzenes	7.1847	1720.37	216.413	0.6363	0.0123	14.654%	134.22	4.5936%	5.65E-04
Benzene	6.8140	1090.43	197.146	51.7729	1.0011	0.017%	78.11	0.0092%	9.17E-05
Butanol	7.2906	1282.85	173.247	3.4334	0.0664	1.004%	74.12	0.5699%	3.78E-04
Butyl Acetate	7.2341	1515.76	222.077	7.6771	0.1485	1.937%	116.16	0.7016%	1.04E-03
Cresol-m	6.8749	1303.18	124.000	0.0041	7.89E-05	1.578%	108.10	0.6142%	4.85E-07
Cyclohexanone	7.6065	1884.55	243.036	2.2386	0.0433	3.156%	98.20	1.3522%	5.85E-04
Ethyl Alcohol	8.1348	1662.48	238.131	40.7490	0.7880	1.148%	46.07	1.0484%	8.26E-03
Ethyl Benzene	7.1561	1559.55	228.582	6.2671	0.1212	1.498%	106.17	0.5936%	7.19E-04
Glycol Ethers	9.6994	3147.10	264.246	0.0314	6.06E-04	0.861%	62.07	0.5836%	3.54E-06
Hexane	6.9895	1216.92	227.451	101.0522	1.9540	1.363%	86.17	0.6655%	0.01300
Isopropyl Alcohol	7.8306	1483.30	217.413	31.1753	0.6028	6.241%	60.09	4.3699%	2.63E-02
Methyl Alcohol	8.0913	1582.91	239.096	79.8504	1.5440	1.650%	32.04	2.1668%	0.03346
Methyl Ethyl Ketone	7.2010	1325.15	227.093	58.1745	1.1249	1.650%	72.10	0.9629%	0.01083
Methyl Isobutyl Ketone	7.1597	1421.73	216.266	11.3790	0.2200	0.660%	100.20	0.2771%	6.10E-04
Methyl t-Butyl Ether	7.0760	1233.70	238.879	177.1108	3.4248	0.646%	88.15	0.3083%	0.01056
Methylene Chloride	7.1146	1152.41	232.442	307.9582	5.9549	0.789%	84.94	0.3908%	0.02327
Naphthalene	6.8912	1551.48	168.879	0.0338	6.54E-04	0.430%	128.20	0.1411%	9.2350E-07
Tetrahydrofuran	7.1054	1256.68	232.621	115.9517	2.2421	0.430%	72.12	0.2509%	5.62E-03
Toluene	7.1362	1457.29	231.827	18.6946	0.3615	9.323%	92.13	4.2577%	0.01539
Trichloroethane, 1,1,1-	7.0072	1253.20	229.624	82.9663	1.6043	0.287%	133.42	0.0905%	1.45E-03
Trichloroethylene	6.8798	1157.83	202.580	39.7067	0.7678	0.215%	131.40	0.0688%	5.29E-04
Trimethylbenzene, 1,2,4-	7.2933	1763.35	230.248	1.4182	0.0274	0.081%	120.19	0.0284%	7.78E-06
Water, Oil, Dirt (inerts)	8.0557	1723.64	233.080	14.2615	0.2758	27.944%	18.02	65.2629%	0.17998
Xylene	7.2122	1546.92	217.144	3.9450	0.0763	15.553%	106.17	6.1636%	4.70E-03
						100.00%		100.00%	0.46632

(continued on next page)

Appendix A to the Technical Support Document
Potential to Emit - Fill Blend Box to Make Blended Fuel
(continued from previous page)

Batches Processed per Year	**17,586**	**batches per year**	**68,760,847**	**gallon/yr**
Volume Displaced per Batch	**522.69**	**cubic feet (3,910 gallons)**		
Ideal Gas Constant	**10.7316**	**FT^3 . PSI / R . LB-MOLE**		
Temperature	**521.67**	**˚R**		

PTE Calculations - Loading Hydrapulper							**Uncontrolled**	
Component	**HAP**	**VOC**	**Partial Pressure (psia)**	**Moles in Vapor (mole/batch)**	**M.W.**	**Emission per Batch (lb/batch)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**
Acetone	NO	NO	0.08396	7.84E-03	58.08	0.4553	not regulated	
Aliphatics	NO	YES	0.04495	4.20E-03	73.14	0.3069	2.70	
Alkyl Benzenes	YES	YES	5.65E-04	5.28E-05	134.22	7.08E-03	0.06	0.06
Benzene	YES	YES	9.17E-05	8.56E-06	78.11	6.69E-04	5.88E-03	5.88E-03
Butanol	NO	YES	3.78E-04	3.53E-05	74.12	2.62E-03	0.02	
Butyl Acetate	NO	YES	1.04E-03	9.72E-05	116.16	0.0113	0.10	
Cresol-m	YES	YES	4.85E-07	4.52E-08	108.10	4.89E-06	4.30E-05	4.30E-05
Cyclohexanone	NO	YES	5.85E-04	5.46E-05	98.20	5.37E-03	0.05	
Ethyl Alcohol	NO	YES	8.26E-03	7.71E-04	46.07	0.0355	0.31	
Ethyl Benzene	YES	YES	7.19E-04	6.72E-05	106.17	7.13E-03	0.06	0.06
Glycol Ethers	YES	YES	3.54E-06	3.30E-07	62.07	2.05065E-05	1.80E-04	1.80E-04
Hexane	YES	YES	0.01300	1.21E-03	86.17	0.1046	0.92	0.92
Isopropyl Alcohol	NO	YES	0.02634	2.46E-03	60.09	0.1478	1.30	
Methyl Alcohol	YES	YES	0.03346	3.12E-03	32.04	0.1001	0.88	0.88
Methyl Ethyl Ketone	NO	YES	0.01083	1.01E-03	72.10	0.0729	0.64	
Methyl Isobutyl Ketone	YES	YES	6.10E-04	5.69E-05	100.20	5.70E-03	0.05	0.05
Methyl t-Butyl Ether	YES	YES	0.01056	9.86E-04	88.15	0.0869	0.76	0.76
Methylene Chloride	YES	NO	0.02327	2.17E-03	84.94	0.1846		1.62
Naphthalene	YES	YES	9.23E-07	8.62E-08	128.20	1.11E-05	9.72E-05	9.72E-05
Tetrahydrofuran	YES	YES	5.62E-03	5.25E-04	72.12	0.0379	0.33	0.33
Toluene	YES	YES	0.01539	1.44E-03	92.13	0.1324	1.16	1.16
Trichloroethane, 1,1,1-	YES	YES	1.45E-03	1.36E-04	133.42	0.0181	0.16	0.16
Trichloroethylene	YES	YES	5.29E-04	4.94E-05	131.40	6.48E-03	0.06	0.06
Trimethylbenzene, 1,2,4-	NO	YES	7.78E-06	7.26E-07	120.19	8.73E-05	7.67E-04	7.67E-04
Water, Oil, Dirt (inerts)	NO	NO	0.17998	0.01680	18.02	0.3027	not regulated	
Xylene	YES	YES	4.70E-03	4.39E-04	106.17	0.0466	0.41	0.41
							Uncontrolled PTE	
							9.99	**6.49**

Methodology:
1) Vapor pressure was calculated using Antoine equation.
2) Vapor Pressure (mmHg) = exp (A - B / (T + C); temperature in Celsius.
3) Partial Pressure (psia) = pure vapor pressure (psia) x liquid mole fraction (%)
4) Moles per Batch (lb-mole) = partial pressure (psia) x Batch (FT3) / (gas constant x Temp in Rankine)
5) Emissions per Batch (TPY) = moles per batch (lb-mole/batch) x M.W. (lb/lb-mole)
6) PTE (TPY) = emissions per batch (lb/batch) x batches per year (batch/yr) x 1 ton/2,000 lb

Appendix A to the Technical Support Document
Potential to Emit - Fill Blend Box to Clean - Cutter

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

System Pressure	**14.70 psi**		
Temperature	**521.67 ˚R**	**62 ˚F**	**(annual average high temperature for Indianapolis, Indiana)**
Temperature	**16.67 ˚C**		

Vapor Pressure Calculations

Component	A	B	C	Vapor Pressure (mmHg)	Vapor Pressure (psia)	Liquid Wt %	Molecular Weight	Liquid Mole Fraction	Partial Pressure (psia)
Acetone	7.3141	1315.67	240.479	157.6478	3.0484	5.300%	58.08	7.9584%	0.24260
Aliphatics	6.5570	829.07	170.077	131.0252	2.5336	4.300%	73.14	5.1273%	0.12991
Alkyl Benzenes	7.1847	1720.37	216.413	0.6363	0.0123	20.400%	134.22	13.2553%	1.63E-03
Benzene	6.8140	1090.43	197.146	51.7729	1.0011	0.00%	78.11	0.0000%	0.00000
Butanol	7.2906	1282.85	173.247	3.4334	0.0664	1.400%	74.12	1.6473%	1.09E-03
Butyl Acetate	7.2341	1515.76	222.077	7.6771	0.1485	2.700%	116.16	2.0271%	3.01E-03
Cresol-m	6.8749	1303.18	124.000	4.08E-03	7.89E-05	2.200%	108.10	1.7749%	1.40E-06
Cyclohexanone	7.6065	1884.55	243.036	2.2386	0.0433	4.400%	98.20	3.9077%	1.69E-03
Ethyl Alcohol	8.1348	1662.48	238.131	40.7490	0.7880	1.600%	46.07	3.0288%	0.02387
Ethyl Benzene	7.1561	1559.55	228.582	6.2671	0.1212	2.000%	106.17	1.6429%	1.99E-03
Glycol Ethers	9.6994	3147.10	264.246	0.0314	6.06E-04	1.200%	62.07	1.6861%	1.02E-05
Hexane	6.9895	1216.92	227.451	101.0522	1.9540	1.900%	86.17	1.9230%	0.03758
Isopropyl Alcohol	7.8306	1483.30	217.413	31.1753	0.6028	8.700%	60.09	12.6268%	0.07612
Methyl Alcohol	8.0913	1582.91	239.096	79.8504	1.5440	2.300%	3.20E+01	6.2605%	0.09667
Methyl Ethyl Ketone	7.2010	1325.15	227.093	58.1745	1.1249	2.300%	72.10	2.7821%	0.03130
Methyl Isobutyl Ketone	7.1597	1421.73	216.266	11.3790	0.2200	0.900%	100.20	0.7833%	1.72E-03
Methyl t-Butyl Ether	7.0760	1233.70	238.879	177.1108	3.4248	0.900%	88.15	0.8904%	0.03049
Methylene Chloride	7.1146	1152.41	232.442	307.9582	5.9549	1.100%	84.94	1.1294%	0.06726
Naphthalene	6.8912	1551.48	168.879	0.0338	6.54E-04	0.600%	128.20	0.4082%	2.6710E-06
Tetrahydrofuran	7.1054	1256.68	232.621	115.9517	2.2421	0.600%	72.12	0.7256%	0.01627
Toluene	7.1362	1457.29	231.827	18.6946	0.3615	12.900%	92.13	12.2114%	0.04414
Trichloroethane, 1,1,1-	7.0072	1253.20	229.624	82.9663	1.6043	0.400%	133.42	0.2615%	0.00419
Trichloroethylene	6.8798	1157.83	202.580	39.7067	0.7678	0.300%	131.40	0.1991%	0.00153
Trimethylbenzene, 1,2,4-	7.2933	1763.35	230.248	1.4182	0.0274	0.00%	120.19	0.0000%	0.00E+00
Water, Oil, Dirt (inerts)	8.0557	1723.64	233.080	14.2615	0.2758	0.00%	18.02	0.0000%	0.00E+00
Xylene	7.2122	1546.92	217.144	3.9450	0.0763	21.600%	106.17	17.7430%	0.01354
						100.00%		100.00%	0.82661

(continued on next page)

Appendix A to the Technical Support Document
Potential to Emit - Fill Blend Box to Clean - Cutter

(continued from previous page)

Batches Processed per Year	**17,586**	**batches per year**	**24,972,120**	**gallon/yr**
Volume Displaced per Batch	**189.83**	**cubic feet (1,420 gallons)**		
Ideal Gas Constant	**10.7316**	**FT^3 . PSI / R . LB-MOLE**		
Temperature	**521.67**	**˚R**		

PTE Calculations - Blend Box Cleaning							**Uncontrolled**	
Component	**HAP**	**VOC**	**Partial Pressure (psia)**	**Moles in Vapor (mole/batch)**	**M.W.**	**Emission per Batch (lb/batch)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**
Acetone	NO	NO	0.24260	8.23E-03	58.08	0.4778	not regulated	
Aliphatics	NO	YES	0.12991	4.40E-03	73.14	0.3222	2.83	
Alkyl Benzenes	YES	YES	1.63E-03	5.53E-05	134.22	7.42E-03	0.07	0.07
Benzene	YES	YES	0.00E+00	0.00E+00	78.11	0.00E+00	0.00E+00	0.00E+00
Butanol	NO	YES	1.09E-03	3.71E-05	74.12	2.75E-03	0.02	
Butyl Acetate	NO	YES	3.01E-03	1.02E-04	116.16	0.0119	0.10	
Cresol-m	YES	YES	1.40E-06	4.75E-08	108.10	5.13E-06	4.51E-05	4.51E-05
Cyclohexanone	NO	YES	1.69E-03	5.74E-05	98.20	5.63E-03	0.05	
Ethyl Alcohol	NO	YES	0.02387	8.09E-04	46.07	0.0373	0.33	
Ethyl Benzene	YES	YES	1.99E-03	6.75E-05	106.17	7.17E-03	0.06	0.06
Glycol Ethers	YES	YES	1.02E-05	3.47E-07	62.07	2.15153E-05	1.89E-04	1.89E-04
Hexane	YES	YES	0.03758	1.27E-03	86.17	0.1098	0.97	0.97
Isopropyl Alcohol	NO	YES	0.07612	2.58E-03	60.09	0.1551	1.36	
Methyl Alcohol	YES	YES	0.09667	3.28E-03	32.04	0.1050	0.92	0.92
Methyl Ethyl Ketone	NO	YES	0.03130	1.06E-03	72.10	0.0765	0.67	
Methyl Isobutyl Ketone	YES	YES	1.72E-03	5.84E-05	100.20	5.86E-03	0.05	0.05
Methyl t-Butyl Ether	YES	YES	0.03049	1.03E-03	88.15	0.0911	0.80	0.80
Methylene Chloride	YES	NO	0.06726	2.28E-03	84.94	0.1937		1.70
Naphthalene	YES	YES	2.67E-06	9.06E-08	128.20	1.16E-05	1.02E-04	1.02E-04
Tetrahydrofuran	YES	YES	0.01627	5.52E-04	72.12	0.0398	0.35	0.35
Toluene	YES	YES	0.04414	1.50E-03	92.13	0.1379	1.21	1.21
Trichloroethane, 1,1,1-	YES	YES	0.00419	1.42E-04	133.42	0.0190	0.17	0.17
Trichloroethylene	YES	YES	1.53E-03	5.18E-05	131.40	6.81E-03	0.06	0.06
Trimethylbenzene, 1,2,4-	NO	YES	0.00E+00	0.00E+00	120.19	0.00E+00	0.00	0.00
Water, Oil, Dirt (inerts)	NO	NO	0.00E+00	0.00E+00	18.02	0.00E+00	not regulated	
Xylene	YES	YES	0.01354	4.59E-04	106.17	0.0487	0.43	0.43

Uncontrolled PTE

10.46	**6.79**

Methodology:

1) Vapor pressure was calculated using Antoine equation.
2) Vapor Pressure (mmHg) = exp (A - B / (T + C); temperature in Celsius.
3) Partial Pressure (psia) = pure vapor pressure (psia) x liquid mole fraction (%)
4) Moles per Batch (lb-mole) = partial pressure (psia) x Batch (FT3) / (gas constant x Temp in Rankine)
5) Emissions per Batch (TPY) = moles per batch (lb-mole/batch) x M.W. (lb/lb-mole)
6) PTE (TPY) = emissions per batch (lb/batch) x batches per year (batch/yr) x 1 ton/2,000 lb

Appendix A to the Technical Support Document (TSD)
VOC and HAP Emissions from Blend Box Mixing - Blended Fuel

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Pounds Emitted per Batch	**0.07**	**lb/batch**			
Batches per Year	**17,586**	**batch/yr**		**68,760,847**	**gallons/year**
Mass Emitted per Year	**1,231.0**	**lb/yr**	**0.6155**	**TPY**	

				Uncontrolled		
Pollutant	**Wt%**	**VOC**	**HAP**	**PTE (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**
Acetone	3.802%	NO	NO	46.80		
Aliphatics	3.084%	YES	NO	37.96	0.0190	
Alkyl Benzenes	14.654%	YES	YES	180.39	0.0902	0.0902
Benzene	0.017%	YES	YES	0.21	1.05E-04	1.05E-04
Butanol	1.004%	YES	NO	12.36	6.18E-03	
Butyl Acetate	1.937%	YES	NO	23.84	0.0119	
Cresol-m	1.578%	YES	YES	19.43	0.0097	0.0097
Cyclohexanone	3.156%	YES	NO	38.85	0.0194	
Ethyl Alcohol	1.148%	YES	NO	14.13	7.07E-03	
Ethyl Benzene	1.498%	YES	YES	18.44	0.0092	0.0092
Glycol Ethers	0.861%	YES	YES	10.60	5.30E-03	5.30E-03
Hexane	1.363%	YES	YES	16.78	8.39E-03	8.39E-03
Isopropyl Alcohol	6.241%	YES	NO	76.83	0.0384	
Methyl Alcohol	1.650%	YES	YES	20.31	0.0102	0.0102
Methyl Ethyl Ketone	1.650%	YES	NO	20.31	0.0102	
Methyl Isobutyl Ketone	0.660%	YES	YES	8.12	4.06E-03	4.06E-03
Methyl t-Butyl Ether	0.646%	YES	YES	7.95	3.98E-03	3.98E-03
Methylene Chloride	0.789%	NO	YES	9.71		4.86E-03
Naphthalene	0.430%	YES	YES	5.29	2.65E-03	2.65E-03
Tetrahydrofuran	0.430%	YES	YES	5.29	2.65E-03	2.65E-03
Toluene	9.323%	YES	YES	114.77	0.0574	0.0574
Trichloroethane, 1,1,1-	0.287%	YES	YES	3.53	1.77E-03	1.77E-03
Trichloroethylene	0.215%	YES	YES	2.65	1.32E-03	1.32E-03
Trimethylbenzene, 1,2,4-	0.081%	YES	NO	1.00	4.99E-04	
Water, Oil, Dirt (inerts)	27.944%	NO	NO	344.00		
Xylene	15.553%	YES	YES	191.46	0.0957	0.0957
	100.00%			**1,231.03**	**0.42**	**0.31**

	Uncontrolled PTE		PTE after Control	
VOC	**0.42**	**TPY**	**#REF!**	**TPY**
Single HAP - Methylene Chloride	**0.0049**	**TPY**	**#REF!**	**TPY**
Combined HAP	**0.31**	**TPY**	**#REF!**	**TPY**

Appendix A to the Technical Support Document (TSD)
Blend Box - Process Emission Factors

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Batches at PTE 17,586 batch/yr 68,760,847 gallons/yr blended fuel

						Uncontrolled		
Pollutant	HAP	VOC	Filling (TPY)	Clean (TPY)	Heat of Mixing (TPY)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/batch)
Acetone	NO	NO	Not Regulated			Not Regulated		
Aliphatics	NO	YES	2.6989	2.8329	0.0190		5.5508	0.6313
Alkyl Benzenes	YES	YES	0.0623	0.0653	0.0902	0.2177	0.2177	0.0248
Benzene	YES	YES	5.88E-03		1.05E-04	5.98E-03	5.98E-03	6.80E-04
Butanol	NO	YES	0.0230	0.0242	0.0062		0.0534	6.07E-03
Butyl Acetate	NO	YES	0.0993	0.1042	0.0119		0.2155	0.0245
Cresol-m	YES	YES	4.30E-05	4.51E-05	0.0097	0.0098	0.0098	1.11E-03
Cyclohexanone	NO	YES	0.0472	0.0495	0.0194		0.1161	0.0132
Ethyl Alcohol	NO	YES	0.3125	0.3278	0.0071		0.6473	0.0736
Ethyl Benzene	YES	YES	0.0627	0.0630	0.0092	0.1349	0.1349	0.0153
Glycol Ethers	YES	YES	1.80E-04	1.89E-04	5.30E-03	5.67E-03	5.67E-03	6.45E-04
Hexane	YES	YES	0.9200	0.9654	8.39E-03	1.8937	1.8937	0.2154
Isopropyl Alcohol	NO	YES	1.2995	1.3637	0.0384		2.7017	0.3073
Methyl Alcohol	YES	YES	0.8800	0.9234	0.0102	1.8136	1.8136	0.2063
Methyl Ethyl Ketone	NO	YES	0.6411	0.6728	0.0102		1.3240	0.1506
Methyl Isobutyl Ketone	YES	YES	0.0502	0.0515	4.06E-03	0.1057	0.1057	0.0120
Methyl t-Butyl Ether	YES	YES	0.7642	0.8015	3.98E-03	1.5696	1.5696	0.1785
Methylene Chloride	YES	NO	1.6229	1.7033	4.86E-03	3.3310		0.3788
Naphthalene	YES	YES	9.72E-05	1.02E-04	2.65E-03	2.85E-03	2.85E-03	3.24E-04
Tetrahydrofuran	YES	YES	0.3330	0.3498	2.65E-03	0.6855	0.6855	0.0780
Toluene	YES	YES	1.1641	1.2126	0.0574	2.4341	2.4341	0.2768
Trichloroethane, 1,1,1-	YES	YES	0.1590	0.1669	1.77E-03	0.3277	0.3277	0.0373
Trichloroethylene	YES	YES	0.0570	0.0599	1.32E-03	0.1182	0.1182	0.0134
Trimethylbenzene, 1,2,4-	NO	YES	7.67E-04		4.99E-04		1.27E-03	1.44E-04
Water, Oil, Dirt (inerts)	NO	NO	Not Regulated			Not Regulated		
Xylene	YES	YES	0.4098	0.4285	0.0957	0.9340	0.9340	0.1062
						13.59	**20.87**	

Uncontrolled PTE

VOC Emission Factor	**20.87**	**TPY**	**2.37**	**lb/batch**
Single HAP - Methylene Chloride	**3.33**	**TPY**	**0.38**	**lb/batch**
Combined HAP	**13.59**	**TPY**	**1.55**	**lb/batch**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Cutter

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

INPUT - CLIMATE DATA - Indianapolis, Indiana				
Tax (Daily Maximum Ambient Temperature)	62.00	°F	16.7 °C	521.67 °R
Tan (Daily Minimum Ambient Temperature)	42.20	°F	5.7 °C	501.87 °R
Daily Solar Isolation Factor (I)	1165	Btu/CF • day	K_N	0.1776
Tank Paint Solar Absorbance (α)	0.17	white	K_P	1.0

Source: AP-42, Chapter 7.1, Table 7.1-7, November 2006
N = The number of annual turnovers per year
K_N (Working Loss Turnover Factor) = (180 + N) / 6N for more than 36 turnovers per year, AP-42, Chapter 7.1, Eq. 1-29.
K_N (Working Loss Turnover Factor) = 1.0 for 36 or less turnovers per year, AP-42, Chapter 7.1, Eq. 1-29
K_p (Working Loss Product Factor) = 0.75 for crude oils and 1.0 for all other organic, AP-42, Chapter 7.1, Eq. 1-31

INPUT - TANK DATA			User Input	
Tank Diameter (D)	12.00	Ft		
Shell Height (Hs)	30.00	Ft	Constant Temperature Tank (Y/N)	N
Stock Liquid Height (Hl)	29.55	Ft	If so, what temperature (°R) ?	
Roof Height (H_R) - See Table to Right	6.00	Ft		
Tank Radius (R_S = D/2)	6.00	Ft	Atmospheric Pressure (psi)	14.7
Cone Roof Slope (S_R in ft/ft - 0.0625 default)	0.0625	Ft/Ft		
Roof Outage (H_{RO}) - See Table to Right	0.1250	Ft	Number of Turnovers (N) per Year	2750.43
Vapor Space Outage ($H_{VO} = H_S - H_L + H_{RO}$)	0.5771	Ft	N = Q (gpy) / Max. Liquid Volume (gallons)	
Tank Vapor Space Volume ($V_V = (\pi/4)D^2 H_{VO}$)	65.27	FT^3		
Max. Liquid Volume = 7.481 $(\pi/4) D^2 H_L$	25,000.00	gallons	Roof Outage	
Breather Vent Pressure Setting (P_{BP})	0.030	psi	Cone Roof $H_{RO} = (1/3)(S_R)(R_S)$ =	0.1250
Breather Vent Vacuum Setting (P_{BV})	-0.030	psi	H_R = D/2 =	6.0000
Annual Throughput (Q)	68,760,847	gal/yr	Dome Roof $H_{RO} = 0.137 R_S$ =	0.8220
Annual Throughput (Q) (1 bbl = 42 gallons)	1,637,163	bbl/yr	$H_R = 0.268 R_S$ =	1.6080

Maximum Fuel Usage	68,760,847	gallon/yr
Recirculation	0	gallon/yr
Annual Throughput	**68,760,847**	gallon/yr

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Cutter

(continued from previous page)

Temperature Calculations (AP-42, Chapter 7.1)

T_{AA} (Daily Average Ambient Temperature) AP-42, Chapter 7.1, Equation 1-27	= (TAX (°R) + TAN (°R)) / 2 =	511.77	°R
		11.16	°C
T_B (Liquid Bulk Temperature) AP-42, Chapter 7.1, Equation 1-28	= (TAA (R) + (6 x α) - 1) =	511.79	°R
		11.17	°C
T_{LA} (Daily Average Liquid Surface Temperature) AP-42, Chapter 7.1, Equation 1-26	= 0.44 TAA + 0.56 TB + 0.0079 α I =	513.35	°R
		12.03	°C

ΔT_A (Daily Ambient Temperature Range) AP-42, Chapter 7.1, Equation 1-12	= (TAX (°R) - TAN (°R)) =	19.80	°R
		-262.16	°C
ΔT_V (Daily Vapor Temperature Range) AP-42, Chapter 7.1, Equation 1-8	= 0.72 ΔTA + 0.028 α I =	19.80	°R
		-262.16	°C
T_{LX} (Maximum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA + 0.25 ΔTV =	518.30	°R
		14.78	°C
T_{LN} (Minimum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA - 0.25 ΔTV =	508.40	°R
		9.28	°C

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Cutter

(continued from previous page)

Liquid Properties

Average Density of the Liquid - All Components					
Component	**Specific Gravity**	**Density (lb/gal)**	**Wt %**	**Product of Density x Weight %**	**Notes**
Acetone	0.7949	6.6277	5.3000%	0.3513	Wt % from site sampling, S.G. from wikipedia
Aliphatics (Diethylamine Similar)	0.7075	5.8990	4.3000%	0.2537	
Alkyl Benzenes (Butyl Benzene Similar)	0.9000	7.5040	20.4000%	1.5308	
Butanol	0.8050	6.7119	1.4000%	0.0940	
Butyl Acetate	0.8825	7.3581	2.7000%	0.1987	
Cresol-m	1.0350	8.6296	2.2000%	0.1899	
Cyclohexanone	0.9478	7.9026	4.4000%	0.3477	
Ethyl Alcohol	0.7890	6.5785	1.6000%	0.1053	
Ethyl Benzene	0.8665	7.2247	2.0000%	0.1445	
Glycol Ethers (Ethylene Glycol Similar)	1.1132	9.2816	1.2000%	0.1114	
Hexane	0.6548	5.4596	1.9000%	0.1037	
Isopropyl Alcohol	0.7860	6.5535	8.7000%	0.5702	
Methyl Alcohol	0.7920	6.6035	2.3000%	0.1519	
Methyl Ethyl Ketone	0.8050	6.7119	2.3000%	0.1544	
Methyl Isobutyl Ketone	0.8020	6.6869	0.9000%	0.0602	
Methyl t-Butyl Ether	0.7404	6.1733	0.9000%	0.0556	
Methylene Chloride	1.3266	11.0609	1.1000%	0.1217	
Naphthalene	1.3289	11.0801	0.6000%	0.0665	
Tetrahydrofuran	0.8900	7.4206	0.6000%	0.0445	
Toluene	0.8709	7.2614	12.9000%	0.9367	
Trichloroethane, 1,1,1-	1.3200	11.0059	0.4000%	0.0440	
Trichloroethylene	1.4719	12.2724	0.3000%	0.0368	
Xylene	0.8688	7.2439	21.6000%	1.5647	
Total Weight % =			100.00%	----------	----------
Avg. Liquid Density = (Sum Density x Wt %) / Total Wt% =				7.2379	----------
Tank Throughput (lb/yr) = Throughput (gallons/yr) x Density (lb/gallon) =					497,682,209.20

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Cutter

(continued from previous page)

HAP and VOC with Antoine Coefficients							
Basis :	**100**	**lbs fluid**					
Component	**Mol. Weight**	**Weight %**	**Weight (lbs)**	**Moles**	**Mole %**	**HAP (YES/NO)**	**VOC (YES/NO)**
Acetone	58.08	5.30%	5.3000	0.0913	7.9584%	NO	NO
Aliphatics (Diethylamine Similar)	73.14	4.30%	4.3000	0.0588	5.1273%	NO	YES
Alkyl Benzenes (Butyl Benzene Similar)	134.22	20.40%	20.4000	0.1520	13.2553%	YES	YES
Butanol	74.12	1.40%	1.4000	0.0189	1.6473%	NO	YES
Butyl Acetate	116.16	2.70%	2.7000	0.0232	2.0271%	NO	YES
Cresol-m	108.10	2.20%	2.2000	0.0204	1.7749%	YES	YES
Cyclohexanone	98.20	4.40%	4.4000	0.0448	3.9077%	NO	YES
Ethyl Alcohol	46.07	1.60%	1.6000	0.0347	3.0288%	NO	YES
Ethyl Benzene	106.17	2.00%	2.0000	0.0188	1.6429%	YES	YES
Glycol Ethers (Ethylene Glycol Similar)	62.07	1.20%	1.2000	0.0193	1.6861%	YES	YES
Hexane	86.17	1.90%	1.9000	0.0220	1.9230%	YES	YES
Isopropyl Alcohol	60.09	8.70%	8.7000	0.1448	12.6268%	NO	YES
Methyl Alcohol	32.04	2.30%	2.3000	0.0718	6.2605%	YES	YES
Methyl Ethyl Ketone	72.10	2.30%	2.3000	0.0319	2.7821%	NO	YES
Methyl Isobutyl Ketone	100.20	0.90%	0.9000	0.0090	0.7833%	YES	YES
Methyl t-Butyl Ether	88.15	0.90%	0.9000	0.0102	0.8904%	YES	YES
Methylene Chloride	84.94	1.10%	1.1000	0.0130	1.1294%	YES	NO
Naphthalene	128.20	0.60%	0.6000	0.0047	0.4082%	YES	YES
Tetrahydrofuran	72.12	0.60%	0.6000	0.0083	0.7256%	YES	YES
Toluene	92.13	12.90%	12.9000	0.1400	12.2114%	YES	YES
Trichloroethane, 1,1,1-	133.42	0.40%	0.4000	0.0030	0.2615%	YES	YES
Trichloroethylene	131.40	0.30%	0.3000	0.0023	0.1991%	YES	YES
Xylene	106.17	21.60%	21.6000	0.2034	17.7430%	YES	YES
Totals		100.00%	100.00	1.15	100.00%	---	---

HAP or VOC without Antoine Coefficients - Assume 100% Volatilization					
Component	**Tank Throughput (lb/yr)**	**Component Wt%**	**Total Emissions (lb/yr)**	**HAP (YES/NO)**	**VOC (YES/NO)**

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Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Cutter (continued from previous page)

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Antoine Coefficients for Vapor Pressure Estimation

Antoine Equation Data

Compound	A	B	C	Valid Range (Celsius)	Source
Acetone	7.3141	1,315.67	240.4790	-94.70 to 235.05	Yaws Handbook of Vapor Pressure, 2007
Aliphatics (Diethylamine Similar)	6.5570	829.07	170.0770	-46.00 to 223.45	Yaws Handbook of Vapor Pressure, 2007
Alkyl Benzenes (Butyl Benzene Similar)	7.1847	1,720.37	216.4130	-87.85 to 387.40	Yaws Handbook of Vapor Pressure, 2007
Butanol	7.2906	1,282.85	173.2470	-37.00 to 289.90	Yaws Handbook of Vapor Pressure, 2007
Butyl Acetate	7.2341	1,515.76	222.0770	-73.50 to 306.50	Yaws Handbook of Vapor Pressure, 2007
Cresol-m	6.8749	1,303.18	124.0000	20.80 to 432.70	Yaws Handbook of Vapor Pressure, 2007
Cyclohexanone	7.6065	1,884.55	243.0360	-31.15 to 356.00	Yaws Handbook of Vapor Pressure, 2007
Ethyl Alcohol	8.1348	1,662.48	238.1310	-114.10 to 243.10	Yaws Handbook of Vapor Pressure, 2007
Ethyl Benzene	7.1561	1,559.55	228.5820	-94.95 to 344.02	Yaws Handbook of Vapor Pressure, 2007
Glycol Ethers (Ethylene Glycol Similar)	9.6994	3,147.10	264.2460	-13.00 to 371.85	Yaws Handbook of Vapor Pressure, 2007
Hexane	6.9895	1,216.92	227.4510	-95.31 to 234.28	Yaws Handbook of Vapor Pressure, 2007
Isopropyl Alcohol	7.8306	1,483.30	217.4130	-87.87 to 235.16	Yaws Handbook of Vapor Pressure, 2007
Methyl Alcohol	8.0913	1,582.91	239.0960	-97.68 to 239.43	Yaws Handbook of Vapor Pressure, 2007
Methyl Ethyl Ketone	7.2010	1,325.15	227.0930	-85.00 to 262.35	Yaws Handbook of Vapor Pressure, 2007
Methyl Isobutyl Ketone	7.1597	1,421.73	216.2660	-84.00 to 298.25	Yaws Handbook of Vapor Pressure, 2007
Methyl t-Butyl Ether	7.0760	1,233.70	238.8790	-108.60 to 223.95	Yaws Handbook of Vapor Pressure, 2007
Methylene Chloride	7.1146	1,152.41	232.4420	-95.14 to 236.85	Yaws Handbook of Vapor Pressure, 2007
Naphthalene	6.8912	1,551.48	168.8790	3.2 to 475.25	Yaws Handbook of Vapor Pressure, 2007
Tetrahydrofuran	7.1054	1,256.68	232.6210	-108.50 to 267.00	Yaws Handbook of Vapor Pressure, 2007
Toluene	7.1362	1,457.29	231.8270	-94.97 to 318.64	Yaws Handbook of Vapor Pressure, 2007
Trichloroethane, 1,1,1-	7.0072	1,253.20	229.6240	-30.40 to 271.85	Yaws Handbook of Vapor Pressure, 2007
Trichloroethylene	6.8798	1,157.83	202.5800	-74.00 to 297.85	Yaws Handbook of Vapor Pressure, 2007
Xylene	7.2122	1,546.92	217.1440	-2.66 to 197.02	Yaws Handbook of Vapor Pressure, 2007

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Cutter

(continued from previous page)

Vapor Pressure Calculations

Use Antoine Equation from AP-42, Chapter 7.1, Page 7.1-94:

Log P = A - [B / (T + C)] **Where: P = Vapor Pressure in mmHg**

T = Temperature in °C

T_{LN} (°C) = 9.28 T_{LA} (°C) = 12.03 T_{LX} (°C) = 14.78

Compound	mmHg			bar			psi		
	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	111.2674	126.9807	144.5011	0.1483	0.1693	0.1927	2.1516	2.4554	2.7942
Aliphatics (Diethylamine Similar)	86.0030	100.9990	118.0440	0.1147	0.1347	0.1574	1.6630	1.9530	2.2826
Alkyl Benzenes (Butyl Benzene Similar)	0.3648	0.4507	0.5539	4.86E-04	6.01E-04	7.38E-04	0.0071	0.0087	0.0107
Butanol	1.8296	2.3264	2.9373	0.0024	0.0031	0.0039	0.0354	0.0450	0.0568
Butyl Acetate	4.8139	5.7472	6.8332	0.0064	0.0077	0.0091	0.0931	0.1111	0.1321
Cresol-m	1.25E-03	1.97E-03	3.05E-03	1.67E-06	2.63E-06	4.07E-06	2.42E-05	3.81E-05	5.90E-05
Cyclohexanone	1.3726	1.6522	1.9809	0.0018	0.0022	0.0026	0.0265	0.0319	0.0383
Ethyl Alcohol	26.0205	30.8449	36.4287	0.0347	0.0411	0.0486	0.5032	0.5964	0.7044
Ethyl Benzene	3.9773	4.7263	5.5945	0.0053	0.0063	0.0075	0.0769	0.0914	0.1082
Glycol Ethers (Ethylene Glycol Similar)	0.0156	0.0203	0.0263	2.08E-05	2.71E-05	3.51E-05	3.02E-04	3.93E-04	5.09E-04
Hexane	70.6320	80.9153	92.4101	0.0942	0.1079	0.1232	1.3658	1.5646	1.7869
Isopropyl Alcohol	19.3790	23.2143	27.6899	0.0258	0.0309	0.0369	0.3747	0.4489	0.5354
Methyl Alcohol	52.2658	61.3771	71.8264	0.0697	0.0818	0.0958	1.0107	1.1868	1.3889
Methyl Ethyl Ketone	39.3413	45.6374	52.7629	0.0525	0.0608	0.0703	0.7607	0.8825	1.0203
Methyl Isobutyl Ketone	7.1814	8.5534	10.1453	0.0096	0.0114	0.0135	0.1389	0.1654	0.1962
Methyl t-Butyl Ether	127.2166	144.2219	163.0562	0.1696	0.1923	0.2174	2.4600	2.7888	3.1530
Methylene Chloride	222.3943	251.6240	283.9145	0.2965	0.3355	0.3785	4.3004	4.8656	5.4900
Naphthalene	0.0152	0.0207	0.0278	2.03E-05	2.75E-05	3.70E-05	2.95E-04	4.00E-04	5.37E-04
Tetrahydrofuran	81.3472	93.0545	106.1290	0.1085	0.1241	0.1415	1.5730	1.7994	2.0522
Toluene	12.3609	14.4614	16.8597	0.0165	0.0193	0.0225	0.2390	0.2796	0.3260
Trichloroethane, 1,1,1-	57.7534	66.2631	75.7920	0.0770	0.0883	0.1010	1.1168	1.2813	1.4656
Trichloroethylene	25.9860	30.5329	35.7294	0.0346	0.0407	0.0476	0.5025	0.5904	0.6909
Xylene	2.4000	2.8986	3.4852	0.0032	0.0039	0.0046	0.0464	0.0561	0.0674
Total Pressures	953.94	1096.5243	1256.73	1.2718	1.4619	1.6755	18.4462	21.2033	24.3012

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Cutter

(continued from previous page)

Raoult's Law Calculations for Vapor Partial Pressures

Raoult's Law $P_{partial\ of\ i} = X_i \times P_{vap\ of\ i}$

Where: $P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
$P_{vap\ of\ i}$ is the vapor pressure of pure i
X_i is the liquid mole fraction of i

$Y_i = P_{partial\ of\ i} / P_{total}$

Y_i is the vapor phase mole fraction of component i
$P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
P_{total} is the total pressure of all components in the vapor phase

Compound	X_i	$P_{vap\ of\ i}$ (psi)			$P_{partial\ of\ i}$ (psi)			Y_i		
		T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	7.96%	2.1516	2.4554	2.7942	0.1712	0.1954	0.2224	30.59%	30.11%	29.66%
Aliphatics (Diethylamine Similar)	5.13%	1.6630	1.9530	2.2826	0.0853	0.1001	0.1170	15.232%	15.432%	15.608%
Alkyl Benzenes (Butyl Benzene Similar)	13.26%	0.0071	0.0087	0.0107	0.0009	0.0012	0.0014	0.167%	0.178%	0.189%
Butanol	1.65%	0.0354	0.0450	0.0568	0.0006	0.0007	0.0009	0.104%	0.114%	0.125%
Butyl Acetate	2.03%	0.0931	0.1111	0.1321	0.0019	0.0023	0.0027	0.337%	0.347%	0.357%
Cresol-m	1.77%	2.42E-05	3.81E-05	5.90E-05	4.29E-07	6.77E-07	1.05E-06	0.0001%	0.0001%	0.0001%
Cyclohexanone	3.91%	0.0265	0.0319	0.0383	0.0010	0.0012	0.0015	0.185%	0.192%	0.200%
Ethyl Alcohol	3.03%	0.5032	0.5964	0.7044	0.0152	0.0181	0.0213	2.722%	2.784%	2.845%
Ethyl Benzene	1.64%	0.0769	0.0914	0.1082	0.0013	0.0015	0.0018	0.226%	0.231%	0.237%
Glycol Ethers (Ethylene Glycol Similar)	1.69%	3.02E-04	3.93E-04	5.09E-04	5.09E-06	6.63E-06	8.59E-06	0.001%	0.001%	0.001%
Hexane	1.92%	1.3658	1.5646	1.7869	0.0263	0.0301	0.0344	4.69%	4.64%	4.58%
Isopropyl Alcohol	12.63%	0.3747	0.4489	0.5354	0.0473	0.0567	0.0676	8.45%	8.73%	9.02%
Methyl Alcohol	6.26%	1.0107	1.1868	1.3889	0.0633	0.0743	0.0870	11.30%	11.45%	11.60%
Methyl Ethyl Ketone	2.78%	0.7607	0.8825	1.0203	0.0212	0.0246	0.0284	3.78%	3.78%	3.79%
Methyl Isobutyl Ketone	0.78%	0.1389	0.1654	0.1962	0.0011	0.0013	0.0015	0.19%	0.20%	0.20%
Methyl t-Butyl Ether	0.89%	2.4600	2.7888	3.1530	0.0219	0.0248	0.0281	3.91%	3.83%	3.74%
Methylene Chloride	1.13%	4.3004	4.8656	5.4900	0.0486	0.0550	0.0620	8.68%	8.47%	8.27%
Naphthalene	0.41%	0.0003	0.0004	0.0005	1.20E-06	1.63E-06	2.19E-06	0.0002%	0.0003%	0.0003%
Tetrahydrofuran	0.73%	1.5730	1.7994	2.0522	0.0114	0.0131	0.0149	2.04%	2.01%	1.99%
Toluene	12.21%	0.2390	0.2796	0.3260	0.0292	0.0341	0.0398	5.21%	5.26%	5.31%
Trichloroethane, 1,1,1-	0.26%	1.1168	1.2813	1.4656	0.0029	0.0034	0.0038	0.52%	0.52%	0.51%
Trichloroethylene	0.20%	0.5025	0.5904	0.6909	0.0010	0.0012	0.0014	0.18%	0.18%	0.18%
Xylene	17.74%	0.0464	0.0561	0.0674	0.0082	0.0099	0.0120	1.47%	1.53%	1.59%
Totals	100.00%	18.4462	21.2033	24.3012	0.5598	0.6489	0.7499	100.00%	100.00%	100.00%

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Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Cutter
(continued from previous page)

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Calculate Stock Density (lb/cubic foot)

M_V Calculation			
Compound	**MW**	**Y_i**	**MW x Y_i**
Acetone	58.08	30.11%	17.4904
Aliphatics (Diethylamine Similar)	73.14	15.43%	11.2868
Alkyl Benzenes (Butyl Benzene Similar)	134.22	0.18%	0.2389
Butanol	74.12	0.11%	0.0846
Butyl Acetate	116.16	0.35%	0.4033
Cresol-m	108.10	0.0001%	0.0001
Cyclohexanone	98.20	0.19%	0.1889
Ethyl Alcohol	46.07	2.78%	1.2826
Ethyl Benzene	106.17	0.23%	0.2457
Glycol Ethers (Ethylene Glycol Similar)	62.07	0.001%	0.0006
Hexane	86.17	4.64%	3.9955
Isopropyl Alcohol	60.09	8.73%	5.2488
Methyl Alcohol	32.04	11.45%	3.6688
Methyl Ethyl Ketone	72.10	3.78%	2.7279
Methyl Isobutyl Ketone	100.20	0.20%	0.2001
Methyl t-Butyl Ether	88.15	3.83%	3.3733
Methylene Chloride	84.94	8.47%	7.1933
Naphthalene	128.20	0.0003%	0.0003
Tetrahydrofuran	72.12	2.01%	1.4510
Toluene	92.13	5.26%	4.8482
Trichloroethane, 1,1,1-	133.42	0.52%	0.6888
Trichloroethylene	131.40	0.18%	0.2381
Xylene	106.17	1.53%	1.6272
M_V = Sum (MW_i x Y_i)			**66.4833**

Stock Density

$$W_V = (M_V \times P_{VA}) / (R \times T_{LA})$$

Where: W_V is the stock density in lb/cubic foot

M_V is the molecular weight of the vapor

P_{VA} is the total pressure of the mixture in psia

R ideal gas constant
(10.731 psia cubic foot / lb-mole °R)

T_{LA} is the daily average liquid temperature in °R

M_V = 66.48 (see below)

P_{VA} = 0.6489 psi

R = 10.731 psia cubic foot / lb-mole °R

T_{LA} = 513.35 °R

$$W_V = (66.48 \times 0.6489) / (10.731 \times 513.35)$$

W_V = 0.0078 lb/cubic foot

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Cutter

(continued from previous page)

Calculate Vapor Space Expansion Factor (K_E)

$K_E = (\Delta T_V / T_{LA}) + (\Delta P_V - \Delta P_B) / (P_A - P_{VA})$ AP-42, Chapter 7.1, Equation 1-7

Where:
K_E = Vapor Space Expansion Factor (Calculated Below)
ΔT_V = 19.80 (°R - Daily Vapor Temperature Range)
T_{LA} = 513.35 (°R - Average Daily Liquid Surface Temperature)
ΔP_V = Daily Vapor Pressure Range (Calcuated Below)
ΔP_B = Breather Vent Pressure Setting Range (Calcuated Below)
P_A = 14.7 (psia - Atmospheric Pressure)
P_{VA} = 0.6489 (psia - Total Mixture Pressure)

ΔP_V

$\Delta P_V = P_{LX} - P_{LN}$

Where: ΔP_V is the daily vapor pressure range
P_{LX} = 0.7499 psi
P_{LN} = 0.5598 psi

ΔP_V = 0.74985420473472 - 0.559783749750263 = 0.1901 psi

ΔP_B

$\Delta P_B = P_{BP} - P_{BV}$

Where: ΔP_B is the breather vent pressure setting range
P_{BP} = 0.03 psi
P_{BV} = -0.03 psi

ΔP_B = (0.03) - (-0.03) = 0.06 psi

K_E = 0.047827 (Unitless)
If KE is less than zero, it is assumed to be zero.

Calculate Vented Vapor Space Saturation Factor (K_S)

$K_S = 1 / (1 + 0.053 (P_{VA}) (H_{VO}))$ AP-42, Chapter 7.1, Equation 1-20

Where: Ks is the vented vapor space saturation factor
P_{VA} is the total mixture pressure P_{VA} = 0.6489 psi
H_{VO} is the vapor space outage H_{VO} = 0.5771 Ft

K_S = 1 / (1 + 0.053 (0.6489) (0.5771) = 0.98054 (Unitless)

Loss Calculations (HAP and VOC Emissions)

Standing Storage Loss L_S (lb/yr) = $365 (W_V)(V_V)(K_E)(K_S)$
Working Loss L_W (lb/yr) = $0.0010 (M_V)(P_{VA})(Q)(K_N)(K_P)$
Total Loss L_T (lb/yr) = $L_S + L_W$

Where:
W_V = 0.00783093 Vapor Density in lb/cubic feet
V_V = 65.27 Vapor Space Volume in cubic feet
K_E = 0.04782713 Vapor Space Expansion Factor
K_S = 0.98053981 Vented Vapor Space Saturation Factor - See Above for Calculation
M_V = 66.48 Molecular Weight of the Vapor in lb/lb-mole
P_{VA} = 0.6489 Total Mixture Pressure in psi
Q = 1,637,163 bbl/yr
K_N = 0.2 working turnovers
K_P = 1.0 working loss product factor, unitless

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Cutter

(continued from previous page)

Standing Storage Loss		
L_S (lb/yr)	8.75	lb/yr
Working Loss		
L_W (lb/yr)	12,541.18	lb/yr
Total Loss		
L_T (lb/yr)	12,549.93	lb/yr

Individual Compound Emissions

Basis:	100	lb-moles of vapor for weight fraction calculation
Total Emissions:	12,549.93	lb/yr
Control Efficiency:	95%	

Compound Information						PTE Calculations					
Compound	**Yi**	**lb-moles**	**MW**	**Pounds**	**Weight %**	**PTE VOC (lb/yr)**	**PTE HAP (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**	**PTE VOC w/control (TPY)**	**PTE HAP w/control (TPY)**
Acetone	30.11%	30.11427	58.08	1,749.04	26.31%						
Aliphatics (Diethylamine Similar)	15.43%	15.43179	73.14	1,128.68	16.98%	2,130.59		1.07		0.05	
Alkyl Benzenes (Butyl Benzene Similar)	0.18%	0.178015	134.22	23.89	0.36%	45.10	45.10	0.02	0.02	1.13E-03	1.13E-03
Butanol	0.11%	0.114199	74.12	8.46	0.13%	15.98		7.99E-03		3.99E-04	
Butyl Acetate	0.35%	0.347173	116.16	40.33	0.61%	76.13		0.04		1.90E-03	
Cresol-m	0.0001%	0.000104	108.10	0.01	0.0002%	0.02	0.02	1.06E-05	1.06E-05	5.32E-07	5.32E-07
Cyclohexanone	0.19%	0.19239	98.20	18.89	0.28%	35.66		0.02		8.92E-04	
Ethyl Alcohol	2.78%	2.784007	46.07	128.26	1.93%	242.11		0.12		6.05E-03	
Ethyl Benzene	0.23%	0.231386	106.17	24.57	0.37%	46.37	46.37	0.02	0.02	1.16E-03	1.16E-03
Glycol Ethers (Ethylene Glycol Similar)	0.001%	0.001022	62.07	0.06	0.001%	0.12	0.12	5.99E-05	5.99E-05	2.99E-06	2.99E-06
Hexane	4.64%	4.636748	86.17	399.55	6.01%	754.22	754.22	0.38	0.38	1.89E-02	1.89E-02
Isopropyl Alcohol	8.73%	8.734897	60.09	524.88	7.89%	990.81		0.50		2.48E-02	
Methyl Alcohol	11.45%	11.45058	32.04	366.88	5.52%	692.55	692.55	0.35	0.35	1.73E-02	1.73E-02
Methyl Ethyl Ketone	3.78%	3.783549	72.10	272.79	4.10%	514.95		0.26		1.29E-02	
Methyl Isobutyl Ketone	0.20%	0.199664	100.20	20.01	0.30%	37.77	37.77	0.02	0.02	9.44E-04	9.44E-04
Methyl t-Butyl Ether	3.83%	3.82681	88.15	337.33	5.07%	636.78	636.78	0.32	0.32	1.59E-02	1.59E-02
Methylene Chloride	8.47%	8.468725	84.94	719.33	10.82%		1,357.87		0.68		3.39E-02
Naphthalene	0.0003%	0.000251	128.20	0.03	0.0005%	0.06	0.06	3.04E-05	3.04E-05	1.52E-06	1.52E-06
Tetrahydrofuran	2.01%	2.011956	72.12	145.10	2.18%	273.91	273.91	0.14	0.14	6.85E-03	6.85E-03
Toluene	5.26%	5.262398	92.13	484.82	7.29%	915.19	915.19	0.46	0.46	2.29E-02	2.29E-02
Trichloroethane, 1,1,1-	0.52%	0.516293	133.42	68.88	1.04%	130.03	130.03	0.07	0.07	3.25E-03	3.25E-03
Trichloroethylene	0.18%	0.181167	131.40	23.81	0.36%	44.94	44.94	0.02	0.02	1.12E-03	1.12E-03
Xylene	1.53%	1.532609	106.17	162.72	2.45%	307.16	307.16	0.15	0.15	7.68E-03	7.68E-03
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Totals				**6,648.33**	**100.00%**	**7,890**	**5,242.09**	**3.95**	**2.62**	**0.20**	**0.13**

Worst Case HAP	**Methylene Chloride**	**0.68**	**TPY - Uncontrolled**
Worst Case HAP	**Methylene Chloride**	**0.03**	**TPY - After Control**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Blended Fuel

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

INPUT - CLIMATE DATA - Indianapolis, Indiana				
Tax (Daily Maximum Ambient Temperature)	62.00	°F	16.7 °C	521.67 °R
Tan (Daily Minimum Ambient Temperature)	42.20	°F	5.7 °C	501.87 °R
Daily Solar Isolation Factor (I)	1165	Btu/CF • day	K_N	0.1776
Tank Paint Solar Absorbance (α)	0.17	white	K_P	1.0

Source: AP-42, Chapter 7.1, Table 7.1-7, November 2006
N = The number of annual turnovers per year
K_N (Working Loss Turnover Factor) = (180 + N) / 6N for more than 36 turnovers per year, AP-42, Chapter 7.1, Eq. 1-29.
K_N (Working Loss Turnover Factor) = 1.0 for 36 or less turnovers per year, AP-42, Chapter 7.1, Eq. 1-29
K_p (Working Loss Product Factor) = 0.75 for crude oils and 1.0 for all other organic, AP-42, Chapter 7.1, Eq. 1-31

INPUT - TANK DATA			User Input	
Tank Diameter (D)	12.00	Ft		
Shell Height (Hs)	30.00	Ft	Constant Temperature Tank (Y/N)	N
Stock Liquid Height (Hl)	29.55	Ft	If so, what temperature (°R) ?	
Roof Height (H_R) - See Table to Right	6.00	Ft		
Tank Radius (R_S = D/2)	6.00	Ft	Atmospheric Pressure (psi)	14.7
Cone Roof Slope (S_R in ft/ft - 0.0625 default)	0.0625	Ft/Ft		
Roof Outage (H_{RO}) - See Table to Right	0.1250	Ft	Number of Turnovers (N) per Year	2750.43
Vapor Space Outage ($H_{VO} = H_S - H_L + H_{RO}$)	0.5771	Ft	N = Q (gpy) / Max. Liquid Volume (gallons)	
Tank Vapor Space Volume ($V_V = (\pi/4)D^2 H_{VO}$)	65.27	FT^3		
Max. Liquid Volume = 7.481 $(\pi/4) D^2 H_L$	25,000.00	gallons	Roof Outage	
Breather Vent Pressure Setting (P_{BP})	0.030	psi	Cone Roof $H_{RO} = (1/3)(S_R)(R_S)$ =	0.1250
Breather Vent Vacuum Setting (P_{BV})	-0.030	psi	H_R = D/2 =	6.0000
Annual Throughput (Q)	68,760,847	gal/yr	Dome Roof $H_{RO} = 0.137 R_S$ =	0.8220
Annual Throughput (Q) (1 bbl = 42 gallons)	1,637,163	bbl/yr	$H_R = 0.268 R_S$ =	1.6080

Maximum Fuel Usage	68,760,847	gallon/yr
Recirculation	0	gallon/yr
Annual Throughput	**68,760,847**	gallon/yr

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Blended Fuel

(continued from previous page)

Temperature Calculations (AP-42, Chapter 7.1)

T_{AA} (Daily Average Ambient Temperature) AP-42, Chapter 7.1, Equation 1-27	= (TAX (°R) + TAN (°R)) / 2 =	511.77	°R
		11.16	°C
T_B (Liquid Bulk Temperature) AP-42, Chapter 7.1, Equation 1-28	= (TAA (R) + (6 x α) - 1) =	511.79	°R
		11.17	°C
T_{LA} (Daily Average Liquid Surface Temperature) AP-42, Chapter 7.1, Equation 1-26	= 0.44 TAA + 0.56 TB + 0.0079 α I =	513.35	°R
		12.03	°C

ΔT_A (Daily Ambient Temperature Range) AP-42, Chapter 7.1, Equation 1-12	= (TAX (°R) - TAN (°R)) =	19.80	°R
		-262.16	°C
ΔT_V (Daily Vapor Temperature Range) AP-42, Chapter 7.1, Equation 1-8	= 0.72 ΔTA + 0.028 α I =	19.80	°R
		-262.16	°C
T_{LX} (Maximum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA + 0.25 ΔTV =	518.30	°R
		14.78	°C
T_{LN} (Minimum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA - 0.25 ΔTV =	508.40	°R
		9.28	°C

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Blended Fuel

(continued from previous page)

Liquid Properties

Average Density of the Liquid - All Components					
Component	**Specific Gravity**	**Density (lb/gal)**	**Wt %**	**Product of Density x Weight %**	**Notes**
Acetone	0.7949	6.6277	3.8020%	0.2520	Wt % from site sampling, S.G. from wikipedia
Aliphatics	0.7075	5.8990	3.0840%	0.1819	
Alkyl Benzenes	0.9000	7.5040	14.6540%	1.0996	
Benzene	0.8760	7.3039	0.0170%	0.0012	
Butanol	0.8050	6.7119	1.0040%	0.0674	
Butyl Acetate	0.8825	7.3581	1.9370%	0.1425	
Cresol-m	1.0350	8.6296	1.5780%	0.1362	
Cyclohexanone	0.9478	7.9026	3.1560%	0.2494	
Ethyl Alcohol	0.7890	6.5785	1.1480%	0.0755	
Ethyl Benzene	0.8665	7.2247	1.4980%	0.1082	
Glycol Ethers	1.1132	9.2816	0.8610%	0.0799	
Hexane	0.6548	5.4596	1.3630%	0.0744	
Isopropyl Alcohol	0.7860	6.5535	6.2410%	0.4090	
Methyl Alcohol	0.7920	6.6035	1.6500%	0.1090	
Methyl Ethyl Ketone	0.8050	6.7119	1.6500%	0.1107	
Methyl Isobutyl Ketone	0.8020	6.6869	0.6600%	0.0441	
Methyl t-Butyl Ether	0.7404	6.1733	0.6460%	0.0399	
Methylene Chloride	1.3266	11.0609	0.7890%	0.0873	
Naphthalene	1.3289	11.0801	0.4300%	0.0476	
Tetrahydrofuran	0.8900	7.4206	0.4300%	0.0319	
Toluene	0.8709	7.2614	9.3230%	0.6770	
Trichloroethane, 1,1,1-	1.3200	11.0059	0.2870%	0.0316	
Trichloroethylene	1.4719	12.2724	0.2150%	0.0264	
Trimethylbenzene, 1,2,4	0.8761	7.3047	0.0810%	0.0059	
Water, Oil, Dirt (solids)	1.0000	8.3378	27.9440%	2.3299	
Xylene	0.8688	7.2439	15.5530%	1.1266	
Total Weight % =			100.00%	----------	----------
Avg. Liquid Density = (Sum Density x Wt %) / Total Wt% =				7.5453	----------
Tank Throughput (lb/yr) = Throughput (gallons/yr) x Density (lb/gallon) =					518,818,244.03

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Blended Fuel

(continued from previous page)

HAP and VOC with Antoine Coefficients							
Basis :	**100**	**lbs fluid**					
Component	**Mol. Weight**	**Weight %**	**Weight (lbs)**	**Moles**	**Mole %**	**HAP (YES/NO)**	**VOC (YES/NO)**
Acetone	58.08	3.80%	3.8020	0.0655	2.7547%	NO	NO
Aliphatics	73.14	3.08%	3.0840	0.0422	1.7744%	NO	YES
Alkyl Benzenes	134.22	14.65%	14.6540	0.1092	4.5944%	YES	YES
Benzene	78.11	0.02%	0.0170	0.0002	0.0092%	YES	YES
Butanol	74.12	1.00%	1.0040	0.0135	0.5700%	NO	YES
Butyl Acetate	116.16	1.94%	1.9370	0.0167	0.7017%	NO	YES
Cresol-m	108.10	1.58%	1.5780	0.0146	0.6143%	YES	YES
Cyclohexanone	98.20	3.16%	3.1560	0.0321	1.3524%	NO	YES
Ethyl Alcohol	46.07	1.15%	1.1480	0.0249	1.0486%	NO	YES
Ethyl Benzene	106.17	1.50%	1.4980	0.0141	0.5937%	YES	YES
Glycol Ethers	62.07	0.86%	0.8610	0.0139	0.5837%	YES	YES
Hexane	86.17	1.36%	1.3630	0.0158	0.6656%	YES	YES
Isopropyl Alcohol	60.09	6.24%	6.2410	0.1039	4.3706%	NO	YES
Methyl Alcohol	32.04	1.65%	1.6500	0.0515	2.1671%	YES	YES
Methyl Ethyl Ketone	72.10	1.65%	1.6500	0.0229	0.9630%	NO	YES
Methyl Isobutyl Ketone	100.20	0.66%	0.6600	0.0066	0.2772%	YES	YES
Methyl t-Butyl Ether	88.15	0.65%	0.6460	0.0073	0.3084%	YES	YES
Methylene Chloride	84.94	0.79%	0.7890	0.0093	0.3909%	YES	NO
Naphthalene	128.20	0.43%	0.4300	0.0034	0.1411%	YES	YES
Tetrahydrofuran	72.12	0.43%	0.4300	0.0060	0.2509%	YES	YES
Toluene	92.13	9.32%	9.3230	0.1012	4.2584%	YES	YES
Trichloroethane, 1,1,1-	133.42	0.29%	0.2870	0.0022	0.0905%	YES	YES
Trichloroethylene	131.40	0.22%	0.2150	0.0016	0.0689%	YES	YES
Trimethylbenzene, 1,2,4	120.19	0.08%	0.0810	0.0007	0.0284%	NO	YES
Water, Oil, Dirt (solids)	18.02	27.94%	27.9440	1.5507	65.2570%	NO	NO
Xylene	106.17	15.55%	15.5530	0.1465	6.1646%	YES	YES
Totals		100.00%	100.00	2.38	100.00%	---	---

HAP or VOC without Antoine Coefficients - Assume 100% Volatilization					
Component	**Tank Throughput (lb/yr)**	**Component Wt%**	**Total Emissions (lb/yr)**	**HAP (YES/NO)**	**VOC (YES/NO)**

(continued on next page)

Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Blended Fuel (continued from previous page)

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Antoine Coefficients for Vapor Pressure Estimation

Antoine Equation Data

Compound	A	B	C	Valid Range (Celsius)	Source
Acetone	7.3141	1,315.67	240.4790	-94.70 to 235.05	Yaws Handbook of Vapor Pressure, 2007
Aliphatics	6.5570	829.07	170.0770	-46.00 to 223.45	Yaws Handbook of Vapor Pressure, 2007
Alkyl Benzenes	7.1847	1,720.37	216.4130	-87.85 to 387.40	Yaws Handbook of Vapor Pressure, 2007
Benzene	6.8140	1,090.43	197.1460	-40.00 to 288.90	Yaws Handbook of Vapor Pressure, 2007
Butanol	7.2906	1,282.85	173.2470	-37.00 to 289.90	Yaws Handbook of Vapor Pressure, 2007
Butyl Acetate	7.2341	1,515.76	222.0770	-73.50 to 306.50	Yaws Handbook of Vapor Pressure, 2007
Cresol-m	6.8749	1,303.18	124.0000	20.80 to 432.70	Yaws Handbook of Vapor Pressure, 2007
Cyclohexanone	7.6065	1,884.55	243.0360	-31.15 to 356.00	Yaws Handbook of Vapor Pressure, 2007
Ethyl Alcohol	8.1348	1,662.48	238.1310	-114.10 to 243.10	Yaws Handbook of Vapor Pressure, 2007
Ethyl Benzene	7.1561	1,559.55	228.5820	-94.95 to 344.02	Yaws Handbook of Vapor Pressure, 2007
Glycol Ethers	9.6994	3,147.10	264.2460	-13.00 to 371.85	Yaws Handbook of Vapor Pressure, 2007
Hexane	6.9895	1,216.92	227.4510	-95.31 to 234.28	Yaws Handbook of Vapor Pressure, 2007
Isopropyl Alcohol	7.8306	1,483.30	217.4130	-87.87 to 235.16	Yaws Handbook of Vapor Pressure, 2007
Methyl Alcohol	8.0913	1,582.91	239.0960	-97.68 to 239.43	Yaws Handbook of Vapor Pressure, 2007
Methyl Ethyl Ketone	7.2010	1,325.15	227.0930	-85.00 to 262.35	Yaws Handbook of Vapor Pressure, 2007
Methyl Isobutyl Ketone	7.1597	1,421.73	216.2660	-84.00 to 298.25	Yaws Handbook of Vapor Pressure, 2007
Methyl t-Butyl Ether	7.0760	1,233.70	238.8790	-108.60 to 223.95	Yaws Handbook of Vapor Pressure, 2007
Methylene Chloride	7.1146	1,152.41	232.4420	-95.14 to 236.85	Yaws Handbook of Vapor Pressure, 2007
Naphthalene	6.8912	1,551.48	168.8790	3.2 to 475.25	Yaws Handbook of Vapor Pressure, 2007
Tetrahydrofuran	7.1054	1,256.68	232.6210	-108.50 to 267.00	Yaws Handbook of Vapor Pressure, 2007
Toluene	7.1362	1,457.29	231.8270	-94.97 to 318.64	Yaws Handbook of Vapor Pressure, 2007
Trichloroethane, 1,1,1-	7.0072	1,253.20	229.6240	-30.40 to 271.85	Yaws Handbook of Vapor Pressure, 2007
Trichloroethylene	6.8798	1,157.83	202.5800	-74.00 to 297.85	Yaws Handbook of Vapor Pressure, 2007
Trimethylbenzene, 1,2,4	7.2933	1,763.35	230.2480	-43.77 to 375.98	Yaws Handbook of Vapor Pressure, 2007
Water, Oil, Dirt (solids)	8.0557	1,723.64	233.0800	0.01 to 373.98	Yaws Handbook of Vapor Pressure, 2007
Xylene	7.2122	1,546.92	217.1440	-2.66 to 197.02	Yaws Handbook of Vapor Pressure, 2007

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Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Blended Fuel

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Vapor Pressure Calculations

Use Antoine Equation from AP-42, Chapter 7.1, Page 7.1-94:

Log P = A - [B / (T + C)] **Where: P = Vapor Pressure in mmHg**

T = Temperature in °C

T_{LN} (°C) = 9.28 T_{LA} (°C) = 12.03 T_{LX} (°C) = 14.78

Compound	mmHg			bar			psi		
	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	111.2674	126.9807	144.5011	0.1483	0.1693	0.1927	2.1516	2.4554	2.7942
Aliphatics	86.0030	100.9990	118.0440	0.1147	0.1347	0.1574	1.6630	1.9530	2.2826
Alkyl Benzenes	0.3648	0.4507	0.5539	4.86E-04	6.01E-04	7.38E-04	0.0071	0.0087	0.0107
Benzene	34.0101	39.9076	46.6338	4.53E-02	5.32E-02	6.22E-02	0.6576	0.7717	0.9017
Butanol	1.8296	2.3264	2.9373	2.44E-03	3.10E-03	3.92E-03	0.0354	0.0450	0.0568
Butyl Acetate	4.8139	5.7472	6.8332	0.0064	0.0077	0.0091	0.0931	0.1111	0.1321
Cresol-m	1.25E-03	1.97E-03	3.05E-03	1.67E-06	2.63E-06	4.07E-06	2.42E-05	3.81E-05	5.90E-05
Cyclohexanone	1.3726	1.6522	1.9809	0.0018	0.0022	0.0026	0.0265	0.0319	0.0383
Ethyl Alcohol	26.0205	30.8449	36.4287	0.0347	0.0411	0.0486	0.5032	0.5964	0.7044
Ethyl Benzene	3.9773	4.7263	5.5945	0.0053	0.0063	0.0075	0.0769	0.0914	0.1082
Glycol Ethers	0.0156	0.0203	0.0263	2.08E-05	2.71E-05	3.51E-05	3.02E-04	3.93E-04	5.09E-04
Hexane	70.6320	80.9153	92.4101	0.0942	0.1079	0.1232	1.3658	1.5646	1.7869
Isopropyl Alcohol	19.3790	23.2143	27.6899	0.0258	0.0309	0.0369	0.3747	0.4489	0.5354
Methyl Alcohol	52.2658	61.3771	71.8264	0.0697	0.0818	0.0958	1.0107	1.1868	1.3889
Methyl Ethyl Ketone	39.3413	45.6374	52.7629	0.0525	0.0608	0.0703	0.7607	0.8825	1.0203
Methyl Isobutyl Ketone	7.1814	8.5534	10.1453	0.0096	0.0114	0.0135	0.1389	0.1654	0.1962
Methyl t-Butyl Ether	127.2166	144.2219	163.0562	0.1696	0.1923	0.2174	2.4600	2.7888	3.1530
Methylene Chloride	222.3943	251.6240	283.9145	0.2965	0.3355	0.3785	4.3004	4.8656	5.4900
Naphthalene	0.0152	0.0207	0.0278	2.03E-05	2.75E-05	3.70E-05	2.95E-04	4.00E-04	5.37E-04
Tetrahydrofuran	81.3472	93.0545	106.1290	0.1085	0.1241	0.1415	1.5730	1.7994	2.0522
Toluene	12.3609	14.4614	16.8597	0.0165	0.0193	0.0225	0.2390	0.2796	0.3260
Trichloroethane, 1,1,1-	57.7534	66.2631	75.7920	0.0770	0.0883	0.1010	1.1168	1.2813	1.4656
Trichloroethylene	25.9860	30.5329	35.7294	0.0346	0.0407	0.0476	0.5025	0.5904	0.6909
Trimethylbenzene, 1,2,4	0.8541	1.0353	1.2496	0.0011	0.0014	0.0017	0.0165	0.0200	0.0242
Water, Oil, Dirt (solids)	8.7866	10.5587	12.6367	0.0117	0.0141	0.0168	0.1699	0.2042	0.2444
Xylene	2.4000	2.8986	3.4852	0.0032	0.0039	0.0046	0.0464	0.0561	0.0674
Total Pressures	997.59	1148.0260	1317.25	1.3300	1.5306	1.7562	19.2902	22.1992	25.4715

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Raoult's Law Calculations for Vapor Partial Pressures

Raoult's Law $P_{partial\ of\ i} = X_i \times P_{vap\ of\ i}$

Where: $P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
$P_{vap\ of\ i}$ is the vapor pressure of pure i
X_i is the liquid mole fraction of i

$Y_i = P_{partial\ of\ i} / P_{total}$

Y_i is the vapor phase mole fraction of component i
$P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
P_{total} is the total pressure of all components in the vapor phase

Compound	X_i	$P_{vap\ of\ i}$ (psi)			$P_{partial\ of\ i}$ (psi)			Y_i		
		T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	2.75%	2.1516	2.4554	2.7942	0.0593	0.0676	0.0770	19.44%	18.89%	18.36%
Aliphatics	1.77%	1.6630	1.9530	2.2826	0.0295	0.0347	0.0405	9.681%	9.679%	9.661%
Alkyl Benzenes	4.59%	0.0071	0.0087	0.0107	0.0003	0.0004	0.0005	0.106%	0.112%	0.117%
Benzene	0.01%	0.6576	0.7717	0.9017	0.0001	0.0001	0.0001	0.020%	0.020%	0.020%
Butanol	0.57%	0.0354	0.0450	0.0568	0.0002	0.0003	0.0003	0.066%	0.072%	0.077%
Butyl Acetate	0.70%	0.0931	0.1111	0.1321	0.0007	0.0008	0.0009	0.214%	0.218%	0.221%
Cresol-m	0.61%	2.42E-05	3.81E-05	5.90E-05	1.49E-07	2.34E-07	3.63E-07	0.00005%	0.0001%	0.0001%
Cyclohexanone	1.35%	0.0265	0.0319	0.0383	0.0004	0.0004	0.0005	0.118%	0.121%	0.124%
Ethyl Alcohol	1.05%	0.5032	0.5964	0.7044	0.0053	0.0063	0.0074	1.731%	1.747%	1.762%
Ethyl Benzene	0.59%	0.0769	0.0914	0.1082	0.0005	0.0005	0.0006	0.150%	0.152%	0.153%
Glycol Ethers	0.58%	3.02E-04	3.93E-04	5.09E-04	1.76E-06	2.30E-06	2.97E-06	0.001%	0.001%	0.001%
Hexane	0.67%	1.3658	1.5646	1.7869	0.0091	0.0104	0.0119	2.98%	2.91%	2.84%
Isopropyl Alcohol	4.37%	0.3747	0.4489	0.5354	0.0164	0.0196	0.0234	5.37%	5.48%	5.58%
Methyl Alcohol	2.17%	1.0107	1.1868	1.3889	0.0219	0.0257	0.0301	7.19%	7.18%	7.18%
Methyl Ethyl Ketone	0.96%	0.7607	0.8825	1.0203	0.0073	0.0085	0.0098	2.40%	2.37%	2.34%
Methyl Isobutyl Ketone	0.28%	0.1389	0.1654	0.1962	0.0004	0.0005	0.0005	0.13%	0.13%	0.13%
Methyl t-Butyl Ether	0.31%	2.4600	2.7888	3.1530	0.0076	0.0086	0.0097	2.49%	2.40%	2.32%
Methylene Chloride	0.39%	4.3004	4.8656	5.4900	0.0168	0.0190	0.0215	5.51%	5.31%	5.12%
Naphthalene	0.14%	0.0003	0.0004	0.0005	4.16E-07	5.64E-07	7.58E-07	0.0001%	0.0002%	0.0002%
Tetrahydrofuran	0.25%	1.5730	1.7994	2.0522	0.0039	0.0045	0.0051	1.29%	1.26%	1.23%
Toluene	4.26%	0.2390	0.2796	0.3260	0.0102	0.0119	0.0139	3.34%	3.33%	3.31%
Trichloroethane, 1,1,1-	0.09%	1.1168	1.2813	1.4656	0.0010	0.0012	0.0013	0.33%	0.32%	0.32%
Trichloroethylene	0.07%	0.5025	0.5904	0.6909	0.0003	0.0004	0.0005	0.11%	0.11%	0.11%
Trimethylbenzene, 1,2,4	0.03%	0.0165	0.0200	0.0242	4.68E-06	5.68E-06	6.85E-06	0.002%	0.002%	0.002%
Water, Oil, Dirt (solids)	65.26%	0.1699	0.2042	0.2444	0.1109	0.1332	0.1595	36.37%	37.21%	38.03%
Xylene	6.16%	0.0464	0.0561	0.0674	0.0029	0.0035	0.0042	0.94%	0.97%	0.99%
Totals	100.00%	19.2902	22.1992	25.4715	0.3048	0.3581	0.4193	100.00%	100.00%	100.00%

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Potential to Emit - One (1) 25,000 Gallon Truck Wash Tank - T2 - Blended Fuel (continued from previous page)

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Calculate Stock Density (lb/cubic foot)

M_V Calculation			
Compound	**MW**	**Y_i**	**MW x Y_i**
Acetone	58.08	18.89%	10.9719
Aliphatics	73.14	9.68%	7.0789
Alkyl Benzenes	134.22	0.11%	0.1501
Benzene	78.11	0.02%	0.0154
Butanol	74.12	0.07%	0.0531
Butyl Acetate	116.16	0.22%	0.2530
Cresol-m	108.10	0.0001%	0.0001
Cyclohexanone	98.20	0.12%	0.1185
Ethyl Alcohol	46.07	1.75%	0.8047
Ethyl Benzene	106.17	0.15%	0.1609
Glycol Ethers	62.07	0.001%	0.0004
Hexane	86.17	2.91%	2.5065
Isopropyl Alcohol	60.09	5.48%	3.2926
Methyl Alcohol	32.04	7.18%	2.3016
Methyl Ethyl Ketone	72.10	2.37%	1.7113
Methyl Isobutyl Ketone	100.20	0.13%	0.1283
Methyl t-Butyl Ether	88.15	2.40%	2.1174
Methylene Chloride	84.94	5.31%	4.5119
Naphthalene	128.20	0.0002%	0.0002
Tetrahydrofuran	72.12	1.26%	0.9094
Toluene	92.13	3.33%	3.0641
Trichloroethane, 1,1,1-	133.42	0.32%	0.4322
Trichloroethylene	131.40	0.11%	0.1492
Trimethylbenzene, 1,2,4	120.19	0.002%	0.0019
Water, Oil, Dirt (solids)	18.02	37.21%	6.7055
Xylene	106.17	0.97%	1.0246
M_V = Sum (MW_i x Y_i)			**48.4636**

Stock Density

$$W_V = (M_V \times P_{VA}) / (R \times T_{LA})$$

Where: W_V is the stock density in lb/cubic foot

M_V is the molecular weight of the vapor

P_{VA} is the total pressure of the mixture in psia

R ideal gas constant
(10.731 psia cubic foot / lb-mole °R)

T_{LA} is the daily average liquid temperature in °R

M_V = 48.46 (see below)

P_{VA} = 0.3581 psi

R = 10.731 psia cubic foot / lb-mole °R

T_{LA} = 513.35 °R

W_V = (48.46 x 0.3581) / (10.731 x 513.35)

W_V = 0.0031 lb/cubic foot

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Calculate Vapor Space Expansion Factor (K_E)

$K_E = (\Delta T_V / T_{LA}) + (\Delta P_V - \Delta P_B) / (P_A - P_{VA})$ AP-42, Chapter 7.1, Equation 1-7

Where:
K_E = Vapor Space Expansion Factor (Calculated Below)
ΔT_V = 19.80 (°R - Daily Vapor Temperature Range)
T_{LA} = 513.35 (°R - Average Daily Liquid Surface Temperature)
ΔP_V = Daily Vapor Pressure Range (Calcuated Below)
ΔP_B = Breather Vent Pressure Setting Range (Calcuated Below)
P_A = 14.7 (psia - Atmospheric Pressure)
P_{VA} = 0.3581 (psia - Total Mixture Pressure)

ΔP_V

$\Delta P_V = P_{LX} - P_{LN}$

Where: ΔP_V is the daily vapor pressure range
P_{LX} = 0.4193 psi
P_{LN} = 0.3048 psi

ΔP_V = 0.419253547358546 - 0.304812927869811 = 0.1144 psi

ΔP_B

$\Delta P_B = P_{BP} - P_{BV}$

Where: ΔP_B is the breather vent pressure setting range
P_{BP} = 0.03 psi
P_{BV} = -0.03 psi

ΔP_B = (0.03) - (-0.03) = 0.06 psi

K_E = 0.042366 (Unitless)
If KE is less than zero, it is assumed to be zero.

Calculate Vented Vapor Space Saturation Factor (K_S)

$K_S = 1 / (1 + 0.053 (P_{VA}) (H_{VO}))$ AP-42, Chapter 7.1, Equation 1-20

Where: Ks is the vented vapor space saturation factor
P_{VA} is the total mixture pressure P_{VA} = 0.3581 psi
H_{VO} is the vapor space outage H_{VO} = 0.5771 Ft

$K_S = 1 / (1 + 0.053 (0.3581) (0.5771) =$ 0.989168 (Unitless)

Loss Calculations (HAP and VOC Emissions)

Standing Storage Loss L_S (lb/yr) $= 365 (W_V)(V_V)(K_E)(K_S)$
Working Loss L_W (lb/yr) $= 0.0010 (M_V)(P_{VA})(Q)(K_N)(K_P)$
Total Loss L_T (lb/yr) $= L_S + L_W$

Where:
W_V = 0.00314975 Vapor Density in lb/cubic feet
V_V = 65.27 Vapor Space Volume in cubic feet
K_E = 0.04236608 Vapor Space Expansion Factor
K_S = 0.98916768 Vented Vapor Space Saturation Factor - See Above for Calculation
M_V = 48.46 Molecular Weight of the Vapor in lb/lb-mole
P_{VA} = 0.3581 Total Mixture Pressure in psi
Q = 1,637,163 bbl/yr
K_N = 0.2 working turnovers
K_P = 1.0 working loss product factor, unitless

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Standing Storage Loss		
L_S (lb/yr)	3.14	lb/yr
Working Loss		
L_W (lb/yr)	5,044.30	lb/yr
Total Loss		
L_T (lb/yr)	5,047.44	lb/yr

Individual Compound Emissions

Basis:	100	lb-moles of vapor for weight fraction calculation
Total Emissions:	5,047.44	lb/yr
Control Efficiency:	95.00%	

Compound Information						PTE Calculations					
Compound	**Yi**	**lb-moles**	**MW**	**Pounds**	**Weight %**	**PTE VOC (lb/yr)**	**PTE HAP (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**	**PTE VOC w/control (TPY)**	**PTE HAP w/control (TPY)**
Acetone	18.89%	18.89104	58.08	1,097.19	22.64%						
Aliphatics	9.68%	9.678532	73.14	707.89	14.61%	737.26		0.37		0.02	
Alkyl Benzenes	0.11%	0.111822	134.22	15.01	0.31%	15.63	15.63	7.8E-03	7.82E-03	3.9E-04	3.9E-04
Benzene	0.02%	0.019739	78.11	1.54	0.03%	1.61	1.61	8.0E-04	8.03E-04	4.0E-05	4.0E-05
Butanol	0.07%	0.071617	74.12	5.31	0.11%	5.53		2.8E-03		1.4E-04	
Butyl Acetate	0.22%	0.2178	116.16	25.30	0.52%	26.35		1.3E-02		6.6E-04	
Cresol-m	0.0001%	6.54E-05	108.10	0.01	0.0001%	0.01	0.01	3.68E-06	3.68E-06	1.84E-07	1.8E-07
Cyclohexanone	0.12%	0.120674	98.20	11.85	0.24%	12.34		6.2E-03		3.1E-04	
Ethyl Alcohol	1.75%	1.746785	46.07	80.47	1.66%	83.81		4.2E-02		2.1E-03	
Ethyl Benzene	0.15%	0.151553	106.17	16.09	0.33%	16.76	16.76	8.4E-03	8.38E-03	4.2E-04	4.2E-04
Glycol Ethers	0.001%	0.000641	62.07	0.04	0.001%	0.04	0.04	2.07E-05	2.07E-05	1.04E-06	1.04E-06
Hexane	2.91%	2.908728	86.17	250.65	5.17%	261.04	261.04	0.13	0.13	6.53E-03	6.53E-03
Isopropyl Alcohol	5.48%	5.479489	60.09	329.26	6.79%	342.92		0.17		8.57E-03	
Methyl Alcohol	7.18%	7.183415	32.04	230.16	4.75%	239.71	239.71	0.12	0.12	5.99E-03	5.99E-03
Methyl Ethyl Ketone	2.37%	2.373575	72.10	171.13	3.53%	178.24		0.09		4.46E-03	
Methyl Isobutyl Ketone	0.13%	0.128041	100.20	12.83	0.26%	13.36	13.36	6.68E-03	6.68E-03	3.34E-04	3.34E-04
Methyl t-Butyl Ether	2.40%	2.402007	88.15	211.74	4.37%	220.52	220.52	0.11	0.11	5.51E-03	5.51E-03
Methylene Chloride	5.31%	5.311898	84.94	451.19	9.31%		469.91		0.23		1.17E-02
Naphthalene	0.0002%	0.000157	128.20	0.02	0.0004%	0.02	0.02	1.05E-05	1.05E-05	5.26E-07	5.26E-07
Tetrahydrofuran	1.26%	1.260907	72.12	90.94	1.88%	94.71	94.71	0.05	0.05	2.37E-03	2.37E-03
Toluene	3.33%	3.325807	92.13	306.41	6.32%	319.12	319.12	0.16	0.16	7.98E-03	7.98E-03
Trichloroethane, 1,1,1-	0.32%	0.323941	133.42	43.22	0.89%	45.01	45.01	0.02	0.02	1.13E-03	1.13E-03
Trichloroethylene	0.11%	0.113539	131.40	14.92	0.31%	15.54	15.54	7.77E-03	7.77E-03	3.88E-04	3.88E-04
Trimethylbenzene, 1,2,4	0.002%	0.001586	120.19	0.19	0.00%	0.20		9.92E-05		4.96E-06	
Water, Oil, Dirt (solids)	37.21%	37.21161	18.02	670.55	13.84%						
Xylene	0.97%	0.965026	106.17	102.46	2.11%	106.71	106.71	0.05	0.05	2.67E-03	2.67E-03
	---	---	---	---	---						
	---	---	---	---	---						
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	---	---	---	---	---						
Totals				**4,846.36**	**100.00%**	**2,736**	**1,819.70**	**1.37**	**0.91**	**0.07**	**0.05**

Worst Case HAP	**Methylene Chloride**	**0.23**	**TPY - Uncontrolled**
Worst Case HAP	**Methylene Chloride**	**0.01**	**TPY - After Control**

Appendix A to the Technical Support Document (TSD)
PTE and Emission Factor Calculation - Truck Wash Tank - T2

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Throughput for Calculation 68,760,847 gallons/yr
68,761 kgallon/yr

Control Efficiency 95%

						Uncontrolled			After Control		
Pollutant	HAP	VOC	PTE with Cutter (TPY)	PTE with Blended Fuel (TPY)	Worst Case (TPY)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/kgal)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/kgal)
Acetone	NO	NO	---	---	---	not regulated			not regulated		
Aliphatics	NO	YES	1.0653	0.3686	1.0653		1.065	0.031		0.053	0.002
Alkyl Benzenes	YES	YES	0.0226	0.0078	0.0226	0.0226	0.023	6.559E-04	1.13E-03	1.13E-03	3.28E-05
Benzene	YES	YES	0.00E+00	8.03E-04	8.03E-04	0.0008	8.03E-04	2.335E-05	4.01E-05	4.01E-05	1.17E-06
Butanol	NO	YES	0.0080	0.0028	0.0080		0.008	2.324E-04		3.99E-04	1.16E-05
Butyl Acetate	NO	YES	0.0381	0.0132	0.0381		0.038	1.107E-03		1.90E-03	5.54E-05
Cresol-m	YES	YES	1.06E-05	3.68E-06	1.06E-05	1.06E-05	1.06E-05	3.095E-07	5.32E-07	5.32E-07	1.55E-08
Cyclohexanone	NO	YES	0.0178	0.0062	0.0178		0.018	5.187E-04		8.92E-04	2.59E-05
Ethyl Alcohol	NO	YES	0.1211	0.0419	0.1211		0.121	0.004		6.05E-03	1.76E-04
Ethyl Benzene	YES	YES	0.0232	0.0084	0.0232	0.0232	0.023	6.744E-04	1.16E-03	1.16E-03	3.37E-05
Glycol Ethers	YES	YES	5.99E-05	2.07E-05	5.99E-05	5.99E-05	5.99E-05	1.741E-06	2.99E-06	2.99E-06	8.71E-08
Hexane	YES	YES	0.3771	0.1305	0.3771	0.3771	0.377	0.011	1.89E-02	0.019	5.48E-04
Isopropyl Alcohol	NO	YES	0.4954	0.1715	0.4954		0.495	0.014		0.025	7.20E-04
Methyl Alcohol	YES	YES	0.3463	0.1199	0.3463	0.3463	0.346	0.010	1.73E-02	0.017	5.04E-04
Methyl Ethyl Ketone	NO	YES	0.2575	0.0891	0.2575		0.257	0.007		0.013	3.74E-04
Methyl Isobutyl Ketone	YES	YES	0.0189	0.0067	0.0189	0.0189	0.019	5.492E-04	9.44E-04	9.44E-04	2.75E-05
Methyl t-Butyl Ether	YES	YES	0.3184	0.1103	0.3184	0.3184	0.318	0.009	1.59E-02	0.016	4.63E-04
Methylene Chloride	YES	NO	0.6789	0.2350	0.6789	0.6789		0.020	3.39E-02		9.87E-04
Naphthalene	YES	YES	3.04E-05	1.05E-05	3.04E-05	3.04E-05	3.04E-05	8.844E-07	1.52E-06	1.52E-06	4.42E-08
Tetrahydrofuran	YES	YES	0.1370	0.0474	0.1370	0.1370	0.137	0.004	6.85E-03	0.007	1.99E-04
Toluene	YES	YES	0.4576	0.1596	0.4576	0.4576	0.458	0.013	2.29E-02	0.023	6.65E-04
Trichloroethane, 1,1,1-	YES	YES	0.0650	0.0225	0.0650	0.0650	0.065	0.002	3.25E-03	0.003	9.46E-05
Trichloroethylene	YES	YES	0.0225	0.0078	0.0225	0.0225	0.022	6.535E-04	1.12E-03	1.12E-03	3.27E-05
Trimethylbenzene, 1,2,4	NO	YES	0.00E+00	9.92E-05	9.92E-05		9.92E-05	2.887E-06		4.96E-06	1.44E-07
Water, Oil, Dirt (solids)	NO	NO	---	---	---	not regulated			not regulated		
Xylene	YES	YES	0.1536	0.0534	0.1536	0.1536	0.154	0.0045	7.68E-03	0.008	0.0002
						2.62	**3.95**	**0.1345**	**0.13**	**0.20**	**0.01**

	Uncontrolled PTE				PTE after Control			
VOC	**3.946**	**TPY**	**0.115**	**lb/kgal**	**0.197**	**TPY**	**0.01**	**lb/kgal**
Single HAP - Methylene Chloride	**0.679**	**TPY**	**0.020**	**lb/kgal**	**0.034**	**TPY**	**0.001**	**lb/kgal**
Combined HAP	**2.622**	**TPY**	**0.076**	**lb/kgal**	**0.131**	**TPY**	**0.004**	**lb/kgal**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallons Burn Tank - T10 and T11 - Cutter

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

INPUT - CLIMATE DATA - Indianapolis, Indiana				
Tax (Daily Maximum Ambient Temperature)	62.00	°F	16.7 °C	521.67 °R
Tan (Daily Minimum Ambient Temperature)	42.20	°F	5.7 °C	501.87 °R
Daily Solar Isolation Factor (I)	1165	Btu/CF • day	K_N	0.2321
Tank Paint Solar Absorbance (α)	0.17	white	K_P	1.0

Source: AP-42, Chapter 7.1, Table 7.1-7, November 2006
N = The number of annual turnovers per year
K_N (Working Loss Turnover Factor) = (180 + N) / 6N for more than 36 turnovers per year, AP-42, Chapter 7.1, Eq. 1-29.
K_N (Working Loss Turnover Factor) = 1.0 for 36 or less turnovers per year, AP-42, Chapter 7.1, Eq. 1-29
K_p (Working Loss Product Factor) = 0.75 for crude oils and 1.0 for all other organic, AP-42, Chapter 7.1, Eq. 1-31

INPUT - TANK DATA			User Input	
Tank Diameter (D)	30.00	Ft		
Shell Height (Hs)	30.00	Ft	Constant Temperature Tank (Y/N)	N
Stock Liquid Height (Hl)	28.37	Ft	If so, what temperature (°R) ?	
Roof Height (H_R) - See Table to Right	15.00	Ft		
Tank Radius (R_S = D/2)	15.00	Ft	Atmospheric Pressure (psi)	14.7
Cone Roof Slope (S_R in ft/ft - 0.0625 default)	0.0625	Ft/Ft		
Roof Outage (H_{RO}) - See Table to Right	0.3125	Ft	Number of Turnovers (N) per Year	458.41
Vapor Space Outage ($H_{VO} = H_S - H_L + H_{RO}$)	1.9465	Ft	N = Q (gpy) / Max. Liquid Volume (gallons)	
Tank Vapor Space Volume ($V_V = (\pi/4)D^2 H_{VO}$)	1,375.90	FT^3		
Max. Liquid Volume = 7.481 $(\pi/4) D^2 H_L$	150,000.00	gallons	Roof Outage	
Breather Vent Pressure Setting (P_{BP})	0.030	psi	Cone Roof $H_{RO} = (1/3)(S_R)(R_S)$ =	0.3125
Breather Vent Vacuum Setting (P_{BV})	-0.030	psi	H_R = D/2 =	15.0000
Annual Throughput (Q)	68,760,847	gal/yr	Dome Roof $H_{RO} = 0.137 R_S$ =	2.0550
Annual Throughput (Q) (1 bbl = 42 gallons)	1,637,163	bbl/yr	$H_R = 0.268 R_S$ =	4.0200

Maximum Fuel Usage	68,760,847	gallon/yr
Recirculation	0	gallon/yr
Annual Throughput	**68,760,847**	gallon/yr

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallons Burn Tank - T10 and T11 - Cutter

(continued from previous page)

Temperature Calculations (AP-42, Chapter 7.1)

T_{AA} (Daily Average Ambient Temperature) AP-42, Chapter 7.1, Equation 1-27	= (TAX (°R) + TAN (°R)) / 2 =	511.77	°R
		11.16	°C
T_B (Liquid Bulk Temperature) AP-42, Chapter 7.1, Equation 1-28	= (TAA (R) + (6 x α) - 1) =	511.79	°R
		11.17	°C
T_{LA} (Daily Average Liquid Surface Temperature) AP-42, Chapter 7.1, Equation 1-26	= 0.44 TAA + 0.56 TB + 0.0079 α I =	513.35	°R
		12.03	°C

ΔT_A (Daily Ambient Temperature Range) AP-42, Chapter 7.1, Equation 1-12	= (TAX (°R) - TAN (°R)) =	19.80	°R
		-262.16	°C
ΔT_V (Daily Vapor Temperature Range) AP-42, Chapter 7.1, Equation 1-8	= 0.72 ΔTA + 0.028 α I =	19.80	°R
		-262.16	°C
T_{LX} (Maximum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA + 0.25 ΔTV =	518.30	°R
		14.78	°C
T_{LN} (Minimum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA - 0.25 ΔTV =	508.40	°R
		9.28	°C

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallons Burn Tank - T10 and T11 - Cutter

(continued from previous page)

Liquid Properties

Average Density of the Liquid - All Components					
Component	**Specific Gravity**	**Density (lb/gal)**	**Wt %**	**Product of Density x Weight %**	**Notes**
Acetone	0.7949	6.6277	5.3000%	0.3513	Wt % from site sampling, S.G. from wikipedia
Aliphatics (Diethylamine Similar)	0.7075	5.8990	4.3000%	0.2537	
Alkyl Benzenes (Butyl Benzene Similar)	0.9000	7.5040	20.4000%	1.5308	
Butanol	0.8050	6.7119	1.4000%	0.0940	
Butyl Acetate	0.8825	7.3581	2.7000%	0.1987	
Cresol-m	1.0350	8.6296	2.2000%	0.1899	
Cyclohexanone	0.9478	7.9026	4.4000%	0.3477	
Ethyl Alcohol	0.7890	6.5785	1.6000%	0.1053	
Ethyl Benzene	0.8665	7.2247	2.0000%	0.1445	
Glycol Ethers (Ethylene Glycol Similar)	1.1132	9.2816	1.2000%	0.1114	
Hexane	0.6548	5.4596	1.9000%	0.1037	
Isopropyl Alcohol	0.7860	6.5535	8.7000%	0.5702	
Methyl Alcohol	0.7920	6.6035	2.3000%	0.1519	
Methyl Ethyl Ketone	0.8050	6.7119	2.3000%	0.1544	
Methyl Isobutyl Ketone	0.8020	6.6869	0.9000%	0.0602	
Methyl t-Butyl Ether	0.7404	6.1733	0.9000%	0.0556	
Methylene Chloride	1.3266	11.0609	1.1000%	0.1217	
Naphthalene	1.3289	11.0801	0.6000%	0.0665	
Tetrahydrofuran	0.8900	7.4206	0.6000%	0.0445	
Toluene	0.8709	7.2614	12.9000%	0.9367	
Trichloroethane, 1,1,1-	1.3200	11.0059	0.4000%	0.0440	
Trichloroethylene	1.4719	12.2724	0.3000%	0.0368	
Xylene	0.8688	7.2439	21.6000%	1.5647	
Total Weight % =			100.00%	----------	----------
Avg. Liquid Density = (Sum Density x Wt %) / Total Wt% =				7.2379	----------
Tank Throughput (lb/yr) = Throughput (gallons/yr) x Density (lb/gallon) =					497,682,209.20

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallons Burn Tank - T10 and T11 - Cutter

(continued from previous page)

HAP and VOC with Antoine Coefficients							
Basis :	**100**	**lbs fluid**					
Component	**Mol. Weight**	**Weight %**	**Weight (lbs)**	**Moles**	**Mole %**	**HAP (YES/NO)**	**VOC (YES/NO)**
Acetone	58.08	5.30%	5.3000	0.0913	7.9584%	NO	NO
Aliphatics (Diethylamine Similar)	73.14	4.30%	4.3000	0.0588	5.1273%	NO	YES
Alkyl Benzenes (Butyl Benzene Similar)	134.22	20.40%	20.4000	0.1520	13.2553%	YES	YES
Butanol	74.12	1.40%	1.4000	0.0189	1.6473%	NO	YES
Butyl Acetate	116.16	2.70%	2.7000	0.0232	2.0271%	NO	YES
Cresol-m	108.10	2.20%	2.2000	0.0204	1.7749%	YES	YES
Cyclohexanone	98.20	4.40%	4.4000	0.0448	3.9077%	NO	YES
Ethyl Alcohol	46.07	1.60%	1.6000	0.0347	3.0288%	NO	YES
Ethyl Benzene	106.17	2.00%	2.0000	0.0188	1.6429%	YES	YES
Glycol Ethers (Ethylene Glycol Similar)	62.07	1.20%	1.2000	0.0193	1.6861%	YES	YES
Hexane	86.17	1.90%	1.9000	0.0220	1.9230%	YES	YES
Isopropyl Alcohol	60.09	8.70%	8.7000	0.1448	12.6268%	NO	YES
Methyl Alcohol	32.04	2.30%	2.3000	0.0718	6.2605%	YES	YES
Methyl Ethyl Ketone	72.10	2.30%	2.3000	0.0319	2.7821%	NO	YES
Methyl Isobutyl Ketone	100.20	0.90%	0.9000	0.0090	0.7833%	YES	YES
Methyl t-Butyl Ether	88.15	0.90%	0.9000	0.0102	0.8904%	YES	YES
Methylene Chloride	84.94	1.10%	1.1000	0.0130	1.1294%	YES	NO
Naphthalene	128.20	0.60%	0.6000	0.0047	0.4082%	YES	YES
Tetrahydrofuran	72.12	0.60%	0.6000	0.0083	0.7256%	YES	YES
Toluene	92.13	12.90%	12.9000	0.1400	12.2114%	YES	YES
Trichloroethane, 1,1,1-	133.42	0.40%	0.4000	0.0030	0.2615%	YES	YES
Trichloroethylene	131.40	0.30%	0.3000	0.0023	0.1991%	YES	YES
Xylene	106.17	21.60%	21.6000	0.2034	17.7430%	YES	YES
Totals		100.00%	100.00	1.15	100.00%	---	---

HAP or VOC without Antoine Coefficients - Assume 100% Volatilization					
Component	**Tank Throughput (lb/yr)**	**Component Wt%**	**Total Emissions (lb/yr)**	**HAP (YES/NO)**	**VOC (YES/NO)**

(continued on next page)

Potential to Emit - One (1) 150,000 Gallons Burn Tank - T10 and T11 - Cutter (continued from previous page)

(continued from previous page)

Antoine Coefficients for Vapor Pressure Estimation

Antoine Equation Data

Compound	A	B	C	Valid Range (Celsius)	Source
Acetone	7.3141	1,315.67	240.4790	-94.70 to 235.05	Yaws Handbook of Vapor Pressure, 2007
Aliphatics (Diethylamine Similar)	6.5570	829.07	170.0770	-46.00 to 223.45	Yaws Handbook of Vapor Pressure, 2007
Alkyl Benzenes (Butyl Benzene Similar)	7.1847	1,720.37	216.4130	-87.85 to 387.40	Yaws Handbook of Vapor Pressure, 2007
Butanol	7.2906	1,282.85	173.2470	-37.00 to 289.90	Yaws Handbook of Vapor Pressure, 2007
Butyl Acetate	7.2341	1,515.76	222.0770	-73.50 to 306.50	Yaws Handbook of Vapor Pressure, 2007
Cresol-m	6.8749	1,303.18	124.0000	20.80 to 432.70	Yaws Handbook of Vapor Pressure, 2007
Cyclohexanone	7.6065	1,884.55	243.0360	-31.15 to 356.00	Yaws Handbook of Vapor Pressure, 2007
Ethyl Alcohol	8.1348	1,662.48	238.1310	-114.10 to 243.10	Yaws Handbook of Vapor Pressure, 2007
Ethyl Benzene	7.1561	1,559.55	228.5820	-94.95 to 344.02	Yaws Handbook of Vapor Pressure, 2007
Glycol Ethers (Ethylene Glycol Similar)	9.6994	3,147.10	264.2460	-13.00 to 371.85	Yaws Handbook of Vapor Pressure, 2007
Hexane	6.9895	1,216.92	227.4510	-95.31 to 234.28	Yaws Handbook of Vapor Pressure, 2007
Isopropyl Alcohol	7.8306	1,483.30	217.4130	-87.87 to 235.16	Yaws Handbook of Vapor Pressure, 2007
Methyl Alcohol	8.0913	1,582.91	239.0960	-97.68 to 239.43	Yaws Handbook of Vapor Pressure, 2007
Methyl Ethyl Ketone	7.2010	1,325.15	227.0930	-85.00 to 262.35	Yaws Handbook of Vapor Pressure, 2007
Methyl Isobutyl Ketone	7.1597	1,421.73	216.2660	-84.00 to 298.25	Yaws Handbook of Vapor Pressure, 2007
Methyl t-Butyl Ether	7.0760	1,233.70	238.8790	-108.60 to 223.95	Yaws Handbook of Vapor Pressure, 2007
Methylene Chloride	7.1146	1,152.41	232.4420	-95.14 to 236.85	Yaws Handbook of Vapor Pressure, 2007
Naphthalene	6.8912	1,551.48	168.8790	3.2 to 475.25	Yaws Handbook of Vapor Pressure, 2007
Tetrahydrofuran	7.1054	1,256.68	232.6210	-108.50 to 267.00	Yaws Handbook of Vapor Pressure, 2007
Toluene	7.1362	1,457.29	231.8270	-94.97 to 318.64	Yaws Handbook of Vapor Pressure, 2007
Trichloroethane, 1,1,1-	7.0072	1,253.20	229.6240	-30.40 to 271.85	Yaws Handbook of Vapor Pressure, 2007
Trichloroethylene	6.8798	1,157.83	202.5800	-74.00 to 297.85	Yaws Handbook of Vapor Pressure, 2007
Xylene	7.2122	1,546.92	217.1440	-2.66 to 197.02	Yaws Handbook of Vapor Pressure, 2007

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallons Burn Tank - T10 and T11 - Cutter

(continued from previous page)

Vapor Pressure Calculations

Use Antoine Equation from AP-42, Chapter 7.1, Page 7.1-94:

Log P = A - [B / (T + C)] **Where: P = Vapor Pressure in mmHg**

T = Temperature in °C

T_{LN} (°C) = 9.28 T_{LA} (°C) = 12.03 T_{LX} (°C) = 14.78

Compound	mmHg			bar			psi		
	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	111.2674	126.9807	144.5011	0.1483	0.1693	0.1927	2.1516	2.4554	2.7942
Aliphatics (Diethylamine Similar)	86.0030	100.9990	118.0440	0.1147	0.1347	0.1574	1.6630	1.9530	2.2826
Alkyl Benzenes (Butyl Benzene Similar)	0.3648	0.4507	0.5539	0.0005	0.0006	0.0007	0.0071	0.0087	0.0107
Butanol	1.8296	2.3264	2.9373	0.0024	0.0031	0.0039	0.0354	0.0450	0.0568
Butyl Acetate	4.8139	5.7472	6.8332	0.0064	0.0077	0.0091	0.0931	0.1111	0.1321
Cresol-m	0.0013	0.0020	0.0031	1.67E-06	2.63E-06	4.07E-06	2.42E-05	3.81E-05	5.90E-05
Cyclohexanone	1.3726	1.6522	1.9809	0.0018	0.0022	0.0026	0.0265	0.0319	0.0383
Ethyl Alcohol	26.0205	30.8449	36.4287	0.0347	0.0411	0.0486	0.5032	0.5964	0.7044
Ethyl Benzene	3.9773	4.7263	5.5945	0.0053	0.0063	0.0075	0.0769	0.0914	0.1082
Glycol Ethers (Ethylene Glycol Similar)	0.0156	0.0203	0.0263	2.08E-05	2.71E-05	3.51E-05	3.02E-04	3.93E-04	5.09E-04
Hexane	70.6320	80.9153	92.4101	0.0942	0.1079	0.1232	1.3658	1.5646	1.7869
Isopropyl Alcohol	19.3790	23.2143	27.6899	0.0258	0.0309	0.0369	0.3747	0.4489	0.5354
Methyl Alcohol	52.2658	61.3771	71.8264	0.0697	0.0818	0.0958	1.0107	1.1868	1.3889
Methyl Ethyl Ketone	39.3413	45.6374	52.7629	0.0525	0.0608	0.0703	0.7607	0.8825	1.0203
Methyl Isobutyl Ketone	7.1814	8.5534	10.1453	0.0096	0.0114	0.0135	0.1389	0.1654	0.1962
Methyl t-Butyl Ether	127.2166	144.2219	163.0562	0.1696	0.1923	0.2174	2.4600	2.7888	3.1530
Methylene Chloride	222.3943	251.6240	283.9145	0.2965	0.3355	0.3785	4.3004	4.8656	5.4900
Naphthalene	0.0152	0.0207	0.0278	2.03E-05	2.75E-05	3.70E-05	2.95E-04	4.00E-04	5.37E-04
Tetrahydrofuran	81.3472	93.0545	106.1290	0.1085	0.1241	0.1415	1.5730	1.7994	2.0522
Toluene	12.3609	14.4614	16.8597	0.0165	0.0193	0.0225	0.2390	0.2796	0.3260
Trichloroethane, 1,1,1-	57.7534	66.2631	75.7920	0.0770	0.0883	0.1010	1.1168	1.2813	1.4656
Trichloroethylene	25.9860	30.5329	35.7294	0.0346	0.0407	0.0476	0.5025	0.5904	0.6909
Xylene	2.4000	2.8986	3.4852	0.0032	0.0039	0.0046	0.0464	0.0561	0.0674
Total Pressures	953.94	1096.5243	1256.73	1.2718	1.4619	1.6755	18.4462	21.2033	24.3012

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallons Burn Tank - T10 and T11 - Cutter

(continued from previous page)

Raoult's Law Calculations for Vapor Partial Pressures

Raoult's Law $P_{partial\ of\ i} = X_i \times P_{vap\ of\ i}$

Where: $P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
$P_{vap\ of\ i}$ is the vapor pressure of pure i
X_i is the liquid mole fraction of i

$Y_i = P_{partial\ of\ i} / P_{total}$

Y_i is the vapor phase mole fraction of component i
$P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
P_{total} is the total pressure of all components in the vapor phase

Compound	X_i	$P_{vap\ of\ i}$ (psi)			$P_{partial\ of\ i}$ (psi)			Y_i		
		T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	7.96%	2.1516	2.4554	2.7942	0.1712	0.1954	0.2224	30.59%	30.11%	29.66%
Aliphatics (Diethylamine Similar)	5.13%	1.6630	1.9530	2.2826	0.0853	0.1001	0.1170	15.232%	15.432%	15.608%
Alkyl Benzenes (Butyl Benzene Similar)	13.26%	0.0071	0.0087	0.0107	0.0009	0.0012	0.0014	0.167%	0.178%	0.189%
Butanol	1.65%	0.0354	0.0450	0.0568	0.0006	0.0007	0.0009	0.104%	0.114%	0.125%
Butyl Acetate	2.03%	0.0931	0.1111	0.1321	0.0019	0.0023	0.0027	0.337%	0.347%	0.357%
Cresol-m	1.77%	2.42E-05	3.81E-05	5.90E-05	4.29E-07	6.77E-07	1.05E-06	0.0001%	0.0001%	0.0001%
Cyclohexanone	3.91%	0.0265	0.0319	0.0383	0.0010	0.0012	0.0015	0.185%	0.192%	0.200%
Ethyl Alcohol	3.03%	0.5032	0.5964	0.7044	0.0152	0.0181	0.0213	2.722%	2.784%	2.845%
Ethyl Benzene	1.64%	0.0769	0.0914	0.1082	0.0013	0.0015	0.0018	0.226%	0.231%	0.237%
Glycol Ethers (Ethylene Glycol Similar)	1.69%	3.02E-04	3.93E-04	5.09E-04	5.09E-06	6.63E-06	8.59E-06	0.001%	0.001%	0.001%
Hexane	1.92%	1.3658	1.5646	1.7869	0.0263	0.0301	0.0344	4.69%	4.64%	4.58%
Isopropyl Alcohol	12.63%	0.3747	0.4489	0.5354	0.0473	0.0567	0.0676	8.45%	8.73%	9.02%
Methyl Alcohol	6.26%	1.0107	1.1868	1.3889	0.0633	0.0743	0.0870	11.30%	11.45%	11.60%
Methyl Ethyl Ketone	2.78%	0.7607	0.8825	1.0203	0.0212	0.0246	0.0284	3.78%	3.78%	3.79%
Methyl Isobutyl Ketone	0.78%	0.1389	0.1654	0.1962	0.0011	0.0013	0.0015	0.19%	0.20%	0.20%
Methyl t-Butyl Ether	0.89%	2.4600	2.7888	3.1530	0.0219	0.0248	0.0281	3.91%	3.83%	3.74%
Methylene Chloride	1.13%	4.3004	4.8656	5.4900	0.0486	0.0550	0.0620	8.68%	8.47%	8.27%
Naphthalene	0.41%	0.0003	0.0004	0.0005	1.20E-06	1.63E-06	2.19E-06	0.0002%	0.0003%	0.0003%
Tetrahydrofuran	0.73%	1.5730	1.7994	2.0522	0.0114	0.0131	0.0149	2.04%	2.01%	1.99%
Toluene	12.21%	0.2390	0.2796	0.3260	0.0292	0.0341	0.0398	5.21%	5.26%	5.31%
Trichloroethane, 1,1,1-	0.26%	1.1168	1.2813	1.4656	0.0029	0.0034	0.0038	0.52%	0.52%	0.51%
Trichloroethylene	0.20%	0.5025	0.5904	0.6909	0.0010	0.0012	0.0014	0.18%	0.18%	0.18%
Xylene	17.74%	0.0464	0.0561	0.0674	0.0082	0.0099	0.0120	1.47%	1.53%	1.59%
Totals	100.00%	18.4462	21.2033	24.3012	0.5598	0.6489	0.7499	100.00%	100.00%	100.00%

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Potential to Emit - One (1) 150,000 Gallons Burn Tank - T10 and T11 - Cutter (continued from previous page)

(continued from previous page)

Calculate Stock Density (lb/cubic foot)

M_V Calculation			
Compound	**MW**	**Y_i**	**MW x Y_i**
Acetone	58.08	30.11%	17.4904
Aliphatics (Diethylamine Similar)	73.14	15.43%	11.2868
Alkyl Benzenes (Butyl Benzene Similar)	134.22	0.18%	0.2389
Butanol	74.12	0.11%	0.0846
Butyl Acetate	116.16	0.35%	0.4033
Cresol-m	108.10	0.0001%	0.0001
Cyclohexanone	98.20	0.19%	0.1889
Ethyl Alcohol	46.07	2.78%	1.2826
Ethyl Benzene	106.17	0.23%	0.2457
Glycol Ethers (Ethylene Glycol Similar)	62.07	0.001%	0.0006
Hexane	86.17	4.64%	3.9955
Isopropyl Alcohol	60.09	8.73%	5.2488
Methyl Alcohol	32.04	11.45%	3.6688
Methyl Ethyl Ketone	72.10	3.78%	2.7279
Methyl Isobutyl Ketone	100.20	0.20%	0.2001
Methyl t-Butyl Ether	88.15	3.83%	3.3733
Methylene Chloride	84.94	8.47%	7.1933
Naphthalene	128.20	0.0003%	0.0003
Tetrahydrofuran	72.12	2.01%	1.4510
Toluene	92.13	5.26%	4.8482
Trichloroethane, 1,1,1-	133.42	0.52%	0.6888
Trichloroethylene	131.40	0.18%	0.2381
Xylene	106.17	1.53%	1.6272
M_V = Sum (MW_i x Y_i)			**66.4833**

Stock Density

$$W_V = (M_V \times P_{VA}) / (R \times T_{LA})$$

Where: W_V is the stock density in lb/cubic foot

M_V is the molecular weight of the vapor

P_{VA} is the total pressure of the mixture in psia

R ideal gas constant
(10.731 psia cubic foot / lb-mole °R)

T_{LA} is the daily average liquid temperature in °R

M_V = 66.48 (see below)

P_{VA} = 0.6489 psi

R = 10.731 psia cubic foot / lb-mole °R

T_{LA} = 513.35 °R

$$W_V = (66.48 \times 0.6489) / (10.731 \times 513.35)$$

W_V = 0.0078 lb/cubic foot

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallons Burn Tank - T10 and T11 - Cutter

(continued from previous page)

Calculate Vapor Space Expansion Factor (K_E)

$K_E = (\Delta T_V / T_{LA}) + (\Delta P_V - \Delta P_B) / (P_A - P_{VA})$ AP-42, Chapter 7.1, Equation 1-7

Where:

K_E =	Vapor Space Expansion Factor (Calculated Below)	
ΔT_V =	19.80	(°R - Daily Vapor Temperature Range)
T_{LA} =	513.35	(°R - Average Daily Liquid Surface Temperature)
ΔP_V =	Daily Vapor Pressure Range (Calcuated Below)	
ΔP_B =	Breather Vent Pressure Setting Range (Calcuated Below)	
P_A =	14.7	(psia - Atmospheric Pressure)
P_{VA} =	0.6489	(psia - Total Mixture Pressure)

ΔP_V

$\Delta P_V = P_{LX} - P_{LN}$

Where: ΔP_V is the daily vapor pressure range

P_{LX} = 0.7499 psi

P_{LN} = 0.5598 psi

ΔP_V = 0.7499 - 0.5598 = 0.1901 psi

ΔP_B

$\Delta P_B = P_{BP} - P_{BV}$

Where: ΔP_B is the breather vent pressure setting range

P_{BP} = 0.03 psi

P_{BV} = -0.03 psi

ΔP_B = (0.03) - (-0.03) = 0.06 psi

K_E = 0.047827 (Unitless)

If KE is less than zero, it is assumed to be zero.

Calculate Vented Vapor Space Saturation Factor (K_S)

$K_S = 1 / (1 + 0.053 (P_{VA}) (H_{VO}))$ AP-42, Chapter 7.1, Equation 1-20

Where: Ks is the vented vapor space saturation factor

P_{VA} is the total mixture pressure — P_{VA} = 0.6489 psi

H_{VO} is the vapor space outage — H_{VO} = 1.9465 Ft

$K_S = 1 / (1 + 0.053 (0.6489) (1.9465) =$ 0.937257 (Unitless)

Loss Calculations (HAP and VOC Emissions)

Standing Storage Loss	L_S (lb/yr)	$= 365 (W_V)(V_V)(K_E)(K_S)$
Working Loss	L_W (lb/yr)	$= 0.0010 (M_V)(P_{VA})(Q)(K_N)(K_P)$
Total Loss	L_T (lb/yr)	$= L_S + L_W$

Where:

W_V =	0.00783093	Vapor Density in lb/cubic feet
V_V =	1,375.90	Vapor Space Volume in cubic feet
K_E =	0.04782713	Vapor Space Expansion Factor
K_S =	0.93725724	Vented Vapor Space Saturation Factor
M_V =	66.48	Molecular Weight of the Vapor in lb/lb-mole
P_{VA} =	0.6489	Total Mixture Pressure in psi
Q =	1,637,163	bbl/yr
K_N =	0.2	working turnovers
K_P =	1.0	working loss product factor, unitless

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallons Burn Tank - T10 and T11 - Cutter

(continued from previous page)

Standing Storage Loss		
L_S (lb/yr)	176.29	lb/yr
Working Loss		
L_W (lb/yr)	16,392.80	lb/yr
Total Loss		
L_T (lb/yr)	16,569.09	lb/yr

Individual Compound Emissions

Basis:	100	lb-moles of vapor for weight fraction calculation
Total Emissions:	16,569.09	lb/yr
Control Efficiency:	95%	

Compound Information						PTE Calculations					
Compound	**Yi**	**lb-moles**	**MW**	**Pounds**	**Weight %**	**PTE VOC (lb/yr)**	**PTE HAP (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**	**PTE VOC w/control (TPY)**	**PTE HAP w/control (TPY)**
Acetone	30.11%	30.11427	58.08	1,749.04	26.31%						
Aliphatics (Diethylamine Similar)	15.43%	15.43179	73.14	1,128.68	16.98%	2,812.92		1.41		7.03E-02	
Alkyl Benzenes (Butyl Benzene Similar)	0.18%	0.178015	134.22	23.89	0.36%	59.55	59.55	0.03	0.03	1.49E-03	1.49E-03
Butanol	0.11%	0.114199	74.12	8.46	0.13%	21.10		1.05E-02		5.27E-04	
Butyl Acetate	0.35%	0.347173	116.16	40.33	0.61%	100.51		0.05		2.51E-03	
Cresol-m	0.0001%	0.000104	108.10	0.0113	0.0002%	2.81E-02	2.81E-02	1.40E-05	1.40E-05	7.02E-07	7.02E-07
Cyclohexanone	0.19%	0.19239	98.20	18.89	0.28%	47.08		0.02		1.18E-03	
Ethyl Alcohol	2.78%	2.784007	46.07	128.26	1.93%	319.65		0.16		7.99E-03	
Ethyl Benzene	0.23%	0.231386	106.17	24.57	0.37%	61.22	61.22	0.03	0.03	1.53E-03	1.53E-03
Glycol Ethers (Ethylene Glycol Similar)	0.001%	0.001022	62.07	0.06	0.001%	0.16	0.16	7.90E-05	7.90E-05	3.95E-06	3.95E-06
Hexane	4.64%	4.636748	86.17	399.55	6.01%	995.76	995.76	0.50	0.50	0.02	0.02
Isopropyl Alcohol	8.73%	8.734897	60.09	524.88	7.89%	1,308.11		0.65		0.03	
Methyl Alcohol	11.45%	11.45058	32.04	366.88	5.52%	914.34	914.34	0.46	0.46	0.02	0.02
Methyl Ethyl Ketone	3.78%	3.783549	72.10	272.79	4.10%	679.86		0.34		0.02	
Methyl Isobutyl Ketone	0.20%	0.199664	100.20	20.01	0.30%	49.86	49.86	0.02	0.02	1.25E-03	1.25E-03
Methyl t-Butyl Ether	3.83%	3.82681	88.15	337.33	5.07%	840.71	840.71	0.42	0.42	0.02	0.02
Methylene Chloride	8.47%	8.468725	84.94	719.33	10.82%		1,792.74		0.90		0.04
Naphthalene	0.0003%	0.000251	128.20	0.03	0.0005%	0.08	0.08	4.01E-05	4.01E-05	2.01E-06	2.01E-06
Tetrahydrofuran	2.01%	2.011956	72.12	145.10	2.18%	361.63	361.63	0.18	0.18	9.04E-03	9.04E-03
Toluene	5.26%	5.262398	92.13	484.82	7.29%	1,208.29	1,208.29	0.60	0.60	0.03	0.03
Trichloroethane, 1,1,1-	0.52%	0.516293	133.42	68.88	1.04%	171.67	171.67	0.09	0.09	4.29E-03	4.29E-03
Trichloroethylene	0.18%	0.181167	131.40	23.81	0.36%	59.33	59.33	0.03	0.03	1.48E-03	1.48E-03
Xylene	1.53%	1.532609	106.17	162.72	2.45%	405.53	405.53	0.20	0.20	1.01E-02	1.01E-02
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Totals				**6,648.33**	**100.00%**	**10,417**	**6,920.88**	**5.21**	**3.46**	**0.26**	**0.17**

Worst Case HAP	**Methylene Chloride**	**0.90**	**TPY - Uncontrolled**
Worst Case HAP	**Methylene Chloride**	**0.04**	**TPY - After Control**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T10 and T11 - Blended Fuel

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

INPUT - CLIMATE DATA - Indianapolis, Indiana				
Tax (Daily Maximum Ambient Temperature)	62.00	°F	16.7 °C	521.67 °R
Tan (Daily Minimum Ambient Temperature)	42.20	°F	5.7 °C	501.87 °R
Daily Solar Isolation Factor (I)	1165	Btu/CF • day	K_N	0.2321
Tank Paint Solar Absorbance (α)	0.17	white	K_P	1.0

Source: AP-42, Chapter 7.1, Table 7.1-7, November 2006
N = The number of annual turnovers per year
K_N (Working Loss Turnover Factor) = (180 + N) / 6N for more than 36 turnovers per year, AP-42, Chapter 7.1, Eq. 1-29.
K_N (Working Loss Turnover Factor) = 1.0 for 36 or less turnovers per year, AP-42, Chapter 7.1, Eq. 1-29
K_p (Working Loss Product Factor) = 0.75 for crude oils and 1.0 for all other organic, AP-42, Chapter 7.1, Eq. 1-31

INPUT - TANK DATA			User Input	
Tank Diameter (D)	30.00	Ft		
Shell Height (Hs)	30.00	Ft	Constant Temperature Tank (Y/N)	N
Stock Liquid Height (Hl)	28.37	Ft	If so, what temperature (°R) ?	
Roof Height (H_R) - See Table to Right	15.00	Ft		
Tank Radius (R_S = D/2)	15.00	Ft	Atmospheric Pressure (psi)	14.7
Cone Roof Slope (S_R in ft/ft - 0.0625 default)	0.0625	Ft/Ft		
Roof Outage (H_{RO}) - See Table to Right	0.3125	Ft	Number of Turnovers (N) per Year	458.41
Vapor Space Outage ($H_{VO} = H_S - H_L + H_{RO}$)	1.9465	Ft	N = Q (gpy) / Max. Liquid Volume (gallons)	
Tank Vapor Space Volume ($V_V = (\pi/4)D^2 H_{VO}$)	1,375.90	FT^3		
Max. Liquid Volume = 7.481 $(\pi/4) D^2 H_L$	150,000.00	gallons	Roof Outage	
Breather Vent Pressure Setting (P_{BP})	0.030	psi	Cone Roof $H_{RO} = (1/3)(S_R)(R_S)$ =	0.3125
Breather Vent Vacuum Setting (P_{BV})	-0.030	psi	H_R = D/2 =	15.0000
Annual Throughput (Q)	68,760,847	gal/yr	Dome Roof $H_{RO} = 0.137 R_S$ =	2.0550
Annual Throughput (Q) (1 bbl = 42 gallons)	1,637,163	bbl/yr	$H_R = 0.268 R_S$ =	4.0200

Maximum Fuel Usage	68,760,847	gallon/yr
Recirculation	0	gallon/yr
Annual Throughput	**68,760,847**	gallon/yr

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T10 and T11 - Blended Fuel

(continued from previous page)

Temperature Calculations (AP-42, Chapter 7.1)

T_{AA} (Daily Average Ambient Temperature) AP-42, Chapter 7.1, Equation 1-27	= (TAX (°R) + TAN (°R)) / 2 =	511.77	°R
		11.16	°C
T_B (Liquid Bulk Temperature) AP-42, Chapter 7.1, Equation 1-28	= (TAA (R) + (6 x α) - 1) =	511.79	°R
		11.17	°C
T_{LA} (Daily Average Liquid Surface Temperature) AP-42, Chapter 7.1, Equation 1-26	= 0.44 TAA + 0.56 TB + 0.0079 α I =	513.35	°R
		12.03	°C

ΔT_A (Daily Ambient Temperature Range) AP-42, Chapter 7.1, Equation 1-12	= (TAX (°R) - TAN (°R)) =	19.80	°R
		-262.16	°C
ΔT_V (Daily Vapor Temperature Range) AP-42, Chapter 7.1, Equation 1-8	= 0.72 ΔTA + 0.028 α I =	19.80	°R
		-262.16	°C
T_{LX} (Maximum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA + 0.25 ΔTV =	518.30	°R
		14.78	°C
T_{LN} (Minimum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA - 0.25 ΔTV =	508.40	°R
		9.28	°C

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T10 and T11 - Blended Fuel

(continued from previous page)

Liquid Properties

Average Density of the Liquid - All Components					
Component	**Specific Gravity**	**Density (lb/gal)**	**Wt %**	**Product of Density x Weight %**	**Notes**
Acetone	0.7949	6.6277	3.8020%	0.2520	Wt % from site sampling, S.G. from wikipedia
Aliphatics	0.7075	5.8990	3.0840%	0.1819	
Alkyl Benzenes	0.9000	7.5040	14.6540%	1.0996	
Benzene	0.8760	7.3039	0.0170%	0.0012	
Butanol	0.8050	6.7119	1.0040%	0.0674	
Butyl Acetate	0.8825	7.3581	1.9370%	0.1425	
Cresol-m	1.0350	8.6296	1.5780%	0.1362	
Cyclohexanone	0.9478	7.9026	3.1560%	0.2494	
Ethyl Alcohol	0.7890	6.5785	1.1480%	0.0755	
Ethyl Benzene	0.8665	7.2247	1.4980%	0.1082	
Glycol Ethers	1.1132	9.2816	0.8610%	0.0799	
Hexane	0.6548	5.4596	1.3630%	0.0744	
Isopropyl Alcohol	0.7860	6.5535	6.2410%	0.4090	
Methyl Alcohol	0.7920	6.6035	1.6500%	0.1090	
Methyl Ethyl Ketone	0.8050	6.7119	1.6500%	0.1107	
Methyl Isobutyl Ketone	0.8020	6.6869	0.6600%	0.0441	
Methyl t-Butyl Ether	0.7404	6.1733	0.6460%	0.0399	
Methylene Chloride	1.3266	11.0609	0.7890%	0.0873	
Naphthalene	1.3289	11.0801	0.4300%	0.0476	
Tetrahydrofuran	0.8900	7.4206	0.4300%	0.0319	
Toluene	0.8709	7.2614	9.3230%	0.6770	
Trichloroethane, 1,1,1-	1.3200	11.0059	0.2870%	0.0316	
Trichloroethylene	1.4719	12.2724	0.2150%	0.0264	
Trimethylbenzene, 1,2,4	0.8761	7.3047	0.0810%	0.0059	
Water, Oil, Dirt (solids)	1.0000	8.3378	27.9440%	2.3299	
Xylene	0.8688	7.2439	15.5530%	1.1266	
Total Weight % =			100.00%	----------	----------
Avg. Liquid Density = (Sum Density x Wt %) / Total Wt% =				7.5453	----------
Tank Throughput (lb/yr) = Throughput (gallons/yr) x Density (lb/gallon) =					518,818,244.03

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T10 and T11 - Blended Fuel

(continued from previous page)

HAP and VOC with Antoine Coefficients							
Basis :	**100**	**lbs fluid**					
Component	**Mol. Weight**	**Weight %**	**Weight (lbs)**	**Moles**	**Mole %**	**HAP (YES/NO)**	**VOC (YES/NO)**
Acetone	58.08	3.80%	3.8020	0.0655	2.7547%	NO	NO
Aliphatics	73.14	3.08%	3.0840	0.0422	1.7744%	NO	YES
Alkyl Benzenes	134.22	14.65%	14.6540	0.1092	4.5944%	YES	YES
Benzene	78.11	0.02%	0.0170	0.0002	0.0092%	YES	YES
Butanol	74.12	1.00%	1.0040	0.0135	0.5700%	NO	YES
Butyl Acetate	116.16	1.94%	1.9370	0.0167	0.7017%	NO	YES
Cresol-m	108.10	1.58%	1.5780	0.0146	0.6143%	YES	YES
Cyclohexanone	98.20	3.16%	3.1560	0.0321	1.3524%	NO	YES
Ethyl Alcohol	46.07	1.15%	1.1480	0.0249	1.0486%	NO	YES
Ethyl Benzene	106.17	1.50%	1.4980	0.0141	0.5937%	YES	YES
Glycol Ethers	62.07	0.86%	0.8610	0.0139	0.5837%	YES	YES
Hexane	86.17	1.36%	1.3630	0.0158	0.6656%	YES	YES
Isopropyl Alcohol	60.09	6.24%	6.2410	0.1039	4.3706%	NO	YES
Methyl Alcohol	32.04	1.65%	1.6500	0.0515	2.1671%	YES	YES
Methyl Ethyl Ketone	72.10	1.65%	1.6500	0.0229	0.9630%	NO	YES
Methyl Isobutyl Ketone	100.20	0.66%	0.6600	0.0066	0.2772%	YES	YES
Methyl t-Butyl Ether	88.15	0.65%	0.6460	0.0073	0.3084%	YES	YES
Methylene Chloride	84.94	0.79%	0.7890	0.0093	0.3909%	YES	NO
Naphthalene	128.20	0.43%	0.4300	0.0034	0.1411%	YES	YES
Tetrahydrofuran	72.12	0.43%	0.4300	0.0060	0.2509%	YES	YES
Toluene	92.13	9.32%	9.3230	0.1012	4.2584%	YES	YES
Trichloroethane, 1,1,1-	133.42	0.29%	0.2870	0.0022	0.0905%	YES	YES
Trichloroethylene	131.40	0.22%	0.2150	0.0016	0.0689%	YES	YES
Trimethylbenzene, 1,2,4	120.19	0.08%	0.0810	0.0007	0.0284%	NO	YES
Water, Oil, Dirt (solids)	18.02	27.94%	27.9440	1.5507	65.2570%	NO	NO
Xylene	106.17	15.55%	15.5530	0.1465	6.1646%	YES	YES
Totals		100.00%	100.00	2.38	100.00%	---	---

HAP or VOC without Antoine Coefficients - Assume 100% Volatilization					
Component	**Tank Throughput (lb/yr)**	**Component Wt%**	**Total Emissions (lb/yr)**	**HAP (YES/NO)**	**VOC (YES/NO)**

(continued on next page)

Potential to Emit - One (1) 150,000 Gallon Storage Tank - T10 and T11 - Blended Fuel (continued from previous page)

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Antoine Coefficients for Vapor Pressure Estimation

Antoine Equation Data

Compound	A	B	C	Valid Range (Celsius)	Source
Acetone	7.3141	1,315.67	240.4790	-94.70 to 235.05	Yaws Handbook of Vapor Pressure, 2007
Aliphatics	6.5570	829.07	170.0770	-46.00 to 223.45	Yaws Handbook of Vapor Pressure, 2007
Alkyl Benzenes	7.1847	1,720.37	216.4130	-87.85 to 387.40	Yaws Handbook of Vapor Pressure, 2007
Benzene	6.8140	1,090.43	197.1460	-40.00 to 288.90	Yaws Handbook of Vapor Pressure, 2007
Butanol	7.2906	1,282.85	173.2470	-37.00 to 289.90	Yaws Handbook of Vapor Pressure, 2007
Butyl Acetate	7.2341	1,515.76	222.0770	-73.50 to 306.50	Yaws Handbook of Vapor Pressure, 2007
Cresol-m	6.8749	1,303.18	124.0000	20.80 to 432.70	Yaws Handbook of Vapor Pressure, 2007
Cyclohexanone	7.6065	1,884.55	243.0360	-31.15 to 356.00	Yaws Handbook of Vapor Pressure, 2007
Ethyl Alcohol	8.1348	1,662.48	238.1310	-114.10 to 243.10	Yaws Handbook of Vapor Pressure, 2007
Ethyl Benzene	7.1561	1,559.55	228.5820	-94.95 to 344.02	Yaws Handbook of Vapor Pressure, 2007
Glycol Ethers	9.6994	3,147.10	264.2460	-13.00 to 371.85	Yaws Handbook of Vapor Pressure, 2007
Hexane	6.9895	1,216.92	227.4510	-95.31 to 234.28	Yaws Handbook of Vapor Pressure, 2007
Isopropyl Alcohol	7.8306	1,483.30	217.4130	-87.87 to 235.16	Yaws Handbook of Vapor Pressure, 2007
Methyl Alcohol	8.0913	1,582.91	239.0960	-97.68 to 239.43	Yaws Handbook of Vapor Pressure, 2007
Methyl Ethyl Ketone	7.2010	1,325.15	227.0930	-85.00 to 262.35	Yaws Handbook of Vapor Pressure, 2007
Methyl Isobutyl Ketone	7.1597	1,421.73	216.2660	-84.00 to 298.25	Yaws Handbook of Vapor Pressure, 2007
Methyl t-Butyl Ether	7.0760	1,233.70	238.8790	-108.60 to 223.95	Yaws Handbook of Vapor Pressure, 2007
Methylene Chloride	7.1146	1,152.41	232.4420	-95.14 to 236.85	Yaws Handbook of Vapor Pressure, 2007
Naphthalene	6.8912	1,551.48	168.8790	3.2 to 475.25	Yaws Handbook of Vapor Pressure, 2007
Tetrahydrofuran	7.1054	1,256.68	232.6210	-108.50 to 267.00	Yaws Handbook of Vapor Pressure, 2007
Toluene	7.1362	1,457.29	231.8270	-94.97 to 318.64	Yaws Handbook of Vapor Pressure, 2007
Trichloroethane, 1,1,1-	7.0072	1,253.20	229.6240	-30.40 to 271.85	Yaws Handbook of Vapor Pressure, 2007
Trichloroethylene	6.8798	1,157.83	202.5800	-74.00 to 297.85	Yaws Handbook of Vapor Pressure, 2007
Trimethylbenzene, 1,2,4	7.2933	1,763.35	230.2480	-43.77 to 375.98	Yaws Handbook of Vapor Pressure, 2007
Water, Oil, Dirt (solids)	8.0557	1,723.64	233.0800	0.01 to 373.98	Yaws Handbook of Vapor Pressure, 2007
Xylene	7.2122	1,546.92	217.1440	-2.66 to 197.02	Yaws Handbook of Vapor Pressure, 2007

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Potential to Emit - One (1) 150,000 Gallon Storage Tank - T10 and T11 - Blended Fuel

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Vapor Pressure Calculations

Use Antoine Equation from AP-42, Chapter 7.1, Page 7.1-94:

Log P = A - [B / (T + C)] **Where: P = Vapor Pressure in mmHg**

T = Temperature in °C

T_{LN} (°C) = 9.28 T_{LA} (°C) = 12.03 T_{LX} (°C) = 14.78

Compound	mmHg			bar			psi		
	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	111.2674	126.9807	144.5011	0.1483	0.1693	0.1927	2.1516	2.4554	2.7942
Aliphatics	86.0030	100.9990	118.0440	0.1147	0.1347	0.1574	1.6630	1.9530	2.2826
Alkyl Benzenes	0.3648	0.4507	0.5539	4.86E-04	6.01E-04	7.38E-04	0.0071	0.0087	0.0107
Benzene	34.0101	39.9076	46.6338	4.53E-02	5.32E-02	6.22E-02	0.6576	0.7717	0.9017
Butanol	1.8296	2.3264	2.9373	2.44E-03	3.10E-03	3.92E-03	0.0354	0.0450	0.0568
Butyl Acetate	4.8139	5.7472	6.8332	0.0064	0.0077	0.0091	0.0931	0.1111	0.1321
Cresol-m	1.25E-03	1.97E-03	3.05E-03	1.67E-06	2.63E-06	4.07E-06	2.42E-05	3.81E-05	5.90E-05
Cyclohexanone	1.3726	1.6522	1.9809	0.0018	0.0022	0.0026	0.0265	0.0319	0.0383
Ethyl Alcohol	26.0205	30.8449	36.4287	0.0347	0.0411	0.0486	0.5032	0.5964	0.7044
Ethyl Benzene	3.9773	4.7263	5.5945	0.0053	0.0063	0.0075	0.0769	0.0914	0.1082
Glycol Ethers	0.0156	0.0203	0.0263	2.08E-05	2.71E-05	3.51E-05	3.02E-04	3.93E-04	5.09E-04
Hexane	70.6320	80.9153	92.4101	0.0942	0.1079	0.1232	1.3658	1.5646	1.7869
Isopropyl Alcohol	19.3790	23.2143	27.6899	0.0258	0.0309	0.0369	0.3747	0.4489	0.5354
Methyl Alcohol	52.2658	61.3771	71.8264	0.0697	0.0818	0.0958	1.0107	1.1868	1.3889
Methyl Ethyl Ketone	39.3413	45.6374	52.7629	0.0525	0.0608	0.0703	0.7607	0.8825	1.0203
Methyl Isobutyl Ketone	7.1814	8.5534	10.1453	0.0096	0.0114	0.0135	0.1389	0.1654	0.1962
Methyl t-Butyl Ether	127.2166	144.2219	163.0562	0.1696	0.1923	0.2174	2.4600	2.7888	3.1530
Methylene Chloride	222.3943	251.6240	283.9145	0.2965	0.3355	0.3785	4.3004	4.8656	5.4900
Naphthalene	0.0152	0.0207	0.0278	2.03E-05	2.75E-05	3.70E-05	2.95E-04	4.00E-04	5.37E-04
Tetrahydrofuran	81.3472	93.0545	106.1290	0.1085	0.1241	0.1415	1.5730	1.7994	2.0522
Toluene	12.3609	14.4614	16.8597	0.0165	0.0193	0.0225	0.2390	0.2796	0.3260
Trichloroethane, 1,1,1-	57.7534	66.2631	75.7920	0.0770	0.0883	0.1010	1.1168	1.2813	1.4656
Trichloroethylene	25.9860	30.5329	35.7294	0.0346	0.0407	0.0476	0.5025	0.5904	0.6909
Trimethylbenzene, 1,2,4	0.8541	1.0353	1.2496	0.0011	0.0014	0.0017	0.0165	0.0200	0.0242
Water, Oil, Dirt (solids)	8.7866	10.5587	12.6367	0.0117	0.0141	0.0168	0.1699	0.2042	0.2444
Xylene	2.4000	2.8986	3.4852	0.0032	0.0039	0.0046	0.0464	0.0561	0.0674
Total Pressures	997.59	1,148.03	1,317.25	1.3300	1.5306	1.7562	19.2902	22.1992	25.4715

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Raoult's Law Calculations for Vapor Partial Pressures

Raoult's Law $P_{partial\ of\ i} = X_i \times P_{vap\ of\ i}$

Where: $P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
$P_{vap\ of\ i}$ is the vapor pressure of pure i
X_i is the liquid mole fraction of i

$Y_i = P_{partial\ of\ i} / P_{total}$

Y_i is the vapor phase mole fraction of component i
$P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
P_{total} is the total pressure of all components in the vapor phase

Compound	X_i	$P_{vap\ of\ i}$ (psi)			$P_{partial\ of\ i}$ (psi)			Y_i		
		T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	2.75%	2.1516	2.4554	2.7942	0.0593	0.0676	0.0770	19.44%	18.89%	18.36%
Aliphatics	1.77%	1.6630	1.9530	2.2826	0.0295	0.0347	0.0405	9.681%	9.679%	9.661%
Alkyl Benzenes	4.59%	0.0071	0.0087	0.0107	0.0003	0.0004	0.0005	0.106%	0.112%	0.117%
Benzene	0.01%	0.6576	0.7717	0.9017	0.0001	0.0001	0.0001	0.020%	0.020%	0.020%
Butanol	0.57%	0.0354	0.0450	0.0568	0.0002	0.0003	0.0003	0.066%	0.072%	0.077%
Butyl Acetate	0.70%	0.0931	0.1111	0.1321	0.0007	0.0008	0.0009	0.214%	0.218%	0.221%
Cresol-m	0.61%	2.42E-05	3.81E-05	5.90E-05	1.49E-07	2.34E-07	3.63E-07	0.00005%	0.0001%	0.0001%
Cyclohexanone	1.35%	0.0265	0.0319	0.0383	0.0004	0.0004	0.0005	0.118%	0.121%	0.124%
Ethyl Alcohol	1.05%	0.5032	0.5964	0.7044	0.0053	0.0063	0.0074	1.731%	1.747%	1.762%
Ethyl Benzene	0.59%	0.0769	0.0914	0.1082	0.0005	0.0005	0.0006	0.150%	0.152%	0.153%
Glycol Ethers	0.58%	3.02E-04	3.93E-04	5.09E-04	1.76E-06	2.30E-06	2.97E-06	0.001%	0.001%	0.001%
Hexane	0.67%	1.3658	1.5646	1.7869	0.0091	0.0104	0.0119	2.98%	2.91%	2.84%
Isopropyl Alcohol	4.37%	0.3747	0.4489	0.5354	0.0164	0.0196	0.0234	5.37%	5.48%	5.58%
Methyl Alcohol	2.17%	1.0107	1.1868	1.3889	0.0219	0.0257	0.0301	7.19%	7.18%	7.18%
Methyl Ethyl Ketone	0.96%	0.7607	0.8825	1.0203	0.0073	0.0085	0.0098	2.40%	2.37%	2.34%
Methyl Isobutyl Ketone	0.28%	0.1389	0.1654	0.1962	0.0004	0.0005	0.0005	0.13%	0.13%	0.13%
Methyl t-Butyl Ether	0.31%	2.4600	2.7888	3.1530	0.0076	0.0086	0.0097	2.49%	2.40%	2.32%
Methylene Chloride	0.39%	4.3004	4.8656	5.4900	0.0168	0.0190	0.0215	5.51%	5.31%	5.12%
Naphthalene	0.14%	0.0003	0.0004	0.0005	4.16E-07	5.64E-07	7.58E-07	0.0001%	0.0002%	0.0002%
Tetrahydrofuran	0.25%	1.5730	1.7994	2.0522	0.0039	0.0045	0.0051	1.29%	1.26%	1.23%
Toluene	4.26%	0.2390	0.2796	0.3260	0.0102	0.0119	0.0139	3.34%	3.33%	3.31%
Trichloroethane, 1,1,1-	0.09%	1.1168	1.2813	1.4656	0.0010	0.0012	0.0013	0.33%	0.32%	0.32%
Trichloroethylene	0.07%	0.5025	0.5904	0.6909	0.0003	0.0004	0.0005	0.11%	0.11%	0.11%
Trimethylbenzene, 1,2,4	0.03%	0.0165	0.0200	0.0242	4.68E-06	5.68E-06	6.85E-06	0.002%	0.002%	0.002%
Water, Oil, Dirt (solids)	65.26%	0.1699	0.2042	0.2444	0.1109	0.1332	0.1595	36.37%	37.21%	38.03%
Xylene	6.16%	0.0464	0.0561	0.0674	0.0029	0.0035	0.0042	0.94%	0.97%	0.99%
Totals	100.00%	19.2902	22.1992	25.4715	0.3048	0.3581	0.4193	100.00%	100.00%	100.00%

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Potential to Emit - One (1) 150,000 Gallon Storage Tank - T10 and T11 - Blended Fuel (continued from previous page)

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Calculate Stock Density (lb/cubic foot)

M_V Calculation			
Compound	**MW**	**Y_i**	**MW x Y_i**
Acetone	58.08	18.89%	10.9719
Aliphatics	73.14	9.68%	7.0789
Alkyl Benzenes	134.22	0.11%	0.1501
Benzene	78.11	0.02%	0.0154
Butanol	74.12	0.07%	0.0531
Butyl Acetate	116.16	0.22%	0.2530
Cresol-m	108.10	0.00%	0.0001
Cyclohexanone	98.20	0.12%	0.1185
Ethyl Alcohol	46.07	1.75%	0.8047
Ethyl Benzene	106.17	0.15%	0.1609
Glycol Ethers	62.07	0.00%	0.0004
Hexane	86.17	2.91%	2.5065
Isopropyl Alcohol	60.09	5.48%	3.2926
Methyl Alcohol	32.04	7.18%	2.3016
Methyl Ethyl Ketone	72.10	2.37%	1.7113
Methyl Isobutyl Ketone	100.20	0.13%	0.1283
Methyl t-Butyl Ether	88.15	2.40%	2.1174
Methylene Chloride	84.94	5.31%	4.5119
Naphthalene	128.20	0.00%	0.0002
Tetrahydrofuran	72.12	1.26%	0.9094
Toluene	92.13	3.33%	3.0641
Trichloroethane, 1,1,1-	133.42	0.32%	0.4322
Trichloroethylene	131.40	0.11%	0.1492
Trimethylbenzene, 1,2,4	120.19	0.00%	0.0019
Water, Oil, Dirt (solids)	18.02	37.21%	6.7055
Xylene	106.17	0.97%	1.0246
M_V = Sum (MW_i x Y_i)			**48.4636**

Stock Density

$$W_V = (M_V \times P_{VA}) / (R \times T_{LA})$$

Where: W_V is the stock density in lb/cubic foot

M_V is the molecular weight of the vapor

P_{VA} is the total pressure of the mixture in psia

R ideal gas constant
(10.731 psia cubic foot / lb-mole °R)

T_{LA} is the daily average liquid temperature in °R

M_V = 48.46 (see below)

P_{VA} = 0.3581 psi

R = 10.731 psia cubic foot / lb-mole °R

T_{LA} = 513.35 °R

W_V = (48.46 x 0.3581) / (10.731 x 513.35)

W_V = 0.0031 lb/cubic foot

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Calculate Vapor Space Expansion Factor (K_E)

$K_E = (\Delta T_V / T_{LA}) + (\Delta P_V - \Delta P_B) / (P_A - P_{VA})$ AP-42, Chapter 7.1, Equation 1-7

Where:
K_E = Vapor Space Expansion Factor (Calculated Below)
ΔT_V = 19.80 (°R - Daily Vapor Temperature Range)
T_{LA} = 513.35 (°R - Average Daily Liquid Surface Temperature)
ΔP_V = Daily Vapor Pressure Range (Calcuated Below)
ΔP_B = Breather Vent Pressure Setting Range (Calcuated Below)
P_A = 14.7 (psia - Atmospheric Pressure)
P_{VA} = 0.3581 (psia - Total Mixture Pressure)

ΔP_V

$\Delta P_V = P_{LX} - P_{LN}$

Where: ΔP_V is the daily vapor pressure range
P_{LX} = 0.4193 psi
P_{LN} = 0.3048 psi

ΔP_V = 0.419253547358546 - 0.304812927869811 = 0.1144 psi

ΔP_B

$\Delta P_B = P_{BP} - P_{BV}$

Where: ΔP_B is the breather vent pressure setting range
P_{BP} = 0.03 psi
P_{BV} = -0.03 psi

ΔP_B = (0.03) - (-0.03) = 0.06 psi

K_E = 0.042366 (Unitless)
If KE is less than zero, it is assumed to be zero.

Calculate Vented Vapor Space Saturation Factor (K_S)

$K_S = 1 / (1 + 0.053 (P_{VA}) (H_{VO}))$ AP-42, Chapter 7.1, Equation 1-20

Where: Ks is the vented vapor space saturation factor
P_{VA} is the total mixture pressure P_{VA} = 0.3581 psi
H_{VO} is the vapor space outage H_{VO} = 1.9465 Ft

$K_S = 1 / (1 + 0.053 (0.3581) (1.9465)$ = 0.964378 (Unitless)

Loss Calculations (HAP and VOC Emissions)

Standing Storage Loss L_S (lb/yr) $= 365 (W_V)(V_V)(K_E)(K_S)$
Working Loss L_W (lb/yr) $= 0.0010 (M_V)(P_{VA})(Q)(K_N)(K_P)$
Total Loss L_T (lb/yr) $= L_S + L_W$

Where:
W_V = 0.00314975 Vapor Density in lb/cubic feet
V_V = 1,375.90 Vapor Space Volume in cubic feet
K_E = 0.04236608 Vapor Space Expansion Factor
K_S = 0.9643777 Vented Vapor Space Saturation Factor - See Above for Calculation
M_V = 48.46 Molecular Weight of the Vapor in lb/lb-mole
P_{VA} = 0.3581 Total Mixture Pressure in psi
Q = 1,637,163 bbl/yr
K_N = 0.2 working turnovers
K_P = 1.0 working loss product factor, unitless

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Standing Storage Loss		
L_S (lb/yr)	64.63	lb/yr
Working Loss		
L_W (lb/yr)	6,593.49	lb/yr
Total Loss		
L_T (lb/yr)	6,658.12	lb/yr

Individual Compound Emissions

Basis:	100	lb-moles of vapor for weight fraction calculation
Total Emissions:	6,658.12	lb/yr
Control Efficiency:	95%	

Compound Information						PTE Calculations					
Compound	**Yi**	**lb-moles**	**MW**	**Pounds**	**Weight %**	**PTE VOC (lb/yr)**	**PTE HAP (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**	**PTE VOC w/control (TPY)**	**PTE HAP w/control (TPY)**
Acetone	18.89%	18.89104	58.08	1,097.19	22.64%						
Aliphatics	9.68%	9.678532	73.14	707.89	14.61%	972.52		0.49		0.02	
Alkyl Benzenes	0.11%	0.111822	134.22	15.01	0.31%	20.62	20.62	0.01	0.01	5.2E-04	5.2E-04
Benzene	0.02%	0.019739	78.11	1.54	0.03%	2.12	2.12	1.1E-03	1.06E-03	5.3E-05	5.3E-05
Butanol	0.07%	0.071617	74.12	5.31	0.11%	7.29		3.6E-03		1.8E-04	
Butyl Acetate	0.22%	0.2178	116.16	25.30	0.52%	34.76		0.02		8.7E-04	
Cresol-m	0.0001%	6.54E-05	108.10	0.01	0.0001%	0.01	0.01	4.86E-06	4.86E-06	2.43E-07	2.4E-07
Cyclohexanone	0.12%	0.120674	98.20	11.85	0.24%	16.28		0.01		4.1E-04	
Ethyl Alcohol	1.75%	1.746785	46.07	80.47	1.66%	110.56		0.06		2.8E-03	
Ethyl Benzene	0.15%	0.151553	106.17	16.09	0.33%	22.11	22.11	0.01	0.01	5.5E-04	5.5E-04
Glycol Ethers	0.001%	0.000641	62.07	0.04	0.001%	0.05	0.05	2.73E-05	2.73E-05	1.37E-06	1.37E-06
Hexane	2.91%	2.908728	86.17	250.65	5.17%	344.35	344.35	0.17	0.17	8.61E-03	8.6E-03
Isopropyl Alcohol	5.48%	5.479489	60.09	329.26	6.79%	452.35		0.23		1.13E-02	
Methyl Alcohol	7.18%	7.183415	32.04	230.16	4.75%	316.20	316.20	0.16	0.16	7.90E-03	7.9E-03
Methyl Ethyl Ketone	2.37%	2.373575	72.10	171.13	3.53%	235.11		0.12		5.88E-03	
Methyl Isobutyl Ketone	0.13%	0.128041	100.20	12.83	0.26%	17.63	17.63	0.01	0.01	4.41E-04	4.41E-04
Methyl t-Butyl Ether	2.40%	2.402007	88.15	211.74	4.37%	290.89	290.89	0.15	0.15	7.27E-03	7.27E-03
Methylene Chloride	5.31%	5.311898	84.94	451.19	9.31%		619.87		0.31		1.55E-02
Naphthalene	0.0002%	0.000157	128.20	0.02	0.0004%	0.03	0.03	1.39E-05	1.39E-05	6.93E-07	6.93E-07
Tetrahydrofuran	1.26%	1.260907	72.12	90.94	1.88%	124.93	124.93	0.06	0.06	3.12E-03	3.12E-03
Toluene	3.33%	3.325807	92.13	306.41	6.32%	420.95	420.95	0.21	0.21	1.05E-02	1.05E-02
Trichloroethane, 1,1,1-	0.32%	0.323941	133.42	43.22	0.89%	59.38	59.38	0.03	0.03	1.48E-03	1.48E-03
Trichloroethylene	0.11%	0.113539	131.40	14.92	0.31%	20.50	20.50	0.01	0.01	5.12E-04	5.12E-04
Trimethylbenzene, 1,2,4	0.002%	0.001586	120.19	0.19	0.004%	0.26		1.31E-04		6.55E-06	
Water, Oil, Dirt (solids)	37.21%	37.21161	18.02	670.55	13.84%						
Xylene	0.97%	0.965026	106.17	102.46	2.11%	140.76	140.76	0.07	0.07	3.52E-03	3.52E-03
	---	---	---	---	---						
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	---	---	---	---	---						
	---	---	---	---	---						
Totals				**4,846.36**	**100.00%**	**3,609.66**	**2,400.38**	**1.80**	**1.20**	**0.09**	**0.06**

Worst Case HAP	**Methylene Chloride**	**0.31**	**TPY - Uncontrolled**
Worst Case HAP	**Methylene Chloride**	**0.02**	**TPY - After Control**

Appendix A to the Technical Support Document (TSD)
PTE and Emission Factor Calculation - Tank T10 and T11

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Throughput for Calculation 68,760,847 gallons/yr
68,761 kgallon/yr

Control Efficiency 95%

						Uncontrolled			After Control		
Pollutant	HAP	VOC	PTE with Cutter (TPY)	PTE with Blended Fuel (TPY)	Worst Case (TPY)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/kgal)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/kgal)
Acetone	NO	NO	---	---	---	not regulated			not regulated		
Aliphatics	NO	YES	1.4065	0.4863	1.4065		1.406	0.041		0.070	0.002
Alkyl Benzenes	YES	YES	0.0298	0.0103	0.0298	0.0298	0.030	8.66E-04	1.49E-03	1.49E-03	4.33E-05
Benzene	YES	YES		0.0011	0.0011	0.0011	1.06E-03	3.08E-05	5.30E-05	5.30E-05	1.54E-06
Butanol	NO	YES	0.0105	0.0036	0.0105		0.011	3.07E-04		5.27E-04	1.53E-05
Butyl Acetate	NO	YES	0.0503	0.0174	0.0503		0.050	1.46E-03		0.003	7.31E-05
Cresol-m	YES	YES	1.40E-05	4.86E-06	1.40E-05	1.40E-05	1.40E-05	4.09E-07	7.02E-07	7.02E-07	2.04E-08
Cyclohexanone	NO	YES	0.0235	0.0081	0.0235		0.024	6.85E-04		1.18E-03	3.42E-05
Ethyl Alcohol	NO	YES	0.1598	0.0553	0.1598		0.160	0.005		0.008	2.32E-04
Ethyl Benzene	YES	YES	0.0306	0.0111	0.0306	0.0306	0.031	8.90E-04	1.53E-03	0.002	4.45E-05
Glycol Ethers	YES	YES	7.90E-05	2.73E-05	7.90E-05	7.90E-05	7.90E-05	2.30E-06	3.95E-06	3.95E-06	1.15E-07
Hexane	YES	YES	0.4979	0.1722	0.4979	0.4979	0.498	0.014	0.02	0.025	7.24E-04
Isopropyl Alcohol	NO	YES	0.6541	0.2262	0.6541		0.654	0.019		0.033	9.51E-04
Methyl Alcohol	YES	YES	0.4572	0.1581	0.4572	0.4572	0.457	0.013	0.02	0.023	6.65E-04
Methyl Ethyl Ketone	NO	YES	0.3399	0.1176	0.3399		0.340	0.010		0.017	4.94E-04
Methyl Isobutyl Ketone	YES	YES	0.0249	0.0088	0.0249	0.0249	0.025	7.25E-04	1.25E-03	1.25E-03	3.63E-05
Methyl t-Butyl Ether	YES	YES	0.4204	0.1454	0.4204	0.4204	0.420	0.012	2.10E-02	0.021	6.11E-04
Methylene Chloride	YES	NO	0.8964		0.8964	0.8964		0.026	0.04		1.30E-03
Naphthalene	YES	YES	4.01E-05	1.39E-05	4.01E-05	4.01E-05	4.01E-05	1.17E-06	2.01E-06	2.01E-06	5.84E-08
Tetrahydrofuran	YES	YES	0.1808	0.0625	0.1808	0.1808	0.181	0.005	9.04E-03	0.009	2.63E-04
Toluene	YES	YES	0.6041	0.2105	0.6041	0.6041	0.604	0.018	0.03	0.030	8.79E-04
Trichloroethane, 1,1,1-	YES	YES	0.0858	0.0297	0.0858	0.0858	0.086	0.002	4.29E-03	0.004	1.25E-04
Trichloroethylene	YES	YES	0.0297	0.0102	0.0297	0.0297	0.030	8.63E-04	1.48E-03	1.48E-03	4.31E-05
Trimethylbenzene, 1,2,4	NO	YES		1.31E-04	1.31E-04		1.31E-04	3.81E-06		6.55E-06	1.90E-07
Water, Oil, Dirt (solids)	NO	NO	---	---	---	not regulated			not regulated		
Xylene	YES	YES	0.2028	0.0704	0.2028	0.2028	0.203	0.0059	0.0101	0.0101	2.95E-04
						3.46	**5.21**	**0.18**	**0.17**	**0.26**	

	Uncontrolled PTE				PTE after Control			
VOC	**5.210**	**TPY**	**0.152**	**lb/kgal**	**0.260**	**TPY**	**0.01**	**lb/kgal**
Single HAP - Methylene Chloride	**0.896**	**TPY**	**0.026**	**lb/kgal**	**0.045**	**TPY**	**0.001**	**lb/kgal**
Combined HAP	**3.461**	**TPY**	**0.101**	**lb/kgal**	**0.173**	**TPY**	**0.005**	**lb/kgal**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Cutter

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

INPUT - CLIMATE DATA - Indianapolis, Indiana				
Tax (Daily Maximum Ambient Temperature)	62.00	°F	16.7 °C	521.67 °R
Tan (Daily Minimum Ambient Temperature)	42.20	°F	5.7 °C	501.87 °R
Daily Solar Isolation Factor (I)	1165	Btu/CF • day	K_N	0.1710
Tank Paint Solar Absorbance (α)	0.17	white	K_P	1.0

Source: AP-42, Chapter 7.1, Table 7.1-7, November 2006
N = The number of annual turnovers per year
K_N (Working Loss Turnover Factor) = (180 + N) / 6N for more than 36 turnovers per year, AP-42, Chapter 7.1, Eq. 1-29.
K_N (Working Loss Turnover Factor) = 1.0 for 36 or less turnovers per year, AP-42, Chapter 7.1, Eq. 1-29
K_p (Working Loss Product Factor) = 0.75 for crude oils and 1.0 for all other organic, AP-42, Chapter 7.1, Eq. 1-31
Tax and Tan were estimated by IDEM, OAQ. See Sheet 4 for calculation.

INPUT - TANK DATA			User Input	
Tank Diameter (D)	12.00	Ft		
Shell Height (Hs)	30.00	Ft	Constant Temperature Tank (Y/N)	N
Stock Liquid Height (Hl)	29.55	Ft	If so, what temperature (°R) ?	
Roof Height (H_R) - See Table to Right	6.00	Ft		
Tank Radius (R_S = D/2)	6.00	Ft	Atmospheric Pressure (psi)	14.7
Cone Roof Slope (S_R in ft/ft - 0.0625 default)	0.0625	Ft/Ft		
Roof Outage (H_{RO}) - See Table to Right	0.1250	Ft	Number of Turnovers (N) per Year	6955.23
Vapor Space Outage ($H_{VO} = H_S - H_L + H_{RO}$)	0.5771	Ft	N = Q (gpy) / Max. Liquid Volume (gallons)	
Tank Vapor Space Volume ($V_V = (\pi/4)D^2 H_{VO}$)	65.27	FT^3		
Max. Liquid Volume = 7.481 $(\pi/4) D^2 H_L$	25,000.00	gallons	Roof Outage	
Breather Vent Pressure Setting (P_{BP})	0.030	psi	Cone Roof $H_{RO} = (1/3)(S_R)(R_S)$ =	0.1250
Breather Vent Vacuum Setting (P_{BV})	-0.030	psi	H_R = D/2 =	6.0000
Annual Throughput (Q)	173,880,847	gal/yr	Dome Roof $H_{RO} = 0.137 R_S$ =	0.8220
Annual Throughput (Q) (1 bbl = 42 gallons)	4,140,020	bbl/yr	$H_R = 0.268 R_S$ =	1.6080

Maximum Fuel Usage	68,760,847	gallon/yr
Recirculation	105,120,000	gallon/yr
Annual Throughput	**173,880,847**	gallon/yr

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Cutter

(continued from previous page)

Temperature Calculations (AP-42, Chapter 7.1)

T_{AA} (Daily Average Ambient Temperature) AP-42, Chapter 7.1, Equation 1-27	= (TAX (°R) + TAN (°R)) / 2 =	511.77	°R
		11.16	°C
T_B (Liquid Bulk Temperature) AP-42, Chapter 7.1, Equation 1-28	= (TAA (R) + (6 x α) - 1) =	511.79	°R
		11.17	°C
T_{LA} (Daily Average Liquid Surface Temperature) AP-42, Chapter 7.1, Equation 1-26	= 0.44 TAA + 0.56 TB + 0.0079 α I =	513.35	°R
		12.03	°C

ΔT_A (Daily Ambient Temperature Range) AP-42, Chapter 7.1, Equation 1-12	= (TAX (°R) - TAN (°R)) =	19.80	°R
		-262.16	°C
ΔT_V (Daily Vapor Temperature Range) AP-42, Chapter 7.1, Equation 1-8	= 0.72 ΔTA + 0.028 α I =	19.80	°R
		-262.16	°C
T_{LX} (Maximum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA + 0.25 ΔTV =	518.30	°R
		14.78	°C
T_{LN} (Minimum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA - 0.25 ΔTV =	508.40	°R
		9.28	°C

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Cutter

(continued from previous page)

Liquid Properties

Average Density of the Liquid - All Components					
Component	**Specific Gravity**	**Density (lb/gal)**	**Wt %**	**Product of Density x Weight %**	**Notes**
Acetone	0.7949	6.6277	5.3000%	0.3513	Wt % from site sampling, S.G. from wikipedia
Aliphatics (Diethylamine Similar)	0.7075	5.8990	4.3000%	0.2537	
Alkyl Benzenes (Butyl Benzene Similar)	0.9000	7.5040	20.4000%	1.5308	
Butanol	0.8050	6.7119	1.4000%	0.0940	
Butyl Acetate	0.8825	7.3581	2.7000%	0.1987	
Cresol-m	1.0350	8.6296	2.2000%	0.1899	
Cyclohexanone	0.9478	7.9026	4.4000%	0.3477	
Ethyl Alcohol	0.7890	6.5785	1.6000%	0.1053	
Ethyl Benzene	0.8665	7.2247	2.0000%	0.1445	
Glycol Ethers (Ethylene Glycol Similar)	1.1132	9.2816	1.2000%	0.1114	
Hexane	0.6548	5.4596	1.9000%	0.1037	
Isopropyl Alcohol	0.7860	6.5535	8.7000%	0.5702	
Methyl Alcohol	0.7920	6.6035	2.3000%	0.1519	
Methyl Ethyl Ketone	0.8050	6.7119	2.3000%	0.1544	
Methyl Isobutyl Ketone	0.8020	6.6869	0.9000%	0.0602	
Methyl t-Butyl Ether	0.7404	6.1733	0.9000%	0.0556	
Methylene Chloride	1.3266	11.0609	1.1000%	0.1217	
Naphthalene	1.3289	11.0801	0.6000%	0.0665	
Tetrahydrofuran	0.8900	7.4206	0.6000%	0.0445	
Toluene	0.8709	7.2614	12.9000%	0.9367	
Trichloroethane, 1,1,1-	1.3200	11.0059	0.4000%	0.0440	
Trichloroethylene	1.4719	12.2724	0.3000%	0.0368	
Xylene	0.8688	7.2439	21.6000%	1.5647	
Total Weight % =			100.00%	----------	----------
Avg. Liquid Density = (Sum Density x Wt %) / Total Wt% =				7.2379	----------
Tank Throughput (lb/yr) = Throughput (gallons/yr) x Density (lb/gallon) =					1,258,527,313.84

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Cutter

(continued from previous page)

HAP and VOC with Antoine Coefficients							
Basis :	**100**	**lbs fluid**					
Component	**Mol. Weight**	**Weight %**	**Weight (lbs)**	**Moles**	**Mole %**	**HAP (YES/NO)**	**VOC (YES/NO)**
Acetone	58.08	5.30%	5.3000	0.0913	7.9584%	NO	NO
Aliphatics (Diethylamine Similar)	73.14	4.30%	4.3000	0.0588	5.1273%	NO	YES
Alkyl Benzenes (Butyl Benzene Similar)	134.22	20.40%	20.4000	0.1520	13.2553%	YES	YES
Butanol	74.12	1.40%	1.4000	0.0189	1.6473%	NO	YES
Butyl Acetate	116.16	2.70%	2.7000	0.0232	2.0271%	NO	YES
Cresol-m	108.10	2.20%	2.2000	0.0204	1.7749%	YES	YES
Cyclohexanone	98.20	4.40%	4.4000	0.0448	3.9077%	NO	YES
Ethyl Alcohol	46.07	1.60%	1.6000	0.0347	3.0288%	NO	YES
Ethyl Benzene	106.17	2.00%	2.0000	0.0188	1.6429%	YES	YES
Glycol Ethers (Ethylene Glycol Similar)	62.07	1.20%	1.2000	0.0193	1.6861%	YES	YES
Hexane	86.17	1.90%	1.9000	0.0220	1.9230%	YES	YES
Isopropyl Alcohol	60.09	8.70%	8.7000	0.1448	12.6268%	NO	YES
Methyl Alcohol	32.04	2.30%	2.3000	0.0718	6.2605%	YES	YES
Methyl Ethyl Ketone	72.10	2.30%	2.3000	0.0319	2.7821%	NO	YES
Methyl Isobutyl Ketone	100.20	0.90%	0.9000	0.0090	0.7833%	YES	YES
Methyl t-Butyl Ether	88.15	0.90%	0.9000	0.0102	0.8904%	YES	YES
Methylene Chloride	84.94	1.10%	1.1000	0.0130	1.1294%	YES	NO
Naphthalene	128.20	0.60%	0.6000	0.0047	0.4082%	YES	YES
Tetrahydrofuran	72.12	0.60%	0.6000	0.0083	0.7256%	YES	YES
Toluene	92.13	12.90%	12.9000	0.1400	12.2114%	YES	YES
Trichloroethane, 1,1,1-	133.42	0.40%	0.4000	0.0030	0.2615%	YES	YES
Trichloroethylene	131.40	0.30%	0.3000	0.0023	0.1991%	YES	YES
Xylene	106.17	21.60%	21.6000	0.2034	17.7430%	YES	YES
Totals		100.00%	100.00	1.15	100.00%	---	---

HAP or VOC without Antoine Coefficients - Assume 100% Volatilization					
Component	**Tank Throughput (lb/yr)**	**Component Wt%**	**Total Emissions (lb/yr)**	**HAP (YES/NO)**	**VOC (YES/NO)**

(continued on next page)

Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Cutter (continued from previous page)

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Antoine Coefficients for Vapor Pressure Estimation

Antoine Equation Data

Compound	A	B	C	Valid Range (Celsius)	Source
Acetone	7.3141	1,315.67	240.4790	-94.70 to 235.05	Yaws Handbook of Vapor Pressure, 2007
Aliphatics (Diethylamine Similar)	6.5570	829.07	170.0770	-46.00 to 223.45	Yaws Handbook of Vapor Pressure, 2007
Alkyl Benzenes (Butyl Benzene Similar)	7.1847	1,720.37	216.4130	-87.85 to 387.40	Yaws Handbook of Vapor Pressure, 2007
Butanol	7.2906	1,282.85	173.2470	-37.00 to 289.90	Yaws Handbook of Vapor Pressure, 2007
Butyl Acetate	7.2341	1,515.76	222.0770	-73.50 to 306.50	Yaws Handbook of Vapor Pressure, 2007
Cresol-m	6.8749	1,303.18	124.0000	20.80 to 432.70	Yaws Handbook of Vapor Pressure, 2007
Cyclohexanone	7.6065	1,884.55	243.0360	-31.15 to 356.00	Yaws Handbook of Vapor Pressure, 2007
Ethyl Alcohol	8.1348	1,662.48	238.1310	-114.10 to 243.10	Yaws Handbook of Vapor Pressure, 2007
Ethyl Benzene	7.1561	1,559.55	228.5820	-94.95 to 344.02	Yaws Handbook of Vapor Pressure, 2007
Glycol Ethers (Ethylene Glycol Similar)	9.6994	3,147.10	264.2460	-13.00 to 371.85	Yaws Handbook of Vapor Pressure, 2007
Hexane	6.9895	1,216.92	227.4510	-95.31 to 234.28	Yaws Handbook of Vapor Pressure, 2007
Isopropyl Alcohol	7.8306	1,483.30	217.4130	-87.87 to 235.16	Yaws Handbook of Vapor Pressure, 2007
Methyl Alcohol	8.0913	1,582.91	239.0960	-97.68 to 239.43	Yaws Handbook of Vapor Pressure, 2007
Methyl Ethyl Ketone	7.2010	1,325.15	227.0930	-85.00 to 262.35	Yaws Handbook of Vapor Pressure, 2007
Methyl Isobutyl Ketone	7.1597	1,421.73	216.2660	-84.00 to 298.25	Yaws Handbook of Vapor Pressure, 2007
Methyl t-Butyl Ether	7.0760	1,233.70	238.8790	-108.60 to 223.95	Yaws Handbook of Vapor Pressure, 2007
Methylene Chloride	7.1146	1,152.41	232.4420	-95.14 to 236.85	Yaws Handbook of Vapor Pressure, 2007
Naphthalene	6.8912	1,551.48	168.8790	3.2 to 475.25	Yaws Handbook of Vapor Pressure, 2007
Tetrahydrofuran	7.1054	1,256.68	232.6210	-108.50 to 267.00	Yaws Handbook of Vapor Pressure, 2007
Toluene	7.1362	1,457.29	231.8270	-94.97 to 318.64	Yaws Handbook of Vapor Pressure, 2007
Trichloroethane, 1,1,1-	7.0072	1,253.20	229.6240	-30.40 to 271.85	Yaws Handbook of Vapor Pressure, 2007
Trichloroethylene	6.8798	1,157.83	202.5800	-74.00 to 297.85	Yaws Handbook of Vapor Pressure, 2007
Xylene	7.2122	1,546.92	217.1440	-2.66 to 197.02	Yaws Handbook of Vapor Pressure, 2007

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Cutter

(continued from previous page)

Vapor Pressure Calculations

Use Antoine Equation from AP-42, Chapter 7.1, Page 7.1-94:

Log P = A - [B / (T + C)] **Where: P = Vapor Pressure in mmHg**

T = Temperature in °C

T_{LN} (°C) = 9.28 T_{LA} (°C) = 12.03 T_{LX} (°C) = 14.78

Compound	mmHg			bar			psi		
	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	111.2674	126.9807	144.5011	0.1483	0.1693	0.1927	2.1516	2.4554	2.7942
Aliphatics (Diethylamine Similar)	86.0030	100.9990	118.0440	0.1147	0.1347	0.1574	1.6630	1.9530	2.2826
Alkyl Benzenes (Butyl Benzene Similar)	0.3648	0.4507	0.5539	0.0005	0.0006	0.0007	0.0071	0.0087	0.0107
Butanol	1.8296	2.3264	2.9373	0.0024	0.0031	0.0039	0.0354	0.0450	0.0568
Butyl Acetate	4.8139	5.7472	6.8332	0.0064	0.0077	0.0091	0.0931	0.1111	0.1321
Cresol-m	0.0013	0.0020	0.0031	1.67E-06	2.63E-06	4.07E-06	2.42E-05	3.81E-05	0.0001
Cyclohexanone	1.3726	1.6522	1.9809	0.0018	0.0022	0.0026	0.0265	0.0319	0.0383
Ethyl Alcohol	26.0205	30.8449	36.4287	0.0347	0.0411	0.0486	0.5032	0.5964	0.7044
Ethyl Benzene	3.9773	4.7263	5.5945	0.0053	0.0063	0.0075	0.0769	0.0914	0.1082
Glycol Ethers (Ethylene Glycol Similar)	0.0156	0.0203	0.0263	2.08E-05	2.71E-05	3.51E-05	3.02E-04	3.93E-04	5.09E-04
Hexane	70.6320	80.9153	92.4101	0.0942	0.1079	0.1232	1.3658	1.5646	1.7869
Isopropyl Alcohol	19.3790	23.2143	27.6899	0.0258	0.0309	0.0369	0.3747	0.4489	0.5354
Methyl Alcohol	52.2658	61.3771	71.8264	0.0697	0.0818	0.0958	1.0107	1.1868	1.3889
Methyl Ethyl Ketone	39.3413	45.6374	52.7629	0.0525	0.0608	0.0703	0.7607	0.8825	1.0203
Methyl Isobutyl Ketone	7.1814	8.5534	10.1453	0.0096	0.0114	0.0135	0.1389	0.1654	0.1962
Methyl t-Butyl Ether	127.2166	144.2219	163.0562	0.1696	0.1923	0.2174	2.4600	2.7888	3.1530
Methylene Chloride	222.3943	251.6240	283.9145	0.2965	0.3355	0.3785	4.3004	4.8656	5.4900
Naphthalene	0.0152	0.0207	0.0278	2.03E-05	2.75E-05	3.70E-05	2.95E-04	4.00E-04	5.37E-04
Tetrahydrofuran	81.3472	93.0545	106.1290	0.1085	0.1241	0.1415	1.5730	1.7994	2.0522
Toluene	12.3609	14.4614	16.8597	0.0165	0.0193	0.0225	0.2390	0.2796	0.3260
Trichloroethane, 1,1,1-	57.7534	66.2631	75.7920	0.0770	0.0883	0.1010	1.1168	1.2813	1.4656
Trichloroethylene	25.9860	30.5329	35.7294	0.0346	0.0407	0.0476	0.5025	0.5904	0.6909
Xylene	2.4000	2.8986	3.4852	0.0032	0.0039	0.0046	0.0464	0.0561	0.0674
Total Pressures	953.94	1096.5243	1256.73	1.2718	1.4619	1.6755	18.4462	21.2033	24.3012

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Cutter

(continued from previous page)

Raoult's Law Calculations for Vapor Partial Pressures

Raoult's Law $P_{partial\ of\ i} = X_i \times P_{vap\ of\ i}$

Where: $P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
$P_{vap\ of\ i}$ is the vapor pressure of pure i
X_i is the liquid mole fraction of i

$Y_i = P_{partial\ of\ i} / P_{total}$

Y_i is the vapor phase mole fraction of component i
$P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
P_{total} is the total pressure of all components in the vapor phase

Compound	X_i	$P_{vap\ of\ i}$ (psi)			$P_{partial\ of\ i}$ (psi)			Y_i		
		T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	7.96%	2.1516	2.4554	2.7942	0.1712	0.1954	0.2224	30.59%	30.11%	29.66%
Aliphatics (Diethylamine Similar)	5.13%	1.6630	1.9530	2.2826	0.0853	0.1001	0.1170	15.232%	15.432%	15.608%
Alkyl Benzenes (Butyl Benzene Similar)	13.26%	0.0071	0.0087	0.0107	0.0009	0.0012	0.0014	0.167%	0.178%	0.189%
Butanol	1.65%	0.0354	0.0450	0.0568	0.0006	0.0007	0.0009	0.104%	0.114%	0.125%
Butyl Acetate	2.03%	0.0931	0.1111	0.1321	0.0019	0.0023	0.0027	0.337%	0.347%	0.357%
Cresol-m	1.77%	2.42E-05	3.81E-05	5.90E-05	4.29E-07	6.77E-07	1.05E-06	0.0001%	0.0001%	0.0001%
Cyclohexanone	3.91%	0.0265	0.0319	0.0383	0.0010	0.0012	0.0015	0.185%	0.192%	0.200%
Ethyl Alcohol	3.03%	0.5032	0.5964	0.7044	0.0152	0.0181	0.0213	2.722%	2.784%	2.845%
Ethyl Benzene	1.64%	0.0769	0.0914	0.1082	0.0013	0.0015	0.0018	0.226%	0.231%	0.237%
Glycol Ethers (Ethylene Glycol Similar)	1.69%	3.02E-04	3.93E-04	5.09E-04	5.09E-06	6.63E-06	8.59E-06	0.001%	0.001%	0.001%
Hexane	1.92%	1.3658	1.5646	1.7869	0.0263	0.0301	0.0344	4.69%	4.64%	4.58%
Isopropyl Alcohol	12.63%	0.3747	0.4489	0.5354	0.0473	0.0567	0.0676	8.45%	8.73%	9.02%
Methyl Alcohol	6.26%	1.0107	1.1868	1.3889	0.0633	0.0743	0.0870	11.30%	11.45%	11.60%
Methyl Ethyl Ketone	2.78%	0.7607	0.8825	1.0203	0.0212	0.0246	0.0284	3.78%	3.78%	3.79%
Methyl Isobutyl Ketone	0.78%	0.1389	0.1654	0.1962	0.0011	0.0013	0.0015	0.19%	0.20%	0.20%
Methyl t-Butyl Ether	0.89%	2.4600	2.7888	3.1530	0.0219	0.0248	0.0281	3.91%	3.83%	3.74%
Methylene Chloride	1.13%	4.3004	4.8656	5.4900	0.0486	0.0550	0.0620	8.68%	8.47%	8.27%
Naphthalene	0.41%	2.95E-04	4.00E-04	5.37E-04	1.20E-06	1.63E-06	2.19E-06	0.0002%	0.0003%	0.0003%
Tetrahydrofuran	0.73%	1.5730	1.7994	2.0522	0.0114	0.0131	0.0149	2.04%	2.01%	1.99%
Toluene	12.21%	0.2390	0.2796	0.3260	0.0292	0.0341	0.0398	5.21%	5.26%	5.31%
Trichloroethane, 1,1,1-	0.26%	1.1168	1.2813	1.4656	0.0029	0.0034	0.0038	0.52%	0.52%	0.51%
Trichloroethylene	0.20%	0.5025	0.5904	0.6909	0.0010	0.0012	0.0014	0.18%	0.18%	0.18%
Xylene	17.74%	0.0464	0.0561	0.0674	0.0082	0.0099	0.0120	1.47%	1.53%	1.59%
Totals	100.00%	18.4462	21.2033	24.3012	0.5598	0.6489	0.7499	100.00%	100.00%	100.00%

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Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Cutter (continued from previous page)

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Calculate Stock Density (lb/cubic foot)

M_V Calculation			
Compound	**MW**	**Y_i**	**MW x Y_i**
Acetone	58.08	30.11%	17.4904
Aliphatics (Diethylamine Similar)	73.14	15.43%	11.2868
Alkyl Benzenes (Butyl Benzene Similar)	134.22	0.18%	0.2389
Butanol	74.12	0.11%	0.0846
Butyl Acetate	116.16	0.35%	0.4033
Cresol-m	108.10	0.0001%	0.0001
Cyclohexanone	98.20	0.19%	0.1889
Ethyl Alcohol	46.07	2.78%	1.2826
Ethyl Benzene	106.17	0.23%	0.2457
Glycol Ethers (Ethylene Glycol Similar)	62.07	0.001%	0.0006
Hexane	86.17	4.64%	3.9955
Isopropyl Alcohol	60.09	8.73%	5.2488
Methyl Alcohol	32.04	11.45%	3.6688
Methyl Ethyl Ketone	72.10	3.78%	2.7279
Methyl Isobutyl Ketone	100.20	0.20%	0.2001
Methyl t-Butyl Ether	88.15	3.83%	3.3733
Methylene Chloride	84.94	8.47%	7.1933
Naphthalene	128.20	0.0003%	0.0003
Tetrahydrofuran	72.12	2.01%	1.4510
Toluene	92.13	5.26%	4.8482
Trichloroethane, 1,1,1-	133.42	0.52%	0.6888
Trichloroethylene	131.40	0.18%	0.2381
Xylene	106.17	1.53%	1.6272
M_V = Sum (MW_i x Y_i)			**66.4833**

Stock Density

$$W_V = (M_V \times P_{VA}) / (R \times T_{LA})$$

Where: W_V is the stock density in lb/cubic foot

M_V is the molecular weight of the vapor

P_{VA} is the total pressure of the mixture in psia

R ideal gas constant
(10.731 psia cubic foot / lb-mole °R)

T_{LA} is the daily average liquid temperature in °R

M_V = 66.48 (see below)

P_{VA} = 0.6489 psi

R = 10.731 psia cubic foot / lb-mole °R

T_{LA} = 513.35 °R

$$W_V = (66.48 \times 0.6489) / (10.731 \times 513.35)$$

W_V = 0.0078 lb/cubic foot

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Cutter

(continued from previous page)

Calculate Vapor Space Expansion Factor (K_E)

$K_E = (\Delta T_V / T_{LA}) + (\Delta P_V - \Delta P_B) / (P_A - P_{VA})$ AP-42, Chapter 7.1, Equation 1-7

Where:
K_E = Vapor Space Expansion Factor
ΔT_V = 19.80 (°R - Daily Vapor Temperature Range)
T_{LA} = 513.35 (°R - Average Daily Liquid Surface Temperature)
ΔP_V = Daily Vapor Pressure Range (Calcuated Below)
ΔP_B = Breather Vent Pressure Setting Range (Calcuated Below)
P_A = 14.7 (psia - Atmospheric Pressure)
P_{VA} = 0.6489 (psia - Total Mixture Pressure)

ΔP_V

$\Delta P_V = P_{LX} - P_{LN}$

Where: ΔP_V is the daily vapor pressure range
P_{LX} = 0.7499 psi
P_{LN} = 0.5598 psi

ΔP_V = 0.7499 - 0.5598 = 0.1901 psi

ΔP_B

$\Delta P_B = P_{BP} - P_{BV}$

Where: ΔP_B is the breather vent pressure setting range
P_{BP} = 0.03 psi
P_{BV} = -0.03 psi

ΔP_B = (0.03) - (-0.03) = 0.06 psi

K_E = 0.047827 (Unitless)
If KE is less than zero, it is assumed to be zero.

Calculate Vented Vapor Space Saturation Factor (K_S)

$K_S = 1 / (1 + 0.053 (P_{VA}) (H_{VO}))$ AP-42, Chapter 7.1, Equation 1-20

Where: Ks is the vented vapor space saturation factor
P_{VA} is the total mixture pressure P_{VA} = 0.6489 psi
H_{VO} is the vapor space outage H_{VO} = 0.5771 Ft

K_S = 1 / (1 + 0.053 (0.6489) (0.5771) = 0.98054 (Unitless)

Loss Calculations (HAP and VOC Emissions)

Standing Storage Loss L_S (lb/yr) = $365 (W_V)(V_V)(K_E)(K_S)$
Working Loss L_W (lb/yr) = $0.0010 (M_V)(P_{VA})(Q)(K_N)(K_P)$
Total Loss L_T (lb/yr) = $L_S + L_W$

Where:
W_V = 0.00783093 Vapor Density in lb/cubic feet
V_V = 65.27 Vapor Space Volume in cubic feet
K_E = 0.04782713 Vapor Space Expansion Factor
K_S = 0.98053981 Vented Vapor Space Saturation Factor
M_V = 66.48 Molecular Weight of the Vapor in lb/lb-mole
P_{VA} = 0.6489 Total Mixture Pressure in psi
Q = 4,140,020 bbl/yr
K_N = 0.2 working turnovers
K_P = 1.0 working loss product factor, unitless

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Cutter

(continued from previous page)

Standing Storage Loss		
L_S (lb/yr)	8.75	lb/yr
Working Loss		
L_W (lb/yr)	30,536.17	lb/yr
Total Loss		
L_T (lb/yr)	30,544.92	lb/yr

Individual Compound Emissions

Basis:	100	lb-moles of vapor for weight fraction calculation
Total Emissions:	30,544.92	lb/yr
Control Efficiency:	95%	

Compound Information						PTE Calculations					
Compound	**Yi**	**lb-moles**	**MW**	**Pounds**	**Weight %**	**PTE VOC (lb/yr)**	**PTE HAP (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**	**PTE VOC w/control (TPY)**	**PTE HAP w/control (TPY)**
Acetone	30.11%	30.11427	58.08	1,749.04	26.31%						
Aliphatics (Diethylamine Similar)	15.43%	15.43179	73.14	1,128.68	16.98%	5,185.58		2.59		0.13	
Alkyl Benzenes (Butyl Benzene Similar)	0.18%	0.178015	134.22	23.89	0.36%	109.77	109.77	0.05	0.05	2.74E-03	2.74E-03
Butanol	0.11%	0.114199	74.12	8.46	0.13%	38.89		0.02		9.72E-04	
Butyl Acetate	0.35%	0.347173	116.16	40.33	0.61%	185.28		0.09		4.63E-03	
Cresol-m	0.0001%	0.000104	108.10	0.011	0.0002%	5.18E-02	5.18E-02	2.59E-05	2.59E-05	1.29E-06	1.29E-06
Cyclohexanone	0.19%	0.19239	98.20	18.89	0.28%	86.80		0.04		2.17E-03	
Ethyl Alcohol	2.78%	2.784007	46.07	128.26	1.93%	589.27		0.29		1.47E-02	
Ethyl Benzene	0.23%	0.231386	106.17	24.57	0.37%	112.87	112.87	0.06	0.06	2.82E-03	2.82E-03
Glycol Ethers (Ethylene Glycol Similar)	0.001%	0.001022	62.07	0.06	0.001%	0.29	0.29	1.46E-04	1.46E-04	7.28E-06	7.28E-06
Hexane	4.64%	4.636748	86.17	399.55	6.01%	1,835.67	1,835.67	0.92	0.92	0.05	0.05
Isopropyl Alcohol	8.73%	8.734897	60.09	524.88	7.89%	2,411.49		1.21		0.06	
Methyl Alcohol	11.45%	11.45058	32.04	366.88	5.52%	1,685.57	1,685.57	0.84	0.84	0.04	0.04
Methyl Ethyl Ketone	3.78%	3.783549	72.10	272.79	4.10%	1,253.32		0.63		0.03	
Methyl Isobutyl Ketone	0.20%	0.199664	100.20	20.01	0.30%	91.92	91.92	0.05	0.05	2.30E-03	2.30E-03
Methyl t-Butyl Ether	3.83%	3.82681	88.15	337.33	5.07%	1,549.83	1,549.83	0.77	0.77	0.04	0.04
Methylene Chloride	8.47%	8.468725	84.94	719.33	10.82%		3,304.89		1.65		0.08
Naphthalene	0.0003%	0.000251	128.20	0.03	0.0005%	0.15	0.15	7.40E-05	7.40E-05	3.70E-06	3.70E-06
Tetrahydrofuran	2.01%	2.011956	72.12	145.10	2.18%	666.65	666.65	0.33	0.33	0.02	0.02
Toluene	5.26%	5.262398	92.13	484.82	7.29%	2227.47	2,227.47	1.11	1.11	0.06	0.06
Trichloroethane, 1,1,1-	0.52%	0.516293	133.42	68.88	1.04%	316.48	316.48	0.16	0.16	7.91E-03	7.91E-03
Trichloroethylene	0.18%	0.181167	131.40	23.81	0.36%	109.37	109.37	0.05	0.05	2.73E-03	2.73E-03
Xylene	1.53%	1.532609	106.17	162.72	2.45%	747.58	747.58	0.37	0.37	0.02	0.02
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Totals				**6,648.33**	**100.00%**	**19,204**	**12,758.56**	**9.60**	**6.38**	**0.48**	**0.32**

Worst Case HAP	**Methylene Chloride**	**1.65**	**TPY - Uncontrolled**
Worst Case HAP	**Methylene Chloride**	**0.08**	**TPY - After Control**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Blended Fuel

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

INPUT - CLIMATE DATA - Indianapolis, Indiana				
Tax (Daily Maximum Ambient Temperature)	62.00	°F	16.7 °C	521.67 °R
Tan (Daily Minimum Ambient Temperature)	42.20	°F	5.7 °C	501.87 °R
Daily Solar Isolation Factor (I)	1165	Btu/CF • day	K_N	0.1710
Tank Paint Solar Absorbance (α)	0.17	white	K_P	1.0

Source: AP-42, Chapter 7.1, Table 7.1-7, November 2006
N = The number of annual turnovers per year
K_N (Working Loss Turnover Factor) = (180 + N) / 6N for more than 36 turnovers per year, AP-42, Chapter 7.1, Eq. 1-29.
K_N (Working Loss Turnover Factor) = 1.0 for 36 or less turnovers per year, AP-42, Chapter 7.1, Eq. 1-29
K_p (Working Loss Product Factor) = 0.75 for crude oils and 1.0 for all other organic, AP-42, Chapter 7.1, Eq. 1-31

INPUT - TANK DATA			User Input	
Tank Diameter (D)	12.00	Ft		
Shell Height (Hs)	30.00	Ft	Constant Temperature Tank (Y/N)	N
Stock Liquid Height (Hl)	29.55	Ft	If so, what temperature (°R) ?	
Roof Height (H_R) - See Table to Right	6.00	Ft		
Tank Radius (R_S = D/2)	6.00	Ft	Atmospheric Pressure (psi)	14.7
Cone Roof Slope (S_R in ft/ft - 0.0625 default)	0.0625	Ft/Ft		
Roof Outage (H_{RO}) - See Table to Right	0.1250	Ft	Number of Turnovers (N) per Year	6955.23
Vapor Space Outage ($H_{VO} = H_S - H_L + H_{RO}$)	0.5771	Ft	N = Q (gpy) / Max. Liquid Volume (gallons)	
Tank Vapor Space Volume ($V_V = (\pi/4)D^2 H_{VO}$)	65.27	FT^3		
Max. Liquid Volume = 7.481 $(\pi/4) D^2 H_L$	25,000.00	gallons	Roof Outage	
Breather Vent Pressure Setting (P_{BP})	0.030	psi	Cone Roof $H_{RO} = (1/3)(S_R)(R_S)$ =	0.1250
Breather Vent Vacuum Setting (P_{BV})	-0.030	psi	H_R = D/2 =	6.0000
Annual Throughput (Q)	173,880,847	gal/yr	Dome Roof $H_{RO} = 0.137 R_S$ =	0.8220
Annual Throughput (Q) (1 bbl = 42 gallons)	4,140,020	bbl/yr	$H_R = 0.268 R_S$ =	1.6080

Maximum Fuel Usage	68,760,847	gallon/yr
Recirculation	105,120,000	gallon/yr
Annual Throughput	**173,880,847**	gallon/yr

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Blended Fuel

(continued from previous page)

Temperature Calculations (AP-42, Chapter 7.1)

T_{AA} (Daily Average Ambient Temperature) AP-42, Chapter 7.1, Equation 1-27	= (TAX (°R) + TAN (°R)) / 2 =	511.77	°R
		11.16	°C
T_B (Liquid Bulk Temperature) AP-42, Chapter 7.1, Equation 1-28	= (TAA (R) + (6 x α) - 1) =	511.79	°R
		11.17	°C
T_{LA} (Daily Average Liquid Surface Temperature) AP-42, Chapter 7.1, Equation 1-26	= 0.44 TAA + 0.56 TB + 0.0079 α I =	513.35	°R
		12.03	°C

ΔT_A (Daily Ambient Temperature Range) AP-42, Chapter 7.1, Equation 1-12	= (TAX (°R) - TAN (°R)) =	19.80	°R
		-262.16	°C
ΔT_V (Daily Vapor Temperature Range) AP-42, Chapter 7.1, Equation 1-8	= 0.72 ΔTA + 0.028 α I =	19.80	°R
		-262.16	°C
T_{LX} (Maximum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA + 0.25 ΔTV =	518.30	°R
		14.78	°C
T_{LN} (Minimum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA - 0.25 ΔTV =	508.40	°R
		9.28	°C

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Blended Fuel

(continued from previous page)

Liquid Properties

Average Density of the Liquid - All Components					
Component	**Specific Gravity**	**Density (lb/gal)**	**Wt %**	**Product of Density x Weight %**	**Notes**
Acetone	0.7949	6.6277	3.8020%	0.2520	Wt % from site sampling, S.G. from wikipedia
Aliphatics	0.7075	5.8990	3.0840%	0.1819	
Alkyl Benzenes	0.9000	7.5040	14.6540%	1.0996	
Benzene	0.8760	7.3039	0.0170%	0.0012	
Butanol	0.8050	6.7119	1.0040%	0.0674	
Butyl Acetate	0.8825	7.3581	1.9370%	0.1425	
Cresol-m	1.0350	8.6296	1.5780%	0.1362	
Cyclohexanone	0.9478	7.9026	3.1560%	0.2494	
Ethyl Alcohol	0.7890	6.5785	1.1480%	0.0755	
Ethyl Benzene	0.8665	7.2247	1.4980%	0.1082	
Glycol Ethers	1.1132	9.2816	0.8610%	0.0799	
Hexane	0.6548	5.4596	1.3630%	0.0744	
Isopropyl Alcohol	0.7860	6.5535	6.2410%	0.4090	
Methyl Alcohol	0.7920	6.6035	1.6500%	0.1090	
Methyl Ethyl Ketone	0.8050	6.7119	1.6500%	0.1107	
Methyl Isobutyl Ketone	0.8020	6.6869	0.6600%	0.0441	
Methyl t-Butyl Ether	0.7404	6.1733	0.6460%	0.0399	
Methylene Chloride	1.3266	11.0609	0.7890%	0.0873	
Naphthalene	1.3289	11.0801	0.4300%	0.0476	
Tetrahydrofuran	0.8900	7.4206	0.4300%	0.0319	
Toluene	0.8709	7.2614	9.3230%	0.6770	
Trichloroethane, 1,1,1-	1.3200	11.0059	0.2870%	0.0316	
Trichloroethylene	1.4719	12.2724	0.2150%	0.0264	
Trimethylbenzene, 1,2,4	0.8761	7.3047	0.0810%	0.0059	
Water, Oil, Dirt (solids)	1.0000	8.3378	27.9440%	2.3299	
Xylene	0.8688	7.2439	15.5530%	1.1266	
Total Weight % =			100.00%	----------	----------
Avg. Liquid Density = (Sum Density x Wt %) / Total Wt% =				7.5453	----------
Tank Throughput (lb/yr) = Throughput (gallons/yr) x Density (lb/gallon) =					1,311,975,632.16

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Blended Fuel

(continued from previous page)

HAP and VOC with Antoine Coefficients							
Basis :	**100**	**lbs fluid**					
Component	**Mol. Weight**	**Weight %**	**Weight (lbs)**	**Moles**	**Mole %**	**HAP (YES/NO)**	**VOC (YES/NO)**
Acetone	58.08	3.80%	3.8020	0.0655	2.7547%	NO	NO
Aliphatics	73.14	3.08%	3.0840	0.0422	1.7744%	NO	YES
Alkyl Benzenes	134.22	14.65%	14.6540	0.1092	4.5944%	YES	YES
Benzene	78.11	0.02%	0.0170	0.0002	0.0092%	YES	YES
Butanol	74.12	1.00%	1.0040	0.0135	0.5700%	NO	YES
Butyl Acetate	116.16	1.94%	1.9370	0.0167	0.7017%	NO	YES
Cresol-m	108.10	1.58%	1.5780	0.0146	0.6143%	YES	YES
Cyclohexanone	98.20	3.16%	3.1560	0.0321	1.3524%	NO	YES
Ethyl Alcohol	46.07	1.15%	1.1480	0.0249	1.0486%	NO	YES
Ethyl Benzene	106.17	1.50%	1.4980	0.0141	0.5937%	YES	YES
Glycol Ethers	62.07	0.86%	0.8610	0.0139	0.5837%	YES	YES
Hexane	86.17	1.36%	1.3630	0.0158	0.6656%	YES	YES
Isopropyl Alcohol	60.09	6.24%	6.2410	0.1039	4.3706%	NO	YES
Methyl Alcohol	32.04	1.65%	1.6500	0.0515	2.1671%	YES	YES
Methyl Ethyl Ketone	72.10	1.65%	1.6500	0.0229	0.9630%	NO	YES
Methyl Isobutyl Ketone	100.20	0.66%	0.6600	0.0066	0.2772%	YES	YES
Methyl t-Butyl Ether	88.15	0.65%	0.6460	0.0073	0.3084%	YES	YES
Methylene Chloride	84.94	0.79%	0.7890	0.0093	0.3909%	YES	NO
Naphthalene	128.20	0.43%	0.4300	0.0034	0.1411%	YES	YES
Tetrahydrofuran	72.12	0.43%	0.4300	0.0060	0.2509%	YES	YES
Toluene	92.13	9.32%	9.3230	0.1012	4.2584%	YES	YES
Trichloroethane, 1,1,1-	133.42	0.29%	0.2870	0.0022	0.0905%	YES	YES
Trichloroethylene	131.40	0.22%	0.2150	0.0016	0.0689%	YES	YES
Trimethylbenzene, 1,2,4	120.19	0.08%	0.0810	0.0007	0.0284%	NO	YES
Water, Oil, Dirt (solids)	18.02	27.94%	27.9440	1.5507	65.2570%	NO	NO
Xylene	106.17	15.55%	15.5530	0.1465	6.1646%	YES	YES
Totals		100.00%	100.00	2.38	100.00%	---	---

HAP or VOC without Antoine Coefficients - Assume 100% Volatilization					
Component	**Tank Throughput (lb/yr)**	**Component Wt%**	**Total Emissions (lb/yr)**	**HAP (YES/NO)**	**VOC (YES/NO)**

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Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Blended Fuel (continued from previous page)

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Antoine Coefficients for Vapor Pressure Estimation

Antoine Equation Data

Compound	A	B	C	Valid Range (Celsius)	Source
Acetone	7.3141	1,315.67	240.4790	-94.70 to 235.05	Yaws Handbook of Vapor Pressure, 2007
Aliphatics	6.5570	829.07	170.0770	-46.00 to 223.45	Yaws Handbook of Vapor Pressure, 2007
Alkyl Benzenes	7.1847	1,720.37	216.4130	-87.85 to 387.40	Yaws Handbook of Vapor Pressure, 2007
Benzene	6.8140	1,090.43	197.1460	-40.00 to 288.90	Yaws Handbook of Vapor Pressure, 2007
Butanol	7.2906	1,282.85	173.2470	-37.00 to 289.90	Yaws Handbook of Vapor Pressure, 2007
Butyl Acetate	7.2341	1,515.76	222.0770	-73.50 to 306.50	Yaws Handbook of Vapor Pressure, 2007
Cresol-m	6.8749	1,303.18	124.0000	20.80 to 432.70	Yaws Handbook of Vapor Pressure, 2007
Cyclohexanone	7.6065	1,884.55	243.0360	-31.15 to 356.00	Yaws Handbook of Vapor Pressure, 2007
Ethyl Alcohol	8.1348	1,662.48	238.1310	-114.10 to 243.10	Yaws Handbook of Vapor Pressure, 2007
Ethyl Benzene	7.1561	1,559.55	228.5820	-94.95 to 344.02	Yaws Handbook of Vapor Pressure, 2007
Glycol Ethers	9.6994	3,147.10	264.2460	-13.00 to 371.85	Yaws Handbook of Vapor Pressure, 2007
Hexane	6.9895	1,216.92	227.4510	-95.31 to 234.28	Yaws Handbook of Vapor Pressure, 2007
Isopropyl Alcohol	7.8306	1,483.30	217.4130	-87.87 to 235.16	Yaws Handbook of Vapor Pressure, 2007
Methyl Alcohol	8.0913	1,582.91	239.0960	-97.68 to 239.43	Yaws Handbook of Vapor Pressure, 2007
Methyl Ethyl Ketone	7.2010	1,325.15	227.0930	-85.00 to 262.35	Yaws Handbook of Vapor Pressure, 2007
Methyl Isobutyl Ketone	7.1597	1,421.73	216.2660	-84.00 to 298.25	Yaws Handbook of Vapor Pressure, 2007
Methyl t-Butyl Ether	7.0760	1,233.70	238.8790	-108.60 to 223.95	Yaws Handbook of Vapor Pressure, 2007
Methylene Chloride	7.1146	1,152.41	232.4420	-95.14 to 236.85	Yaws Handbook of Vapor Pressure, 2007
Naphthalene	6.8912	1,551.48	168.8790	3.2 to 475.25	Yaws Handbook of Vapor Pressure, 2007
Tetrahydrofuran	7.1054	1,256.68	232.6210	-108.50 to 267.00	Yaws Handbook of Vapor Pressure, 2007
Toluene	7.1362	1,457.29	231.8270	-94.97 to 318.64	Yaws Handbook of Vapor Pressure, 2007
Trichloroethane, 1,1,1-	7.0072	1,253.20	229.6240	-30.40 to 271.85	Yaws Handbook of Vapor Pressure, 2007
Trichloroethylene	6.8798	1,157.83	202.5800	-74.00 to 297.85	Yaws Handbook of Vapor Pressure, 2007
Trimethylbenzene, 1,2,4	7.2933	1,763.35	230.2480	-43.77 to 375.98	Yaws Handbook of Vapor Pressure, 2007
Water, Oil, Dirt (solids)	8.0557	1,723.64	233.0800	0.01 to 373.98	Yaws Handbook of Vapor Pressure, 2007
Xylene	7.2122	1,546.92	217.1440	-2.66 to 197.02	Yaws Handbook of Vapor Pressure, 2007

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Blended Fuel

(continued from previous page)

Vapor Pressure Calculations

Use Antoine Equation from AP-42, Chapter 7.1, Page 7.1-94:

Log P = A - [B / (T + C)] **Where: P = Vapor Pressure in mmHg**

T = Temperature in °C

T_{LN} (°C) = 9.28 T_{LA} (°C) = 12.03 T_{LX} (°C) = 14.78

Compound	mmHg			bar			psi		
	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	111.2674	126.9807	144.5011	0.1483	0.1693	0.1927	2.1516	2.4554	2.7942
Aliphatics	86.0030	100.9990	118.0440	0.1147	0.1347	0.1574	1.6630	1.9530	2.2826
Alkyl Benzenes	0.3648	0.4507	0.5539	4.86E-04	6.01E-04	7.38E-04	0.0071	0.0087	0.0107
Benzene	34.0101	39.9076	46.6338	4.53E-02	5.32E-02	6.22E-02	0.6576	0.7717	0.9017
Butanol	1.8296	2.3264	2.9373	2.44E-03	3.10E-03	3.92E-03	0.0354	0.0450	0.0568
Butyl Acetate	4.8139	5.7472	6.8332	0.0064	0.0077	0.0091	0.0931	0.1111	0.1321
Cresol-m	1.25E-03	1.97E-03	3.05E-03	1.67E-06	2.63E-06	4.07E-06	2.42E-05	3.81E-05	5.90E-05
Cyclohexanone	1.3726	1.6522	1.9809	0.0018	0.0022	0.0026	0.0265	0.0319	0.0383
Ethyl Alcohol	26.0205	30.8449	36.4287	0.0347	0.0411	0.0486	0.5032	0.5964	0.7044
Ethyl Benzene	3.9773	4.7263	5.5945	0.0053	0.0063	0.0075	0.0769	0.0914	0.1082
Glycol Ethers	0.0156	0.0203	0.0263	2.08E-05	2.71E-05	3.51E-05	3.02E-04	3.93E-04	5.09E-04
Hexane	70.6320	80.9153	92.4101	0.0942	0.1079	0.1232	1.3658	1.5646	1.7869
Isopropyl Alcohol	19.3790	23.2143	27.6899	0.0258	0.0309	0.0369	0.3747	0.4489	0.5354
Methyl Alcohol	52.2658	61.3771	71.8264	0.0697	0.0818	0.0958	1.0107	1.1868	1.3889
Methyl Ethyl Ketone	39.3413	45.6374	52.7629	0.0525	0.0608	0.0703	0.7607	0.8825	1.0203
Methyl Isobutyl Ketone	7.1814	8.5534	10.1453	0.0096	0.0114	0.0135	0.1389	0.1654	0.1962
Methyl t-Butyl Ether	127.2166	144.2219	163.0562	0.1696	0.1923	0.2174	2.4600	2.7888	3.1530
Methylene Chloride	222.3943	251.6240	283.9145	0.2965	0.3355	0.3785	4.3004	4.8656	5.4900
Naphthalene	0.0152	0.0207	0.0278	2.03E-05	2.75E-05	3.70E-05	2.95E-04	4.00E-04	5.37E-04
Tetrahydrofuran	81.3472	93.0545	106.1290	0.1085	0.1241	0.1415	1.5730	1.7994	2.0522
Toluene	12.3609	14.4614	16.8597	0.0165	0.0193	0.0225	0.2390	0.2796	0.3260
Trichloroethane, 1,1,1-	57.7534	66.2631	75.7920	0.0770	0.0883	0.1010	1.1168	1.2813	1.4656
Trichloroethylene	25.9860	30.5329	35.7294	0.0346	0.0407	0.0476	0.5025	0.5904	0.6909
Trimethylbenzene, 1,2,4	0.8541	1.0353	1.2496	0.0011	0.0014	0.0017	0.0165	0.0200	0.0242
Water, Oil, Dirt (solids)	8.7866	10.5587	12.6367	0.0117	0.0141	0.0168	0.1699	0.2042	0.2444
Xylene	2.4000	2.8986	3.4852	0.0032	0.0039	0.0046	0.0464	0.0561	0.0674
Total Pressures	997.59	1148.0260	1317.25	1.3300	1.5306	1.7562	19.2902	22.1992	25.4715

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Raoult's Law Calculations for Vapor Partial Pressures

Raoult's Law $P_{partial\ of\ i} = X_i \times P_{vap\ of\ i}$

Where: $P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
$P_{vap\ of\ i}$ is the vapor pressure of pure i
X_i is the liquid mole fraction of i

$Y_i = P_{partial\ of\ i} / P_{total}$

Y_i is the vapor phase mole fraction of component i
$P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
P_{total} is the total pressure of all components in the vapor phase

Compound	X_i	$P_{vap\ of\ i}$ (psi)			$P_{partial\ of\ i}$ (psi)			Y_i		
		T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	2.75%	2.1516	2.4554	2.7942	0.0593	0.0676	0.0770	19.44%	18.89%	18.36%
Aliphatics	1.77%	1.6630	1.9530	2.2826	0.0295	0.0347	0.0405	9.681%	9.679%	9.661%
Alkyl Benzenes	4.59%	0.0071	0.0087	0.0107	3.24E-04	4.00E-04	4.92E-04	0.106%	0.112%	0.117%
Benzene	0.01%	0.6576	0.7717	0.9017	6.02E-05	7.07E-05	8.26E-05	0.020%	0.020%	0.020%
Butanol	0.57%	0.0354	0.0450	0.0568	2.02E-04	2.56E-04	3.24E-04	0.066%	0.072%	0.077%
Butyl Acetate	0.70%	0.0931	0.1111	0.1321	6.53E-04	7.80E-04	9.27E-04	0.214%	0.218%	0.221%
Cresol-m	0.61%	2.42E-05	3.81E-05	5.90E-05	1.49E-07	2.34E-07	3.63E-07	0.00005%	0.0001%	0.0001%
Cyclohexanone	1.35%	0.0265	0.0319	0.0383	0.0004	0.0004	0.0005	0.118%	0.121%	0.124%
Ethyl Alcohol	1.05%	0.5032	0.5964	0.7044	0.0053	0.0063	0.0074	1.731%	1.747%	1.762%
Ethyl Benzene	0.59%	0.0769	0.0914	0.1082	0.0005	0.0005	0.0006	0.150%	0.152%	0.153%
Glycol Ethers	0.58%	3.02E-04	3.93E-04	5.09E-04	1.76E-06	2.30E-06	2.97E-06	0.001%	0.001%	0.001%
Hexane	0.67%	1.3658	1.5646	1.7869	0.0091	0.0104	0.0119	2.98%	2.91%	2.84%
Isopropyl Alcohol	4.37%	0.3747	0.4489	0.5354	0.0164	0.0196	0.0234	5.37%	5.48%	5.58%
Methyl Alcohol	2.17%	1.0107	1.1868	1.3889	0.0219	0.0257	0.0301	7.19%	7.18%	7.18%
Methyl Ethyl Ketone	0.96%	0.7607	0.8825	1.0203	0.0073	0.0085	0.0098	2.40%	2.37%	2.34%
Methyl Isobutyl Ketone	0.28%	0.1389	0.1654	0.1962	0.0004	0.0005	0.0005	0.13%	0.13%	0.13%
Methyl t-Butyl Ether	0.31%	2.4600	2.7888	3.1530	0.0076	0.0086	0.0097	2.49%	2.40%	2.32%
Methylene Chloride	0.39%	4.3004	4.8656	5.4900	0.0168	0.0190	0.0215	5.51%	5.31%	5.12%
Naphthalene	0.14%	0.0003	0.0004	0.0005	4.16E-07	5.64E-07	7.58E-07	0.0001%	0.0002%	0.0002%
Tetrahydrofuran	0.25%	1.5730	1.7994	2.0522	0.0039	0.0045	0.0051	1.29%	1.26%	1.23%
Toluene	4.26%	0.2390	0.2796	0.3260	0.0102	0.0119	0.0139	3.34%	3.33%	3.31%
Trichloroethane, 1,1,1-	0.09%	1.1168	1.2813	1.4656	0.0010	0.0012	0.0013	0.33%	0.32%	0.32%
Trichloroethylene	0.07%	0.5025	0.5904	0.6909	0.0003	0.0004	0.0005	0.11%	0.11%	0.11%
Trimethylbenzene, 1,2,4	0.03%	0.0165	0.0200	0.0242	4.68E-06	5.68E-06	6.85E-06	0.002%	0.002%	0.002%
Water, Oil, Dirt (solids)	65.26%	0.1699	0.2042	0.2444	0.1109	0.1332	0.1595	36.37%	37.21%	38.03%
Xylene	6.16%	0.0464	0.0561	0.0674	0.0029	0.0035	0.0042	0.94%	0.97%	0.99%
Totals	100.00%	19.2902	22.1992	25.4715	0.3048	0.3581	0.4193	100.00%	100.00%	100.00%

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Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Blended Fuel (continued from previous page)

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Calculate Stock Density (lb/cubic foot)

M_V Calculation			
Compound	**MW**	**Y_i**	**MW x Y_i**
Acetone	58.08	18.89%	10.9719
Aliphatics	73.14	9.68%	7.0789
Alkyl Benzenes	134.22	0.11%	0.1501
Benzene	78.11	0.02%	0.0154
Butanol	74.12	0.07%	0.0531
Butyl Acetate	116.16	0.22%	0.2530
Cresol-m	108.10	0.0001%	0.0001
Cyclohexanone	98.20	0.12%	0.1185
Ethyl Alcohol	46.07	1.75%	0.8047
Ethyl Benzene	106.17	0.15%	0.1609
Glycol Ethers	62.07	0.001%	0.0004
Hexane	86.17	2.91%	2.5065
Isopropyl Alcohol	60.09	5.48%	3.2926
Methyl Alcohol	32.04	7.18%	2.3016
Methyl Ethyl Ketone	72.10	2.37%	1.7113
Methyl Isobutyl Ketone	100.20	0.13%	0.1283
Methyl t-Butyl Ether	88.15	2.40%	2.1174
Methylene Chloride	84.94	5.31%	4.5119
Naphthalene	128.20	0.0002%	0.0002
Tetrahydrofuran	72.12	1.26%	0.9094
Toluene	92.13	3.33%	3.0641
Trichloroethane, 1,1,1-	133.42	0.32%	0.4322
Trichloroethylene	131.40	0.11%	0.1492
Trimethylbenzene, 1,2,4	120.19	0.002%	0.0019
Water, Oil, Dirt (solids)	18.02	37.21%	6.7055
Xylene	106.17	0.97%	1.0246
M_V = Sum (MW_i x Y_i)			**48.4636**

Stock Density

$$W_V = (M_V \times P_{VA}) / (R \times T_{LA})$$

Where: W_V is the stock density in lb/cubic foot

M_V is the molecular weight of the vapor

P_{VA} is the total pressure of the mixture in psia

R ideal gas constant
(10.731 psia cubic foot / lb-mole °R)

T_{LA} is the daily average liquid temperature in °R

M_V = 48.46 (see below)

P_{VA} = 0.3581 psi

R = 10.731 psia cubic foot / lb-mole °R

T_{LA} = 513.35 °R

W_V = (48.46 x 0.3581) / (10.731 x 513.35)

W_V = 0.0031 lb/cubic foot

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Calculate Vapor Space Expansion Factor (K_E)

$K_E = (\Delta T_V / T_{LA}) + (\Delta P_V - \Delta P_B) / (P_A - P_{VA})$ AP-42, Chapter 7.1, Equation 1-7

Where:
K_E = Vapor Space Expansion Factor (Calculated Below)
ΔT_V = 19.80 (°R - Daily Vapor Temperature Range)
T_{LA} = 513.35 (°R - Average Daily Liquid Surface Temperature)
ΔP_V = Daily Vapor Pressure Range (Calcuated Below)
ΔP_B = Breather Vent Pressure Setting Range (Calcuated Below)
P_A = 14.7 (psia - Atmospheric Pressure)
P_{VA} = 0.3581 (psia - Total Mixture Pressure)

ΔP_V

$\Delta P_V = P_{LX} - P_{LN}$

Where: ΔP_V is the daily vapor pressure range
P_{LX} = 0.4193 psi
P_{LN} = 0.3048 psi

ΔP_V = 0.419253547358546 - 0.304812927869811 = 0.1144 psi

ΔP_B

$\Delta P_B = P_{BP} - P_{BV}$

Where: ΔP_B is the breather vent pressure setting range
P_{BP} = 0.03 psi
P_{BV} = -0.03 psi

ΔP_B = (0.03) - (-0.03) = 0.06 psi

K_E = 0.042366 (Unitless)
If KE is less than zero, it is assumed to be zero.

Calculate Vented Vapor Space Saturation Factor (K_S)

$K_S = 1 / (1 + 0.053 (P_{VA}) (H_{VO}))$ AP-42, Chapter 7.1, Equation 1-20

Where: Ks is the vented vapor space saturation factor
P_{VA} is the total mixture pressure P_{VA} = 0.3581 psi
H_{VO} is the vapor space outage H_{VO} = 0.5771 Ft

K_S = 1 / (1 + 0.053 (0.3581) (0.5771) = 0.989168 (Unitless)

Loss Calculations (HAP and VOC Emissions)

Standing Storage Loss L_S (lb/yr) = $365 (W_V)(V_V)(K_E)(K_S)$
Working Loss L_W (lb/yr) = $0.0010 (M_V)(P_{VA})(Q)(K_N)(K_P)$
Total Loss L_T (lb/yr) = $L_S + L_W$

Where:
W_V = 0.00314975 Vapor Density in lb/cubic feet
V_V = 65.27 Vapor Space Volume in cubic feet
K_E = 0.04236608 Vapor Space Expansion Factor
K_S = 0.98916768 Vented Vapor Space Saturation Factor - See Above for Calculation
M_V = 48.46 Molecular Weight of the Vapor in lb/lb-mole
P_{VA} = 0.3581 Total Mixture Pressure in psi
Q = 4,140,020 bbl/yr
K_N = 0.2 working turnovers
K_P = 1.0 working loss product factor, unitless

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 25,000 Gallon Storage Tank - T1, 3, 4, 5, and 6 - Blended Fuel

(continued from previous page)

Standing Storage Loss		
L_S (lb/yr)	3.14	lb/yr
Working Loss		
L_W (lb/yr)	12,282.22	lb/yr
Total Loss		
L_T (lb/yr)	12,285.36	lb/yr

Individual Compound Emissions

Basis:	100	lb-moles of vapor for weight fraction calculation
Total Emissions:	12,285.36	lb/yr
Control Efficiency:	95%	

Compound Information						PTE Calculations					
Compound	**Yi**	**lb-moles**	**MW**	**Pounds**	**Weight %**	**PTE VOC (lb/yr)**	**PTE HAP (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**	**PTE VOC w/control (TPY)**	**PTE HAP w/control (TPY)**
Acetone	18.89%	18.89104	58.08	1,097.19	22.64%						
Aliphatics	9.68%	9.678532	73.14	707.89	14.61%	1,794.47		0.90		0.04	
Alkyl Benzenes	0.11%	0.111822	134.22	15.01	0.31%	38.05	38.05	0.02	0.02	9.5E-04	9.5E-04
Benzene	0.02%	0.019739	78.11	1.54	0.03%	3.91	3.91	2.0E-03	1.95E-03	9.8E-05	9.8E-05
Butanol	0.07%	0.071617	74.12	5.31	0.11%	13.46		6.7E-03		3.4E-04	
Butyl Acetate	0.22%	0.2178	116.16	25.30	0.52%	64.13		0.03		1.6E-03	
Cresol-m	0.0001%	6.54E-05	108.10	0.01	0.0001%	0.02	0.02	8.96E-06	8.96E-06	4.5E-07	4.5E-07
Cyclohexanone	0.12%	0.120674	98.20	11.85	0.24%	30.04		0.02		7.5E-04	
Ethyl Alcohol	1.75%	1.746785	46.07	80.47	1.66%	204.00		0.10		5.1E-03	
Ethyl Benzene	0.15%	0.151553	106.17	16.09	0.33%	40.79	40.79	0.02	0.02	1.0E-03	1.0E-03
Glycol Ethers	0.001%	0.000641	62.07	0.04	0.001%	0.10	0.10	5.04E-05	5.04E-05	2.52E-06	2.52E-06
Hexane	2.91%	2.908728	86.17	250.65	5.17%	635.38	635.38	0.32	0.32	0.02	0.02
Isopropyl Alcohol	5.48%	5.479489	60.09	329.26	6.79%	834.67		0.42		0.02	
Methyl Alcohol	7.18%	7.183415	32.04	230.16	4.75%	583.44	583.44	0.29	0.29	1.46E-02	1.46E-02
Methyl Ethyl Ketone	2.37%	2.373575	72.10	171.13	3.53%	433.82		0.22		1.08E-02	
Methyl Isobutyl Ketone	0.13%	0.128041	100.20	12.83	0.26%	32.52	32.52	0.02	0.02	8.13E-04	8.13E-04
Methyl t-Butyl Ether	2.40%	2.402007	88.15	211.74	4.37%	536.75	536.75	0.27	0.27	1.34E-02	1.34E-02
Methylene Chloride	5.31%	5.311898	84.94	451.19	9.31%		1,143.76		0.57		0.03
Naphthalene	0.0002%	0.000157	128.20	0.02	0.0004%	0.05	0.05	2.56E-05	2.56E-05	1.28E-06	1.28E-06
Tetrahydrofuran	1.26%	1.260907	72.12	90.94	1.88%	230.52	230.52	0.12	0.12	5.76E-03	5.76E-03
Toluene	3.33%	3.325807	92.13	306.41	6.32%	776.73	776.73	0.39	0.39	0.02	0.02
Trichloroethane, 1,1,1-	0.32%	0.323941	133.42	43.22	0.89%	109.56	109.56	0.05	0.05	2.74E-03	2.74E-03
Trichloroethylene	0.11%	0.113539	131.40	14.92	0.31%	37.82	37.82	0.02	0.02	9.45E-04	9.45E-04
Trimethylbenzene, 1,2,4	0.002%	0.001586	120.19	0.19	0.004%	0.48		2.42E-04		1.21E-05	
Water, Oil, Dirt (solids)	37.21%	37.21161	18.02	670.55	13.84%						
Xylene	0.97%	0.965026	106.17	102.46	2.11%	259.72	259.72	0.13	0.13	6.49E-03	6.49E-03
	---	---	---	---	---						
	---	---	---	---	---						
	---	---	---	---	---						
	---	---	---	---	---						
	---	---	---	---	---						
Totals				**4,846.36**	**100.00%**	**6,660**	**4,429.11**	**3.33**	**2.21**	**0.17**	**0.11**

Worst Case HAP	**Methylene Chloride**	**0.57**	**TPY - Uncontrolled**
Worst Case HAP	**Methylene Chloride**	**0.03**	**TPY - After Control**

Appendix A to the Technical Support Document (TSD)
PTE and Emission Factor Calculation - Tank T1, T3, T4, T5, and T6

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Throughput for Calculation 173,880,847 gallons/yr
173,881 kgallon/yr

Control Efficiency 95%

						Uncontrolled			After Control		
Pollutant	HAP	VOC	PTE with Cutter (TPY)	PTE with Blended Fuel (TPY)	Worst Case (TPY)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/kgal)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/kgal)
Acetone	NO	NO	---	---	---	not regulated			not regulated		
Aliphatics	NO	YES	2.5928	0.8972	2.5928		2.593	0.030		0.130	1.49E-03
Alkyl Benzenes	YES	YES	0.0549	0.0190	0.0549	0.0549	0.055	6.31E-04	2.74E-03	2.74E-03	3.16E-05
Benzene	YES	YES		0.0020	0.0020	0.0020	1.95E-03	2.25E-05	9.77E-05	9.77E-05	1.12E-06
Butanol	NO	YES	0.0194	0.0067	0.0194		1.94E-02	2.24E-04		9.72E-04	1.12E-05
Butyl Acetate	NO	YES	0.0926	0.0321	0.0926		0.093	1.07E-03		4.63E-03	5.33E-05
Cresol-m	YES	YES	2.59E-05	8.96E-06	2.59E-05	2.59E-05	2.59E-05	2.98E-07	1.29E-06	1.29E-06	1.49E-08
Cyclohexanone	NO	YES	0.0434	0.0150	0.0434		0.043	4.99E-04		2.17E-03	2.50E-05
Ethyl Alcohol	NO	YES	0.2946	0.1020	0.2946		0.295	3.39E-03		0.015	1.69E-04
Ethyl Benzene	YES	YES	0.0564	0.0204	0.0564	0.0564	0.056	6.49E-04	2.82E-03	2.82E-03	3.25E-05
Glycol Ethers	YES	YES	1.46E-04	5.04E-05	1.46E-04	1.46E-04	1.46E-04	1.68E-06	7.28E-06	7.28E-06	8.38E-08
Hexane	YES	YES	0.9178	0.3177	0.9178	0.9178	0.918	0.011	4.59E-02	0.046	5.28E-04
Isopropyl Alcohol	NO	YES	1.2057	0.4173	1.2057		1.206	0.014		0.060	6.93E-04
Methyl Alcohol	YES	YES	0.8428	0.2917	0.8428	0.8428	0.843	9.69E-03	4.21E-02	0.042	4.85E-04
Methyl Ethyl Ketone	NO	YES	0.6267	0.2169	0.6267		0.627	7.21E-03		0.031	3.60E-04
Methyl Isobutyl Ketone	YES	YES	0.0460	0.0163	0.0460	0.0460	0.046	5.29E-04	2.30E-03	2.30E-03	2.64E-05
Methyl t-Butyl Ether	YES	YES	0.7749	0.2684	0.7749	0.7749	0.775	8.91E-03	3.87E-02	0.039	4.46E-04
Methylene Chloride	YES	NO	1.6524	0.5719	1.6524	1.6524		0.019	8.26E-02		9.50E-04
Naphthalene	YES	YES	7.40E-05	2.56E-05	7.40E-05	7.40E-05	7.40E-05	8.51E-07	3.70E-06	3.70E-06	4.26E-08
Tetrahydrofuran	YES	YES	0.3333	0.1153	0.3333	0.3333	0.333	3.83E-03	1.67E-02	0.017	1.92E-04
Toluene	YES	YES	1.1137	0.3884	1.1137	1.1137	1.114	0.013	5.57E-02	0.056	6.41E-04
Trichloroethane, 1,1,1-	YES	YES	0.1582	0.0548	0.1582	0.1582	0.158	1.82E-03	7.91E-03	7.91E-03	9.10E-05
Trichloroethylene	YES	YES	0.0547	0.0189	0.0547	0.0547	0.055	6.29E-04	2.73E-03	2.73E-03	3.14E-05
Trimethylbenzene, 1,2,4	NO	YES		0.0002	0.0002		2.42E-04	2.78E-06		1.21E-05	1.39E-07
Water, Oil, Dirt (solids)	NO	NO	---	---	---	not regulated			not regulated		
Xylene	YES	YES	0.3738	0.1299	0.3738	0.3738	0.374	0.0043	1.87E-02	0.019	2.15E-04
						6.38	**9.60**		**0.32**	**0.48**	

	Uncontrolled PTE				PTE after Control			
VOC	**9.604**	**TPY**	**0.110**	**lb/kgal**	**0.480**	**TPY**	**0.006**	**lb/kgal**
Single HAP - Methylene Chloride	**1.652**	**TPY**	**0.019**	**lb/kgal**	**0.083**	**TPY**	**0.001**	**lb/kgal**
Combined HAP	**6.381**	**TPY**	**0.073**	**lb/kgal**	**0.319**	**TPY**	**0.004**	**lb/kgal**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Cutter

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

INPUT - CLIMATE DATA - Indianapolis, Indiana				
Tax (Daily Maximum Ambient Temperature)	62.00	°F	16.7 °C	521.67 °R
Tan (Daily Minimum Ambient Temperature)	42.20	°F	5.7 °C	501.87 °R
Daily Solar Isolation Factor (I)	1165	Btu/CF • day	K_N	0.1925
Tank Paint Solar Absorbance (α)	0.17	white	K_P	1.0

Source: AP-42, Chapter 7.1, Table 7.1-7, November 2006
N = The number of annual turnovers per year
K_N (Working Loss Turnover Factor) = (180 + N) / 6N for more than 36 turnovers per year, AP-42, Chapter 7.1, Eq. 1-29.
K_N (Working Loss Turnover Factor) = 1.0 for 36 or less turnovers per year, AP-42, Chapter 7.1, Eq. 1-29
K_p (Working Loss Product Factor) = 0.75 for crude oils and 1.0 for all other organic, AP-42, Chapter 7.1, Eq. 1-31

INPUT - TANK DATA			User Input	
Tank Diameter (D)	30.00	Ft		
Shell Height (Hs)	30.00	Ft	Constant Temperature Tank (Y/N)	N
Stock Liquid Height (Hl)	28.37	Ft	If so, what temperature (°R) ?	
Roof Height (H_R) - See Table to Right	15.00	Ft		
Tank Radius (R_S = D/2)	15.00	Ft	Atmospheric Pressure (psi)	14.7
Cone Roof Slope (S_R in ft/ft - 0.0625 default)	0.0625	Ft/Ft		
Roof Outage (H_{RO}) - See Table to Right	0.3125	Ft	Number of Turnovers (N) per Year	1159.21
Vapor Space Outage ($H_{VO} = H_S - H_L + H_{RO}$)	1.9465	Ft	N = Q (gpy) / Max. Liquid Volume (gallons)	
Tank Vapor Space Volume ($V_V = (\pi/4)D^2 H_{VO}$)	1,375.90	FT^3		
Max. Liquid Volume = 7.481 $(\pi/4) D^2 H_L$	150,000.00	gallons	Roof Outage	
Breather Vent Pressure Setting (P_{BP})	0.030	psi	Cone Roof $H_{RO} = (1/3)(S_R)(R_S)$ =	0.3125
Breather Vent Vacuum Setting (P_{BV})	-0.030	psi	H_R = D/2 =	15.0000
Annual Throughput (Q)	173,880,847	gal/yr	Dome Roof $H_{RO} = 0.137 R_S$ =	2.0550
Annual Throughput (Q) (1 bbl = 42 gallons)	4,140,020	bbl/yr	$H_R = 0.268 R_S$ =	4.0200

Maximum Fuel Usage	68,760,847	gallon/yr
Recirculation	105,120,000	gallon/yr
Annual Throughput	**173,880,847**	gallon/yr

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Cutter

(continued from previous page)

Temperature Calculations (AP-42, Chapter 7.1)

T_{AA} (Daily Average Ambient Temperature) AP-42, Chapter 7.1, Equation 1-27	= (TAX (°R) + TAN (°R)) / 2 =	511.77	°R
		11.16	°C
T_B (Liquid Bulk Temperature) AP-42, Chapter 7.1, Equation 1-28	= (TAA (R) + (6 x α) - 1) =	511.79	°R
		11.17	°C
T_{LA} (Daily Average Liquid Surface Temperature) AP-42, Chapter 7.1, Equation 1-26	= 0.44 TAA + 0.56 TB + 0.0079 α I =	513.35	°R
		12.03	°C

ΔT_A (Daily Ambient Temperature Range) AP-42, Chapter 7.1, Equation 1-12	= (TAX (°R) - TAN (°R)) =	19.80	°R
		-262.16	°C
ΔT_V (Daily Vapor Temperature Range) AP-42, Chapter 7.1, Equation 1-8	= 0.72 ΔTA + 0.028 α I =	19.80	°R
		-262.16	°C
T_{LX} (Maximum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA + 0.25 ΔTV =	518.30	°R
		14.78	°C
T_{LN} (Minimum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA - 0.25 ΔTV =	508.40	°R
		9.28	°C

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Cutter

(continued from previous page)

Liquid Properties

Average Density of the Liquid - All Components					
Component	**Specific Gravity**	**Density (lb/gal)**	**Wt %**	**Product of Density x Weight %**	**Notes**
Acetone	0.7949	6.6277	5.3000%	0.3513	Wt % from site sampling, S.G. from wikipedia
Aliphatics (Diethylamine Similar)	0.7075	5.8990	4.3000%	0.2537	
Alkyl Benzenes (Butyl Benzene Similar)	0.9000	7.5040	20.4000%	1.5308	
Butanol	0.8050	6.7119	1.4000%	0.0940	
Butyl Acetate	0.8825	7.3581	2.7000%	0.1987	
Cresol-m	1.0350	8.6296	2.2000%	0.1899	
Cyclohexanone	0.9478	7.9026	4.4000%	0.3477	
Ethyl Alcohol	0.7890	6.5785	1.6000%	0.1053	
Ethyl Benzene	0.8665	7.2247	2.0000%	0.1445	
Glycol Ethers (Ethylene Glycol Similar)	1.1132	9.2816	1.2000%	0.1114	
Hexane	0.6548	5.4596	1.9000%	0.1037	
Isopropyl Alcohol	0.7860	6.5535	8.7000%	0.5702	
Methyl Alcohol	0.7920	6.6035	2.3000%	0.1519	
Methyl Ethyl Ketone	0.8050	6.7119	2.3000%	0.1544	
Methyl Isobutyl Ketone	0.8020	6.6869	0.9000%	0.0602	
Methyl t-Butyl Ether	0.7404	6.1733	0.9000%	0.0556	
Methylene Chloride	1.3266	11.0609	1.1000%	0.1217	
Naphthalene	1.3289	11.0801	0.6000%	0.0665	
Tetrahydrofuran	0.8900	7.4206	0.6000%	0.0445	
Toluene	0.8709	7.2614	12.9000%	0.9367	
Trichloroethane, 1,1,1-	1.3200	11.0059	0.4000%	0.0440	
Trichloroethylene	1.4719	12.2724	0.3000%	0.0368	
Xylene	0.8688	7.2439	21.6000%	1.5647	
Total Weight % =			100.00%	----------	----------
Avg. Liquid Density = (Sum Density x Wt %) / Total Wt% =				7.2379	----------
Tank Throughput (lb/yr) = Throughput (gallons/yr) x Density (lb/gallon) =					1,258,527,313.84

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Cutter

(continued from previous page)

HAP and VOC with Antoine Coefficients							
Basis :	**100**	**lbs fluid**					
Component	**Mol. Weight**	**Weight %**	**Weight (lbs)**	**Moles**	**Mole %**	**HAP (YES/NO)**	**VOC (YES/NO)**
Acetone	58.08	5.30%	5.3000	0.0913	7.9584%	NO	NO
Aliphatics (Diethylamine Similar)	73.14	4.30%	4.3000	0.0588	5.1273%	NO	YES
Alkyl Benzenes (Butyl Benzene Similar)	134.22	20.40%	20.4000	0.1520	13.2553%	YES	YES
Butanol	74.12	1.40%	1.4000	0.0189	1.6473%	NO	YES
Butyl Acetate	116.16	2.70%	2.7000	0.0232	2.0271%	NO	YES
Cresol-m	108.10	2.20%	2.2000	0.0204	1.7749%	YES	YES
Cyclohexanone	98.20	4.40%	4.4000	0.0448	3.9077%	NO	YES
Ethyl Alcohol	46.07	1.60%	1.6000	0.0347	3.0288%	NO	YES
Ethyl Benzene	106.17	2.00%	2.0000	0.0188	1.6429%	YES	YES
Glycol Ethers (Ethylene Glycol Similar)	62.07	1.20%	1.2000	0.0193	1.6861%	YES	YES
Hexane	86.17	1.90%	1.9000	0.0220	1.9230%	YES	YES
Isopropyl Alcohol	60.09	8.70%	8.7000	0.1448	12.6268%	NO	YES
Methyl Alcohol	32.04	2.30%	2.3000	0.0718	6.2605%	YES	YES
Methyl Ethyl Ketone	72.10	2.30%	2.3000	0.0319	2.7821%	NO	YES
Methyl Isobutyl Ketone	100.20	0.90%	0.9000	0.0090	0.7833%	YES	YES
Methyl t-Butyl Ether	88.15	0.90%	0.9000	0.0102	0.8904%	YES	YES
Methylene Chloride	84.94	1.10%	1.1000	0.0130	1.1294%	YES	NO
Naphthalene	128.20	0.60%	0.6000	0.0047	0.4082%	YES	YES
Tetrahydrofuran	72.12	0.60%	0.6000	0.0083	0.7256%	YES	YES
Toluene	92.13	12.90%	12.9000	0.1400	12.2114%	YES	YES
Trichloroethane, 1,1,1-	133.42	0.40%	0.4000	0.0030	0.2615%	YES	YES
Trichloroethylene	131.40	0.30%	0.3000	0.0023	0.1991%	YES	YES
Xylene	106.17	21.60%	21.6000	0.2034	17.7430%	YES	YES
Totals		100.00%	100.00	1.15	100.00%	---	---

HAP or VOC without Antoine Coefficients - Assume 100% Volatilization					
Component	**Tank Throughput (lb/yr)**	**Component Wt%**	**Total Emissions (lb/yr)**	**HAP (YES/NO)**	**VOC (YES/NO)**

(continued on next page)

Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Cutter
(continued from previous page)

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Antoine Coefficients for Vapor Pressure Estimation

Antoine Equation Data

Compound	A	B	C	Valid Range (Celsius)	Source
Acetone	7.3141	1,315.67	240.4790	-94.70 to 235.05	Yaws Handbook of Vapor Pressure, 2007
Aliphatics (Diethylamine Similar)	6.5570	829.07	170.0770	-46.00 to 223.45	Yaws Handbook of Vapor Pressure, 2007
Alkyl Benzenes (Butyl Benzene Similar)	7.1847	1,720.37	216.4130	-87.85 to 387.40	Yaws Handbook of Vapor Pressure, 2007
Butanol	7.2906	1,282.85	173.2470	-37.00 to 289.90	Yaws Handbook of Vapor Pressure, 2007
Butyl Acetate	7.2341	1,515.76	222.0770	-73.50 to 306.50	Yaws Handbook of Vapor Pressure, 2007
Cresol-m	6.8749	1,303.18	124.0000	20.80 to 432.70	Yaws Handbook of Vapor Pressure, 2007
Cyclohexanone	7.6065	1,884.55	243.0360	-31.15 to 356.00	Yaws Handbook of Vapor Pressure, 2007
Ethyl Alcohol	8.1348	1,662.48	238.1310	-114.10 to 243.10	Yaws Handbook of Vapor Pressure, 2007
Ethyl Benzene	7.1561	1,559.55	228.5820	-94.95 to 344.02	Yaws Handbook of Vapor Pressure, 2007
Glycol Ethers (Ethylene Glycol Similar)	9.6994	3,147.10	264.2460	-13.00 to 371.85	Yaws Handbook of Vapor Pressure, 2007
Hexane	6.9895	1,216.92	227.4510	-95.31 to 234.28	Yaws Handbook of Vapor Pressure, 2007
Isopropyl Alcohol	7.8306	1,483.30	217.4130	-87.87 to 235.16	Yaws Handbook of Vapor Pressure, 2007
Methyl Alcohol	8.0913	1,582.91	239.0960	-97.68 to 239.43	Yaws Handbook of Vapor Pressure, 2007
Methyl Ethyl Ketone	7.2010	1,325.15	227.0930	-85.00 to 262.35	Yaws Handbook of Vapor Pressure, 2007
Methyl Isobutyl Ketone	7.1597	1,421.73	216.2660	-84.00 to 298.25	Yaws Handbook of Vapor Pressure, 2007
Methyl t-Butyl Ether	7.0760	1,233.70	238.8790	-108.60 to 223.95	Yaws Handbook of Vapor Pressure, 2007
Methylene Chloride	7.1146	1,152.41	232.4420	-95.14 to 236.85	Yaws Handbook of Vapor Pressure, 2007
Naphthalene	6.8912	1,551.48	168.8790	3.2 to 475.25	Yaws Handbook of Vapor Pressure, 2007
Tetrahydrofuran	7.1054	1,256.68	232.6210	-108.50 to 267.00	Yaws Handbook of Vapor Pressure, 2007
Toluene	7.1362	1,457.29	231.8270	-94.97 to 318.64	Yaws Handbook of Vapor Pressure, 2007
Trichloroethane, 1,1,1-	7.0072	1,253.20	229.6240	-30.40 to 271.85	Yaws Handbook of Vapor Pressure, 2007
Trichloroethylene	6.8798	1,157.83	202.5800	-74.00 to 297.85	Yaws Handbook of Vapor Pressure, 2007
Xylene	7.2122	1,546.92	217.1440	-2.66 to 197.02	Yaws Handbook of Vapor Pressure, 2007

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Cutter

(continued from previous page)

Vapor Pressure Calculations

Use Antoine Equation from AP-42, Chapter 7.1, Page 7.1-94:

Log P = A - [B / (T + C)] **Where: P = Vapor Pressure in mmHg**

T = Temperature in °C

T_{LN} (°C) = 9.28 T_{LA} (°C) = 12.03 T_{LX} (°C) = 14.78

Compound	mmHg			bar			psi		
	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	111.2674	126.9807	144.5011	0.1483	0.1693	0.1927	2.1516	2.4554	2.7942
Aliphatics (Diethylamine Similar)	86.0030	100.9990	118.0440	0.1147	0.1347	0.1574	1.6630	1.9530	2.2826
Alkyl Benzenes (Butyl Benzene Similar)	0.3648	0.4507	0.5539	0.0005	0.0006	0.0007	0.0071	0.0087	0.0107
Butanol	1.8296	2.3264	2.9373	0.0024	0.0031	0.0039	0.0354	0.0450	0.0568
Butyl Acetate	4.8139	5.7472	6.8332	0.0064	0.0077	0.0091	0.0931	0.1111	0.1321
Cresol-m	0.0013	0.0020	0.0031	1.67E-06	2.63E-06	4.07E-06	2.42E-05	3.81E-05	5.90E-05
Cyclohexanone	1.3726	1.6522	1.9809	0.0018	0.0022	0.0026	0.0265	0.0319	0.0383
Ethyl Alcohol	26.0205	30.8449	36.4287	0.0347	0.0411	0.0486	0.5032	0.5964	0.7044
Ethyl Benzene	3.9773	4.7263	5.5945	0.0053	0.0063	0.0075	0.0769	0.0914	0.1082
Glycol Ethers (Ethylene Glycol Similar)	0.0156	0.0203	0.0263	2.08E-05	2.71E-05	3.51E-05	3.02E-04	3.93E-04	5.09E-04
Hexane	70.6320	80.9153	92.4101	0.0942	0.1079	0.1232	1.3658	1.5646	1.7869
Isopropyl Alcohol	19.3790	23.2143	27.6899	0.0258	0.0309	0.0369	0.3747	0.4489	0.5354
Methyl Alcohol	52.2658	61.3771	71.8264	0.0697	0.0818	0.0958	1.0107	1.1868	1.3889
Methyl Ethyl Ketone	39.3413	45.6374	52.7629	0.0525	0.0608	0.0703	0.7607	0.8825	1.0203
Methyl Isobutyl Ketone	7.1814	8.5534	10.1453	0.0096	0.0114	0.0135	0.1389	0.1654	0.1962
Methyl t-Butyl Ether	127.2166	144.2219	163.0562	0.1696	0.1923	0.2174	2.4600	2.7888	3.1530
Methylene Chloride	222.3943	251.6240	283.9145	0.2965	0.3355	0.3785	4.3004	4.8656	5.4900
Naphthalene	0.0152	0.0207	0.0278	2.03E-05	2.75E-05	3.70E-05	2.95E-04	4.00E-04	5.37E-04
Tetrahydrofuran	81.3472	93.0545	106.1290	0.1085	0.1241	0.1415	1.5730	1.7994	2.0522
Toluene	12.3609	14.4614	16.8597	0.0165	0.0193	0.0225	0.2390	0.2796	0.3260
Trichloroethane, 1,1,1-	57.7534	66.2631	75.7920	0.0770	0.0883	0.1010	1.1168	1.2813	1.4656
Trichloroethylene	25.9860	30.5329	35.7294	0.0346	0.0407	0.0476	0.5025	0.5904	0.6909
Xylene	2.4000	2.8986	3.4852	0.0032	0.0039	0.0046	0.0464	0.0561	0.0674
Total Pressures	953.94	1096.5243	1256.73	1.2718	1.4619	1.6755	18.4462	21.2033	24.3012

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Cutter

(continued from previous page)

Raoult's Law Calculations for Vapor Partial Pressures

Raoult's Law $P_{partial\ of\ i} = X_i \times P_{vap\ of\ i}$

Where: $P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
$P_{vap\ of\ i}$ is the vapor pressure of pure i
X_i is the liquid mole fraction of i

$Y_i = P_{partial\ of\ i} / P_{total}$

Y_i is the vapor phase mole fraction of component i
$P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
P_{total} is the total pressure of all components in the vapor phase

Compound	X_i	$P_{vap\ of\ i}$ (psi)			$P_{partial\ of\ i}$ (psi)			Y_i		
		T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	7.96%	2.1516	2.4554	2.7942	0.1712	0.1954	0.2224	30.59%	30.11%	29.66%
Aliphatics (Diethylamine Similar)	5.13%	1.6630	1.9530	2.2826	0.0853	0.1001	0.1170	15.232%	15.432%	15.608%
Alkyl Benzenes (Butyl Benzene Similar)	13.26%	0.0071	0.0087	0.0107	0.0009	0.0012	0.0014	0.167%	0.178%	0.189%
Butanol	1.65%	0.0354	0.0450	0.0568	0.0006	0.0007	0.0009	0.104%	0.114%	0.125%
Butyl Acetate	2.03%	0.0931	0.1111	0.1321	0.0019	0.0023	0.0027	0.337%	0.347%	0.357%
Cresol-m	1.77%	2.42E-05	3.81E-05	5.90E-05	4.29E-07	6.77E-07	1.05E-06	0.000%	0.000%	0.000%
Cyclohexanone	3.91%	0.0265	0.0319	0.0383	0.0010	0.0012	0.0015	0.185%	0.192%	0.200%
Ethyl Alcohol	3.03%	0.5032	0.5964	0.7044	0.0152	0.0181	0.0213	2.722%	2.784%	2.845%
Ethyl Benzene	1.64%	0.0769	0.0914	0.1082	0.0013	0.0015	0.0018	0.226%	0.231%	0.237%
Glycol Ethers (Ethylene Glycol Similar)	1.69%	0.0003	0.0004	0.0005	5.09E-06	6.63E-06	8.59E-06	0.001%	0.001%	0.001%
Hexane	1.92%	1.3658	1.5646	1.7869	0.0263	0.0301	0.0344	4.69%	4.64%	4.58%
Isopropyl Alcohol	12.63%	0.3747	0.4489	0.5354	0.0473	0.0567	0.0676	8.45%	8.73%	9.02%
Methyl Alcohol	6.26%	1.0107	1.1868	1.3889	0.0633	0.0743	0.0870	11.30%	11.45%	11.60%
Methyl Ethyl Ketone	2.78%	0.7607	0.8825	1.0203	0.0212	0.0246	0.0284	3.78%	3.78%	3.79%
Methyl Isobutyl Ketone	0.78%	0.1389	0.1654	0.1962	0.0011	0.0013	0.0015	0.19%	0.20%	0.20%
Methyl t-Butyl Ether	0.89%	2.4600	2.7888	3.1530	0.0219	0.0248	0.0281	3.91%	3.83%	3.74%
Methylene Chloride	1.13%	4.3004	4.8656	5.4900	0.0486	0.0550	0.0620	8.68%	8.47%	8.27%
Naphthalene	0.41%	0.0003	0.0004	0.0005	1.20E-06	1.63E-06	2.19E-06	0.0002%	0.0003%	0.0003%
Tetrahydrofuran	0.73%	1.5730	1.7994	2.0522	0.0114	0.0131	0.0149	2.04%	2.01%	1.99%
Toluene	12.21%	0.2390	0.2796	0.3260	0.0292	0.0341	0.0398	5.21%	5.26%	5.31%
Trichloroethane, 1,1,1-	0.26%	1.1168	1.2813	1.4656	0.0029	0.0034	0.0038	0.52%	0.52%	0.51%
Trichloroethylene	0.20%	0.5025	0.5904	0.6909	0.0010	0.0012	0.0014	0.18%	0.18%	0.18%
Xylene	17.74%	0.0464	0.0561	0.0674	0.0082	0.0099	0.0120	1.47%	1.53%	1.59%
Totals	100.00%	18.4462	21.2033	24.3012	0.5598	0.6489	0.7499	100.00%	100.00%	100.00%

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Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Cutter
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Calculate Stock Density (lb/cubic foot)

M_V Calculation			
Compound	**MW**	**Y_i**	**MW x Y_i**
Acetone	58.08	30.11%	17.4904
Aliphatics (Diethylamine Similar)	73.14	15.43%	11.2868
Alkyl Benzenes (Butyl Benzene Similar)	134.22	0.18%	0.2389
Butanol	74.12	0.11%	0.0846
Butyl Acetate	116.16	0.35%	0.4033
Cresol-m	108.10	0.00%	0.0001
Cyclohexanone	98.20	0.19%	0.1889
Ethyl Alcohol	46.07	2.78%	1.2826
Ethyl Benzene	106.17	0.23%	0.2457
Glycol Ethers (Ethylene Glycol Similar)	62.07	0.00%	0.0006
Hexane	86.17	4.64%	3.9955
Isopropyl Alcohol	60.09	8.73%	5.2488
Methyl Alcohol	32.04	11.45%	3.6688
Methyl Ethyl Ketone	72.10	3.78%	2.7279
Methyl Isobutyl Ketone	100.20	0.20%	0.2001
Methyl t-Butyl Ether	88.15	3.83%	3.3733
Methylene Chloride	84.94	8.47%	7.1933
Naphthalene	128.20	0.00%	0.0003
Tetrahydrofuran	72.12	2.01%	1.4510
Toluene	92.13	5.26%	4.8482
Trichloroethane, 1,1,1-	133.42	0.52%	0.6888
Trichloroethylene	131.40	0.18%	0.2381
Xylene	106.17	1.53%	1.6272
M_V = Sum (MW_i x Y_i)			**66.4833**

Stock Density

$$W_V = (M_V \times P_{VA}) / (R \times T_{LA})$$

Where: W_V is the stock density in lb/cubic foot

M_V is the molecular weight of the vapor

P_{VA} is the total pressure of the mixture in psia

R ideal gas constant
(10.731 psia cubic foot / lb-mole °R)

T_{LA} is the daily average liquid temperature in °R

M_V = 66.48 (see below)

P_{VA} = 0.6489 psi

R = 10.731 psia cubic foot / lb-mole °R

T_{LA} = 513.35 °R

$$W_V = (66.48 \times 0.6489) / (10.731 \times 513.35)$$

W_V = 0.0078 lb/cubic foot

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Cutter

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Calculate Vapor Space Expansion Factor (K_E)

$K_E = (\Delta T_V / T_{LA}) + (\Delta P_V - \Delta P_B) / (P_A - P_{VA})$ AP-42, Chapter 7.1, Equation 1-7

Where:
K_E = Vapor Space Expansion Factor (Calculated Below)
ΔT_V = 19.80 (°R - Daily Vapor Temperature Range)
T_{LA} = 513.35 (°R - Average Daily Liquid Surface Temperature)
ΔP_V = Daily Vapor Pressure Range (Calcuated Below)
ΔP_B = Breather Vent Pressure Setting Range (Calcuated Below)
P_A = 14.7 (psia - Atmospheric Pressure)
P_{VA} = 0.6489 (psia - Total Mixture Pressure)

ΔP_V

$\Delta P_V = P_{LX} - P_{LN}$

Where: ΔP_V is the daily vapor pressure range
P_{LX} = 0.7499 psi
P_{LN} = 0.5598 psi

ΔP_V = 0.7499 - 0.5598 = 0.1901 psi

ΔP_B

$\Delta P_B = P_{BP} - P_{BV}$

Where: ΔP_B is the breather vent pressure setting range
P_{BP} = 0.03 psi
P_{BV} = -0.03 psi

ΔP_B = (0.03) - (-0.03) = 0.06 psi

K_E = 0.047827 (Unitless)
If KE is less than zero, it is assumed to be zero.

Calculate Vented Vapor Space Saturation Factor (K_S)

$K_S = 1 / (1 + 0.053 (P_{VA}) (H_{VO}))$ AP-42, Chapter 7.1, Equation 1-20

Where: Ks is the vented vapor space saturation factor
P_{VA} is the total mixture pressure P_{VA} = 0.6489 psi
H_{VO} is the vapor space outage H_{VO} = 1.9465 Ft

K_S = 1 / (1 + 0.053 (0.648897214313135) (1.946494) = 0.937257 (Unitless)

Loss Calculations (HAP and VOC Emissions)

Standing Storage Loss L_S (lb/yr) = $365 (W_V)(V_V)(K_E)(K_S)$
Working Loss L_W (lb/yr) = $0.0010 (M_V)(P_{VA})(Q)(K_N)(K_P)$
Total Loss L_T (lb/yr) = $L_S + L_W$

Where:
W_V = 0.00783093 Vapor Density in lb/cubic feet
V_V = 1,375.90 Vapor Space Volume in cubic feet
K_E = 0.04782713 Vapor Space Expansion Factor
K_S = 0.93725724 Vented Vapor Space Saturation Factor
M_V = 66.48 Molecular Weight of the Vapor in lb/lb-mole
P_{VA} = 0.6489 Total Mixture Pressure in psi
Q = 4,140,020 bbl/yr
K_N = 0.2 working turnovers
K_P = 1.0 working loss product factor, unitless

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Cutter

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Standing Storage Loss		
L_S (lb/yr)	176.29	lb/yr
Working Loss		
L_W (lb/yr)	34,387.82	lb/yr
Total Loss		
L_T (lb/yr)	34,564.11	lb/yr

Individual Compound Emissions

Basis:	100	lb-moles of vapor for weight fraction calculation
Total Emissions:	34,564.11	lb/yr
Control Efficiency:	95%	

Compound Information						PTE Calculations					
Compound	**Yi**	**lb-moles**	**MW**	**Pounds**	**Weight %**	**PTE VOC (lb/yr)**	**PTE HAP (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**	**PTE VOC w/control (TPY)**	**PTE HAP w/control (TPY)**
Acetone	30.11%	30.11427	58.08	1,749.04	26.31%						
Aliphatics (Diethylamine Similar)	15.43%	15.43179	73.14	1,128.68	16.98%	5,867.91		2.93		1.47E-01	
Alkyl Benzenes (Butyl Benzene Similar)	0.18%	0.178015	134.22	23.89	0.36%	124.22	124.22	0.06	0.06	3.11E-03	3.11E-03
Butanol	0.11%	0.114199	74.12	8.46	0.13%	44.01		0.02		1.10E-03	
Butyl Acetate	0.35%	0.347173	116.16	40.33	0.61%	209.66		0.10		5.24E-03	
Cresol-m	0.0001%	0.000104	108.10	0.011	0.0002%	0.06	0.06	2.93E-05	2.93E-05	1.47E-06	1.47E-06
Cyclohexanone	0.19%	0.19239	98.20	18.89	0.28%	98.22		0.05		2.46E-03	
Ethyl Alcohol	2.78%	2.784007	46.07	128.26	1.93%	666.81		0.33		0.02	
Ethyl Benzene	0.23%	0.231386	106.17	24.57	0.37%	127.72	127.72	0.06	0.06	3.19E-03	3.19E-03
Glycol Ethers (Ethylene Glycol Similar)	0.001%	0.001022	62.07	0.06	0.001%	0.33	0.33	1.65E-04	1.65E-04	8.24E-06	8.24E-06
Hexane	4.64%	4.636748	86.17	399.55	6.01%	2,077.22	2,077.22	1.04	1.04	0.05	0.05
Isopropyl Alcohol	8.73%	8.734897	60.09	524.88	7.89%	2,728.81		1.36		0.07	
Methyl Alcohol	11.45%	11.45058	32.04	366.88	5.52%	1,907.36	1,907.36	0.95	0.95	0.05	0.05
Methyl Ethyl Ketone	3.78%	3.783549	72.10	272.79	4.10%	1,418.23		0.71		0.04	
Methyl Isobutyl Ketone	0.20%	0.199664	100.20	20.01	0.30%	104.01	104.01	0.05	0.05	2.60E-03	2.60E-03
Methyl t-Butyl Ether	3.83%	3.82681	88.15	337.33	5.07%	1,753.77	1,753.77	0.88	0.88	0.04	0.04
Methylene Chloride	8.47%	8.468725	84.94	719.33	10.82%		3,739.75		1.87		0.09
Naphthalene	0.0003%	0.000251	128.20	0.03	0.0005%	0.17	0.17	8.37E-05	8.37E-05	4.19E-06	4.19E-06
Tetrahydrofuran	2.01%	2.011956	72.12	145.10	2.18%	754.37	754.37	0.38	0.38	0.02	0.02
Toluene	5.26%	5.262398	92.13	484.82	7.29%	2,520.56	2,520.56	1.26	1.26	0.06	0.06
Trichloroethane, 1,1,1-	0.52%	0.516293	133.42	68.88	1.04%	358.12	358.12	0.18	0.18	8.95E-03	8.95E-03
Trichloroethylene	0.18%	0.181167	131.40	23.81	0.36%	123.76	123.76	0.06	0.06	3.09E-03	3.09E-03
Xylene	1.53%	1.532609	106.17	162.72	2.45%	845.95	845.95	0.42	0.42	0.02	0.02
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Totals				**6,648.33**	**100.00%**	**21,731**	**14,437.37**	**10.87**	**7.22**	**0.54**	**0.36**

Worst Case HAP	**Methylene Chloride**	**1.87**	**TPY - Uncontrolled**
Worst Case HAP	**Methylene Chloride**	**0.09**	**TPY - After Control**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Blended Fuel

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

INPUT - CLIMATE DATA - Indianapolis, Indiana				
Tax (Daily Maximum Ambient Temperature)	62.00	°F	16.7 °C	521.67 °R
Tan (Daily Minimum Ambient Temperature)	42.20	°F	5.7 °C	501.87 °R
Daily Solar Isolation Factor (I)	1165	Btu/CF • day	K_N	0.1925
Tank Paint Solar Absorbance (α)	0.17	white	K_P	1.0

Source: AP-42, Chapter 7.1, Table 7.1-7, November 2006
N = The number of annual turnovers per year
K_N (Working Loss Turnover Factor) = (180 + N) / 6N for more than 36 turnovers per year, AP-42, Chapter 7.1, Eq. 1-29.
K_N (Working Loss Turnover Factor) = 1.0 for 36 or less turnovers per year, AP-42, Chapter 7.1, Eq. 1-29
K_p (Working Loss Product Factor) = 0.75 for crude oils and 1.0 for all other organic, AP-42, Chapter 7.1, Eq. 1-31

INPUT - TANK DATA			User Input	
Tank Diameter (D)	30.00	Ft		
Shell Height (Hs)	30.00	Ft	Constant Temperature Tank (Y/N)	N
Stock Liquid Height (Hl)	28.37	Ft	If so, what temperature (°R) ?	
Roof Height (H_R) - See Table to Right	15.00	Ft		
Tank Radius (R_S = D/2)	15.00	Ft	Atmospheric Pressure (psi)	14.7
Cone Roof Slope (S_R in ft/ft - 0.0625 default)	0.0625	Ft/Ft		
Roof Outage (H_{RO}) - See Table to Right	0.3125	Ft	Number of Turnovers (N) per Year	1159.21
Vapor Space Outage ($H_{VO} = H_S - H_L + H_{RO}$)	1.9465	Ft	N = Q (gpy) / Max. Liquid Volume (gallons)	
Tank Vapor Space Volume ($V_V = (\pi/4)D^2 H_{VO}$)	1,375.90	FT^3		
Max. Liquid Volume = 7.481 $(\pi/4) D^2 H_L$	150,000.00	gallons	Roof Outage	
Breather Vent Pressure Setting (P_{BP})	0.030	psi	Cone Roof $H_{RO} = (1/3)(S_R)(R_S)$ =	0.3125
Breather Vent Vacuum Setting (P_{BV})	-0.030	psi	H_R = D/2 =	15.0000
Annual Throughput (Q)	173,880,847	gal/yr	Dome Roof $H_{RO} = 0.137 R_S$ =	2.0550
Annual Throughput (Q) (1 bbl = 42 gallons)	4,140,020	bbl/yr	$H_R = 0.268 R_S$ =	4.0200

Maximum Fuel Usage	68,760,847	gallon/yr
Recirculation	105,120,000	gallon/yr
Annual Throughput	**173,880,847**	gallon/yr

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Blended Fuel

(continued from previous page)

Temperature Calculations (AP-42, Chapter 7.1)

T_{AA} (Daily Average Ambient Temperature) AP-42, Chapter 7.1, Equation 1-27	= (TAX (°R) + TAN (°R)) / 2 =	511.77	°R
		11.16	°C
T_B (Liquid Bulk Temperature) AP-42, Chapter 7.1, Equation 1-28	= (TAA (R) + (6 x α) - 1) =	511.79	°R
		11.17	°C
T_{LA} (Daily Average Liquid Surface Temperature) AP-42, Chapter 7.1, Equation 1-26	= 0.44 TAA + 0.56 TB + 0.0079 α I =	513.35	°R
		12.03	°C

ΔT_A (Daily Ambient Temperature Range) AP-42, Chapter 7.1, Equation 1-12	= (TAX (°R) - TAN (°R)) =	19.80	°R
		-262.16	°C
ΔT_V (Daily Vapor Temperature Range) AP-42, Chapter 7.1, Equation 1-8	= 0.72 ΔTA + 0.028 α I =	19.80	°R
		-262.16	°C
T_{LX} (Maximum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA + 0.25 ΔTV =	518.30	°R
		14.78	°C
T_{LN} (Minimum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA - 0.25 ΔTV =	508.40	°R
		9.28	°C

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Blended Fuel

(continued from previous page)

Liquid Properties

Average Density of the Liquid - All Components					
Component	**Specific Gravity**	**Density (lb/gal)**	**Wt %**	**Product of Density x Weight %**	**Notes**
Acetone	0.7949	6.6277	3.8020%	0.2520	Wt % from site sampling, S.G. from wikipedia
Aliphatics	0.7075	5.8990	3.0840%	0.1819	
Alkyl Benzenes	0.9000	7.5040	14.6540%	1.0996	
Benzene	0.8760	7.3039	0.0170%	0.0012	
Butanol	0.8050	6.7119	1.0040%	0.0674	
Butyl Acetate	0.8825	7.3581	1.9370%	0.1425	
Cresol-m	1.0350	8.6296	1.5780%	0.1362	
Cyclohexanone	0.9478	7.9026	3.1560%	0.2494	
Ethyl Alcohol	0.7890	6.5785	1.1480%	0.0755	
Ethyl Benzene	0.8665	7.2247	1.4980%	0.1082	
Glycol Ethers	1.1132	9.2816	0.8610%	0.0799	
Hexane	0.6548	5.4596	1.3630%	0.0744	
Isopropyl Alcohol	0.7860	6.5535	6.2410%	0.4090	
Methyl Alcohol	0.7920	6.6035	1.6500%	0.1090	
Methyl Ethyl Ketone	0.8050	6.7119	1.6500%	0.1107	
Methyl Isobutyl Ketone	0.8020	6.6869	0.6600%	0.0441	
Methyl t-Butyl Ether	0.7404	6.1733	0.6460%	0.0399	
Methylene Chloride	1.3266	11.0609	0.7890%	0.0873	
Naphthalene	1.3289	11.0801	0.4300%	0.0476	
Tetrahydrofuran	0.8900	7.4206	0.4300%	0.0319	
Toluene	0.8709	7.2614	9.3230%	0.6770	
Trichloroethane, 1,1,1-	1.3200	11.0059	0.2870%	0.0316	
Trichloroethylene	1.4719	12.2724	0.2150%	0.0264	
Trimethylbenzene, 1,2,4	0.8761	7.3047	0.0810%	0.0059	
Water, Oil, Dirt (solids)	1.0000	8.3378	27.9440%	2.3299	
Xylene	0.8688	7.2439	15.5530%	1.1266	
Total Weight % =			100.00%	----------	----------
Avg. Liquid Density = (Sum Density x Wt %) / Total Wt% =				7.5453	----------
Tank Throughput (lb/yr) = Throughput (gallons/yr) x Density (lb/gallon) =					1,311,975,632.16

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Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Blended Fuel

(continued from previous page)

HAP and VOC with Antoine Coefficients							
Basis :	**100**	**lbs fluid**					
Component	**Mol. Weight**	**Weight %**	**Weight (lbs)**	**Moles**	**Mole %**	**HAP (YES/NO)**	**VOC (YES/NO)**
Acetone	58.08	3.80%	3.8020	0.0655	2.7547%	NO	NO
Aliphatics	73.14	3.08%	3.0840	0.0422	1.7744%	NO	YES
Alkyl Benzenes	134.22	14.65%	14.6540	0.1092	4.5944%	YES	YES
Benzene	78.11	0.02%	0.0170	0.0002	0.0092%	YES	YES
Butanol	74.12	1.00%	1.0040	0.0135	0.5700%	NO	YES
Butyl Acetate	116.16	1.94%	1.9370	0.0167	0.7017%	NO	YES
Cresol-m	108.10	1.58%	1.5780	0.0146	0.6143%	YES	YES
Cyclohexanone	98.20	3.16%	3.1560	0.0321	1.3524%	NO	YES
Ethyl Alcohol	46.07	1.15%	1.1480	0.0249	1.0486%	NO	YES
Ethyl Benzene	106.17	1.50%	1.4980	0.0141	0.5937%	YES	YES
Glycol Ethers	62.07	0.86%	0.8610	0.0139	0.5837%	YES	YES
Hexane	86.17	1.36%	1.3630	0.0158	0.6656%	YES	YES
Isopropyl Alcohol	60.09	6.24%	6.2410	0.1039	4.3706%	NO	YES
Methyl Alcohol	32.04	1.65%	1.6500	0.0515	2.1671%	YES	YES
Methyl Ethyl Ketone	72.10	1.65%	1.6500	0.0229	0.9630%	NO	YES
Methyl Isobutyl Ketone	100.20	0.66%	0.6600	0.0066	0.2772%	YES	YES
Methyl t-Butyl Ether	88.15	0.65%	0.6460	0.0073	0.3084%	YES	YES
Methylene Chloride	84.94	0.79%	0.7890	0.0093	0.3909%	YES	NO
Naphthalene	128.20	0.43%	0.4300	0.0034	0.1411%	YES	YES
Tetrahydrofuran	72.12	0.43%	0.4300	0.0060	0.2509%	YES	YES
Toluene	92.13	9.32%	9.3230	0.1012	4.2584%	YES	YES
Trichloroethane, 1,1,1-	133.42	0.29%	0.2870	0.0022	0.0905%	YES	YES
Trichloroethylene	131.40	0.22%	0.2150	0.0016	0.0689%	YES	YES
Trimethylbenzene, 1,2,4	120.19	0.08%	0.0810	0.0007	0.0284%	NO	YES
Water, Oil, Dirt (solids)	18.02	27.94%	27.9440	1.5507	65.2570%	NO	NO
Xylene	106.17	15.55%	15.5530	0.1465	6.1646%	YES	YES
Totals		100.00%	100.00	2.38	100.00%	---	---

HAP or VOC without Antoine Coefficients - Assume 100% Volatilization					
Component	**Tank Throughput (lb/yr)**	**Component Wt%**	**Total Emissions (lb/yr)**	**HAP (YES/NO)**	**VOC (YES/NO)**

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Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Blended Fuel (continued from previous page)

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Antoine Coefficients for Vapor Pressure Estimation

Antoine Equation Data

Compound	A	B	C	Valid Range (Celsius)	Source
Acetone	7.3141	1,315.67	240.4790	-94.70 to 235.05	Yaws Handbook of Vapor Pressure, 2007
Aliphatics	6.5570	829.07	170.0770	-46.00 to 223.45	Yaws Handbook of Vapor Pressure, 2007
Alkyl Benzenes	7.1847	1,720.37	216.4130	-87.85 to 387.40	Yaws Handbook of Vapor Pressure, 2007
Benzene	6.8140	1,090.43	197.1460	-40.00 to 288.90	Yaws Handbook of Vapor Pressure, 2007
Butanol	7.2906	1,282.85	173.2470	-37.00 to 289.90	Yaws Handbook of Vapor Pressure, 2007
Butyl Acetate	7.2341	1,515.76	222.0770	-73.50 to 306.50	Yaws Handbook of Vapor Pressure, 2007
Cresol-m	6.8749	1,303.18	124.0000	20.80 to 432.70	Yaws Handbook of Vapor Pressure, 2007
Cyclohexanone	7.6065	1,884.55	243.0360	-31.15 to 356.00	Yaws Handbook of Vapor Pressure, 2007
Ethyl Alcohol	8.1348	1,662.48	238.1310	-114.10 to 243.10	Yaws Handbook of Vapor Pressure, 2007
Ethyl Benzene	7.1561	1,559.55	228.5820	-94.95 to 344.02	Yaws Handbook of Vapor Pressure, 2007
Glycol Ethers	9.6994	3,147.10	264.2460	-13.00 to 371.85	Yaws Handbook of Vapor Pressure, 2007
Hexane	6.9895	1,216.92	227.4510	-95.31 to 234.28	Yaws Handbook of Vapor Pressure, 2007
Isopropyl Alcohol	7.8306	1,483.30	217.4130	-87.87 to 235.16	Yaws Handbook of Vapor Pressure, 2007
Methyl Alcohol	8.0913	1,582.91	239.0960	-97.68 to 239.43	Yaws Handbook of Vapor Pressure, 2007
Methyl Ethyl Ketone	7.2010	1,325.15	227.0930	-85.00 to 262.35	Yaws Handbook of Vapor Pressure, 2007
Methyl Isobutyl Ketone	7.1597	1,421.73	216.2660	-84.00 to 298.25	Yaws Handbook of Vapor Pressure, 2007
Methyl t-Butyl Ether	7.0760	1,233.70	238.8790	-108.60 to 223.95	Yaws Handbook of Vapor Pressure, 2007
Methylene Chloride	7.1146	1,152.41	232.4420	-95.14 to 236.85	Yaws Handbook of Vapor Pressure, 2007
Naphthalene	6.8912	1,551.48	168.8790	3.2 to 475.25	Yaws Handbook of Vapor Pressure, 2007
Tetrahydrofuran	7.1054	1,256.68	232.6210	-108.50 to 267.00	Yaws Handbook of Vapor Pressure, 2007
Toluene	7.1362	1,457.29	231.8270	-94.97 to 318.64	Yaws Handbook of Vapor Pressure, 2007
Trichloroethane, 1,1,1-	7.0072	1,253.20	229.6240	-30.40 to 271.85	Yaws Handbook of Vapor Pressure, 2007
Trichloroethylene	6.8798	1,157.83	202.5800	-74.00 to 297.85	Yaws Handbook of Vapor Pressure, 2007
Trimethylbenzene, 1,2,4	7.2933	1,763.35	230.2480	-43.77 to 375.98	Yaws Handbook of Vapor Pressure, 2007
Water, Oil, Dirt (solids)	8.0557	1,723.64	233.0800	0.01 to 373.98	Yaws Handbook of Vapor Pressure, 2007
Xylene	7.2122	1,546.92	217.1440	-2.66 to 197.02	Yaws Handbook of Vapor Pressure, 2007

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Blended Fuel

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Vapor Pressure Calculations

Use Antoine Equation from AP-42, Chapter 7.1, Page 7.1-94:

Log P = A - [B / (T + C)] **Where: P = Vapor Pressure in mmHg**

T = Temperature in °C

T_{LN} (°C) = 9.28 T_{LA} (°C) = 12.03 T_{LX} (°C) = 14.78

Compound	mmHg			bar			psi		
	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	111.2674	126.9807	144.5011	0.1483	0.1693	0.1927	2.1516	2.4554	2.7942
Aliphatics	86.0030	100.9990	118.0440	0.1147	0.1347	0.1574	1.6630	1.9530	2.2826
Alkyl Benzenes	0.3648	0.4507	0.5539	4.86E-04	6.01E-04	7.38E-04	0.0071	0.0087	0.0107
Benzene	34.0101	39.9076	46.6338	4.53E-02	5.32E-02	6.22E-02	0.6576	0.7717	0.9017
Butanol	1.8296	2.3264	2.9373	2.44E-03	3.10E-03	3.92E-03	0.0354	0.0450	0.0568
Butyl Acetate	4.8139	5.7472	6.8332	0.0064	0.0077	0.0091	0.0931	0.1111	0.1321
Cresol-m	1.25E-03	1.97E-03	3.05E-03	1.67E-06	2.63E-06	4.07E-06	2.42E-05	3.81E-05	5.90E-05
Cyclohexanone	1.3726	1.6522	1.9809	0.0018	0.0022	0.0026	0.0265	0.0319	0.0383
Ethyl Alcohol	26.0205	30.8449	36.4287	0.0347	0.0411	0.0486	0.5032	0.5964	0.7044
Ethyl Benzene	3.9773	4.7263	5.5945	0.0053	0.0063	0.0075	0.0769	0.0914	0.1082
Glycol Ethers	0.0156	0.0203	0.0263	2.08E-05	2.71E-05	3.51E-05	3.02E-04	3.93E-04	5.09E-04
Hexane	70.6320	80.9153	92.4101	0.0942	0.1079	0.1232	1.3658	1.5646	1.7869
Isopropyl Alcohol	19.3790	23.2143	27.6899	0.0258	0.0309	0.0369	0.3747	0.4489	0.5354
Methyl Alcohol	52.2658	61.3771	71.8264	0.0697	0.0818	0.0958	1.0107	1.1868	1.3889
Methyl Ethyl Ketone	39.3413	45.6374	52.7629	0.0525	0.0608	0.0703	0.7607	0.8825	1.0203
Methyl Isobutyl Ketone	7.1814	8.5534	10.1453	0.0096	0.0114	0.0135	0.1389	0.1654	0.1962
Methyl t-Butyl Ether	127.2166	144.2219	163.0562	0.1696	0.1923	0.2174	2.4600	2.7888	3.1530
Methylene Chloride	222.3943	251.6240	283.9145	0.2965	0.3355	0.3785	4.3004	4.8656	5.4900
Naphthalene	0.0152	0.0207	0.0278	2.03E-05	2.75E-05	3.70E-05	2.95E-04	4.00E-04	5.37E-04
Tetrahydrofuran	81.3472	93.0545	106.1290	0.1085	0.1241	0.1415	1.5730	1.7994	2.0522
Toluene	12.3609	14.4614	16.8597	0.0165	0.0193	0.0225	0.2390	0.2796	0.3260
Trichloroethane, 1,1,1-	57.7534	66.2631	75.7920	0.0770	0.0883	0.1010	1.1168	1.2813	1.4656
Trichloroethylene	25.9860	30.5329	35.7294	0.0346	0.0407	0.0476	0.5025	0.5904	0.6909
Trimethylbenzene, 1,2,4	0.8541	1.0353	1.2496	0.0011	0.0014	0.0017	0.0165	0.0200	0.0242
Water, Oil, Dirt (solids)	8.7866	10.5587	12.6367	0.0117	0.0141	0.0168	0.1699	0.2042	0.2444
Xylene	2.4000	2.8986	3.4852	0.0032	0.0039	0.0046	0.0464	0.0561	0.0674
Total Pressures	997.59	1148.0260	1317.25	1.3300	1.5306	1.7562	19.2902	22.1992	25.4715

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Raoult's Law Calculations for Vapor Partial Pressures

Raoult's Law $P_{partial\ of\ i} = X_i \times P_{vap\ of\ i}$

Where: $P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
$P_{vap\ of\ i}$ is the vapor pressure of pure i
X_i is the liquid mole fraction of i

$Y_i = P_{partial\ of\ i} / P_{total}$

Y_i is the vapor phase mole fraction of component i
$P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
P_{total} is the total pressure of all components in the vapor phase

Compound	X_i	$P_{vap\ of\ i}$ (psi)			$P_{partial\ of\ i}$ (psi)			Y_i		
		T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	2.75%	2.1516	2.4554	2.7942	0.0593	0.0676	0.0770	19.44%	18.89%	18.36%
Aliphatics	1.77%	1.6630	1.9530	2.2826	0.0295	0.0347	0.0405	9.681%	9.679%	9.661%
Alkyl Benzenes	4.59%	0.0071	0.0087	0.0107	3.24E-04	4.00E-04	4.92E-04	0.106%	0.112%	0.117%
Benzene	0.01%	0.6576	0.7717	0.9017	6.02E-05	7.07E-05	8.26E-05	0.020%	0.020%	0.020%
Butanol	0.57%	0.0354	0.0450	0.0568	2.02E-04	2.56E-04	3.24E-04	0.066%	0.072%	0.077%
Butyl Acetate	0.70%	0.0931	0.1111	0.1321	6.53E-04	7.80E-04	9.27E-04	0.214%	0.218%	0.221%
Cresol-m	0.61%	2.42E-05	3.81E-05	5.90E-05	1.49E-07	2.34E-07	3.63E-07	0.00005%	0.0001%	0.0001%
Cyclohexanone	1.35%	0.0265	0.0319	0.0383	0.0004	0.0004	0.0005	0.118%	0.121%	0.124%
Ethyl Alcohol	1.05%	0.5032	0.5964	0.7044	0.0053	0.0063	0.0074	1.731%	1.747%	1.762%
Ethyl Benzene	0.59%	0.0769	0.0914	0.1082	0.0005	0.0005	0.0006	0.150%	0.152%	0.153%
Glycol Ethers	0.58%	3.02E-04	3.93E-04	5.09E-04	1.76E-06	2.30E-06	2.97E-06	0.001%	0.001%	0.001%
Hexane	0.67%	1.3658	1.5646	1.7869	0.0091	0.0104	0.0119	2.98%	2.91%	2.84%
Isopropyl Alcohol	4.37%	0.3747	0.4489	0.5354	0.0164	0.0196	0.0234	5.37%	5.48%	5.58%
Methyl Alcohol	2.17%	1.0107	1.1868	1.3889	0.0219	0.0257	0.0301	7.19%	7.18%	7.18%
Methyl Ethyl Ketone	0.96%	0.7607	0.8825	1.0203	0.0073	0.0085	0.0098	2.40%	2.37%	2.34%
Methyl Isobutyl Ketone	0.28%	0.1389	0.1654	0.1962	0.0004	0.0005	0.0005	0.13%	0.13%	0.13%
Methyl t-Butyl Ether	0.31%	2.4600	2.7888	3.1530	0.0076	0.0086	0.0097	2.49%	2.40%	2.32%
Methylene Chloride	0.39%	4.3004	4.8656	5.4900	0.0168	0.0190	0.0215	5.51%	5.31%	5.12%
Naphthalene	0.14%	0.0003	0.0004	0.0005	4.16E-07	5.64E-07	7.58E-07	0.0001%	0.0002%	0.0002%
Tetrahydrofuran	0.25%	1.5730	1.7994	2.0522	0.0039	0.0045	0.0051	1.29%	1.26%	1.23%
Toluene	4.26%	0.2390	0.2796	0.3260	0.0102	0.0119	0.0139	3.34%	3.33%	3.31%
Trichloroethane, 1,1,1-	0.09%	1.1168	1.2813	1.4656	0.0010	0.0012	0.0013	0.33%	0.32%	0.32%
Trichloroethylene	0.07%	0.5025	0.5904	0.6909	0.0003	0.0004	0.0005	0.11%	0.11%	0.11%
Trimethylbenzene, 1,2,4	0.03%	0.0165	0.0200	0.0242	4.68E-06	5.68E-06	6.85E-06	0.002%	0.002%	0.002%
Water, Oil, Dirt (solids)	65.26%	0.1699	0.2042	0.2444	0.1109	0.1332	0.1595	36.37%	37.21%	38.03%
Xylene	6.16%	0.0464	0.0561	0.0674	0.0029	0.0035	0.0042	0.94%	0.97%	0.99%
Totals	100.00%	19.2902	22.1992	25.4715	0.3048	0.3581	0.4193	100.00%	100.00%	100.00%

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Calculate Stock Density (lb/cubic foot)

M_V Calculation			
Compound	**MW**	**Y_i**	**MW x Y_i**
Acetone	58.08	18.89%	10.9719
Aliphatics	73.14	9.68%	7.0789
Alkyl Benzenes	134.22	0.11%	0.1501
Benzene	78.11	0.02%	0.0154
Butanol	74.12	0.07%	0.0531
Butyl Acetate	116.16	0.22%	0.2530
Cresol-m	108.10	0.00%	0.0001
Cyclohexanone	98.20	0.12%	0.1185
Ethyl Alcohol	46.07	1.75%	0.8047
Ethyl Benzene	106.17	0.15%	0.1609
Glycol Ethers	62.07	0.00%	0.0004
Hexane	86.17	2.91%	2.5065
Isopropyl Alcohol	60.09	5.48%	3.2926
Methyl Alcohol	32.04	7.18%	2.3016
Methyl Ethyl Ketone	72.10	2.37%	1.7113
Methyl Isobutyl Ketone	100.20	0.13%	0.1283
Methyl t-Butyl Ether	88.15	2.40%	2.1174
Methylene Chloride	84.94	5.31%	4.5119
Naphthalene	128.20	0.00%	0.0002
Tetrahydrofuran	72.12	1.26%	0.9094
Toluene	92.13	3.33%	3.0641
Trichloroethane, 1,1,1-	133.42	0.32%	0.4322
Trichloroethylene	131.40	0.11%	0.1492
Trimethylbenzene, 1,2,4	120.19	0.00%	0.0019
Water, Oil, Dirt (solids)	18.02	37.21%	6.7055
Xylene	106.17	0.97%	1.0246
M_V = Sum (MW_i x Y_i)			**48.4636**

Stock Density

$$W_V = (M_V \times P_{VA}) / (R \times T_{LA})$$

Where: W_V is the stock density in lb/cubic foot

M_V is the molecular weight of the vapor

P_{VA} is the total pressure of the mixture in psia

R ideal gas constant
(10.731 psia cubic foot / lb-mole °R)

T_{LA} is the daily average liquid temperature in °R

M_V = 48.46 (see below)

P_{VA} = 0.3581 psi

R = 10.731 psia cubic foot / lb-mole °R

T_{LA} = 513.35 °R

W_V = (48.46 x 0.3581) / (10.731 x 513.35)

W_V = 0.0031 lb/cubic foot

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Calculate Vapor Space Expansion Factor (K_E)

$K_E = (\Delta T_V / T_{LA}) + (\Delta P_V - \Delta P_B) / (P_A - P_{VA})$ AP-42, Chapter 7.1, Equation 1-7

Where:
K_E = Vapor Space Expansion Factor (Calculated Below)
ΔT_V = 19.80 (°R - Daily Vapor Temperature Range)
T_{LA} = 513.35 (°R - Average Daily Liquid Surface Temperature)
ΔP_V = Daily Vapor Pressure Range (Calcuated Below)
ΔP_B = Breather Vent Pressure Setting Range (Calcuated Below)
P_A = 14.7 (psia - Atmospheric Pressure)
P_{VA} = 0.3581 (psia - Total Mixture Pressure)

ΔP_V

$\Delta P_V = P_{LX} - P_{LN}$

Where: ΔP_V is the daily vapor pressure range
P_{LX} = 0.4193 psi
P_{LN} = 0.3048 psi

ΔP_V = 0.419253547358546 - 0.304812927869811 = 0.1144 psi

ΔP_B

$\Delta P_B = P_{BP} - P_{BV}$

Where: ΔP_B is the breather vent pressure setting range
P_{BP} = 0.03 psi
P_{BV} = -0.03 psi

ΔP_B = (0.03) - (-0.03) = 0.06 psi

K_E = 0.042366 (Unitless)
If KE is less than zero, it is assumed to be zero.

Calculate Vented Vapor Space Saturation Factor (K_S)

$K_S = 1 / (1 + 0.053 (P_{VA}) (H_{VO}))$ AP-42, Chapter 7.1, Equation 1-20

Where: Ks is the vented vapor space saturation factor
P_{VA} is the total mixture pressure P_{VA} = 0.3581 psi
H_{VO} is the vapor space outage H_{VO} = 1.9465 Ft

$K_S = 1 / (1 + 0.053 (0.3581) (1.9465)$ = 0.964378 (Unitless)

Loss Calculations (HAP and VOC Emissions)

Standing Storage Loss	L_S (lb/yr)	$= 365 (W_V)(V_V)(K_E)(K_S)$
Working Loss	L_W (lb/yr)	$= 0.0010 (M_V)(P_{VA})(Q)(K_N)(K_P)$
Total Loss	L_T (lb/yr)	$= L_S + L_W$

Where:
W_V = 0.00314975 Vapor Density in lb/cubic feet
V_V = 1,375.90 Vapor Space Volume in cubic feet
K_E = 0.04236608 Vapor Space Expansion Factor
K_S = 0.9643777 Vented Vapor Space Saturation Factor - See Above for Calculation
M_V = 48.46 Molecular Weight of the Vapor in lb/lb-mole
P_{VA} = 0.3581 Total Mixture Pressure in psi
Q = 4,140,020 bbl/yr
K_N = 0.2 working turnovers
K_P = 1.0 working loss product factor, unitless

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 150,000 Gallon Storage Tank - T7 - Blended Fuel

(continued from previous page)

Standing Storage Loss		
L_S (lb/yr)	64.63	lb/yr
Working Loss		
L_W (lb/yr)	13,831.43	lb/yr
Total Loss		
L_T (lb/yr)	13,896.06	lb/yr

Individual Compound Emissions

Basis:	100	lb-moles of vapor for weight fraction calculation
Total Emissions:	13,896.06	lb/yr
Control Efficiency:	95%	

Compound Information						PTE Calculations					
Compound	**Yi**	**lb-moles**	**MW**	**Pounds**	**Weight %**	**PTE VOC (lb/yr)**	**PTE HAP (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**	**PTE VOC w/control (TPY)**	**PTE HAP w/control (TPY)**
Acetone	18.89%	18.89104	58.08	1,097.19	22.64%						
Aliphatics	9.68%	9.678532	73.14	707.89	14.61%	2,029.74		1.01		0.05	
Alkyl Benzenes	0.11%	0.111822	134.22	15.01	0.31%	43.04	43.04	0.02	0.02	1.1E-03	1.1E-03
Benzene	0.02%	0.019739	78.11	1.54	0.03%	4.42	4.42	2.2E-03	2.21E-03	1.1E-04	1.1E-04
Butanol	0.07%	0.071617	74.12	5.31	0.11%	15.22		7.6E-03		3.8E-04	
Butyl Acetate	0.22%	0.2178	116.16	25.30	0.52%	72.54		0.04		1.8E-03	
Cresol-m	0.0001%	6.54E-05	108.10	0.01	0.0001%	0.02	0.02	1.01E-05	1.01E-05	5.07E-07	5.1E-07
Cyclohexanone	0.12%	0.120674	98.20	11.85	0.24%	33.98		0.02		8.5E-04	
Ethyl Alcohol	1.75%	1.746785	46.07	80.47	1.66%	230.75		0.12		5.8E-03	
Ethyl Benzene	0.15%	0.151553	106.17	16.09	0.33%	46.14	46.14	0.02	0.02	1.2E-03	1.2E-03
Glycol Ethers	0.001%	0.000641	62.07	0.04	0.001%	0.11	0.11	5.71E-05	5.71E-05	2.85E-06	2.85E-06
Hexane	2.91%	2.908728	86.17	250.65	5.17%	718.68	718.68	0.36	0.36	0.02	0.02
Isopropyl Alcohol	5.48%	5.479489	60.09	329.26	6.79%	944.10		0.47		0.02	
Methyl Alcohol	7.18%	7.183415	32.04	230.16	4.75%	659.93	659.93	0.33	0.33	0.02	0.02
Methyl Ethyl Ketone	2.37%	2.373575	72.10	171.13	3.53%	490.70		0.25		0.01	
Methyl Isobutyl Ketone	0.13%	0.128041	100.20	12.83	0.26%	36.79	36.79	0.02	0.02	9.20E-04	9.20E-04
Methyl t-Butyl Ether	2.40%	2.402007	88.15	211.74	4.37%	607.12	607.12	0.30	0.30	0.02	0.02
Methylene Chloride	5.31%	5.311898	84.94	451.19	9.31%		1,293.71		0.65		0.03
Naphthalene	0.0002%	0.000157	128.20	0.02	0.0004%	0.06	0.06	2.89E-05	2.89E-05	1.45E-06	1.45E-06
Tetrahydrofuran	1.26%	1.260907	72.12	90.94	1.88%	260.74	260.74	0.13	0.13	6.52E-03	6.52E-03
Toluene	3.33%	3.325807	92.13	306.41	6.32%	878.57	878.57	0.44	0.44	0.02	0.02
Trichloroethane, 1,1,1-	0.32%	0.323941	133.42	43.22	0.89%	123.93	123.93	0.06	0.06	3.10E-03	3.10E-03
Trichloroethylene	0.11%	0.113539	131.40	14.92	0.31%	42.78	42.78	0.02	0.02	1.07E-03	1.07E-03
Trimethylbenzene, 1,2,4	0.002%	0.001586	120.19	0.19	0.00%	0.55		2.73E-04		1.37E-05	
Water, Oil, Dirt (solids)	37.21%	37.21161	18.02	670.55	13.84%						
Xylene	0.97%	0.965026	106.17	102.46	2.11%	293.78	293.78	0.15	0.15	7.34E-03	7.34E-03
	---	---	---	---	---						
	---	---	---	---	---						
	---	---	---	---	---						
	---	---	---	---	---						
	---	---	---	---	---						
Totals				**4,846.36**	**100.00%**	**7,534**	**5,009.80**	**3.77**	**2.50**	**0.19**	**0.13**

Worst Case HAP	**Methylene Chloride**	**0.65**	**TPY - Uncontrolled**
Worst Case HAP	**Methylene Chloride**	**0.03**	**TPY - After Control**

Appendix A to the Technical Support Document (TSD)
PTE and Emission Factor Calculation - Tank T7

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Throughput for Calculation 173,880,847 gallons/yr
173,881 kgallon/yr

Control Efficiency 95%

						Uncontrolled			After Control		
Pollutant	HAP	VOC	PTE with Cutter (TPY)	PTE with Blended Fuel (TPY)	Worst Case (TPY)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/kgal)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/kgal)
Acetone	NO	NO	---	---	---	not regulated			not regulated		
Aliphatics	NO	YES	2.9340	1.0149	2.9340		2.934	0.034		0.147	0.002
Alkyl Benzenes	YES	YES	0.0621	0.0215	0.0621	0.0621	0.062	7.14E-04	3.11E-03	0.003	3.57E-05
Benzene	YES	YES		0.0022	0.0022	0.0022	2.21E-03	2.54E-05	1.11E-04	1.11E-04	1.27E-06
Butanol	NO	YES	0.0220	0.0076	0.0220		0.022	2.53E-04		1.10E-03	1.27E-05
Butyl Acetate	NO	YES	0.1048	0.0363	0.1048		0.105	1.21E-03		0.005	6.03E-05
Cresol-m	YES	YES	2.93E-05	1.01E-05	2.93E-05	2.93E-05	2.93E-05	3.37E-07	1.47E-06	1.47E-06	1.69E-08
Cyclohexanone	NO	YES	0.0491	0.0170	0.0491		0.049	5.65E-04		0.002	2.82E-05
Ethyl Alcohol	NO	YES	0.3334	0.1154	0.3334		0.333	3.83E-03		0.017	1.92E-04
Ethyl Benzene	YES	YES	0.0639	0.0231	0.0639	0.0639	0.064	7.35E-04	3.19E-03	0.003	3.67E-05
Glycol Ethers	YES	YES	1.65E-04	5.71E-05	1.65E-04	1.65E-04	1.65E-04	1.90E-06	8.24E-06	8.24E-06	9.48E-08
Hexane	YES	YES	1.0386	0.3593	1.0386	1.0386	1.039	0.012	0.05	0.052	5.97E-04
Isopropyl Alcohol	NO	YES	1.3644	0.4721	1.3644		1.364	0.016		0.068	7.85E-04
Methyl Alcohol	YES	YES	0.9537	0.3300	0.9537	0.9537	0.954	0.011	0.05	0.048	5.48E-04
Methyl Ethyl Ketone	NO	YES	0.7091	0.2453	0.7091		0.709	8.16E-03		0.035	4.08E-04
Methyl Isobutyl Ketone	YES	YES	0.0520	0.0184	0.0520	0.0520	0.052	5.98E-04	2.60E-03	0.003	2.99E-05
Methyl t-Butyl Ether	YES	YES	0.8769	0.3036	0.8769	0.8769	0.877	0.010	0.04	0.044	5.04E-04
Methylene Chloride	YES	NO	1.8699	0.6469	1.8699	1.8699		0.022	0.09		1.08E-03
Naphthalene	YES	YES	8.37E-05	2.89E-05	8.37E-05	8.37E-05	8.37E-05	9.63E-07	4.19E-06	4.19E-06	4.82E-08
Tetrahydrofuran	YES	YES	0.3772	0.1304	0.3772	0.3772	0.377	0.004	0.02	0.019	2.17E-04
Toluene	YES	YES	1.2603	0.4393	1.2603	1.2603	1.260	0.014	0.06	0.063	7.25E-04
Trichloroethane, 1,1,1-	YES	YES	0.1791	0.0620	0.1791	0.1791	0.179	0.002	8.95E-03	0.009	1.03E-04
Trichloroethylene	YES	YES	0.0619	0.0214	0.0619	0.0619	0.062	7.12E-04	3.09E-03	0.003	3.56E-05
Trimethylbenzene, 1,2,4	NO	YES		2.73E-04	2.73E-04		2.73E-04	3.14E-06		1.37E-05	1.57E-07
Water, Oil, Dirt (solids)	NO	NO	---	---	---	not regulated			not regulated		
Xylene	YES	YES	0.4230	0.1469	0.4230	0.4230	0.423	0.0049	0.02	0.021	2.43E-04
						7.22	**10.87**		**0.36**	**0.54**	

	Uncontrolled PTE				PTE after Control			
VOC	**10.868**	**TPY**	**0.125**	**lb/kgal**	**0.543**	**TPY**	**0.01**	**lb/kgal**
Single HAP - Methylene Chloride	**1.870**	**TPY**	**0.022**	**lb/kgal**	**0.093**	**TPY**	**0.001**	**lb/kgal**
Combined HAP	**7.221**	**TPY**	**0.083**	**lb/kgal**	**0.361**	**TPY**	**0.004**	**lb/kgal**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 100,000 Gallon Storage Tank -T8 Cutter

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

INPUT - CLIMATE DATA - Indianapolis, Indiana				
Tax (Daily Maximum Ambient Temperature)	62.00	°F	16.7 °C	521.67 °R
Tan (Daily Minimum Ambient Temperature)	42.20	°F	5.7 °C	501.87 °R
Daily Solar Isolation Factor (I)	1165	Btu/CF • day	K_N	0.1839
Tank Paint Solar Absorbance (α)	0.17	white	K_P	1.0

Source: AP-42, Chapter 7.1, Table 7.1-7, November 2006
N = The number of annual turnovers per year
K_N (Working Loss Turnover Factor) = (180 + N) / 6N for more than 36 turnovers per year, AP-42, Chapter 7.1, Eq. 1-29.
K_N (Working Loss Turnover Factor) = 1.0 for 36 or less turnovers per year, AP-42, Chapter 7.1, Eq. 1-29
K_p (Working Loss Product Factor) = 0.75 for crude oils and 1.0 for all other organic, AP-42, Chapter 7.1, Eq. 1-31

INPUT - TANK DATA			User Input	
Tank Diameter (D)	24.00	Ft		
Shell Height (Hs)	30.00	Ft	Constant Temperature Tank (Y/N)	N
Stock Liquid Height (Hl)	29.55	Ft	If so, what temperature (°R) ?	
Roof Height (H_R) - See Table to Right	12.00	Ft		
Tank Radius (R_S = D/2)	12.00	Ft	Atmospheric Pressure (psi)	14.7
Cone Roof Slope (S_R in ft/ft - 0.0625 default)	0.0625	Ft/Ft		
Roof Outage (H_{RO}) - See Table to Right	0.2500	Ft	Number of Turnovers (N) per Year	1738.81
Vapor Space Outage ($H_{VO} = H_S - H_L + H_{RO}$)	0.7021	Ft	N = Q (gpy) / Max. Liquid Volume (gallons)	
Tank Vapor Space Volume ($V_V = (\pi/4)D^2 H_{VO}$)	317.61	FT^3		
Max. Liquid Volume = 7.481 $(\pi/4) D^2 H_L$	100,000.00	gallons	Roof Outage	
Breather Vent Pressure Setting (P_{BP})	0.030	psi	Cone Roof $H_{RO} = (1/3)(S_R)(R_S)$ =	0.2500
Breather Vent Vacuum Setting (P_{BV})	-0.030	psi	H_R = D/2 =	12.0000
Annual Throughput (Q)	173,880,847	gal/yr	Dome Roof $H_{RO} = 0.137 R_S$ =	1.6440
Annual Throughput (Q) (1 bbl = 42 gallons)	4,140,020	bbl/yr	$H_R = 0.268 R_S$ =	3.2160

Maximum Fuel Usage	68,760,847	gallon/yr
Recirculation	105,120,000	gallon/yr
Annual Throughput	**173,880,847**	gallon/yr

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - 100,000 Gallon Storage Tank -T8 Cutter

(continued from previous page)

Temperature Calculations (AP-42, Chapter 7.1)

T_{AA} (Daily Average Ambient Temperature) AP-42, Chapter 7.1, Equation 1-27	= (TAX (°R) + TAN (°R)) / 2 =	511.77	°R
		11.16	°C
T_B (Liquid Bulk Temperature) AP-42, Chapter 7.1, Equation 1-28	= (TAA (R) + (6 x α) - 1) =	511.79	°R
		11.17	°C
T_{LA} (Daily Average Liquid Surface Temperature) AP-42, Chapter 7.1, Equation 1-26	= 0.44 TAA + 0.56 TB + 0.0079 α I =	513.35	°R
		12.03	°C

ΔT_A (Daily Ambient Temperature Range) AP-42, Chapter 7.1, Equation 1-12	= (TAX (°R) - TAN (°R)) =	19.80	°R
		-262.16	°C
ΔT_V (Daily Vapor Temperature Range) AP-42, Chapter 7.1, Equation 1-8	= 0.72 ΔTA + 0.028 α I =	19.80	°R
		-262.16	°C
T_{LX} (Maximum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA + 0.25 ΔTV =	518.30	°R
		14.78	°C
T_{LN} (Minimum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA - 0.25 ΔTV =	508.40	°R
		9.28	°C

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - 100,000 Gallon Storage Tank -T8 Cutter

(continued from previous page)

Liquid Properties

Average Density of the Liquid - All Components					
Component	**Specific Gravity**	**Density (lb/gal)**	**Wt %**	**Product of Density x Weight %**	**Notes**
Acetone	0.7949	6.6277	5.3000%	0.3513	Wt % from site sampling, S.G. from wikipedia
Aliphatics (Diethylamine Similar)	0.7075	5.8990	4.3000%	0.2537	
Alkyl Benzenes (Butyl Benzene Similar)	0.9000	7.5040	20.4000%	1.5308	
Butanol	0.8050	6.7119	1.4000%	0.0940	
Butyl Acetate	0.8825	7.3581	2.7000%	0.1987	
Cresol-m	1.0350	8.6296	2.2000%	0.1899	
Cyclohexanone	0.9478	7.9026	4.4000%	0.3477	
Ethyl Alcohol	0.7890	6.5785	1.6000%	0.1053	
Ethyl Benzene	0.8665	7.2247	2.0000%	0.1445	
Glycol Ethers (Ethylene Glycol Similar)	1.1132	9.2816	1.2000%	0.1114	
Hexane	0.6548	5.4596	1.9000%	0.1037	
Isopropyl Alcohol	0.7860	6.5535	8.7000%	0.5702	
Methyl Alcohol	0.7920	6.6035	2.3000%	0.1519	
Methyl Ethyl Ketone	0.8050	6.7119	2.3000%	0.1544	
Methyl Isobutyl Ketone	0.8020	6.6869	0.9000%	0.0602	
Methyl t-Butyl Ether	0.7404	6.1733	0.9000%	0.0556	
Methylene Chloride	1.3266	11.0609	1.1000%	0.1217	
Naphthalene	1.3289	11.0801	0.6000%	0.0665	
Tetrahydrofuran	0.8900	7.4206	0.6000%	0.0445	
Toluene	0.8709	7.2614	12.9000%	0.9367	
Trichloroethane, 1,1,1-	1.3200	11.0059	0.4000%	0.0440	
Trichloroethylene	1.4719	12.2724	0.3000%	0.0368	
Xylene	0.8688	7.2439	21.6000%	1.5647	
Total Weight % =			100.00%	----------	----------
Avg. Liquid Density = (Sum Density x Wt %) / Total Wt% =				7.2379	----------
Tank Throughput (lb/yr) = Throughput (gallons/yr) x Density (lb/gallon) =					1,258,527,313.84

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - 100,000 Gallon Storage Tank -T8 Cutter

(continued from previous page)

HAP and VOC with Antoine Coefficients							
Basis :	**100**	**lbs fluid**					
Component	**Mol. Weight**	**Weight %**	**Weight (lbs)**	**Moles**	**Mole %**	**HAP (YES/NO)**	**VOC (YES/NO)**
Acetone	58.08	5.30%	5.3000	0.0913	7.9584%	NO	NO
Aliphatics (Diethylamine Similar)	73.14	4.30%	4.3000	0.0588	5.1273%	NO	YES
Alkyl Benzenes (Butyl Benzene Similar)	134.22	20.40%	20.4000	0.1520	13.2553%	YES	YES
Butanol	74.12	1.40%	1.4000	0.0189	1.6473%	NO	YES
Butyl Acetate	116.16	2.70%	2.7000	0.0232	2.0271%	NO	YES
Cresol-m	108.10	2.20%	2.2000	0.0204	1.7749%	YES	YES
Cyclohexanone	98.20	4.40%	4.4000	0.0448	3.9077%	NO	YES
Ethyl Alcohol	46.07	1.60%	1.6000	0.0347	3.0288%	NO	YES
Ethyl Benzene	106.17	2.00%	2.0000	0.0188	1.6429%	YES	YES
Glycol Ethers (Ethylene Glycol Similar)	62.07	1.20%	1.2000	0.0193	1.6861%	YES	YES
Hexane	86.17	1.90%	1.9000	0.0220	1.9230%	YES	YES
Isopropyl Alcohol	60.09	8.70%	8.7000	0.1448	12.6268%	NO	YES
Methyl Alcohol	32.04	2.30%	2.3000	0.0718	6.2605%	YES	YES
Methyl Ethyl Ketone	72.10	2.30%	2.3000	0.0319	2.7821%	NO	YES
Methyl Isobutyl Ketone	100.20	0.90%	0.9000	0.0090	0.7833%	YES	YES
Methyl t-Butyl Ether	88.15	0.90%	0.9000	0.0102	0.8904%	YES	YES
Methylene Chloride	84.94	1.10%	1.1000	0.0130	1.1294%	YES	NO
Naphthalene	128.20	0.60%	0.6000	0.0047	0.4082%	YES	YES
Tetrahydrofuran	72.12	0.60%	0.6000	0.0083	0.7256%	YES	YES
Toluene	92.13	12.90%	12.9000	0.1400	12.2114%	YES	YES
Trichloroethane, 1,1,1-	133.42	0.40%	0.4000	0.0030	0.2615%	YES	YES
Trichloroethylene	131.40	0.30%	0.3000	0.0023	0.1991%	YES	YES
Xylene	106.17	21.60%	21.6000	0.2034	17.7430%	YES	YES
Totals		100.00%	100.00	1.15	100.00%	---	---

HAP or VOC without Antoine Coefficients - Assume 100% Volatilization					
Component	**Tank Throughput (lb/yr)**	**Component Wt%**	**Total Emissions (lb/yr)**	**HAP (YES/NO)**	**VOC (YES/NO)**

(continued on next page)

Potential to Emit - 100,000 Gallon Storage Tank -T8 Cutter
(continued from previous page)

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Antoine Coefficients for Vapor Pressure Estimation

Antoine Equation Data

Compound	A	B	C	Valid Range (Celsius)	Source
Acetone	7.3141	1,315.67	240.4790	-94.70 to 235.05	Yaws Handbook of Vapor Pressure, 2007
Aliphatics (Diethylamine Similar)	6.5570	829.07	170.0770	-46.00 to 223.45	Yaws Handbook of Vapor Pressure, 2007
Alkyl Benzenes (Butyl Benzene Similar)	7.1847	1,720.37	216.4130	-87.85 to 387.40	Yaws Handbook of Vapor Pressure, 2007
Butanol	7.2906	1,282.85	173.2470	-37.00 to 289.90	Yaws Handbook of Vapor Pressure, 2007
Butyl Acetate	7.2341	1,515.76	222.0770	-73.50 to 306.50	Yaws Handbook of Vapor Pressure, 2007
Cresol-m	6.8749	1,303.18	124.0000	20.80 to 432.70	Yaws Handbook of Vapor Pressure, 2007
Cyclohexanone	7.6065	1,884.55	243.0360	-31.15 to 356.00	Yaws Handbook of Vapor Pressure, 2007
Ethyl Alcohol	8.1348	1,662.48	238.1310	-114.10 to 243.10	Yaws Handbook of Vapor Pressure, 2007
Ethyl Benzene	7.1561	1,559.55	228.5820	-94.95 to 344.02	Yaws Handbook of Vapor Pressure, 2007
Glycol Ethers (Ethylene Glycol Similar)	9.6994	3,147.10	264.2460	-13.00 to 371.85	Yaws Handbook of Vapor Pressure, 2007
Hexane	6.9895	1,216.92	227.4510	-95.31 to 234.28	Yaws Handbook of Vapor Pressure, 2007
Isopropyl Alcohol	7.8306	1,483.30	217.4130	-87.87 to 235.16	Yaws Handbook of Vapor Pressure, 2007
Methyl Alcohol	8.0913	1,582.91	239.0960	-97.68 to 239.43	Yaws Handbook of Vapor Pressure, 2007
Methyl Ethyl Ketone	7.2010	1,325.15	227.0930	-85.00 to 262.35	Yaws Handbook of Vapor Pressure, 2007
Methyl Isobutyl Ketone	7.1597	1,421.73	216.2660	-84.00 to 298.25	Yaws Handbook of Vapor Pressure, 2007
Methyl t-Butyl Ether	7.0760	1,233.70	238.8790	-108.60 to 223.95	Yaws Handbook of Vapor Pressure, 2007
Methylene Chloride	7.1146	1,152.41	232.4420	-95.14 to 236.85	Yaws Handbook of Vapor Pressure, 2007
Naphthalene	6.8912	1,551.48	168.8790	3.2 to 475.25	Yaws Handbook of Vapor Pressure, 2007
Tetrahydrofuran	7.1054	1,256.68	232.6210	-108.50 to 267.00	Yaws Handbook of Vapor Pressure, 2007
Toluene	7.1362	1,457.29	231.8270	-94.97 to 318.64	Yaws Handbook of Vapor Pressure, 2007
Trichloroethane, 1,1,1-	7.0072	1,253.20	229.6240	-30.40 to 271.85	Yaws Handbook of Vapor Pressure, 2007
Trichloroethylene	6.8798	1,157.83	202.5800	-74.00 to 297.85	Yaws Handbook of Vapor Pressure, 2007
Xylene	7.2122	1,546.92	217.1440	-2.66 to 197.02	Yaws Handbook of Vapor Pressure, 2007

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - 100,000 Gallon Storage Tank -T8 Cutter

(continued from previous page)

Vapor Pressure Calculations

Use Antoine Equation from AP-42, Chapter 7.1, Page 7.1-94:

Log P = A - [B / (T + C)] **Where: P = Vapor Pressure in mmHg**

T = Temperature in °C

T_{LN} (°C) = 9.28 T_{LA} (°C) = 12.03 T_{LX} (°C) = 14.78

Compound	mmHg			bar			psi		
	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	111.2674	126.9807	144.5011	0.1483	0.1693	0.1927	2.1516	2.4554	2.7942
Aliphatics (Diethylamine Similar)	86.0030	100.9990	118.0440	0.1147	0.1347	0.1574	1.6630	1.9530	2.2826
Alkyl Benzenes (Butyl Benzene Similar)	0.3648	0.4507	0.5539	0.0005	0.0006	0.0007	0.0071	0.0087	0.0107
Butanol	1.8296	2.3264	2.9373	0.0024	0.0031	0.0039	0.0354	0.0450	0.0568
Butyl Acetate	4.8139	5.7472	6.8332	0.0064	0.0077	0.0091	0.0931	0.1111	0.1321
Cresol-m	0.0013	0.0020	0.0031	1.67E-06	2.63E-06	4.07E-06	2.42E-05	3.81E-05	5.90E-05
Cyclohexanone	1.3726	1.6522	1.9809	0.0018	0.0022	0.0026	0.0265	0.0319	0.0383
Ethyl Alcohol	26.0205	30.8449	36.4287	0.0347	0.0411	0.0486	0.5032	0.5964	0.7044
Ethyl Benzene	3.9773	4.7263	5.5945	0.0053	0.0063	0.0075	0.0769	0.0914	0.1082
Glycol Ethers (Ethylene Glycol Similar)	0.0156	0.0203	0.0263	2.08E-05	2.71E-05	3.51E-05	3.02E-04	3.93E-04	5.09E-04
Hexane	70.6320	80.9153	92.4101	0.0942	0.1079	0.1232	1.3658	1.5646	1.7869
Isopropyl Alcohol	19.3790	23.2143	27.6899	0.0258	0.0309	0.0369	0.3747	0.4489	0.5354
Methyl Alcohol	52.2658	61.3771	71.8264	0.0697	0.0818	0.0958	1.0107	1.1868	1.3889
Methyl Ethyl Ketone	39.3413	45.6374	52.7629	0.0525	0.0608	0.0703	0.7607	0.8825	1.0203
Methyl Isobutyl Ketone	7.1814	8.5534	10.1453	0.0096	0.0114	0.0135	0.1389	0.1654	0.1962
Methyl t-Butyl Ether	127.2166	144.2219	163.0562	0.1696	0.1923	0.2174	2.4600	2.7888	3.1530
Methylene Chloride	222.3943	251.6240	283.9145	0.2965	0.3355	0.3785	4.3004	4.8656	5.4900
Naphthalene	0.0152	0.0207	0.0278	2.03E-05	2.75E-05	3.70E-05	2.95E-04	4.00E-04	5.37E-04
Tetrahydrofuran	81.3472	93.0545	106.1290	0.1085	0.1241	0.1415	1.5730	1.7994	2.0522
Toluene	12.3609	14.4614	16.8597	0.0165	0.0193	0.0225	0.2390	0.2796	0.3260
Trichloroethane, 1,1,1-	57.7534	66.2631	75.7920	0.0770	0.0883	0.1010	1.1168	1.2813	1.4656
Trichloroethylene	25.9860	30.5329	35.7294	0.0346	0.0407	0.0476	0.5025	0.5904	0.6909
Xylene	2.4000	2.8986	3.4852	0.0032	0.0039	0.0046	0.0464	0.0561	0.0674
Total Pressures	953.94	1096.5243	1256.73	1.2718	1.4619	1.6755	18.4462	21.2033	24.3012

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - 100,000 Gallon Storage Tank -T8 Cutter

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Raoult's Law Calculations for Vapor Partial Pressures

Raoult's Law $P_{partial\ of\ i} = X_i \times P_{vap\ of\ i}$

Where: $P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
$P_{vap\ of\ i}$ is the vapor pressure of pure i
X_i is the liquid mole fraction of i

$Y_i = P_{partial\ of\ i} / P_{total}$

Y_i is the vapor phase mole fraction of component i
$P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
P_{total} is the total pressure of all components in the vapor phase

Compound	X_i	$P_{vap\ of\ i}$ (psi)			$P_{partial\ of\ i}$ (psi)			Y_i		
		T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	7.96%	2.1516	2.4554	2.7942	0.1712	0.1954	0.2224	30.59%	30.11%	29.66%
Aliphatics (Diethylamine Similar)	5.13%	1.6630	1.9530	2.2826	0.0853	0.1001	0.1170	15.232%	15.432%	15.608%
Alkyl Benzenes (Butyl Benzene Similar)	13.26%	0.0071	0.0087	0.0107	0.0009	0.0012	0.0014	0.167%	0.178%	0.189%
Butanol	1.65%	0.0354	0.0450	0.0568	0.0006	0.0007	0.0009	0.104%	0.114%	0.125%
Butyl Acetate	2.03%	0.0931	0.1111	0.1321	0.0019	0.0023	0.0027	0.337%	0.347%	0.357%
Cresol-m	1.77%	2.42E-05	3.81E-05	5.90E-05	4.29E-07	6.77E-07	1.05E-06	0.0001%	0.0001%	0.0001%
Cyclohexanone	3.91%	0.0265	0.0319	0.0383	0.0010	0.0012	0.0015	0.185%	0.192%	0.200%
Ethyl Alcohol	3.03%	0.5032	0.5964	0.7044	0.0152	0.0181	0.0213	2.722%	2.784%	2.845%
Ethyl Benzene	1.64%	0.0769	0.0914	0.1082	0.0013	0.0015	0.0018	0.226%	0.231%	0.237%
Glycol Ethers (Ethylene Glycol Similar)	1.69%	0.0003	0.0004	0.0005	5.09E-06	6.63E-06	8.59E-06	0.001%	0.001%	0.001%
Hexane	1.92%	1.3658	1.5646	1.7869	0.0263	0.0301	0.0344	4.69%	4.64%	4.58%
Isopropyl Alcohol	12.63%	0.3747	0.4489	0.5354	0.0473	0.0567	0.0676	8.45%	8.73%	9.02%
Methyl Alcohol	6.26%	1.0107	1.1868	1.3889	0.0633	0.0743	0.0870	11.30%	11.45%	11.60%
Methyl Ethyl Ketone	2.78%	0.7607	0.8825	1.0203	0.0212	0.0246	0.0284	3.78%	3.78%	3.79%
Methyl Isobutyl Ketone	0.78%	0.1389	0.1654	0.1962	0.0011	0.0013	0.0015	0.19%	0.20%	0.20%
Methyl t-Butyl Ether	0.89%	2.4600	2.7888	3.1530	0.0219	0.0248	0.0281	3.91%	3.83%	3.74%
Methylene Chloride	1.13%	4.3004	4.8656	5.4900	0.0486	0.0550	0.0620	8.68%	8.47%	8.27%
Naphthalene	0.41%	0.0003	0.0004	0.0005	1.20E-06	1.63E-06	2.19E-06	0.0002%	0.0003%	0.0003%
Tetrahydrofuran	0.73%	1.5730	1.7994	2.0522	0.0114	0.0131	0.0149	2.04%	2.01%	1.99%
Toluene	12.21%	0.2390	0.2796	0.3260	0.0292	0.0341	0.0398	5.21%	5.26%	5.31%
Trichloroethane, 1,1,1-	0.26%	1.1168	1.2813	1.4656	0.0029	0.0034	0.0038	0.52%	0.52%	0.51%
Trichloroethylene	0.20%	0.5025	0.5904	0.6909	0.0010	0.0012	0.0014	0.18%	0.18%	0.18%
Xylene	17.74%	0.0464	0.0561	0.0674	0.0082	0.0099	0.0120	1.47%	1.53%	1.59%
Totals	100.00%	18.4462	21.2033	24.3012	0.5598	0.6489	0.7499	100.00%	100.00%	100.00%

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Potential to Emit - 100,000 Gallon Storage Tank -T8 Cutter
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Calculate Stock Density (lb/cubic foot)

M_V Calculation			
Compound	**MW**	**Y_i**	**MW x Y_i**
Acetone	58.08	30.11%	17.4904
Aliphatics (Diethylamine Similar)	73.14	15.43%	11.2868
Alkyl Benzenes (Butyl Benzene Similar)	134.22	0.18%	0.2389
Butanol	74.12	0.11%	0.0846
Butyl Acetate	116.16	0.35%	0.4033
Cresol-m	108.10	0.00%	0.0001
Cyclohexanone	98.20	0.19%	0.1889
Ethyl Alcohol	46.07	2.78%	1.2826
Ethyl Benzene	106.17	0.23%	0.2457
Glycol Ethers (Ethylene Glycol Similar)	62.07	0.00%	0.0006
Hexane	86.17	4.64%	3.9955
Isopropyl Alcohol	60.09	8.73%	5.2488
Methyl Alcohol	32.04	11.45%	3.6688
Methyl Ethyl Ketone	72.10	3.78%	2.7279
Methyl Isobutyl Ketone	100.20	0.20%	0.2001
Methyl t-Butyl Ether	88.15	3.83%	3.3733
Methylene Chloride	84.94	8.47%	7.1933
Naphthalene	128.20	0.00%	0.0003
Tetrahydrofuran	72.12	2.01%	1.4510
Toluene	92.13	5.26%	4.8482
Trichloroethane, 1,1,1-	133.42	0.52%	0.6888
Trichloroethylene	131.40	0.18%	0.2381
Xylene	106.17	1.53%	1.6272
M_V = Sum (MW_i x Y_i)			**66.4833**

Stock Density

$$W_V = (M_V \times P_{VA}) / (R \times T_{LA})$$

Where: W_V is the stock density in lb/cubic foot

M_V is the molecular weight of the vapor

P_{VA} is the total pressure of the mixture in psia

R ideal gas constant
(10.731 psia cubic foot / lb-mole °R)

T_{LA} is the daily average liquid temperature in °R

M_V = 66.48 (see below)

P_{VA} = 0.6489 psi

R = 10.731 psia cubic foot / lb-mole °R

T_{LA} = 513.35 °R

$$W_V = (66.48 \times 0.6489) / (10.731 \times 513.35)$$

W_V = 0.0078 lb/cubic foot

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Potential to Emit - 100,000 Gallon Storage Tank -T8 Cutter

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Calculate Vapor Space Expansion Factor (K_E)

$K_E = (\Delta T_V / T_{LA}) + (\Delta P_V - \Delta P_B) / (P_A - P_{VA})$ AP-42, Chapter 7.1, Equation 1-7

Where:
K_E = Vapor Space Expansion Factor (Calculated Below)
ΔT_V = 19.80 (°R - Daily Vapor Temperature Range)
T_{LA} = 513.35 (°R - Average Daily Liquid Surface Temperature)
ΔP_V = Daily Vapor Pressure Range (Calcuated Below)
ΔP_B = Breather Vent Pressure Setting Range (Calcuated Below)
P_A = 14.7 (psia - Atmospheric Pressure)
P_{VA} = 0.6489 (psia - Total Mixture Pressure)

ΔP_V

$\Delta P_V = P_{LX} - P_{LN}$

Where: ΔP_V is the daily vapor pressure range
P_{LX} = 0.7499 psi
P_{LN} = 0.5598 psi

ΔP_V = 0.7499 - 0.5598 = 0.1901 psi

ΔP_B

$\Delta P_B = P_{BP} - P_{BV}$

Where: ΔP_B is the breather vent pressure setting range
P_{BP} = 0.03 psi
P_{BV} = -0.03 psi

ΔP_B = (0.03) - (-0.03) = 0.06 psi

K_E = 0.047827 (Unitless)
If KE is less than zero, it is assumed to be zero.

Calculate Vented Vapor Space Saturation Factor (K_S)

$K_S = 1 / (1 + 0.053 (P_{VA}) (H_{VO}))$ AP-42, Chapter 7.1, Equation 1-20

Where: Ks is the vented vapor space saturation factor
P_{VA} is the total mixture pressure P_{VA} = 0.6489 psi
H_{VO} is the vapor space outage H_{VO} = 0.7021 Ft

$K_S = 1 / (1 + 0.053 (0.6489) (0.7021)$ = 0.976424 (Unitless)

Loss Calculations (HAP and VOC Emissions)

Standing Storage Loss L_S (lb/yr) $= 365 (W_V)(V_V)(K_E)(K_S)$
Working Loss L_W (lb/yr) $= 0.0010 (M_V)(P_{VA})(Q)(K_N)(K_P)$
Total Loss L_T (lb/yr) $= L_S + L_W$

Where:
W_V = 0.00783093 Vapor Density in lb/cubic feet
V_V = 317.61 Vapor Space Volume in cubic feet
K_E = 0.04782713 Vapor Space Expansion Factor
K_S = 0.97642378 Vented Vapor Space Saturation Factor
M_V = 66.48 Molecular Weight of the Vapor in lb/lb-mole
P_{VA} = 0.6489 Total Mixture Pressure in psi
Q = 4,140,020 bbl/yr
K_N = 0.2 working turnovers
K_P = 1.0 working loss product factor

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Potential to Emit - 100,000 Gallon Storage Tank -T8 Cutter

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Standing Storage Loss		
L_S (lb/yr)	42.39	lb/yr
Working Loss		
L_W (lb/yr)	32,847.17	lb/yr
Total Loss		
L_T (lb/yr)	32,889.56	lb/yr

Individual Compound Emissions

Basis:	100	lb-moles of vapor for weight fraction calculation
Total Emissions:	32,889.56	lb/yr
Control Efficiency:	95%	

Compound Information						PTE Calculations					
Compound	**Yi**	**lb-moles**	**MW**	**Pounds**	**Weight %**	**PTE VOC (lb/yr)**	**PTE HAP (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**	**PTE VOC w/control (TPY)**	**PTE HAP w/control (TPY)**
Acetone	30.11%	30.11427	58.08	1,749.04	26.31%						
Aliphatics (Diethylamine Similar)	15.43%	15.43179	73.14	1,128.68	16.98%	5,583.63		2.79		0.14	
Alkyl Benzenes (Butyl Benzene Similar)	0.18%	0.178015	134.22	23.89	0.36%	118.20	118.20	0.06	0.06	2.96E-03	2.96E-03
Butanol	0.11%	0.114199	74.12	8.46	0.13%	41.87		0.02		1.05E-03	
Butyl Acetate	0.35%	0.347173	116.16	40.33	0.61%	199.50		0.10		4.99E-03	
Cresol-m	0.0001%	0.000104	108.10	0.011	0.0002%	5.58E-02	5.58E-02	2.79E-05	2.79E-05	1.39E-06	1.39E-06
Cyclohexanone	0.19%	0.19239	98.20	18.89	0.28%	93.46		0.05		2.34E-03	
Ethyl Alcohol	2.78%	2.784007	46.07	128.26	1.93%	634.50		0.32		0.02	
Ethyl Benzene	0.23%	0.231386	106.17	24.57	0.37%	121.53	121.53	0.06	0.06	3.04E-03	3.04E-03
Glycol Ethers (Ethylene Glycol Similar)	0.0010%	0.001022	62.07	0.06	0.0010%	0.31	0.31	1.57E-04	1.57E-04	7.84E-06	7.84E-06
Hexane	4.64%	4.636748	86.17	399.55	6.01%	1,976.58	1,976.58	0.99	0.99	0.05	0.05
Isopropyl Alcohol	8.73%	8.734897	60.09	524.88	7.89%	2,596.60		1.30		0.06	
Methyl Alcohol	11.45%	11.45058	32.04	366.88	5.52%	1,814.95	1,814.95	0.91	0.91	0.05	0.05
Methyl Ethyl Ketone	3.78%	3.783549	72.10	272.79	4.10%	1,349.52		0.67		0.03	
Methyl Isobutyl Ketone	0.20%	0.199664	100.20	20.01	0.30%	98.97	98.97	0.05	0.05	2.47E-03	2.47E-03
Methyl t-Butyl Ether	3.83%	3.82681	88.15	337.33	5.07%	1,668.80	1,668.80	0.83	0.83	0.04	0.04
Methylene Chloride	8.47%	8.468725	84.94	719.33	10.82%		3,558.57		1.78		0.09
Naphthalene	0.0003%	0.000251	128.20	0.03	0.0005%	0.16	0.16	7.97E-05	7.97E-05	3.98E-06	3.98E-06
Tetrahydrofuran	2.01%	2.011956	72.12	145.10	2.18%	717.83	717.83	0.36	0.36	0.02	0.02
Toluene	5.26%	5.262398	92.13	484.82	7.29%	2,398.45	2,398.45	1.20	1.20	0.06	0.06
Trichloroethane, 1,1,1-	0.52%	0.516293	133.42	68.88	1.04%	340.77	340.77	0.17	0.17	8.52E-03	8.52E-03
Trichloroethylene	0.18%	0.181167	131.40	23.81	0.36%	117.77	117.77	0.06	0.06	2.94E-03	2.94E-03
Xylene	1.53%	1.532609	106.17	162.72	2.45%	804.97	804.97	0.40	0.40	0.02	0.02
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Totals				**6,648.33**	**100.00%**	**20,678**	**13,737.92**	**10.34**	**6.87**	**0.52**	**0.34**

Worst Case HAP	**Methylene Chloride**	**1.78**	**TPY - Uncontrolled**
Worst Case HAP	**Methylene Chloride**	**0.09**	**TPY - After Control**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 100,000 Gallon Storage Tank - T8 - Blended Fuel

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

INPUT - CLIMATE DATA - Indianapolis, Indiana				
Tax (Daily Maximum Ambient Temperature)	62.00	°F	16.7 °C	521.67 °R
Tan (Daily Minimum Ambient Temperature)	42.20	°F	5.7 °C	501.87 °R
Daily Solar Isolation Factor (I)	1165	Btu/CF • day	K_N	0.1839
Tank Paint Solar Absorbance (α)	0.17	white	K_P	1.0

Source: AP-42, Chapter 7.1, Table 7.1-7, November 2006
N = The number of annual turnovers per year
K_N (Working Loss Turnover Factor) = (180 + N) / 6N for more than 36 turnovers per year, AP-42, Chapter 7.1, Eq. 1-29.
K_N (Working Loss Turnover Factor) = 1.0 for 36 or less turnovers per year, AP-42, Chapter 7.1, Eq. 1-29
K_p (Working Loss Product Factor) = 0.75 for crude oils and 1.0 for all other organic, AP-42, Chapter 7.1, Eq. 1-31

INPUT - TANK DATA			User Input	
Tank Diameter (D)	24.00	Ft		
Shell Height (Hs)	30.00	Ft	Constant Temperature Tank (Y/N)	N
Stock Liquid Height (Hl)	29.55	Ft	If so, what temperature (°R) ?	
Roof Height (H_R) - See Table to Right	12.00	Ft		
Tank Radius (R_S = D/2)	12.00	Ft	Atmospheric Pressure (psi)	14.7
Cone Roof Slope (S_R in ft/ft - 0.0625 default)	0.0625	Ft/Ft		
Roof Outage (H_{RO}) - See Table to Right	0.2500	Ft	Number of Turnovers (N) per Year	1738.81
Vapor Space Outage ($H_{VO} = H_S - H_L + H_{RO}$)	0.7021	Ft	N = Q (gpy) / Max. Liquid Volume (gallons)	
Tank Vapor Space Volume ($V_V = (\pi/4)D^2 H_{VO}$)	317.61	FT^3		
Max. Liquid Volume = 7.481 $(\pi/4) D^2 H_L$	100,000.00	gallons	Roof Outage	
Breather Vent Pressure Setting (P_{BP})	0.030	psi	Cone Roof $H_{RO} = (1/3)(S_R)(R_S)$ =	0.2500
Breather Vent Vacuum Setting (P_{BV})	-0.030	psi	H_R = D/2 =	12.0000
Annual Throughput (Q)	173,880,847	gal/yr	Dome Roof $H_{RO} = 0.137 R_S$ =	1.6440
Annual Throughput (Q) (1 bbl = 42 gallons)	4,140,020	bbl/yr	$H_R = 0.268 R_S$ =	3.2160

Maximum Fuel Usage	68,760,847	gallon/yr
Recirculation	105,120,000	gallon/yr
Annual Throughput	**173,880,847**	gallon/yr

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 100,000 Gallon Storage Tank - T8 - Blended Fuel

(continued from previous page)

Temperature Calculations (AP-42, Chapter 7.1)

T_{AA} (Daily Average Ambient Temperature) AP-42, Chapter 7.1, Equation 1-27	= (TAX (°R) + TAN (°R)) / 2 =	511.77	°R
		11.16	°C
T_B (Liquid Bulk Temperature) AP-42, Chapter 7.1, Equation 1-28	= (TAA (R) + (6 x α) - 1) =	511.79	°R
		11.17	°C
T_{LA} (Daily Average Liquid Surface Temperature) AP-42, Chapter 7.1, Equation 1-26	= 0.44 TAA + 0.56 TB + 0.0079 α I =	513.35	°R
		12.03	°C

ΔT_A (Daily Ambient Temperature Range) AP-42, Chapter 7.1, Equation 1-12	= (TAX (°R) - TAN (°R)) =	19.80	°R
		-262.16	°C
ΔT_V (Daily Vapor Temperature Range) AP-42, Chapter 7.1, Equation 1-8	= 0.72 ΔTA + 0.028 α I =	19.80	°R
		-262.16	°C
T_{LX} (Maximum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA + 0.25 ΔTV =	518.30	°R
		14.78	°C
T_{LN} (Minimum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA - 0.25 ΔTV =	508.40	°R
		9.28	°C

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Potential to Emit - One (1) 100,000 Gallon Storage Tank - T8 - Blended Fuel

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Liquid Properties

Average Density of the Liquid - All Components					
Component	**Specific Gravity**	**Density (lb/gal)**	**Wt %**	**Product of Density x Weight %**	**Notes**
Acetone	0.7949	6.6277	3.8020%	0.2520	Wt % from site sampling, S.G. from wikipedia
Aliphatics	0.7075	5.8990	3.0840%	0.1819	
Alkyl Benzenes	0.9000	7.5040	14.6540%	1.0996	
Benzene	0.8760	7.3039	0.0170%	0.0012	
Butanol	0.8050	6.7119	1.0040%	0.0674	
Butyl Acetate	0.8825	7.3581	1.9370%	0.1425	
Cresol-m	1.0350	8.6296	1.5780%	0.1362	
Cyclohexanone	0.9478	7.9026	3.1560%	0.2494	
Ethyl Alcohol	0.7890	6.5785	1.1480%	0.0755	
Ethyl Benzene	0.8665	7.2247	1.4980%	0.1082	
Glycol Ethers	1.1132	9.2816	0.8610%	0.0799	
Hexane	0.6548	5.4596	1.3630%	0.0744	
Isopropyl Alcohol	0.7860	6.5535	6.2410%	0.4090	
Methyl Alcohol	0.7920	6.6035	1.6500%	0.1090	
Methyl Ethyl Ketone	0.8050	6.7119	1.6500%	0.1107	
Methyl Isobutyl Ketone	0.8020	6.6869	0.6600%	0.0441	
Methyl t-Butyl Ether	0.7404	6.1733	0.6460%	0.0399	
Methylene Chloride	1.3266	11.0609	0.7890%	0.0873	
Naphthalene	1.3289	11.0801	0.4300%	0.0476	
Tetrahydrofuran	0.8900	7.4206	0.4300%	0.0319	
Toluene	0.8709	7.2614	9.3230%	0.6770	
Trichloroethane, 1,1,1-	1.3200	11.0059	0.2870%	0.0316	
Trichloroethylene	1.4719	12.2724	0.2150%	0.0264	
Trimethylbenzene, 1,2,4	0.8761	7.3047	0.0810%	0.0059	
Water, Oil, Dirt (solids)	1.0000	8.3378	27.9440%	2.3299	
Xylene	0.8688	7.2439	15.5530%	1.1266	
Total Weight % =			100.00%	----------	----------
Avg. Liquid Density = (Sum Density x Wt %) / Total Wt% =				7.5453	----------
Tank Throughput (lb/yr) = Throughput (gallons/yr) x Density (lb/gallon) =					1,311,975,632.16

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Potential to Emit - One (1) 100,000 Gallon Storage Tank - T8 - Blended Fuel

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HAP and VOC with Antoine Coefficients							
Basis :	**100**	**lbs fluid**					
Component	**Mol. Weight**	**Weight %**	**Weight (lbs)**	**Moles**	**Mole %**	**HAP (YES/NO)**	**VOC (YES/NO)**
Acetone	58.08	3.80%	3.8020	0.0655	2.7547%	NO	NO
Aliphatics	73.14	3.08%	3.0840	0.0422	1.7744%	NO	YES
Alkyl Benzenes	134.22	14.65%	14.6540	0.1092	4.5944%	YES	YES
Benzene	78.11	0.02%	0.0170	0.0002	0.0092%	YES	YES
Butanol	74.12	1.00%	1.0040	0.0135	0.5700%	NO	YES
Butyl Acetate	116.16	1.94%	1.9370	0.0167	0.7017%	NO	YES
Cresol-m	108.10	1.58%	1.5780	0.0146	0.6143%	YES	YES
Cyclohexanone	98.20	3.16%	3.1560	0.0321	1.3524%	NO	YES
Ethyl Alcohol	46.07	1.15%	1.1480	0.0249	1.0486%	NO	YES
Ethyl Benzene	106.17	1.50%	1.4980	0.0141	0.5937%	YES	YES
Glycol Ethers	62.07	0.86%	0.8610	0.0139	0.5837%	YES	YES
Hexane	86.17	1.36%	1.3630	0.0158	0.6656%	YES	YES
Isopropyl Alcohol	60.09	6.24%	6.2410	0.1039	4.3706%	NO	YES
Methyl Alcohol	32.04	1.65%	1.6500	0.0515	2.1671%	YES	YES
Methyl Ethyl Ketone	72.10	1.65%	1.6500	0.0229	0.9630%	NO	YES
Methyl Isobutyl Ketone	100.20	0.66%	0.6600	0.0066	0.2772%	YES	YES
Methyl t-Butyl Ether	88.15	0.65%	0.6460	0.0073	0.3084%	YES	YES
Methylene Chloride	84.94	0.79%	0.7890	0.0093	0.3909%	YES	NO
Naphthalene	128.20	0.43%	0.4300	0.0034	0.1411%	YES	YES
Tetrahydrofuran	72.12	0.43%	0.4300	0.0060	0.2509%	YES	YES
Toluene	92.13	9.32%	9.3230	0.1012	4.2584%	YES	YES
Trichloroethane, 1,1,1-	133.42	0.29%	0.2870	0.0022	0.0905%	YES	YES
Trichloroethylene	131.40	0.22%	0.2150	0.0016	0.0689%	YES	YES
Trimethylbenzene, 1,2,4	120.19	0.08%	0.0810	0.0007	0.0284%	NO	YES
Water, Oil, Dirt (solids)	18.02	27.94%	27.9440	1.5507	65.2570%	NO	NO
Xylene	106.17	15.55%	15.5530	0.1465	6.1646%	YES	YES
Totals		100.00%	100.00	2.38	100.00%	---	---

HAP or VOC without Antoine Coefficients - Assume 100% Volatilization					
Component	**Tank Throughput (lb/yr)**	**Component Wt%**	**Total Emissions (lb/yr)**	**HAP (YES/NO)**	**VOC (YES/NO)**

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Potential to Emit - One (1) 100,000 Gallon Storage Tank - T8 - Blended Fuel (continued from previous page)

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Antoine Coefficients for Vapor Pressure Estimation

Antoine Equation Data

Compound	A	B	C	Valid Range (Celsius)	Source
Acetone	7.3141	1,315.67	240.4790	-94.70 to 235.05	Yaws Handbook of Vapor Pressure, 2007
Aliphatics	6.5570	829.07	170.0770	-46.00 to 223.45	Yaws Handbook of Vapor Pressure, 2007
Alkyl Benzenes	7.1847	1,720.37	216.4130	-87.85 to 387.40	Yaws Handbook of Vapor Pressure, 2007
Benzene	6.8140	1,090.43	197.1460	-40.00 to 288.90	Yaws Handbook of Vapor Pressure, 2007
Butanol	7.2906	1,282.85	173.2470	-37.00 to 289.90	Yaws Handbook of Vapor Pressure, 2007
Butyl Acetate	7.2341	1,515.76	222.0770	-73.50 to 306.50	Yaws Handbook of Vapor Pressure, 2007
Cresol-m	6.8749	1,303.18	124.0000	20.80 to 432.70	Yaws Handbook of Vapor Pressure, 2007
Cyclohexanone	7.6065	1,884.55	243.0360	-31.15 to 356.00	Yaws Handbook of Vapor Pressure, 2007
Ethyl Alcohol	8.1348	1,662.48	238.1310	-114.10 to 243.10	Yaws Handbook of Vapor Pressure, 2007
Ethyl Benzene	7.1561	1,559.55	228.5820	-94.95 to 344.02	Yaws Handbook of Vapor Pressure, 2007
Glycol Ethers	9.6994	3,147.10	264.2460	-13.00 to 371.85	Yaws Handbook of Vapor Pressure, 2007
Hexane	6.9895	1,216.92	227.4510	-95.31 to 234.28	Yaws Handbook of Vapor Pressure, 2007
Isopropyl Alcohol	7.8306	1,483.30	217.4130	-87.87 to 235.16	Yaws Handbook of Vapor Pressure, 2007
Methyl Alcohol	8.0913	1,582.91	239.0960	-97.68 to 239.43	Yaws Handbook of Vapor Pressure, 2007
Methyl Ethyl Ketone	7.2010	1,325.15	227.0930	-85.00 to 262.35	Yaws Handbook of Vapor Pressure, 2007
Methyl Isobutyl Ketone	7.1597	1,421.73	216.2660	-84.00 to 298.25	Yaws Handbook of Vapor Pressure, 2007
Methyl t-Butyl Ether	7.0760	1,233.70	238.8790	-108.60 to 223.95	Yaws Handbook of Vapor Pressure, 2007
Methylene Chloride	7.1146	1,152.41	232.4420	-95.14 to 236.85	Yaws Handbook of Vapor Pressure, 2007
Naphthalene	6.8912	1,551.48	168.8790	3.2 to 475.25	Yaws Handbook of Vapor Pressure, 2007
Tetrahydrofuran	7.1054	1,256.68	232.6210	-108.50 to 267.00	Yaws Handbook of Vapor Pressure, 2007
Toluene	7.1362	1,457.29	231.8270	-94.97 to 318.64	Yaws Handbook of Vapor Pressure, 2007
Trichloroethane, 1,1,1-	7.0072	1,253.20	229.6240	-30.40 to 271.85	Yaws Handbook of Vapor Pressure, 2007
Trichloroethylene	6.8798	1,157.83	202.5800	-74.00 to 297.85	Yaws Handbook of Vapor Pressure, 2007
Trimethylbenzene, 1,2,4	7.2933	1,763.35	230.2480	-43.77 to 375.98	Yaws Handbook of Vapor Pressure, 2007
Water, Oil, Dirt (solids)	8.0557	1,723.64	233.0800	0.01 to 373.98	Yaws Handbook of Vapor Pressure, 2007
Xylene	7.2122	1,546.92	217.1440	-2.66 to 197.02	Yaws Handbook of Vapor Pressure, 2007

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Potential to Emit - One (1) 100,000 Gallon Storage Tank - T8 - Blended Fuel

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Vapor Pressure Calculations

Use Antoine Equation from AP-42, Chapter 7.1, Page 7.1-94:

Log P = A - [B / (T + C)] **Where: P = Vapor Pressure in mmHg**

T = Temperature in °C

T_{LN} (°C) = 9.28 T_{LA} (°C) = 12.03 T_{LX} (°C) = 14.78

Compound	mmHg			bar			psi		
	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	111.2674	126.9807	144.5011	0.1483	0.1693	0.1927	2.1516	2.4554	2.7942
Aliphatics	86.0030	100.9990	118.0440	0.1147	0.1347	0.1574	1.6630	1.9530	2.2826
Alkyl Benzenes	0.3648	0.4507	0.5539	4.86E-04	6.01E-04	7.38E-04	0.0071	0.0087	0.0107
Benzene	34.0101	39.9076	46.6338	4.53E-02	5.32E-02	6.22E-02	0.6576	0.7717	0.9017
Butanol	1.8296	2.3264	2.9373	2.44E-03	3.10E-03	3.92E-03	0.0354	0.0450	0.0568
Butyl Acetate	4.8139	5.7472	6.8332	0.0064	0.0077	0.0091	0.0931	0.1111	0.1321
Cresol-m	1.25E-03	1.97E-03	3.05E-03	1.67E-06	2.63E-06	4.07E-06	2.42E-05	3.81E-05	5.90E-05
Cyclohexanone	1.3726	1.6522	1.9809	0.0018	0.0022	0.0026	0.0265	0.0319	0.0383
Ethyl Alcohol	26.0205	30.8449	36.4287	0.0347	0.0411	0.0486	0.5032	0.5964	0.7044
Ethyl Benzene	3.9773	4.7263	5.5945	0.0053	0.0063	0.0075	0.0769	0.0914	0.1082
Glycol Ethers	0.0156	0.0203	0.0263	2.08E-05	2.71E-05	3.51E-05	3.02E-04	3.93E-04	5.09E-04
Hexane	70.6320	80.9153	92.4101	0.0942	0.1079	0.1232	1.3658	1.5646	1.7869
Isopropyl Alcohol	19.3790	23.2143	27.6899	0.0258	0.0309	0.0369	0.3747	0.4489	0.5354
Methyl Alcohol	52.2658	61.3771	71.8264	0.0697	0.0818	0.0958	1.0107	1.1868	1.3889
Methyl Ethyl Ketone	39.3413	45.6374	52.7629	0.0525	0.0608	0.0703	0.7607	0.8825	1.0203
Methyl Isobutyl Ketone	7.1814	8.5534	10.1453	0.0096	0.0114	0.0135	0.1389	0.1654	0.1962
Methyl t-Butyl Ether	127.2166	144.2219	163.0562	0.1696	0.1923	0.2174	2.4600	2.7888	3.1530
Methylene Chloride	222.3943	251.6240	283.9145	0.2965	0.3355	0.3785	4.3004	4.8656	5.4900
Naphthalene	0.0152	0.0207	0.0278	2.03E-05	2.75E-05	3.70E-05	2.95E-04	4.00E-04	5.37E-04
Tetrahydrofuran	81.3472	93.0545	106.1290	0.1085	0.1241	0.1415	1.5730	1.7994	2.0522
Toluene	12.3609	14.4614	16.8597	0.0165	0.0193	0.0225	0.2390	0.2796	0.3260
Trichloroethane, 1,1,1-	57.7534	66.2631	75.7920	0.0770	0.0883	0.1010	1.1168	1.2813	1.4656
Trichloroethylene	25.9860	30.5329	35.7294	0.0346	0.0407	0.0476	0.5025	0.5904	0.6909
Trimethylbenzene, 1,2,4	0.8541	1.0353	1.2496	0.0011	0.0014	0.0017	0.0165	0.0200	0.0242
Water, Oil, Dirt (solids)	8.7866	10.5587	12.6367	0.0117	0.0141	0.0168	0.1699	0.2042	0.2444
Xylene	2.4000	2.8986	3.4852	0.0032	0.0039	0.0046	0.0464	0.0561	0.0674
Total Pressures	997.59	1,148.03	1,317.25	1.3300	1.5306	1.7562	19.2902	22.1992	25.4715

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Raoult's Law Calculations for Vapor Partial Pressures

Raoult's Law $P_{partial\ of\ i} = X_i \times P_{vap\ of\ i}$

Where: $P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
$P_{vap\ of\ i}$ is the vapor pressure of pure i
X_i is the liquid mole fraction of i

$Y_i = P_{partial\ of\ i} / P_{total}$

Y_i is the vapor phase mole fraction of component i
$P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
P_{total} is the total pressure of all components in the vapor phase

Compound	X_i	$P_{vap\ of\ i}$ (psi)			$P_{partial\ of\ i}$ (psi)			Y_i		
		T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	2.75%	2.1516	2.4554	2.7942	0.0593	0.0676	0.0770	19.44%	18.89%	18.36%
Aliphatics	1.77%	1.6630	1.9530	2.2826	0.0295	0.0347	0.0405	9.681%	9.679%	9.661%
Alkyl Benzenes	4.59%	0.0071	0.0087	0.0107	0.0003	0.0004	0.0005	0.106%	0.112%	0.117%
Benzene	0.01%	0.6576	0.7717	0.9017	6.02E-05	7.07E-05	8.26E-05	0.020%	0.020%	0.020%
Butanol	0.57%	0.0354	0.0450	0.0568	0.0002	0.0003	0.0003	0.066%	0.072%	0.077%
Butyl Acetate	0.70%	0.0931	0.1111	0.1321	0.0007	0.0008	0.0009	0.214%	0.218%	0.221%
Cresol-m	0.61%	2.42E-05	3.81E-05	5.90E-05	1.49E-07	2.34E-07	3.63E-07	0.00005%	0.0001%	0.0001%
Cyclohexanone	1.35%	0.0265	0.0319	0.0383	0.0004	0.0004	0.0005	0.118%	0.121%	0.124%
Ethyl Alcohol	1.05%	0.5032	0.5964	0.7044	0.0053	0.0063	0.0074	1.731%	1.747%	1.762%
Ethyl Benzene	0.59%	0.0769	0.0914	0.1082	0.0005	0.0005	0.0006	0.150%	0.152%	0.153%
Glycol Ethers	0.58%	3.02E-04	3.93E-04	5.09E-04	1.76E-06	2.30E-06	2.97E-06	0.001%	0.001%	0.001%
Hexane	0.67%	1.3658	1.5646	1.7869	0.0091	0.0104	0.0119	2.98%	2.91%	2.84%
Isopropyl Alcohol	4.37%	0.3747	0.4489	0.5354	0.0164	0.0196	0.0234	5.37%	5.48%	5.58%
Methyl Alcohol	2.17%	1.0107	1.1868	1.3889	0.0219	0.0257	0.0301	7.19%	7.18%	7.18%
Methyl Ethyl Ketone	0.96%	0.7607	0.8825	1.0203	0.0073	0.0085	0.0098	2.40%	2.37%	2.34%
Methyl Isobutyl Ketone	0.28%	0.1389	0.1654	0.1962	0.0004	0.0005	0.0005	0.13%	0.13%	0.13%
Methyl t-Butyl Ether	0.31%	2.4600	2.7888	3.1530	0.0076	0.0086	0.0097	2.49%	2.40%	2.32%
Methylene Chloride	0.39%	4.3004	4.8656	5.4900	0.0168	0.0190	0.0215	5.51%	5.31%	5.12%
Naphthalene	0.14%	0.0003	0.0004	0.0005	4.16E-07	5.64E-07	7.58E-07	0.0001%	0.0002%	0.0002%
Tetrahydrofuran	0.25%	1.5730	1.7994	2.0522	0.0039	0.0045	0.0051	1.29%	1.26%	1.23%
Toluene	4.26%	0.2390	0.2796	0.3260	0.0102	0.0119	0.0139	3.34%	3.33%	3.31%
Trichloroethane, 1,1,1-	0.09%	1.1168	1.2813	1.4656	0.0010	0.0012	0.0013	0.33%	0.32%	0.32%
Trichloroethylene	0.07%	0.5025	0.5904	0.6909	0.0003	0.0004	0.0005	0.11%	0.11%	0.11%
Trimethylbenzene, 1,2,4	0.03%	0.0165	0.0200	0.0242	4.68E-06	5.68E-06	6.85E-06	0.002%	0.002%	0.002%
Water, Oil, Dirt (solids)	65.26%	0.1699	0.2042	0.2444	0.1109	0.1332	0.1595	36.37%	37.21%	38.03%
Xylene	6.16%	0.0464	0.0561	0.0674	0.0029	0.0035	0.0042	0.94%	0.97%	0.99%
Totals	100.00%	19.2902	22.1992	25.4715	0.3048	0.3581	0.4193	100.00%	100.00%	100.00%

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Calculate Stock Density (lb/cubic foot)

M_V Calculation			
Compound	**MW**	**Y_i**	**MW x Y_i**
Acetone	58.08	18.89%	10.9719
Aliphatics	73.14	9.68%	7.0789
Alkyl Benzenes	134.22	0.11%	0.1501
Benzene	78.11	0.02%	0.0154
Butanol	74.12	0.07%	0.0531
Butyl Acetate	116.16	0.22%	0.2530
Cresol-m	108.10	0.00%	0.0001
Cyclohexanone	98.20	0.12%	0.1185
Ethyl Alcohol	46.07	1.75%	0.8047
Ethyl Benzene	106.17	0.15%	0.1609
Glycol Ethers	62.07	0.00%	0.0004
Hexane	86.17	2.91%	2.5065
Isopropyl Alcohol	60.09	5.48%	3.2926
Methyl Alcohol	32.04	7.18%	2.3016
Methyl Ethyl Ketone	72.10	2.37%	1.7113
Methyl Isobutyl Ketone	100.20	0.13%	0.1283
Methyl t-Butyl Ether	88.15	2.40%	2.1174
Methylene Chloride	84.94	5.31%	4.5119
Naphthalene	128.20	0.00%	0.0002
Tetrahydrofuran	72.12	1.26%	0.9094
Toluene	92.13	3.33%	3.0641
Trichloroethane, 1,1,1-	133.42	0.32%	0.4322
Trichloroethylene	131.40	0.11%	0.1492
Trimethylbenzene, 1,2,4	120.19	0.00%	0.0019
Water, Oil, Dirt (solids)	18.02	37.21%	6.7055
Xylene	106.17	0.97%	1.0246
M_V = Sum (MW_i x Y_i)			**48.4636**

Stock Density

$$W_V = (M_V \times P_{VA}) / (R \times T_{LA})$$

Where: W_V is the stock density in lb/cubic foot

M_V is the molecular weight of the vapor

P_{VA} is the total pressure of the mixture in psia

R ideal gas constant
(10.731 psia cubic foot / lb-mole °R)

T_{LA} is the daily average liquid temperature in °R

M_V = 48.46 (see below)

P_{VA} = 0.3581 psi

R = 10.731 psia cubic foot / lb-mole °R

T_{LA} = 513.35 °R

W_V = (48.46 x 0.3581) / (10.731 x 513.35)

W_V = 0.0031 lb/cubic foot

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 100,000 Gallon Storage Tank - T8 - Blended Fuel

(continued from previous page)

Calculate Vapor Space Expansion Factor (K_E)

$K_E = (\Delta T_V / T_{LA}) + (\Delta P_V - \Delta P_B) / (P_A - P_{VA})$ AP-42, Chapter 7.1, Equation 1-7

Where:
K_E = Vapor Space Expansion Factor (Calculated Below)
ΔT_V = 19.80 (°R - Daily Vapor Temperature Range)
T_{LA} = 513.35 (°R - Average Daily Liquid Surface Temperature)
ΔP_V = Daily Vapor Pressure Range (Calcuated Below)
ΔP_B = Breather Vent Pressure Setting Range (Calcuated Below)
P_A = 14.7 (psia - Atmospheric Pressure)
P_{VA} = 0.3581 (psia - Total Mixture Pressure)

ΔP_V

$\Delta P_V = P_{LX} - P_{LN}$

Where: ΔP_V is the daily vapor pressure range
P_{LX} = 0.4193 psi
P_{LN} = 0.3048 psi

ΔP_V = 0.419253547358546 - 0.304812927869811 = 0.1144 psi

ΔP_B

$\Delta P_B = P_{BP} - P_{BV}$

Where: ΔP_B is the breather vent pressure setting range
P_{BP} = 0.03 psi
P_{BV} = -0.03 psi

ΔP_B = (0.03) - (-0.03) = 0.06 psi

K_E = 0.042366 (Unitless)
If KE is less than zero, it is assumed to be zero.

Calculate Vented Vapor Space Saturation Factor (K_S)

$K_S = 1 / (1 + 0.053 (P_{VA}) (H_{VO}))$ AP-42, Chapter 7.1, Equation 1-20

Where: Ks is the vented vapor space saturation factor
P_{VA} is the total mixture pressure P_{VA} = 0.3581 psi
H_{VO} is the vapor space outage H_{VO} = 0.7021 Ft

K_S = 1 / (1 + 0.053 (0.3581) (0.7021) = 0.986852 (Unitless)

Loss Calculations (HAP and VOC Emissions)

Standing Storage Loss L_S (lb/yr) = $365 (W_V)(V_V)(K_E)(K_S)$
Working Loss L_W (lb/yr) = $0.0010 (M_V)(P_{VA})(Q)(K_N)(K_P)$
Total Loss L_T (lb/yr) = $L_S + L_W$

Where:
W_V = 0.00314975 Vapor Density in lb/cubic feet
V_V = 317.61 Vapor Space Volume in cubic feet
K_E = 0.04236608 Vapor Space Expansion Factor
K_S = 0.98685205 Vented Vapor Space Saturation Factor - See Above for Calculation
M_V = 48.46 Molecular Weight of the Vapor in lb/lb-mole
P_{VA} = 0.3581 Total Mixture Pressure in psi
Q = 4,140,020 bbl/yr
K_N = 0.2 working turnovers
K_P = 1.0 working loss product factor, unitless

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 100,000 Gallon Storage Tank - T8 - Blended Fuel

(continued from previous page)

Standing Storage Loss		
L_S (lb/yr)	15.27	lb/yr
Working Loss		
L_W (lb/yr)	13,211.75	lb/yr
Total Loss		
L_T (lb/yr)	13,227.02	lb/yr

Individual Compound Emissions

Basis:	100	lb-moles of vapor for weight fraction calculation
Total Emissions:	13,227.02	lb/yr
Control Efficiency:	95%	

Compound Information						PTE Calculations					
Compound	**Yi**	**lb-moles**	**MW**	**Pounds**	**Weight %**	**PTE VOC (lb/yr)**	**PTE HAP (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**	**PTE VOC w/control (TPY)**	**PTE HAP w/control (TPY)**
Acetone	18.89%	18.89104	58.08	1,097.19	22.64%						
Aliphatics	9.68%	9.678532	73.14	707.89	14.61%	1,932.02		0.97		0.05	
Alkyl Benzenes	0.11%	0.111822	134.22	15.01	0.31%	40.96	40.96	0.02	0.02	1.0E-03	1.0E-03
Benzene	0.02%	0.019739	78.11	1.54	0.03%	4.21	4.21	2.1E-03	2.10E-03	1.1E-04	1.1E-04
Butanol	0.07%	0.071617	74.12	5.31	0.11%	14.49		7.2E-03		3.6E-04	
Butyl Acetate	0.22%	0.2178	116.16	25.30	0.52%	69.05		0.03		1.7E-03	
Cresol-m	0.0001%	6.54E-05	108.10	0.01	0.0001%	0.02	0.02	9.65E-06	9.65E-06	4.82E-07	4.8E-07
Cyclohexanone	0.12%	0.120674	98.20	11.85	0.24%	32.34		0.02		8.1E-04	
Ethyl Alcohol	1.75%	1.746785	46.07	80.47	1.66%	219.64		0.11		5.5E-03	
Ethyl Benzene	0.15%	0.151553	106.17	16.09	0.33%	43.92	43.92	0.02	0.02	1.1E-03	1.1E-03
Glycol Ethers	0.001%	0.000641	62.07	0.04	0.001%	0.11	0.11	5.43E-05	5.43E-05	2.72E-06	2.72E-06
Hexane	2.91%	2.908728	86.17	250.65	5.17%	684.08	684.08	0.34	0.34	0.02	0.02
Isopropyl Alcohol	5.48%	5.479489	60.09	329.26	6.79%	898.65		0.45		0.02	
Methyl Alcohol	7.18%	7.183415	32.04	230.16	4.75%	628.16	628.16	0.31	0.31	0.02	0.02
Methyl Ethyl Ketone	2.37%	2.373575	72.10	171.13	3.53%	467.07		0.23		1.17E-02	
Methyl Isobutyl Ketone	0.13%	0.128041	100.20	12.83	0.26%	35.02	35.02	0.02	0.02	8.75E-04	8.75E-04
Methyl t-Butyl Ether	2.40%	2.402007	88.15	211.74	4.37%	577.89	577.89	0.29	0.29	1.44E-02	1.44E-02
Methylene Chloride	5.31%	5.311898	84.94	451.19	9.31%		1,231.43		0.62		0.03
Naphthalene	0.0002%	0.000157	128.20	0.02	0.0004%	0.06	0.06	2.76E-05	2.76E-05	1.38E-06	1.38E-06
Tetrahydrofuran	1.26%	1.260907	72.12	90.94	1.88%	248.19	248.19	0.12	0.12	6.20E-03	6.20E-03
Toluene	3.33%	3.325807	92.13	306.41	6.32%	836.27	836.27	0.42	0.42	0.02	0.02
Trichloroethane, 1,1,1-	0.32%	0.323941	133.42	43.22	0.89%	117.96	117.96	0.06	0.06	2.95E-03	2.95E-03
Trichloroethylene	0.11%	0.113539	131.40	14.92	0.31%	40.72	40.72	0.02	0.02	1.02E-03	1.02E-03
Trimethylbenzene, 1,2,4	0.002%	0.001586	120.19	0.19	0.004%	0.52		2.60E-04		1.30E-05	
Water, Oil, Dirt (solids)	37.21%	37.21161	18.02	670.55	13.84%						
Xylene	0.97%	0.965026	106.17	102.46	2.11%	279.63	279.63	0.14	0.14	6.99E-03	6.99E-03
	---	---	---	---	---						
	---	---	---	---	---						
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	---	---	---	---	---						
	---	---	---	---	---						
Totals				**4,846.36**	**100.00%**	**7,171**	**4,768.6**	**3.59**	**2.38**	**0.18**	**0.12**

Worst Case HAP	**Methylene Chloride**	**0.62**	**TPY - Uncontrolled**
Worst Case HAP	**Methylene Chloride**	**0.03**	**TPY - After Control**

Appendix A to the Technical Support Document (TSD)
PTE and Emission Factor Calculation - Tank T8

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Throughput for Calculation 173,880,847 gallons/yr
173,881 kgallon/yr
Control Efficiency 95%

						Uncontrolled			After Control		
Pollutant	HAP	VOC	PTE with Cutter (TPY)	PTE with Blended Fuel (TPY)	Worst Case (TPY)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/kgal)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/kgal)
Acetone	NO	NO	---	---	---	not regulated			not regulated		
Aliphatics	NO	YES	2.7918	0.9660	2.7918		2.792	0.032		0.140	0.002
Alkyl Benzenes	YES	YES	0.0591	0.0205	0.0591	0.0591	0.059	6.80E-04	2.96E-03	2.96E-03	3.40E-05
Benzene	YES	YES		0.0021	0.0021	0.0021	2.10E-03	2.42E-05	1.05E-04	1.05E-04	1.21E-06
Butanol	NO	YES	0.0209	0.0072	0.0209		0.021	2.41E-04		1.05E-03	1.20E-05
Butyl Acetate	NO	YES	0.0998	0.0345	0.0998		0.100	1.15E-03		4.99E-03	5.74E-05
Cresol-m	YES	YES	2.79E-05	9.65E-06	2.79E-05	2.79E-05	2.79E-05	3.21E-07	1.39E-06	1.39E-06	1.60E-08
Cyclohexanone	NO	YES	0.0467	0.0162	0.0467		0.047	5.38E-04		2.34E-03	2.69E-05
Ethyl Alcohol	NO	YES	0.3173	0.1098	0.3173		0.317	0.004		0.016	1.82E-04
Ethyl Benzene	YES	YES	0.0608	0.0220	0.0608	0.0608	0.061	6.99E-04	3.04E-03	3.04E-03	3.49E-05
Glycol Ethers	YES	YES	1.57E-04	5.43E-05	1.57E-04	1.57E-04	1.57E-04	1.80E-06	7.84E-06	7.84E-06	9.02E-08
Hexane	YES	YES	0.9883	0.3420	0.9883	0.9883	0.988	0.011	4.94E-02	0.049	5.68E-04
Isopropyl Alcohol	NO	YES	1.2983	0.4493	1.2983		1.298	0.015		0.065	7.47E-04
Methyl Alcohol	YES	YES	0.9075	0.3141	0.9075	0.9075	0.907	0.010	4.54E-02	0.045	5.22E-04
Methyl Ethyl Ketone	NO	YES	0.6748	0.2335	0.6748		0.675	7.76E-03		0.034	3.88E-04
Methyl Isobutyl Ketone	YES	YES	0.0495	0.0175	0.0495	0.0495	0.049	5.69E-04	2.47E-03	2.47E-03	2.85E-05
Methyl t-Butyl Ether	YES	YES	0.8344	0.2889	0.8344	0.8344	0.834	9.60E-03	4.17E-02	0.042	4.80E-04
Methylene Chloride	YES	NO	1.7793	0.6157	1.7793	1.7793		0.020	8.90E-02		1.02E-03
Naphthalene	YES	YES	7.97E-05	2.76E-05	7.97E-05	7.97E-05	7.97E-05	9.17E-07	3.98E-06	3.98E-06	4.58E-08
Tetrahydrofuran	YES	YES	0.3589	0.1241	0.3589	0.3589	0.359	4.13E-03	1.79E-02	0.018	2.06E-04
Toluene	YES	YES	1.1992	0.4181	1.1992	1.1992	1.199	0.014	6.00E-02	0.060	6.90E-04
Trichloroethane, 1,1,1-	YES	YES	0.1704	0.0590	0.1704	0.1704	0.170	1.96E-03	8.52E-03	8.52E-03	9.80E-05
Trichloroethylene	YES	YES	0.0589	0.0204	0.0589	0.0589	0.059	6.77E-04	2.94E-03	2.94E-03	3.39E-05
Trimethylbenzene, 1,2,4	NO	YES		2.60E-04	2.60E-04		2.60E-04	2.99E-06		1.30E-05	1.50E-07
Water, Oil, Dirt (solids)	NO	NO	---	---	---	not regulated			not regulated		
Xylene	YES	YES	0.4025	0.1398	0.4025	0.4025	0.402	0.0046	0.02	0.020	2.31E-04
						6.87	**10.34**		**0.34**	**0.52**	

	Uncontrolled PTE				PTE after Control			
VOC	**10.342**	**TPY**	**0.119**	**lb/kgal**	**0.517**	**TPY**	**0.01**	**lb/kgal**
Single HAP - Methylene Chloride	**1.779**	**TPY**	**0.020**	**lb/kgal**	**0.089**	**TPY**	**0.001**	**lb/kgal**
Combined HAP	**6.871**	**TPY**	**0.079**	**lb/kgal**	**0.344**	**TPY**	**0.004**	**lb/kgal**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Cutter

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

INPUT - CLIMATE DATA - Indianapolis, Indiana				
Tax (Daily Maximum Ambient Temperature)	62.00	°F	16.7 °C	521.67 °R
Tan (Daily Minimum Ambient Temperature)	42.20	°F	5.7 °C	501.87 °R
Daily Solar Isolation Factor (I)	1165	Btu/CF • day	K_N	0.1684
Tank Paint Solar Absorbance (α)	0.17	white	K_P	1.0

Source: AP-42, Chapter 7.1, Table 7.1-7, November 2006
N = The number of annual turnovers per year
K_N (Working Loss Turnover Factor) = (180 + N) / 6N for more than 36 turnovers per year, AP-42, Chapter 7.1, Eq. 1-29.
K_N (Working Loss Turnover Factor) = 1.0 for 36 or less turnovers per year, AP-42, Chapter 7.1, Eq. 1-29
K_p (Working Loss Product Factor) = 0.75 for crude oils and 1.0 for all other organic, AP-42, Chapter 7.1, Eq. 1-31

INPUT - TANK DATA			User Input	
Tank Diameter (D)	12.00	Ft		
Shell Height (Hs)	12.00	Ft	Constant Temperature Tank (Y/N)	N
Stock Liquid Height (Hl)	11.82	Ft	If so, what temperature (°R) ?	
Roof Height (H_R) - See Table to Right	15.00	Ft		
Tank Radius (R_S = D/2)	6.00	Ft	Atmospheric Pressure (psi)	14.7
Cone Roof Slope (S_R in ft/ft - 0.0625 default)	0.0625	Ft/Ft		
Roof Outage (H_{RO}) - See Table to Right	0.1250	Ft	Number of Turnovers (N) per Year	17388.08
Vapor Space Outage ($H_{VO} = H_S - H_L + H_{RO}$)	0.3058	Ft	N = Q (gpy) / Max. Liquid Volume (gallons)	
Tank Vapor Space Volume ($V_V = (\pi/4)D^2 H_{VO}$)	34.59	FT^3		
Max. Liquid Volume = 7.481 $(\pi/4) D^2 H_L$	10,000.00	gallons	Roof Outage	
Breather Vent Pressure Setting (P_{BP})	0.030	psi	Cone Roof $H_{RO} = (1/3)(S_R)(R_S)$ =	0.1250
Breather Vent Vacuum Setting (P_{BV})	-0.030	psi	H_R = D/2 =	6.0000
Annual Throughput (Q)	173,880,847	gal/yr	Dome Roof $H_{RO} = 0.137 R_S$ =	0.8220
Annual Throughput (Q) (1 bbl = 42 gallons)	4,140,020	bbl/yr	$H_R = 0.268 R_S$ =	1.6080

Maximum Fuel Usage	68,760,847	gallon/yr
Recirculation	105,120,000	gallon/yr
Annual Throughput	**173,880,847**	gallon/yr

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Cutter

(continued from previous page)

Temperature Calculations (AP-42, Chapter 7.1)

T_{AA} (Daily Average Ambient Temperature) AP-42, Chapter 7.1, Equation 1-27	= (TAX (°R) + TAN (°R)) / 2 =	511.77	°R
		11.16	°C
T_B (Liquid Bulk Temperature) AP-42, Chapter 7.1, Equation 1-28	= (TAA (R) + (6 x α) - 1) =	511.79	°R
		11.17	°C
T_{LA} (Daily Average Liquid Surface Temperature) AP-42, Chapter 7.1, Equation 1-26	= 0.44 TAA + 0.56 TB + 0.0079 α I =	513.35	°R
		12.03	°C

ΔT_A (Daily Ambient Temperature Range) AP-42, Chapter 7.1, Equation 1-12	= (TAX (°R) - TAN (°R)) =	19.80	°R
		-262.16	°C
ΔT_V (Daily Vapor Temperature Range) AP-42, Chapter 7.1, Equation 1-8	= 0.72 ΔTA + 0.028 α I =	19.80	°R
		-262.16	°C
T_{LX} (Maximum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA + 0.25 ΔTV =	518.30	°R
		14.78	°C
T_{LN} (Minimum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA - 0.25 ΔTV =	508.40	°R
		9.28	°C

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Cutter

(continued from previous page)

Liquid Properties

Average Density of the Liquid - All Components					
Component	**Specific Gravity**	**Density (lb/gal)**	**Wt %**	**Product of Density x Weight %**	**Notes**
Acetone	0.7949	6.6277	5.3000%	0.3513	Wt % from site sampling, S.G. from wikipedia
Aliphatics (Diethylamine Similar)	0.7075	5.8990	4.3000%	0.2537	
Alkyl Benzenes (Butyl Benzene Similar)	0.9000	7.5040	20.4000%	1.5308	
Butanol	0.8050	6.7119	1.4000%	0.0940	
Butyl Acetate	0.8825	7.3581	2.7000%	0.1987	
Cresol-m	1.0350	8.6296	2.2000%	0.1899	
Cyclohexanone	0.9478	7.9026	4.4000%	0.3477	
Ethyl Alcohol	0.7890	6.5785	1.6000%	0.1053	
Ethyl Benzene	0.8665	7.2247	2.0000%	0.1445	
Glycol Ethers (Ethylene Glycol Similar)	1.1132	9.2816	1.2000%	0.1114	
Hexane	0.6548	5.4596	1.9000%	0.1037	
Isopropyl Alcohol	0.7860	6.5535	8.7000%	0.5702	
Methyl Alcohol	0.7920	6.6035	2.3000%	0.1519	
Methyl Ethyl Ketone	0.8050	6.7119	2.3000%	0.1544	
Methyl Isobutyl Ketone	0.8020	6.6869	0.9000%	0.0602	
Methyl t-Butyl Ether	0.7404	6.1733	0.9000%	0.0556	
Methylene Chloride	1.3266	11.0609	1.1000%	0.1217	
Naphthalene	1.3289	11.0801	0.6000%	0.0665	
Tetrahydrofuran	0.8900	7.4206	0.6000%	0.0445	
Toluene	0.8709	7.2614	12.9000%	0.9367	
Trichloroethane, 1,1,1-	1.3200	11.0059	0.4000%	0.0440	
Trichloroethylene	1.4719	12.2724	0.3000%	0.0368	
Xylene	0.8688	7.2439	21.6000%	1.5647	
Total Weight % =			100.00%	----------	----------
Avg. Liquid Density = (Sum Density x Wt %) / Total Wt% =				7.2379	----------
Tank Throughput (lb/yr) = Throughput (gallons/yr) x Density (lb/gallon) =					1,258,527,313.84

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Cutter

(continued from previous page)

HAP and VOC with Antoine Coefficients							
Basis :	**100**	**lbs fluid**					
Component	**Mol. Weight**	**Weight %**	**Weight (lbs)**	**Moles**	**Mole %**	**HAP (YES/NO)**	**VOC (YES/NO)**
Acetone	58.08	5.30%	5.3000	0.0913	7.9584%	NO	NO
Aliphatics (Diethylamine Similar)	73.14	4.30%	4.3000	0.0588	5.1273%	NO	YES
Alkyl Benzenes (Butyl Benzene Similar)	134.22	20.40%	20.4000	0.1520	13.2553%	YES	YES
Butanol	74.12	1.40%	1.4000	0.0189	1.6473%	NO	YES
Butyl Acetate	116.16	2.70%	2.7000	0.0232	2.0271%	NO	YES
Cresol-m	108.10	2.20%	2.2000	0.0204	1.7749%	YES	YES
Cyclohexanone	98.20	4.40%	4.4000	0.0448	3.9077%	NO	YES
Ethyl Alcohol	46.07	1.60%	1.6000	0.0347	3.0288%	NO	YES
Ethyl Benzene	106.17	2.00%	2.0000	0.0188	1.6429%	YES	YES
Glycol Ethers (Ethylene Glycol Similar)	62.07	1.20%	1.2000	0.0193	1.6861%	YES	YES
Hexane	86.17	1.90%	1.9000	0.0220	1.9230%	YES	YES
Isopropyl Alcohol	60.09	8.70%	8.7000	0.1448	12.6268%	NO	YES
Methyl Alcohol	32.04	2.30%	2.3000	0.0718	6.2605%	YES	YES
Methyl Ethyl Ketone	72.10	2.30%	2.3000	0.0319	2.7821%	NO	YES
Methyl Isobutyl Ketone	100.20	0.90%	0.9000	0.0090	0.7833%	YES	YES
Methyl t-Butyl Ether	88.15	0.90%	0.9000	0.0102	0.8904%	YES	YES
Methylene Chloride	84.94	1.10%	1.1000	0.0130	1.1294%	YES	NO
Naphthalene	128.20	0.60%	0.6000	0.0047	0.4082%	YES	YES
Tetrahydrofuran	72.12	0.60%	0.6000	0.0083	0.7256%	YES	YES
Toluene	92.13	12.90%	12.9000	0.1400	12.2114%	YES	YES
Trichloroethane, 1,1,1-	133.42	0.40%	0.4000	0.0030	0.2615%	YES	YES
Trichloroethylene	131.40	0.30%	0.3000	0.0023	0.1991%	YES	YES
Xylene	106.17	21.60%	21.6000	0.2034	17.7430%	YES	YES
Totals		100.00%	100.00	1.15	100.00%	---	---

HAP or VOC without Antoine Coefficients - Assume 100% Volatilization					
Component	**Tank Throughput (lb/yr)**	**Component Wt%**	**Total Emissions (lb/yr)**	**HAP (YES/NO)**	**VOC (YES/NO)**

(continued on next page)

Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Cutter (continued from previous page)

(continued from previous page)

Antoine Coefficients for Vapor Pressure Estimation

Antoine Equation Data

Compound	A	B	C	Valid Range (Celsius)	Source
Acetone	7.3141	1,315.67	240.4790	-94.70 to 235.05	Yaws Handbook of Vapor Pressure, 2007
Aliphatics (Diethylamine Similar)	6.5570	829.07	170.0770	-46.00 to 223.45	Yaws Handbook of Vapor Pressure, 2007
Alkyl Benzenes (Butyl Benzene Similar)	7.1847	1,720.37	216.4130	-87.85 to 387.40	Yaws Handbook of Vapor Pressure, 2007
Butanol	7.2906	1,282.85	173.2470	-37.00 to 289.90	Yaws Handbook of Vapor Pressure, 2007
Butyl Acetate	7.2341	1,515.76	222.0770	-73.50 to 306.50	Yaws Handbook of Vapor Pressure, 2007
Cresol-m	6.8749	1,303.18	124.0000	20.80 to 432.70	Yaws Handbook of Vapor Pressure, 2007
Cyclohexanone	7.6065	1,884.55	243.0360	-31.15 to 356.00	Yaws Handbook of Vapor Pressure, 2007
Ethyl Alcohol	8.1348	1,662.48	238.1310	-114.10 to 243.10	Yaws Handbook of Vapor Pressure, 2007
Ethyl Benzene	7.1561	1,559.55	228.5820	-94.95 to 344.02	Yaws Handbook of Vapor Pressure, 2007
Glycol Ethers (Ethylene Glycol Similar)	9.6994	3,147.10	264.2460	-13.00 to 371.85	Yaws Handbook of Vapor Pressure, 2007
Hexane	6.9895	1,216.92	227.4510	-95.31 to 234.28	Yaws Handbook of Vapor Pressure, 2007
Isopropyl Alcohol	7.8306	1,483.30	217.4130	-87.87 to 235.16	Yaws Handbook of Vapor Pressure, 2007
Methyl Alcohol	8.0913	1,582.91	239.0960	-97.68 to 239.43	Yaws Handbook of Vapor Pressure, 2007
Methyl Ethyl Ketone	7.2010	1,325.15	227.0930	-85.00 to 262.35	Yaws Handbook of Vapor Pressure, 2007
Methyl Isobutyl Ketone	7.1597	1,421.73	216.2660	-84.00 to 298.25	Yaws Handbook of Vapor Pressure, 2007
Methyl t-Butyl Ether	7.0760	1,233.70	238.8790	-108.60 to 223.95	Yaws Handbook of Vapor Pressure, 2007
Methylene Chloride	7.1146	1,152.41	232.4420	-95.14 to 236.85	Yaws Handbook of Vapor Pressure, 2007
Naphthalene	6.8912	1,551.48	168.8790	3.2 to 475.25	Yaws Handbook of Vapor Pressure, 2007
Tetrahydrofuran	7.1054	1,256.68	232.6210	-108.50 to 267.00	Yaws Handbook of Vapor Pressure, 2007
Toluene	7.1362	1,457.29	231.8270	-94.97 to 318.64	Yaws Handbook of Vapor Pressure, 2007
Trichloroethane, 1,1,1-	7.0072	1,253.20	229.6240	-30.40 to 271.85	Yaws Handbook of Vapor Pressure, 2007
Trichloroethylene	6.8798	1,157.83	202.5800	-74.00 to 297.85	Yaws Handbook of Vapor Pressure, 2007
Xylene	7.2122	1,546.92	217.1440	-2.66 to 197.02	Yaws Handbook of Vapor Pressure, 2007

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Cutter

(continued from previous page)

Vapor Pressure Calculations

Use Antoine Equation from AP-42, Chapter 7.1, Page 7.1-94:

Log P = A - [B / (T + C)] **Where: P = Vapor Pressure in mmHg**

T = Temperature in °C

T_{LN} (°C) = 9.28 T_{LA} (°C) = 12.03 T_{LX} (°C) = 14.78

Compound	mmHg			bar			psi		
	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	111.2674	126.9807	144.5011	0.1483	0.1693	0.1927	2.1516	2.4554	2.7942
Aliphatics (Diethylamine Similar)	86.0030	100.9990	118.0440	0.1147	0.1347	0.1574	1.6630	1.9530	2.2826
Alkyl Benzenes (Butyl Benzene Similar)	0.3648	0.4507	0.5539	0.0005	0.0006	0.0007	0.0071	0.0087	0.0107
Butanol	1.8296	2.3264	2.9373	0.0024	0.0031	0.0039	0.0354	0.0450	0.0568
Butyl Acetate	4.8139	5.7472	6.8332	0.0064	0.0077	0.0091	0.0931	0.1111	0.1321
Cresol-m	0.0013	0.0020	0.0031	1.67E-06	2.63E-06	4.07E-06	2.42E-05	3.81E-05	5.90E-05
Cyclohexanone	1.3726	1.6522	1.9809	0.0018	0.0022	0.0026	0.0265	0.0319	0.0383
Ethyl Alcohol	26.0205	30.8449	36.4287	0.0347	0.0411	0.0486	0.5032	0.5964	0.7044
Ethyl Benzene	3.9773	4.7263	5.5945	0.0053	0.0063	0.0075	0.0769	0.0914	0.1082
Glycol Ethers (Ethylene Glycol Similar)	0.0156	0.0203	0.0263	2.08E-05	2.71E-05	3.51E-05	3.02E-04	3.93E-04	5.09E-04
Hexane	70.6320	80.9153	92.4101	0.0942	0.1079	0.1232	1.3658	1.5646	1.7869
Isopropyl Alcohol	19.3790	23.2143	27.6899	0.0258	0.0309	0.0369	0.3747	0.4489	0.5354
Methyl Alcohol	52.2658	61.3771	71.8264	0.0697	0.0818	0.0958	1.0107	1.1868	1.3889
Methyl Ethyl Ketone	39.3413	45.6374	52.7629	0.0525	0.0608	0.0703	0.7607	0.8825	1.0203
Methyl Isobutyl Ketone	7.1814	8.5534	10.1453	0.0096	0.0114	0.0135	0.1389	0.1654	0.1962
Methyl t-Butyl Ether	127.2166	144.2219	163.0562	0.1696	0.1923	0.2174	2.4600	2.7888	3.1530
Methylene Chloride	222.3943	251.6240	283.9145	0.2965	0.3355	0.3785	4.3004	4.8656	5.4900
Naphthalene	0.0152	0.0207	0.0278	2.03E-05	2.75E-05	3.70E-05	2.95E-04	4.00E-04	5.37E-04
Tetrahydrofuran	81.3472	93.0545	106.1290	0.1085	0.1241	0.1415	1.5730	1.7994	2.0522
Toluene	12.3609	14.4614	16.8597	0.0165	0.0193	0.0225	0.2390	0.2796	0.3260
Trichloroethane, 1,1,1-	57.7534	66.2631	75.7920	0.0770	0.0883	0.1010	1.1168	1.2813	1.4656
Trichloroethylene	25.9860	30.5329	35.7294	0.0346	0.0407	0.0476	0.5025	0.5904	0.6909
Xylene	2.4000	2.8986	3.4852	0.0032	0.0039	0.0046	0.0464	0.0561	0.0674
Total Pressures	953.94	1096.5243	1256.73	1.2718	1.4619	1.6755	18.4462	21.2033	24.3012

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Cutter

(continued from previous page)

Raoult's Law Calculations for Vapor Partial Pressures

Raoult's Law $P_{partial\ of\ i} = X_i \times P_{vap\ of\ i}$

Where: $P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
$P_{vap\ of\ i}$ is the vapor pressure of pure i
X_i is the liquid mole fraction of i

$Y_i = P_{partial\ of\ i} / P_{total}$

Y_i is the vapor phase mole fraction of component i
$P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
P_{total} is the total pressure of all components in the vapor phase

Compound	X_i	$P_{vap\ of\ i}$ (psi)			$P_{partial\ of\ i}$ (psi)			Y_i		
		T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	7.96%	2.1516	2.4554	2.7942	0.1712	0.1954	0.2224	30.59%	30.11%	29.66%
Aliphatics (Diethylamine Similar)	5.13%	1.6630	1.9530	2.2826	0.0853	0.1001	0.1170	15.232%	15.432%	15.608%
Alkyl Benzenes (Butyl Benzene Similar)	13.26%	0.0071	0.0087	0.0107	0.0009	0.0012	0.0014	0.167%	0.178%	0.189%
Butanol	1.65%	0.0354	0.0450	0.0568	0.0006	0.0007	0.0009	0.104%	0.114%	0.125%
Butyl Acetate	2.03%	0.0931	0.1111	0.1321	0.0019	0.0023	0.0027	0.337%	0.347%	0.357%
Cresol-m	1.77%	2.42E-05	3.81E-05	5.90E-05	4.29E-07	6.77E-07	1.05E-06	0.0001%	0.0001%	0.0001%
Cyclohexanone	3.91%	0.0265	0.0319	0.0383	0.0010	0.0012	0.0015	0.185%	0.192%	0.200%
Ethyl Alcohol	3.03%	0.5032	0.5964	0.7044	0.0152	0.0181	0.0213	2.722%	2.784%	2.845%
Ethyl Benzene	1.64%	0.0769	0.0914	0.1082	0.0013	0.0015	0.0018	0.226%	0.231%	0.237%
Glycol Ethers (Ethylene Glycol Similar)	1.69%	3.02E-04	3.93E-04	5.09E-04	5.09E-06	6.63E-06	8.59E-06	0.001%	0.001%	0.001%
Hexane	1.92%	1.3658	1.5646	1.7869	0.0263	0.0301	0.0344	4.69%	4.64%	4.58%
Isopropyl Alcohol	12.63%	0.3747	0.4489	0.5354	0.0473	0.0567	0.0676	8.45%	8.73%	9.02%
Methyl Alcohol	6.26%	1.0107	1.1868	1.3889	0.0633	0.0743	0.0870	11.30%	11.45%	11.60%
Methyl Ethyl Ketone	2.78%	0.7607	0.8825	1.0203	0.0212	0.0246	0.0284	3.78%	3.78%	3.79%
Methyl Isobutyl Ketone	0.78%	0.1389	0.1654	0.1962	0.0011	0.0013	0.0015	0.19%	0.20%	0.20%
Methyl t-Butyl Ether	0.89%	2.4600	2.7888	3.1530	0.0219	0.0248	0.0281	3.91%	3.83%	3.74%
Methylene Chloride	1.13%	4.3004	4.8656	5.4900	0.0486	0.0550	0.0620	8.68%	8.47%	8.27%
Naphthalene	0.41%	0.0003	0.0004	0.0005	1.20E-06	1.63E-06	2.19E-06	0.0002%	0.0003%	0.0003%
Tetrahydrofuran	0.73%	1.5730	1.7994	2.0522	0.0114	0.0131	0.0149	2.04%	2.01%	1.99%
Toluene	12.21%	0.2390	0.2796	0.3260	0.0292	0.0341	0.0398	5.21%	5.26%	5.31%
Trichloroethane, 1,1,1-	0.26%	1.1168	1.2813	1.4656	0.0029	0.0034	0.0038	0.52%	0.52%	0.51%
Trichloroethylene	0.20%	0.5025	0.5904	0.6909	0.0010	0.0012	0.0014	0.18%	0.18%	0.18%
Xylene	17.74%	0.0464	0.0561	0.0674	0.0082	0.0099	0.0120	1.47%	1.53%	1.59%
Totals	100.00%	18.4462	21.2033	24.3012	0.5598	0.6489	0.7499	100.00%	100.00%	100.00%

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Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Cutter
(continued from previous page)

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Calculate Stock Density (lb/cubic foot)

M_V Calculation			
Compound	**MW**	**Y_i**	**MW x Y_i**
Acetone	58.08	30.11%	17.4904
Aliphatics (Diethylamine Similar)	73.14	15.43%	11.2868
Alkyl Benzenes (Butyl Benzene Similar)	134.22	0.18%	0.2389
Butanol	74.12	0.11%	0.0846
Butyl Acetate	116.16	0.35%	0.4033
Cresol-m	108.10	0.0001%	0.0001
Cyclohexanone	98.20	0.19%	0.1889
Ethyl Alcohol	46.07	2.78%	1.2826
Ethyl Benzene	106.17	0.23%	0.2457
Glycol Ethers (Ethylene Glycol Similar)	62.07	0.001%	0.0006
Hexane	86.17	4.64%	3.9955
Isopropyl Alcohol	60.09	8.73%	5.2488
Methyl Alcohol	32.04	11.45%	3.6688
Methyl Ethyl Ketone	72.10	3.78%	2.7279
Methyl Isobutyl Ketone	100.20	0.20%	0.2001
Methyl t-Butyl Ether	88.15	3.83%	3.3733
Methylene Chloride	84.94	8.47%	7.1933
Naphthalene	128.20	0.0003%	0.0003
Tetrahydrofuran	72.12	2.01%	1.4510
Toluene	92.13	5.26%	4.8482
Trichloroethane, 1,1,1-	133.42	0.52%	0.6888
Trichloroethylene	131.40	0.18%	0.2381
Xylene	106.17	1.53%	1.6272
M_V = Sum (MW_i x Y_i)			**66.4833**

Stock Density

$$W_V = (M_V \times P_{VA}) / (R \times T_{LA})$$

Where: W_V is the stock density in lb/cubic foot

M_V is the molecular weight of the vapor

P_{VA} is the total pressure of the mixture in psia

R ideal gas constant
(10.731 psia cubic foot / lb-mole °R)

T_{LA} is the daily average liquid temperature in °R

M_V = 66.48 (see below)

P_{VA} = 0.6489 psi

R = 10.731 psia cubic foot / lb-mole °R

T_{LA} = 513.35 °R

$$W_V = (66.48 \times 0.6489) / (10.731 \times 513.35)$$

W_V = 0.0078 lb/cubic foot

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Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Cutter

(continued from previous page)

Calculate Vapor Space Expansion Factor (K_E)

$K_E = (\Delta T_V / T_{LA}) + (\Delta P_V - \Delta P_B) / (P_A - P_{VA})$ AP-42, Chapter 7.1, Equation 1-7

Where:
K_E = Vapor Space Expansion Factor (Calculated Below)
ΔT_V = 19.80 (°R - Daily Vapor Temperature Range)
T_{LA} = 513.35 (°R - Average Daily Liquid Surface Temperature)
ΔP_V = Daily Vapor Pressure Range (Calcuated Below)
ΔP_B = Breather Vent Pressure Setting Range (Calcuated Below)
P_A = 14.7 (psia - Atmospheric Pressure)
P_{VA} = 0.6489 (psia - Total Mixture Pressure)

ΔP_V

$\Delta P_V = P_{LX} - P_{LN}$

Where: ΔP_V is the daily vapor pressure range
P_{LX} = 0.7499 psi
P_{LN} = 0.5598 psi

ΔP_V = 0.7499 - 0.5598 = 0.1901 psi

ΔP_B

$\Delta P_B = P_{BP} - P_{BV}$

Where: ΔP_B is the breather vent pressure setting range
P_{BP} = 0.03 psi
P_{BV} = -0.03 psi

ΔP_B = (0.03) - (-0.03) = 0.06 psi

K_E = 0.047827 (Unitless)
If KE is less than zero, it is assumed to be zero.

Calculate Vented Vapor Space Saturation Factor (K_S)

$K_S = 1 / (1 + 0.053 (P_{VA}) (H_{VO}))$ AP-42, Chapter 7.1, Equation 1-20

Where: Ks is the vented vapor space saturation factor
P_{VA} is the total mixture pressure P_{VA} = 0.6489 psi
H_{VO} is the vapor space outage H_{VO} = 0.3058 Ft

$K_S = 1 / (1 + 0.053 (0.6489) (0.3058) =$ 0.989592 (Unitless)

Loss Calculations (HAP and VOC Emissions)

Standing Storage Loss L_S (lb/yr) $= 365 (W_V)(V_V)(K_E)(K_S)$
Working Loss L_W (lb/yr) $= 0.0010 (M_V)(P_{VA})(Q)(K_N)(K_P)$
Total Loss L_T (lb/yr) $= L_S + L_W$

Where:
W_V = 0.00783093 Vapor Density in lb/cubic feet
V_V = 34.59 Vapor Space Volume in cubic feet
K_E = 0.04782713 Vapor Space Expansion Factor
K_S = 0.98959168 Vented Vapor Space Saturation Factor
M_V = 66.48 Molecular Weight of the Vapor in lb/lb-mole
P_{VA} = 0.6489 Total Mixture Pressure in psi
Q = 4,140,020 bbl/yr
K_N = 0.2 working turnovers
K_P = 1.0 working loss product factor, unitless

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Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Cutter

(continued from previous page)

Standing Storage Loss		
L_S (lb/yr)	4.68	lb/yr
Working Loss		
L_W (lb/yr)	30,073.97	lb/yr
Total Loss		
L_T (lb/yr)	30,078.65	lb/yr

Individual Compound Emissions

Basis:	100	lb-moles of vapor for weight fraction calculation
Total Emissions:	30,078.65	lb/yr
Control Efficiency:	95%	

Compound Information						PTE Calculations					
Compound	**Yi**	**lb-moles**	**MW**	**Pounds**	**Weight %**	**PTE VOC (lb/yr)**	**PTE HAP (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**	**PTE VOC w/control (TPY)**	**PTE HAP w/control (TPY)**
Acetone	30.11%	30.11427	58.08	1,749.04	26.31%						
Aliphatics (Diethylamine Similar)	15.43%	15.43179	73.14	1,128.68	16.98%	5,106.42		2.55		0.13	
Alkyl Benzenes (Butyl Benzene Similar)	0.18%	0.178015	134.22	23.89	0.36%	108.10	108.10	0.05	0.05	2.70E-03	2.70E-03
Butanol	0.11%	0.114199	74.12	8.46	0.13%	38.30		0.02		9.57E-04	
Butyl Acetate	0.35%	0.347173	116.16	40.33	0.61%	182.45		0.09		4.56E-03	
Cresol-m	0.0001%	0.000104	108.10	0.011	0.0002%	5.10E-02	5.10E-02	2.55E-05	2.55E-05	1.28E-06	1.28E-06
Cyclohexanone	0.19%	0.19239	98.20	18.89	0.28%	85.48		0.04		2.14E-03	
Ethyl Alcohol	2.78%	2.784007	46.07	128.26	1.93%	580.28		0.29		1.45E-02	
Ethyl Benzene	0.23%	0.231386	106.17	24.57	0.37%	111.14	111.14	0.06	0.06	2.78E-03	2.78E-03
Glycol Ethers (Ethylene Glycol Similar)	0.001%	0.001022	62.07	0.06	0.001%	0.29	0.29	1.43E-04	1.43E-04	7.17E-06	7.17E-06
Hexane	4.64%	4.636748	86.17	399.55	6.01%	1,807.65	1,807.65	0.90	0.90	0.05	0.05
Isopropyl Alcohol	8.73%	8.734897	60.09	524.88	7.89%	2,374.68		1.19		0.06	
Methyl Alcohol	11.45%	11.45058	32.04	366.88	5.52%	1,659.84	1,659.84	0.83	0.83	0.04	0.04
Methyl Ethyl Ketone	3.78%	3.783549	72.10	272.79	4.10%	1,234.18		0.62		0.03	
Methyl Isobutyl Ketone	0.20%	0.199664	100.20	20.01	0.30%	90.51	90.51	0.05	0.05	2.26E-03	2.26E-03
Methyl t-Butyl Ether	3.83%	3.82681	88.15	337.33	5.07%	1,526.18	1,526.18	0.76	0.76	0.04	0.04
Methylene Chloride	8.47%	8.468725	84.94	719.33	10.82%		3,254.44		1.63		0.08
Naphthalene	0.0003%	0.000251	128.20	0.03	0.0005%	0.15	0.15	7.29E-05	7.29E-05	3.64E-06	3.64E-06
Tetrahydrofuran	2.01%	2.011956	72.12	145.10	2.18%	656.48	656.48	0.33	0.33	0.02	0.02
Toluene	5.26%	5.262398	92.13	484.82	7.29%	2,193.46	2,193.46	1.10	1.10	0.05	0.05
Trichloroethane, 1,1,1-	0.52%	0.516293	133.42	68.88	1.04%	311.65	311.65	0.16	0.16	7.79E-03	7.79E-03
Trichloroethylene	0.18%	0.181167	131.40	23.81	0.36%	107.70	107.70	0.05	0.05	2.69E-03	2.69E-03
Xylene	1.53%	1.532609	106.17	162.72	2.45%	736.17	736.17	0.37	0.37	0.02	0.02
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Totals				**6,648.33**	**100.00%**	**18,911**	**12,563.80**	**9.46**	**6.28**	**0.47**	**0.31**

Worst Case HAP	**Methylene Chloride**	**1.63**	**TPY - Uncontrolled**
Worst Case HAP	**Methylene Chloride**	**0.08**	**TPY - After Control**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Blended Fuel

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

INPUT - CLIMATE DATA - Indianapolis, Indiana				
Tax (Daily Maximum Ambient Temperature)	62.00	°F	16.7 °C	521.67 °R
Tan (Daily Minimum Ambient Temperature)	42.20	°F	5.7 °C	501.87 °R
Daily Solar Isolation Factor (I)	1165	Btu/CF • day	K_N	0.1684
Tank Paint Solar Absorbance (α)	0.17	white	K_P	1.0

Source: AP-42, Chapter 7.1, Table 7.1-7, November 2006
N = The number of annual turnovers per year
K_N (Working Loss Turnover Factor) = (180 + N) / 6N for more than 36 turnovers per year, AP-42, Chapter 7.1, Eq. 1-29.
K_N (Working Loss Turnover Factor) = 1.0 for 36 or less turnovers per year, AP-42, Chapter 7.1, Eq. 1-29
K_p (Working Loss Product Factor) = 0.75 for crude oils and 1.0 for all other organic, AP-42, Chapter 7.1, Eq. 1-31

INPUT - TANK DATA			User Input	
Tank Diameter (D)	12.00	Ft		
Shell Height (Hs)	12.00	Ft	Constant Temperature Tank (Y/N)	N
Stock Liquid Height (Hl)	11.82	Ft	If so, what temperature (°R) ?	
Roof Height (H_R) - See Table to Right	15.00	Ft		
Tank Radius (R_S = D/2)	6.00	Ft	Atmospheric Pressure (psi)	14.7
Cone Roof Slope (S_R in ft/ft - 0.0625 default)	0.0625	Ft/Ft		
Roof Outage (H_{RO}) - See Table to Right	0.1250	Ft	Number of Turnovers (N) per Year	17388.08
Vapor Space Outage ($H_{VO} = H_S - H_L + H_{RO}$)	0.3058	Ft	N = Q (gpy) / Max. Liquid Volume (gallons)	
Tank Vapor Space Volume ($V_V = (\pi/4)D^2 H_{VO}$)	34.59	FT^3		
Max. Liquid Volume = 7.481 $(\pi/4) D^2 H_L$	10,000.00	gallons	Roof Outage	
Breather Vent Pressure Setting (P_{BP})	0.030	psi	Cone Roof $H_{RO} = (1/3)(S_R)(R_S)$ =	0.1250
Breather Vent Vacuum Setting (P_{BV})	-0.030	psi	H_R = D/2 =	6.0000
Annual Throughput (Q)	173,880,847	gal/yr	Dome Roof $H_{RO} = 0.137 R_S$ =	0.8220
Annual Throughput (Q) (1 bbl = 42 gallons)	4,140,020	bbl/yr	$H_R = 0.268 R_S$ =	1.6080

Maximum Fuel Usage	68,760,847	gallon/yr
Recirculation	105,120,000	gallon/yr
Annual Throughput	**173,880,847**	gallon/yr

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Temperature Calculations (AP-42, Chapter 7.1)

T_{AA} (Daily Average Ambient Temperature) AP-42, Chapter 7.1, Equation 1-27	= (TAX (°R) + TAN (°R)) / 2 =	511.77	°R
		11.16	°C
T_B (Liquid Bulk Temperature) AP-42, Chapter 7.1, Equation 1-28	= (TAA (R) + (6 x α) - 1) =	511.79	°R
		11.17	°C
T_{LA} (Daily Average Liquid Surface Temperature) AP-42, Chapter 7.1, Equation 1-26	= 0.44 TAA + 0.56 TB + 0.0079 α I =	513.35	°R
		12.03	°C

ΔT_A (Daily Ambient Temperature Range) AP-42, Chapter 7.1, Equation 1-12	= (TAX (°R) - TAN (°R)) =	19.80	°R
		-262.16	°C
ΔT_V (Daily Vapor Temperature Range) AP-42, Chapter 7.1, Equation 1-8	= 0.72 ΔTA + 0.028 α I =	19.80	°R
		-262.16	°C
T_{LX} (Maximum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA + 0.25 ΔTV =	518.30	°R
		14.78	°C
T_{LN} (Minimum Liquid Temperature) AP-42, Chapter 7.1, Equation 1-9	= TLA - 0.25 ΔTV =	508.40	°R
		9.28	°C

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Liquid Properties

Average Density of the Liquid - All Components					
Component	**Specific Gravity**	**Density (lb/gal)**	**Wt %**	**Product of Density x Weight %**	**Notes**
Acetone	0.7949	6.6277	3.8020%	0.2520	Wt % from site sampling, S.G. from wikipedia
Aliphatics	0.7075	5.8990	3.0840%	0.1819	
Alkyl Benzenes	0.9000	7.5040	14.6540%	1.0996	
Benzene	0.8760	7.3039	0.0170%	0.0012	
Butanol	0.8050	6.7119	1.0040%	0.0674	
Butyl Acetate	0.8825	7.3581	1.9370%	0.1425	
Cresol-m	1.0350	8.6296	1.5780%	0.1362	
Cyclohexanone	0.9478	7.9026	3.1560%	0.2494	
Ethyl Alcohol	0.7890	6.5785	1.1480%	0.0755	
Ethyl Benzene	0.8665	7.2247	1.4980%	0.1082	
Glycol Ethers	1.1132	9.2816	0.8610%	0.0799	
Hexane	0.6548	5.4596	1.3630%	0.0744	
Isopropyl Alcohol	0.7860	6.5535	6.2410%	0.4090	
Methyl Alcohol	0.7920	6.6035	1.6500%	0.1090	
Methyl Ethyl Ketone	0.8050	6.7119	1.6500%	0.1107	
Methyl Isobutyl Ketone	0.8020	6.6869	0.6600%	0.0441	
Methyl t-Butyl Ether	0.7404	6.1733	0.6460%	0.0399	
Methylene Chloride	1.3266	11.0609	0.7890%	0.0873	
Naphthalene	1.3289	11.0801	0.4300%	0.0476	
Tetrahydrofuran	0.8900	7.4206	0.4300%	0.0319	
Toluene	0.8709	7.2614	9.3230%	0.6770	
Trichloroethane, 1,1,1-	1.3200	11.0059	0.2870%	0.0316	
Trichloroethylene	1.4719	12.2724	0.2150%	0.0264	
Trimethylbenzene, 1,2,4	0.8761	7.3047	0.0810%	0.0059	
Water, Oil, Dirt (solids)	1.0000	8.3378	27.9440%	2.3299	
Xylene	0.8688	7.2439	15.5530%	1.1266	
Total Weight % =			100.00%	----------	----------
Avg. Liquid Density = (Sum Density x Wt %) / Total Wt% =				7.5453	----------
Tank Throughput (lb/yr) = Throughput (gallons/yr) x Density (lb/gallon) =					1,311,975,632.16

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HAP and VOC with Antoine Coefficients							
Basis :	**100**	**lbs fluid**					
Component	**Mol. Weight**	**Weight %**	**Weight (lbs)**	**Moles**	**Mole %**	**HAP (YES/NO)**	**VOC (YES/NO)**
Acetone	58.08	3.80%	3.8020	0.0655	2.7547%	NO	NO
Aliphatics	73.14	3.08%	3.0840	0.0422	1.7744%	NO	YES
Alkyl Benzenes	134.22	14.65%	14.6540	0.1092	4.5944%	YES	YES
Benzene	78.11	0.02%	0.0170	0.0002	0.0092%	YES	YES
Butanol	74.12	1.00%	1.0040	0.0135	0.5700%	NO	YES
Butyl Acetate	116.16	1.94%	1.9370	0.0167	0.7017%	NO	YES
Cresol-m	108.10	1.58%	1.5780	0.0146	0.6143%	YES	YES
Cyclohexanone	98.20	3.16%	3.1560	0.0321	1.3524%	NO	YES
Ethyl Alcohol	46.07	1.15%	1.1480	0.0249	1.0486%	NO	YES
Ethyl Benzene	106.17	1.50%	1.4980	0.0141	0.5937%	YES	YES
Glycol Ethers	62.07	0.86%	0.8610	0.0139	0.5837%	YES	YES
Hexane	86.17	1.36%	1.3630	0.0158	0.6656%	YES	YES
Isopropyl Alcohol	60.09	6.24%	6.2410	0.1039	4.3706%	NO	YES
Methyl Alcohol	32.04	1.65%	1.6500	0.0515	2.1671%	YES	YES
Methyl Ethyl Ketone	72.10	1.65%	1.6500	0.0229	0.9630%	NO	YES
Methyl Isobutyl Ketone	100.20	0.66%	0.6600	0.0066	0.2772%	YES	YES
Methyl t-Butyl Ether	88.15	0.65%	0.6460	0.0073	0.3084%	YES	YES
Methylene Chloride	84.94	0.79%	0.7890	0.0093	0.3909%	YES	NO
Naphthalene	128.20	0.43%	0.4300	0.0034	0.1411%	YES	YES
Tetrahydrofuran	72.12	0.43%	0.4300	0.0060	0.2509%	YES	YES
Toluene	92.13	9.32%	9.3230	0.1012	4.2584%	YES	YES
Trichloroethane, 1,1,1-	133.42	0.29%	0.2870	0.0022	0.0905%	YES	YES
Trichloroethylene	131.40	0.22%	0.2150	0.0016	0.0689%	YES	YES
Trimethylbenzene, 1,2,4	120.19	0.08%	0.0810	0.0007	0.0284%	NO	YES
Water, Oil, Dirt (solids)	18.02	27.94%	27.9440	1.5507	65.2570%	NO	NO
Xylene	106.17	15.55%	15.5530	0.1465	6.1646%	YES	YES
Totals		100.00%	100.00	2.38	100.00%	---	---

HAP or VOC without Antoine Coefficients - Assume 100% Volatilization					
Component	**Tank Throughput (lb/yr)**	**Component Wt%**	**Total Emissions (lb/yr)**	**HAP (YES/NO)**	**VOC (YES/NO)**

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Antoine Coefficients for Vapor Pressure Estimation

Antoine Equation Data

Compound	A	B	C	Valid Range (Celsius)	Source
Acetone	7.3141	1,315.67	240.4790	-94.70 to 235.05	Yaws Handbook of Vapor Pressure, 2007
Aliphatics	6.5570	829.07	170.0770	-46.00 to 223.45	Yaws Handbook of Vapor Pressure, 2007
Alkyl Benzenes	7.1847	1,720.37	216.4130	-87.85 to 387.40	Yaws Handbook of Vapor Pressure, 2007
Benzene	6.8140	1,090.43	197.1460	-40.00 to 288.90	Yaws Handbook of Vapor Pressure, 2007
Butanol	7.2906	1,282.85	173.2470	-37.00 to 289.90	Yaws Handbook of Vapor Pressure, 2007
Butyl Acetate	7.2341	1,515.76	222.0770	-73.50 to 306.50	Yaws Handbook of Vapor Pressure, 2007
Cresol-m	6.8749	1,303.18	124.0000	20.80 to 432.70	Yaws Handbook of Vapor Pressure, 2007
Cyclohexanone	7.6065	1,884.55	243.0360	-31.15 to 356.00	Yaws Handbook of Vapor Pressure, 2007
Ethyl Alcohol	8.1348	1,662.48	238.1310	-114.10 to 243.10	Yaws Handbook of Vapor Pressure, 2007
Ethyl Benzene	7.1561	1,559.55	228.5820	-94.95 to 344.02	Yaws Handbook of Vapor Pressure, 2007
Glycol Ethers	9.6994	3,147.10	264.2460	-13.00 to 371.85	Yaws Handbook of Vapor Pressure, 2007
Hexane	6.9895	1,216.92	227.4510	-95.31 to 234.28	Yaws Handbook of Vapor Pressure, 2007
Isopropyl Alcohol	7.8306	1,483.30	217.4130	-87.87 to 235.16	Yaws Handbook of Vapor Pressure, 2007
Methyl Alcohol	8.0913	1,582.91	239.0960	-97.68 to 239.43	Yaws Handbook of Vapor Pressure, 2007
Methyl Ethyl Ketone	7.2010	1,325.15	227.0930	-85.00 to 262.35	Yaws Handbook of Vapor Pressure, 2007
Methyl Isobutyl Ketone	7.1597	1,421.73	216.2660	-84.00 to 298.25	Yaws Handbook of Vapor Pressure, 2007
Methyl t-Butyl Ether	7.0760	1,233.70	238.8790	-108.60 to 223.95	Yaws Handbook of Vapor Pressure, 2007
Methylene Chloride	7.1146	1,152.41	232.4420	-95.14 to 236.85	Yaws Handbook of Vapor Pressure, 2007
Naphthalene	6.8912	1,551.48	168.8790	3.2 to 475.25	Yaws Handbook of Vapor Pressure, 2007
Tetrahydrofuran	7.1054	1,256.68	232.6210	-108.50 to 267.00	Yaws Handbook of Vapor Pressure, 2007
Toluene	7.1362	1,457.29	231.8270	-94.97 to 318.64	Yaws Handbook of Vapor Pressure, 2007
Trichloroethane, 1,1,1-	7.0072	1,253.20	229.6240	-30.40 to 271.85	Yaws Handbook of Vapor Pressure, 2007
Trichloroethylene	6.8798	1,157.83	202.5800	-74.00 to 297.85	Yaws Handbook of Vapor Pressure, 2007
Trimethylbenzene, 1,2,4	7.2933	1,763.35	230.2480	-43.77 to 375.98	Yaws Handbook of Vapor Pressure, 2007
Water, Oil, Dirt (solids)	8.0557	1,723.64	233.0800	0.01 to 373.98	Yaws Handbook of Vapor Pressure, 2007
Xylene	7.2122	1,546.92	217.1440	-2.66 to 197.02	Yaws Handbook of Vapor Pressure, 2007

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Vapor Pressure Calculations

Use Antoine Equation from AP-42, Chapter 7.1, Page 7.1-94:

Log P = A - [B / (T + C)] **Where: P = Vapor Pressure in mmHg**

T = Temperature in °C

T_{LN} (°C) = 9.28 T_{LA} (°C) = 12.03 T_{LX} (°C) = 14.78

Compound	mmHg			bar			psi		
	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	111.2674	126.9807	144.5011	0.1483	0.1693	0.1927	2.1516	2.4554	2.7942
Aliphatics	86.0030	100.9990	118.0440	0.1147	0.1347	0.1574	1.6630	1.9530	2.2826
Alkyl Benzenes	0.3648	0.4507	0.5539	4.86E-04	6.01E-04	7.38E-04	0.0071	0.0087	0.0107
Benzene	34.0101	39.9076	46.6338	4.53E-02	5.32E-02	6.22E-02	0.6576	0.7717	0.9017
Butanol	1.8296	2.3264	2.9373	2.44E-03	3.10E-03	3.92E-03	0.0354	0.0450	0.0568
Butyl Acetate	4.8139	5.7472	6.8332	0.0064	0.0077	0.0091	0.0931	0.1111	0.1321
Cresol-m	1.25E-03	1.97E-03	3.05E-03	1.67E-06	2.63E-06	4.07E-06	2.42E-05	3.81E-05	5.90E-05
Cyclohexanone	1.3726	1.6522	1.9809	0.0018	0.0022	0.0026	0.0265	0.0319	0.0383
Ethyl Alcohol	26.0205	30.8449	36.4287	0.0347	0.0411	0.0486	0.5032	0.5964	0.7044
Ethyl Benzene	3.9773	4.7263	5.5945	0.0053	0.0063	0.0075	0.0769	0.0914	0.1082
Glycol Ethers	0.0156	0.0203	0.0263	2.08E-05	2.71E-05	3.51E-05	3.02E-04	3.93E-04	5.09E-04
Hexane	70.6320	80.9153	92.4101	0.0942	0.1079	0.1232	1.3658	1.5646	1.7869
Isopropyl Alcohol	19.3790	23.2143	27.6899	0.0258	0.0309	0.0369	0.3747	0.4489	0.5354
Methyl Alcohol	52.2658	61.3771	71.8264	0.0697	0.0818	0.0958	1.0107	1.1868	1.3889
Methyl Ethyl Ketone	39.3413	45.6374	52.7629	0.0525	0.0608	0.0703	0.7607	0.8825	1.0203
Methyl Isobutyl Ketone	7.1814	8.5534	10.1453	0.0096	0.0114	0.0135	0.1389	0.1654	0.1962
Methyl t-Butyl Ether	127.2166	144.2219	163.0562	0.1696	0.1923	0.2174	2.4600	2.7888	3.1530
Methylene Chloride	222.3943	251.6240	283.9145	0.2965	0.3355	0.3785	4.3004	4.8656	5.4900
Naphthalene	0.0152	0.0207	0.0278	2.03E-05	2.75E-05	3.70E-05	2.95E-04	4.00E-04	5.37E-04
Tetrahydrofuran	81.3472	93.0545	106.1290	0.1085	0.1241	0.1415	1.5730	1.7994	2.0522
Toluene	12.3609	14.4614	16.8597	0.0165	0.0193	0.0225	0.2390	0.2796	0.3260
Trichloroethane, 1,1,1-	57.7534	66.2631	75.7920	0.0770	0.0883	0.1010	1.1168	1.2813	1.4656
Trichloroethylene	25.9860	30.5329	35.7294	0.0346	0.0407	0.0476	0.5025	0.5904	0.6909
Trimethylbenzene, 1,2,4	0.8541	1.0353	1.2496	0.0011	0.0014	0.0017	0.0165	0.0200	0.0242
Water, Oil, Dirt (solids)	8.7866	10.5587	12.6367	0.0117	0.0141	0.0168	0.1699	0.2042	0.2444
Xylene	2.4000	2.8986	3.4852	0.0032	0.0039	0.0046	0.0464	0.0561	0.0674
Total Pressures	997.59	1148.0260	1317.25	1.3300	1.5306	1.7562	19.2902	22.1992	25.4715

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Raoult's Law Calculations for Vapor Partial Pressures

Raoult's Law $P_{partial\ of\ i} = X_i \times P_{vap\ of\ i}$

Where: $P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
$P_{vap\ of\ i}$ is the vapor pressure of pure i
X_i is the liquid mole fraction of i

$Y_i = P_{partial\ of\ i} / P_{total}$

Y_i is the vapor phase mole fraction of component i
$P_{partial\ of\ i}$ is the partial pressure of i in the vapor phase
P_{total} is the total pressure of all components in the vapor phase

Compound	X_i	$P_{vap\ of\ i}$ (psi)			$P_{partial\ of\ i}$ (psi)			Y_i		
		T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}	T_{LN}	T_{LA}	T_{LX}
Acetone	2.75%	2.1516	2.4554	2.7942	0.0593	0.0676	0.0770	19.44%	18.89%	18.36%
Aliphatics	1.77%	1.6630	1.9530	2.2826	0.0295	0.0347	0.0405	9.681%	9.679%	9.661%
Alkyl Benzenes	4.59%	0.0071	0.0087	0.0107	0.0003	0.0004	0.0005	0.106%	0.112%	0.117%
Benzene	0.01%	0.6576	0.7717	0.9017	0.0001	0.0001	0.0001	0.020%	0.020%	0.020%
Butanol	0.57%	0.0354	0.0450	0.0568	0.0002	0.0003	0.0003	0.066%	0.072%	0.077%
Butyl Acetate	0.70%	0.0931	0.1111	0.1321	0.0007	0.0008	0.0009	0.214%	0.218%	0.221%
Cresol-m	0.61%	2.42E-05	3.81E-05	5.90E-05	1.49E-07	2.34E-07	3.63E-07	0.00005%	0.0001%	0.0001%
Cyclohexanone	1.35%	0.0265	0.0319	0.0383	0.0004	0.0004	0.0005	0.118%	0.121%	0.124%
Ethyl Alcohol	1.05%	0.5032	0.5964	0.7044	0.0053	0.0063	0.0074	1.731%	1.747%	1.762%
Ethyl Benzene	0.59%	0.0769	0.0914	0.1082	0.0005	0.0005	0.0006	0.150%	0.152%	0.153%
Glycol Ethers	0.58%	3.02E-04	3.93E-04	5.09E-04	1.76E-06	2.30E-06	2.97E-06	0.001%	0.001%	0.001%
Hexane	0.67%	1.3658	1.5646	1.7869	0.0091	0.0104	0.0119	2.98%	2.91%	2.84%
Isopropyl Alcohol	4.37%	0.3747	0.4489	0.5354	0.0164	0.0196	0.0234	5.37%	5.48%	5.58%
Methyl Alcohol	2.17%	1.0107	1.1868	1.3889	0.0219	0.0257	0.0301	7.19%	7.18%	7.18%
Methyl Ethyl Ketone	0.96%	0.7607	0.8825	1.0203	0.0073	0.0085	0.0098	2.40%	2.37%	2.34%
Methyl Isobutyl Ketone	0.28%	0.1389	0.1654	0.1962	0.0004	0.0005	0.0005	0.13%	0.13%	0.13%
Methyl t-Butyl Ether	0.31%	2.4600	2.7888	3.1530	0.0076	0.0086	0.0097	2.49%	2.40%	2.32%
Methylene Chloride	0.39%	4.3004	4.8656	5.4900	0.0168	0.0190	0.0215	5.51%	5.31%	5.12%
Naphthalene	0.14%	0.0003	0.0004	0.0005	4.16E-07	5.64E-07	7.58E-07	0.0001%	0.0002%	0.0002%
Tetrahydrofuran	0.25%	1.5730	1.7994	2.0522	0.0039	0.0045	0.0051	1.29%	1.26%	1.23%
Toluene	4.26%	0.2390	0.2796	0.3260	0.0102	0.0119	0.0139	3.34%	3.33%	3.31%
Trichloroethane, 1,1,1-	0.09%	1.1168	1.2813	1.4656	0.0010	0.0012	0.0013	0.33%	0.32%	0.32%
Trichloroethylene	0.07%	0.5025	0.5904	0.6909	0.0003	0.0004	0.0005	0.11%	0.11%	0.11%
Trimethylbenzene, 1,2,4	0.03%	0.0165	0.0200	0.0242	4.68E-06	5.68E-06	6.85E-06	0.002%	0.002%	0.002%
Water, Oil, Dirt (solids)	65.26%	0.1699	0.2042	0.2444	0.1109	0.1332	0.1595	36.37%	37.21%	38.03%
Xylene	6.16%	0.0464	0.0561	0.0674	0.0029	0.0035	0.0042	0.94%	0.97%	0.99%
Totals	100.00%	19.2902	22.1992	25.4715	0.3048	0.3581	0.4193	100.00%	100.00%	100.00%

(continued on next page)

Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Blended Fuel (continued from previous page)

(continued from previous page)

Calculate Stock Density (lb/cubic foot)

M_V Calculation			
Compound	**MW**	**Y_i**	**MW x Y_i**
Acetone	58.08	18.89%	10.9719
Aliphatics	73.14	9.68%	7.0789
Alkyl Benzenes	134.22	0.11%	0.1501
Benzene	78.11	0.02%	0.0154
Butanol	74.12	0.07%	0.0531
Butyl Acetate	116.16	0.22%	0.2530
Cresol-m	108.10	0.00%	0.0001
Cyclohexanone	98.20	0.12%	0.1185
Ethyl Alcohol	46.07	1.75%	0.8047
Ethyl Benzene	106.17	0.15%	0.1609
Glycol Ethers	62.07	0.00%	0.0004
Hexane	86.17	2.91%	2.5065
Isopropyl Alcohol	60.09	5.48%	3.2926
Methyl Alcohol	32.04	7.18%	2.3016
Methyl Ethyl Ketone	72.10	2.37%	1.7113
Methyl Isobutyl Ketone	100.20	0.13%	0.1283
Methyl t-Butyl Ether	88.15	2.40%	2.1174
Methylene Chloride	84.94	5.31%	4.5119
Naphthalene	128.20	0.00%	0.0002
Tetrahydrofuran	72.12	1.26%	0.9094
Toluene	92.13	3.33%	3.0641
Trichloroethane, 1,1,1-	133.42	0.32%	0.4322
Trichloroethylene	131.40	0.11%	0.1492
Trimethylbenzene, 1,2,4	120.19	0.00%	0.0019
Water, Oil, Dirt (solids)	18.02	37.21%	6.7055
Xylene	106.17	0.97%	1.0246
M_V = Sum (MW_i x Y_i)			**48.4636**

Stock Density

$$W_V = (M_V \times P_{VA}) / (R \times T_{LA})$$

Where: W_V is the stock density in lb/cubic foot

M_V is the molecular weight of the vapor

P_{VA} is the total pressure of the mixture in psia

R ideal gas constant
(10.731 psia cubic foot / lb-mole °R)

T_{LA} is the daily average liquid temperature in °R

M_V = 48.46 (see below)

P_{VA} = 0.3581 psi

R = 10.731 psia cubic foot / lb-mole °R

T_{LA} = 513.35 °R

W_V = (48.46 x 0.3581) / (10.731 x 513.35)

W_V = 0.0031 lb/cubic foot

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Blended Fuel

(continued from previous page)

Calculate Vapor Space Expansion Factor (K_E)

$K_E = (\Delta T_V / T_{LA}) + (\Delta P_V - \Delta P_B) / (P_A - P_{VA})$ AP-42, Chapter 7.1, Equation 1-7

Where:
K_E = Vapor Space Expansion Factor (Calculated Below)
ΔT_V = 19.80 (°R - Daily Vapor Temperature Range)
T_{LA} = 513.35 (°R - Average Daily Liquid Surface Temperature)
ΔP_V = Daily Vapor Pressure Range (Calcuated Below)
ΔP_B = Breather Vent Pressure Setting Range (Calcuated Below)
P_A = 14.7 (psia - Atmospheric Pressure)
P_{VA} = 0.3581 (psia - Total Mixture Pressure)

ΔP_V

$\Delta P_V = P_{LX} - P_{LN}$

Where: ΔP_V is the daily vapor pressure range
P_{LX} = 0.4193 psi
P_{LN} = 0.3048 psi

ΔP_V = 0.419253547358546 - 0.304812927869811 = 0.1144 psi

ΔP_B

$\Delta P_B = P_{BP} - P_{BV}$

Where: ΔP_B is the breather vent pressure setting range
P_{BP} = 0.03 psi
P_{BV} = -0.03 psi

ΔP_B = (0.03) - (-0.03) = 0.06 psi

K_E = 0.042366 (Unitless)
If KE is less than zero, it is assumed to be zero.

Calculate Vented Vapor Space Saturation Factor (K_S)

$K_S = 1 / (1 + 0.053 (P_{VA}) (H_{VO}))$ AP-42, Chapter 7.1, Equation 1-20

Where: Ks is the vented vapor space saturation factor
P_{VA} is the total mixture pressure P_{VA} = 0.3581 psi
H_{VO} is the vapor space outage H_{VO} = 0.3058 Ft

K_S = 1 / (1 + 0.053 (0.3581) (0.3058) = 0.99423 (Unitless)

Loss Calculations (HAP and VOC Emissions)

Standing Storage Loss L_S (lb/yr) $= 365 (W_V)(V_V)(K_E)(K_S)$
Working Loss L_W (lb/yr) $= 0.0010 (M_V)(P_{VA})(Q)(K_N)(K_P)$
Total Loss L_T (lb/yr) $= L_S + L_W$

Where:
W_V = 0.00314975 Vapor Density in lb/cubic feet
V_V = 34.59 Vapor Space Volume in cubic feet
K_E = 0.04236608 Vapor Space Expansion Factor
K_S = 0.99422992 Vented Vapor Space Saturation Factor - See Above for Calculation
M_V = 48.46 Molecular Weight of the Vapor in lb/lb-mole
P_{VA} = 0.3581 Total Mixture Pressure in psi
Q = 4,140,020 bbl/yr
K_N = 0.2 working turnovers
K_P = 1.0 working loss product factor, unitless

(continued on next page)

Appendix A to the Technical Support Document (TSD)
Potential to Emit - One (1) 10,000 Gallon Mix Tank - T12 and T13 - Blended Fuel

(continued from previous page)

Standing Storage Loss		
L_S (lb/yr)	1.68	lb/yr
Working Loss		
L_W (lb/yr)	12,096.32	lb/yr
Total Loss		
L_T (lb/yr)	12,098.00	lb/yr

Individual Compound Emissions

Basis:	100	lb-moles of vapor for weight fraction calculation
Total Emissions:	12,098.00	lb/yr
Control Efficiency:	95%	

Compound Information						PTE Calculations					
Compound	**Yi**	**lb-moles**	**MW**	**Pounds**	**Weight %**	**PTE VOC (lb/yr)**	**PTE HAP (lb/yr)**	**PTE VOC (TPY)**	**PTE HAP (TPY)**	**PTE VOC w/control (TPY)**	**PTE HAP w/control (TPY)**
Acetone	18.89%	18.89104	58.08	1,097.19	22.64%						
Aliphatics	9.68%	9.678532	73.14	707.89	14.61%	1,767.10		0.88		0.04	
Alkyl Benzenes	0.11%	0.111822	134.22	15.01	0.31%	37.47	37.47	0.02	0.02	9.37E-04	9.4E-04
Benzene	0.02%	0.019739	78.11	1.54	0.03%	3.85	3.85	1.9E-03	1.92E-03	9.6E-05	9.6E-05
Butanol	0.07%	0.071617	74.12	5.31	0.11%	13.25		6.6E-03		3.3E-04	
Butyl Acetate	0.22%	0.2178	116.16	25.30	0.52%	63.16		0.03		1.58E-03	
Cresol-m	0.0001%	6.54E-05	108.10	0.01	0.0001%	0.02	0.02	8.83E-06	8.83E-06	4.41E-07	4.4E-07
Cyclohexanone	0.12%	0.120674	98.20	11.85	0.24%	29.58		0.01		7.40E-04	
Ethyl Alcohol	1.75%	1.746785	46.07	80.47	1.66%	200.89		0.10		5.02E-03	
Ethyl Benzene	0.15%	0.151553	106.17	16.09	0.33%	40.17	40.17	0.02	0.02	1.00E-03	1.0E-03
Glycol Ethers	0.001%	0.000641	62.07	0.04	0.001%	0.10	0.10	4.97E-05	4.97E-05	2.48E-06	2.48E-06
Hexane	2.91%	2.908728	86.17	250.65	5.17%	625.69	625.69	0.31	0.31	0.02	0.02
Isopropyl Alcohol	5.48%	5.479489	60.09	329.26	6.79%	821.94		0.41		0.02	
Methyl Alcohol	7.18%	7.183415	32.04	230.16	4.75%	574.54	574.54	0.29	0.29	0.01	0.01
Methyl Ethyl Ketone	2.37%	2.373575	72.10	171.13	3.53%	427.20		0.21		0.01	
Methyl Isobutyl Ketone	0.13%	0.128041	100.20	12.83	0.26%	32.03	32.03	0.02	0.02	8.01E-04	8.01E-04
Methyl t-Butyl Ether	2.40%	2.402007	88.15	211.74	4.37%	528.56	528.56	0.26	0.26	0.01	0.01
Methylene Chloride	5.31%	5.311898	84.94	451.19	9.31%		1,126.31		0.56		0.03
Naphthalene	0.0002%	0.000157	128.20	0.02	0.0004%	0.05	0.05	2.52E-05	2.52E-05	1.26E-06	1.26E-06
Tetrahydrofuran	1.26%	1.260907	72.12	90.94	1.88%	227.01	227.01	0.11	0.11	0.01	0.01
Toluene	3.33%	3.325807	92.13	306.41	6.32%	764.88	764.88	0.38	0.38	0.02	0.02
Trichloroethane, 1,1,1-	0.32%	0.323941	133.42	43.22	0.89%	107.89	107.89	0.05	0.05	2.70E-03	2.70E-03
Trichloroethylene	0.11%	0.113539	131.40	14.92	0.31%	37.24	37.24	0.02	0.02	9.31E-04	9.31E-04
Trimethylbenzene, 1,2,4	0.002%	0.001586	120.19	0.19	0.004%	0.48		2.38E-04		1.19E-05	
Water, Oil, Dirt (solids)	37.21%	37.21161	18.02	670.55	13.84%						
Xylene	0.97%	0.965026	106.17	102.46	2.11%	255.76	255.76	0.13	0.13	6.39E-03	6.39E-03
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	---	---	---	---	---						
Totals				**4,846.36**	**100.00%**	**6,559**	**4,361.57**	**3.28**	**2.18**	**0.16**	**0.11**

Worst Case HAP	**Methylene Chloride**	**0.56**	**TPY - Uncontrolled**
Worst Case HAP	**Methylene Chloride**	**0.03**	**TPY - After Control**

Appendix A to the Technical Support Document (TSD)
PTE and Emission Factor Calculation - Tank T12 and T13

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Throughput for Calculation 173,880,847 gallons/yr
173,881 kgallon/yr

Control Efficiency 95%

						Uncontrolled			After Control		
Pollutant	HAP	VOC	PTE with Cutter (TPY)	PTE with Blended Fuel (TPY)	Worst Case (TPY)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/kgal)	HAP PTE (TPY)	VOC PTE (TPY)	Emission Factor (lb/kgal)
Acetone	NO	NO	---	---	---	not regulated			not regulated		
Aliphatics	NO	YES	2.553	0.884	2.553		2.553	0.029		0.128	1.47E-03
Alkyl Benzenes	YES	YES	0.054	1.87E-02	0.054	0.0540	0.054	6.22E-04	2.70E-03	2.70E-03	3.11E-05
Benzene	YES	YES		1.92E-03	1.92E-03	0.0019	1.92E-03	2.21E-05	9.62E-05	9.62E-05	1.11E-06
Butanol	NO	YES	0.019	6.63E-03	0.019		0.019	2.20E-04		9.57E-04	1.10E-05
Butyl Acetate	NO	YES	0.091	0.032	0.091		0.091	1.05E-03		4.56E-03	5.25E-05
Cresol-m	YES	YES	2.55E-05	8.83E-06	2.55E-05	2.55E-05	2.55E-05	2.93E-07	1.28E-06	1.28E-06	1.47E-08
Cyclohexanone	NO	YES	0.043	1.48E-02	0.043		0.043	4.92E-04		2.14E-03	2.46E-05
Ethyl Alcohol	NO	YES	0.290	0.100	0.290		0.290	3.34E-03		0.015	1.67E-04
Ethyl Benzene	YES	YES	0.056	2.01E-02	0.056	0.0556	0.056	6.39E-04	2.78E-03	2.78E-03	3.20E-05
Glycol Ethers	YES	YES	1.43E-04	4.97E-05	1.43E-04	1.43E-04	1.43E-04	1.65E-06	7.17E-06	7.17E-06	8.25E-08
Hexane	YES	YES	0.904	0.313	0.904	0.9038	0.904	0.010	0.05	0.045	5.20E-04
Isopropyl Alcohol	NO	YES	1.187	0.411	1.187		1.187	0.014		0.059	6.83E-04
Methyl Alcohol	YES	YES	0.830	0.287	0.830	0.8299	0.830	0.010	0.04	0.041	4.77E-04
Methyl Ethyl Ketone	NO	YES	0.617	0.214	0.617		0.617	7.10E-03		0.031	3.55E-04
Methyl Isobutyl Ketone	YES	YES	0.045	0.016	0.045	0.0453	0.045	5.21E-04	2.26E-03	2.26E-03	2.60E-05
Methyl t-Butyl Ether	YES	YES	0.763	0.264	0.763	0.7631	0.763	8.78E-03	3.82E-02	0.038	4.39E-04
Methylene Chloride	YES	NO	1.627	0.563	1.627	1.6272		0.019	0.08		9.36E-04
Naphthalene	YES	YES	7.29E-05	2.52E-05	7.29E-05	7.29E-05	7.29E-05	8.38E-07	3.64E-06	3.64E-06	4.19E-08
Tetrahydrofuran	YES	YES	0.328	0.114	0.328	0.3282	0.328	3.78E-03	1.64E-02	0.016	1.89E-04
Toluene	YES	YES	1.097	0.382	1.097	1.0967	1.097	0.013	0.05	0.055	6.31E-04
Trichloroethane, 1,1,1-	YES	YES	0.156	0.054	0.156	0.1558	0.156	1.79E-03	7.79E-03	0.008	8.96E-05
Trichloroethylene	YES	YES		0.019	0.019	0.0186	0.019	2.14E-04	9.31E-04	9.31E-04	1.07E-05
Trimethylbenzene, 1,2,4	NO	YES	0.156	2.38E-04	0.156		0.16	1.79E-03		7.79E-03	8.96E-05
Water, Oil, Dirt (solids)	NO	NO	---	---	---	not regulated			not regulated		
Xylene	YES	YES	0.368	0.128	0.368	0.3681	0.368	0.0042	0.02	0.018	2.12E-04
						6.25	**9.58**		**0.31**	**0.48**	

	Uncontrolled PTE				PTE after Control			
VOC	**9.578**	**TPY**	**0.110**	**lb/kgal**	**0.479**	**TPY**	**0.01**	**lb/kgal**
Single HAP - Methylene Chloride	**1.627**	**TPY**	**0.019**	**lb/kgal**	**0.081**	**TPY**	**0.001**	**lb/kgal**
Combined HAP	**6.249**	**TPY**	**0.072**	**lb/kgal**	**0.312**	**TPY**	**0.004**	**lb/kgal**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - Tank Farm - Tanks T1, T3, T4, T5, T6, T7, T8, T12, and T13

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Worst Case Emission Factor (lb/kgallon)							
Pollutant	HAP	VOC	Tanks T1,T3, T5, & T6	Tank T7	Tank T8	Tanks T12 & T13	Worst Case Emission Factor
Acetone	NO	NO	(not regulated)				
Aliphatics	NO	YES	2.98E-02	3.37E-02	3.21E-02	2.94E-02	0.0337
Alkyl Benzenes	YES	YES	6.31E-04	7.14E-04	6.80E-04	6.22E-04	7.14E-04
Benzene	YES	YES	2.25E-05	2.54E-05	2.42E-05	2.21E-05	2.54E-05
Butanol	NO	YES	2.24E-04	2.53E-04	2.41E-04	2.20E-04	2.53E-04
Butyl Acetate	NO	YES	1.07E-03	1.21E-03	1.15E-03	1.05E-03	1.21E-03
Cresol-m	YES	YES	2.98E-07	3.37E-07	3.21E-07	2.93E-07	3.37E-07
Cyclohexanone	NO	YES	4.99E-04	5.65E-04	5.38E-04	4.92E-04	5.65E-04
Ethyl Alcohol	NO	YES	3.39E-03	3.83E-03	3.65E-03	3.34E-03	3.83E-03
Ethyl Benzene	YES	YES	6.49E-04	7.35E-04	6.99E-04	6.39E-04	7.35E-04
Glycol Ethers	YES	YES	1.68E-06	1.90E-06	1.80E-06	1.65E-06	1.90E-06
Hexane	YES	YES	1.06E-02	1.19E-02	1.14E-02	1.04E-02	0.0119
Isopropyl Alcohol	NO	YES	1.39E-02	1.57E-02	1.49E-02	1.37E-02	0.0157
Methyl Alcohol	YES	YES	9.69E-03	1.10E-02	1.04E-02	9.55E-03	0.0110
Methyl Ethyl Ketone	NO	YES	7.21E-03	8.16E-03	7.76E-03	7.10E-03	8.16E-03
Methyl Isobutyl Ketone	YES	YES	5.29E-04	5.98E-04	5.69E-04	5.21E-04	5.98E-04
Methyl t-Butyl Ether	YES	YES	8.91E-03	1.01E-02	9.60E-03	8.78E-03	0.0101
Methylene Chloride	YES	NO	1.90E-02	2.15E-02	2.05E-02	1.87E-02	0.0215
Naphthalene	YES	YES	8.51E-07	9.63E-07	9.17E-07	8.38E-07	9.63E-07
Tetrahydrofuran	YES	YES	3.83E-03	4.34E-03	4.13E-03	3.78E-03	4.34E-03
Toluene	YES	YES	1.28E-02	1.45E-02	1.38E-02	1.26E-02	0.0145
Trichloroethane, 1,1,1-	YES	YES	1.82E-03	2.06E-03	1.96E-03	1.79E-03	2.06E-03
Trichloroethylene	YES	YES	6.29E-04	7.12E-04	6.77E-04	2.14E-04	7.12E-04
Trimethylbenzene, 1,2,4	NO	YES	2.78E-06	3.14E-06	2.99E-06	1.79E-03	1.79E-03
Water, Oil, Dirt (solids)	NO	NO	(not regulated)				
Xylene	YES	YES	4.30E-03	4.87E-03	4.63E-03	4.23E-03	4.87E-03

Appendix A to the Technical Support Document
Potential to Emit - Truck Cleaning - TANKS Report Summary - Horizontal Tank - Cutter

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

TANKS 4.0.9d - Entry Data - Horizontal Tank

Physical Characteristics Tab

Shell Length (ft)	42.64	
Shell Diameter (ft)	8.2	
Working Volume (gal)	5,500	
Turnovers / Year	12,501.97	
Throughput (gal/yr)	68,760,847	68,760.85 kgallon/yr
Heated	NO	
Underground	NO	
Shell Color	White	
Shell Condition	Good	
Breather Vent Vacuum Setting (psig)	-0.03	
Breather Vent Pressure Setting (psig)	0.03	

Site Selection Tab

Nearest Major City	Indianapolis, IN
Daily Average Ambient Temperature (F)	52.26
Annual Average Maximum Temperature (F)	62.13
Annual Average Minimum Temperature (F)	42.38
Average Wind Speed (mph)	9.58
Annual Average Solar Insulation Factor (Btu/Ft^2 - day)	1,297.9515
Atmospheric Pressure (psia)	14.326

Tank Contents

Chemical Category of Liquid	Organic Liquids
Single or Multicomponent	Multiple
Speciation Option	Full Speciation
Mixture Name	Cutter

(continued on next page)

Appendix A to the Technical Support Document

Potential to Emit - Truck Cleaning - TANKS Report Summary - Horizontal Tank - Cutter

(continued from previous page)

Speciated Components

Acetone	5.30%
Diethylamine (aliphatics)	4.30%
Butyl Benzene (alkyl benzenes)	20.40%
Butanol	1.40%
Butyl Acetate	2.70%
Cresol-m	2.20%
Cyclohexanone	4.40%
Ethyl Alcohol	1.600%
Ethyl Benzene	2.000%
Ethylene Glycol (glycol ethers)	1.200%
Hexane	1.900%
Isopropyl Alcohol	8.700%
Methyl Alcohol	2.300%
Methyl Ethyl Ketone	2.300%
Methyl Isobutyl Ketone	0.900%
Methyl Tert Butyl Ether	0.900%
Methylene Chloride	1.100%
Naphthalene	0.600%
Tetrahydrofuran	0.600%
Toluene	12.900%
Trichloroethane, 1,1,1-	0.400%
Trichloroethylene	0.300%
Xylenes	21.600%
Total	100.00%

Annual Emissions

Pollutant	Working Losses (lb/yr)	Breathing Losses (lb/yr)	Total Emissions (lb/yr)	PTE (TPY)
Acetone	3,204.20	48.39	3,252.59	1.63
Diethylamine (aliphatics)	2,430.04	36.70	2,466.74	1.23
Butyl Benzene (alkyl benzenes)	43.57	0.66	44.23	0.02
Butanol	14.42	0.22	14.64	7.32E-03
Butyl Acetate	65.23	0.99	66.22	0.03
Cresol-m	0.54	0.01	0.55	2.75E-04
Cyclohexanone	47.11	0.71	47.82	0.02
Ethyl Alcohol	206.30	3.12	209.42	0.10
Ethyl Benzene	42.41	0.64	43.05	0.02
Ethylene Glycol (glycol ethers)	0.12	0.00	0.12	6.00E-05
Hexane	749.35	11.32	760.67	0.38
Isopropyl Alcohol	807.78	12.20	819.98	0.41
Methyl Alcohol	661.34	9.99	671.33	0.34
Methyl Ethyl Ketone	503.44	7.60	511.04	0.26
Methyl Isobutyl Ketone	37.28	0.56	37.84	0.02
Methyl Tert Butyl Ether	605.90	9.15	615.05	0.31
Methylene Chloride	1,296.82	19.58	1,316.40	0.66
Naphthalene	0.27	0.01	0.28	1.40E-04
Tetrahydrofuran	251.64	3.80	255.44	0.13
Toluene	850.89	12.85	863.74	0.43
Trichloroethane, 1,1,1-	135.50	2.05	137.55	0.07
Trichloroethylene	49.40	0.75	50.15	0.03
Xylenes	380.61	5.75	386.36	0.19
Totals	**12,384.16**	**187.05**	**12,571.21**	**6.29**

(continued on next page)

Appendix A to the Technical Support Document
Potential to Emit - Truck Cleaning - TANKS Report Summary - Horizontal Tank - Cutter

(continued from previous page)

Annual Throughput **68,760.85** **kgallon/yr**

Emission Factor Calculations					
Pollutant	**HAP**	**VOC**	**PTE HAP (TPY)**	**PTE VOC (TPY)**	**Emission Factor (lb/kgallon)**
Acetone	NO	NO			0.0473
Diethylamine (aliphatics)	NO	YES		1.2334	0.0359
Butyl Benzene (alkyl benzenes)	YES	YES	0.0221	0.0221	6.43E-04
Butanol	NO	YES		7.32E-03	2.13E-04
Butyl Acetate	NO	YES		0.0331	9.63E-04
Cresol-m	YES	YES	2.75E-04	2.75E-04	8.00E-06
Cyclohexanone	NO	YES		0.0239	6.95E-04
Ethyl Alcohol	NO	YES		0.1047	3.05E-03
Ethyl Benzene	YES	YES	0.0215	0.0215	6.26E-04
Ethylene Glycol (glycol ethers)	YES	YES	6.00E-05	6.00E-05	1.75E-06
Hexane	YES	YES	0.3803	0.3803	0.0111
Isopropyl Alcohol	NO	YES		0.4100	0.0119
Methyl Alcohol	YES	YES	0.3357	0.3357	9.76E-03
Methyl Ethyl Ketone	NO	YES		0.2555	7.43E-03
Methyl Isobutyl Ketone	YES	YES	0.0189	0.0189	5.50E-04
Methyl Tert Butyl Ether	YES	YES	0.3075	0.3075	8.94E-03
Methylene Chloride	YES	NO	0.6582		0.0191
Naphthalene	YES	YES	1.40E-04	1.40E-04	4.07E-06
Tetrahydrofuran	YES	YES	0.1277	0.1277	3.71E-03
Toluene	YES	YES	0.4319	0.4319	0.0126
Trichloroethane, 1,1,1-	YES	YES	0.0688	0.0688	2.00E-03
Trichloroethylene	YES	YES	0.0251	0.0251	7.29E-04
Xylenes	YES	YES	0.1932	0.1932	5.62E-03
Totals			**2.59**	**4.00**	**0.1828**

Worst Case Single HAP - Methylene Chloride **0.66 TPY**

Combination HAP **2.59 TPY**

Appendix A to the Technical Support Document
Potential to Emit - Truck Cleaning - TANKS Report Summary - Horizontal Tank - Blended Fuel

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

TANKS 4.0.9d - Entry Data - Horizontal Tank

Physical Characteristics Tab

Shell Length (ft)	42.64	
Shell Diameter (ft)	8.2	
Working Volume (gal)	5,500	
Turnovers / Year	12,501.97	
Throughput (gal/yr)	68,760,847	68,760.85 kgallon/yr
Heated	NO	
Underground	NO	
Shell Color	White	
Shell Condition	Good	
Breather Vent Vacuum Setting (psig)	-0.03	
Breather Vent Pressure Setting (psig)	0.03	

Site Selection Tab

Nearest Major City	Indianapolis, IN
Daily Average Ambient Temperature (F)	52.26
Annual Average Maximum Temperature (F)	62.13
Annual Average Minimum Temperature (F)	42.38
Average Wind Speed (mph)	9.58
Annual Average Solar Insulation Factor (Btu/Ft^2 - day)	1,297.9515
Atmospheric Pressure (psia)	14.326

Tank Contents

Chemical Category of Liquid	Organic Liquids
Single or Multicomponent	Multiple
Speciation Option	Full Speciation
Mixture Name	Blended Fuel

(continued on next page)

Appendix A to the Technical Support Document
Potential to Emit - Truck Cleaning - TANKS Report Summary - Horizontal Tank - Blended Fuel

(continued from previous page)

Speciated Components

Acetone	3.802%
Diethylamine (aliphatics)	3.084%
Butyl Benzene (alkyl benzenes)	14.654%
Benzene	0.017%
Butanol	1.004%
Butyl Acetate	1.937%
Cresol-m	1.578%
Cyclohexanone	3.156%
Ethyl Alcohol	1.148%
Ethyl Benzene	1.498%
Ethylene Glycol (glycol ethers)	0.861%
Hexane	1.363%
Isopropyl Alcohol	6.241%
Methyl Alcohol	1.650%
Methyl Ethyl Ketone	1.650%
Methyl Isobutyl Ketone	0.660%
Methyl Tert Butyl Ether	0.646%
Methylene Chloride	0.789%
Naphthalene	0.430%
Tetrahydrofuran	0.430%
Toluene	9.323%
Trichloroethane, 1,1,1-	0.287%
Trichloroethylene	0.215%
Trimethylbenzene, 1,2,4-	0.081%
Water, Oil, Dirt (inerts)	27.944%
Xylenes	15.553%
Total	100.00%

Annual Emissions

Pollutant	Working Losses (lb/yr)	Breathing Losses (lb/yr)	Total Emissions (lb/yr)	PTE (TPY)
Acetone	1,108.92	15.56	1,124.48	0.56
Diethylamine (aliphatics)	840.82	11.80	852.62	0.43
Butyl Benzene (alkyl benzenes)	15.10	0.21	15.31	7.66E-03
Benzene	1.95	0.03	1.98	9.90E-04
Butanol	4.99	0.07	5.06	2.53E-03
Butyl Acetate	22.58	0.32	22.90	0.01
Cresol-m	0.19	0.00	0.19	9.50E-05
Cyclohexanone	16.30	0.23	16.53	8.27E-03
Ethyl Alcohol	71.41	1.00	72.41	0.04
Ethyl Benzene	15.32	0.21	15.53	7.77E-03
Ethylene Glycol (glycol ethers)	0.04	0.00	0.04	2.00E-05
Hexane	259.34	3.64	262.98	0.13
Isopropyl Alcohol	279.56	3.92	283.48	0.14
Methyl Alcohol	228.89	3.21	232.10	0.12
Methyl Ethyl Ketone	174.24	2.44	176.68	0.09
Methyl Isobutyl Ketone	13.19	0.19	13.38	6.69E-03
Methyl Tert Butyl Ether	209.81	2.94	212.75	0.11
Methylene Chloride	448.75	6.30	455.05	0.23
Naphthalene	0.09	0.01	0.10	5.00E-05
Tetrahydrofuran	87.00	1.22	88.22	4.41E-02
Toluene	296.68	4.16	300.84	0.15
Trichloroethane, 1,1,1-	46.90	0.66	47.56	0.02
Trichloroethylene	17.08	0.24	17.32	8.66E-03
Trimethylbenzene, 1,2,4-	0.15	0.00	0.15	7.50E-05
Water, Oil, Dirt (inerts)	668.65	9.38	678.03	0.34
Xylenes	132.21	1.85	134.06	0.07
Totals	**4,960.16**	**69.59**	**5,029.75**	**2.51**

(continued on next page)

Appendix A to the Technical Support Document
Potential to Emit - Truck Cleaning - TANKS Report Summary - Horizontal Tank - Blended Fuel

(continued from previous page)

Annual Throughput **68,760.85** **kgallon/yr**

Emission Factor Calculations					
Pollutant	**HAP**	**VOC**	**PTE HAP (TPY)**	**PTE VOC (TPY)**	**Emission Factor (lb/kgallon)**
Acetone	NO	NO			0.02
Diethylamine (aliphatics)	NO	YES		0.43	0.01
Butyl Benzene (alkyl benzenes)	YES	YES	7.66E-03	7.66E-03	2.23E-04
Benzene	YES	YES	9.90E-04	9.90E-04	2.88E-05
Butanol	NO	YES		2.53E-03	7.36E-05
Butyl Acetate	NO	YES		0.01	3.33E-04
Cresol-m	YES	YES	9.50E-05	9.50E-05	2.76E-06
Cyclohexanone	NO	YES		8.27E-03	2.40E-04
Ethyl Alcohol	NO	YES		0.04	1.05E-03
Ethyl Benzene	YES	YES	7.77E-03	7.77E-03	2.26E-04
Ethylene Glycol (glycol ethers)	YES	YES	2.00E-05	2.00E-05	5.82E-07
Hexane	YES	YES	0.13	0.13	3.82E-03
Isopropyl Alcohol	NO	YES		0.14	4.12E-03
Methyl Alcohol	YES	YES	0.12	0.12	3.38E-03
Methyl Ethyl Ketone	NO	YES		0.09	2.57E-03
Methyl Isobutyl Ketone	YES	YES	6.69E-03	6.69E-03	1.95E-04
Methyl Tert Butyl Ether	YES	YES	0.11	0.11	3.09E-03
Methylene Chloride	YES	NO	0.23		6.62E-03
Naphthalene	YES	YES	5.00E-05	5.00E-05	1.45E-06
Tetrahydrofuran	YES	YES	0.04	0.04	1.28E-03
Toluene	YES	YES	0.15	0.15	4.38E-03
Trichloroethane, 1,1,1-	YES	YES	0.02	0.02	6.92E-04
Trichloroethylene	YES	YES	8.66E-03	8.66E-03	2.52E-04
Trimethylbenzene, 1,2,4-	NO	YES		7.50E-05	2.18E-06
Water, Oil, Dirt (inerts)	NO	NO			9.86E-03
Xylenes	YES	YES	0.07	0.07	1.95E-03
Totals			**0.90**	**1.39**	**0.0731**

Worst Case Single HAP - Methylene Chloride **0.23 TPY**

Combination HAP **0.90 TPY**

Appendix A to the Technical Support Document (TSD)
Worst Case Emission Factor Determination - Truck Wash

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Pollutant	Emission Factor with Cutter (lb/kgallon)	Emission Factor with Blended Fuel (lb/kgallon)	Worst Case Emission Factor (lb/gallon)
Acetone	0.0473	0.0164	0.0473
Diethylamine (aliphatics)	0.0359	0.0124	0.0359
Butyl Benzene (alkyl benzenes)	0.0006	2.23E-04	6.43E-04
Benzene	0.00E+00	2.88E-05	2.88E-05
Butanol	0.0002	7.36E-05	2.13E-04
Butyl Acetate	0.0010	3.33E-04	9.63E-04
Cresol-m	8.00E-06	2.76E-06	8.00E-06
Cyclohexanone	0.0007	2.40E-04	6.95E-04
Ethyl Alcohol	0.0030	0.0011	3.05E-03
Ethyl Benzene	0.0006	2.26E-04	6.26E-04
Ethylene Glycol (glycol ethers)	1.75E-06	5.82E-07	1.75E-06
Hexane	0.0111	3.82E-03	0.0111
Isopropyl Alcohol	0.0119	4.12E-03	0.0119
Methyl Alcohol	0.0098	3.38E-03	9.76E-03
Methyl Ethyl Ketone	0.0074	2.57E-03	7.43E-03
Methyl Isobutyl Ketone	5.50E-04	1.95E-04	5.50E-04
Methyl Tert Butyl Ether	8.94E-03	3.09E-03	8.94E-03
Methylene Chloride	0.0191	6.62E-03	0.0191
Naphthalene	4.07E-06	1.45E-06	4.07E-06
Tetrahydrofuran	3.71E-03	1.28E-03	3.71E-03
Toluene	0.0126	4.38E-03	0.0126
Trichloroethane, 1,1,1-	2.00E-03	6.92E-04	2.00E-03
Trichloroethylene	7.29E-04	2.52E-04	7.29E-04
Trimethylbenzene, 1,2,4-	0.00E+00	2.18E-06	2.18E-06
Water, Oil, Dirt (inerts)	0.00E+00	9.86E-03	9.86E-03
Xylenes	0.0056	1.95E-03	5.62E-03

Appendix A to the Technical Support Document (TSD)
Hydrapulper - HAP and VOC Emissions from Valves, Fittings, Etc. - Total Enclosure/Activated Carbon

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Potential to Emit - Liquid Waste Derived Fuel - Fugitive Emissions Mass Basis									
Equipment Type	Service	Emission Factor		Emission Factor		Number of Sources	PTE (TPY)	Control Efficiency	Controlled PTE (TPY)
Valves	light liquid	0.0109	(kg/hr) / source	0.02403	(lb/hr) / source	14	1.47	95%	0.07
Pump Seals	light liquid	0.114	(kg/hr) / source	0.25132	(lb/hr) / source	2	2.20	88%	0.26
Pressure Relief Valve	light liquid	0.00025	(kg/hr) / source	0.00055	(lb/hr) / source	7	0.02	95%	8.45E-04
Connectors	light liquid	0.00025	(kg/hr) / source	0.00055	(lb/hr) / source	50	0.12	81%	2.29E-02
Grinders	light liquid	0.00025	(kg/hr) / source	0.00055	(lb/hr) / source	1	2.41E-03	81%	4.59E-04
Agitators	light liquid	0.114	(kg/hr) / source	0.25132	(lb/hr) / source	3	3.30	81%	0.63
Open Ended Valves	light liquid	0.0023	(kg/hr) / source	0.00507	(lb/hr) / source	2	0.04	81%	8.44E-03
Door Seals	light liquid	0.00025	(kg/hr) / source	0.00055	(lb/hr) / source	2	4.83E-03	81%	9.17E-04
						Total	**7.17**		**0.99**

Hydrapulper Fittings - Located within Total Enclosure						LDAR Program		Activated Carbon	
Pollutant	Mass %	VOC	HAP	PTE VOC (TPY)	PTE HAP (TPY)	Controlled PTE VOC (TPY)	Controlled PTE HAP (TPY)	Controlled PTE VOC (TPY)	Controlled PTE HAP (TPY)
Acetone	5.30%	NO	NO						
Aliphatics (non-HAP) [f]	4.30%	YES	NO	0.3082		0.0426		8.52E-03	
Alkyl Benzenes [g]	20.40%	YES	YES	1.4620	1.4620	0.2022	0.2022	0.04	0.04
Butanol	1.40%	YES	NO	0.1003		0.0139		2.77E-03	
Butyl Acetate	2.70%	YES	NO	0.1935		0.0268		5.35E-03	
Cresol-m	2.20%	YES	YES	0.1577	0.1577	0.0218	0.0218	4.36E-03	4.36E-03
Cyclohexanone	4.40%	YES	NO	0.3153		0.0436		8.72E-03	
Ethanol	1.60%	YES	NO	0.1147		0.0159		3.17E-03	
Ethyl Benzene	2.00%	YES	YES	0.1433	0.1433	0.0198	0.0198	3.96E-03	3.96E-03
Glycol Ethers [h]	1.20%	YES	YES	0.0860	0.0860	0.0119	0.0119	2.38E-03	2.38E-03
Hexane	1.90%	YES	YES	0.1362	0.1362	0.0188	0.0188	3.77E-03	3.77E-03
Isopropyl Alcohol	8.70%	YES	NO	0.6235		0.0862		0.02	
Methyl Alcohol	2.30%	YES	YES	0.1648	0.1648	0.0228	0.0228	4.56E-03	4.56E-03
Methyl Ethyl Ketone	2.30%	YES	NO	0.1648		0.0228		4.56E-03	
Methyl Isobutyl Ketone	0.90%	YES	YES	0.0645	0.0645	0.0089	0.0089	1.78E-03	1.78E-03
Methyl t-Butyl Ether	0.90%	YES	YES	0.0645	0.0645	0.0089	0.0089	1.78E-03	1.78E-03
Methylene Chloride	1.10%	NO	YES		0.0788		0.0109		2.18E-03
Naphthalene	0.60%	YES	YES	0.0430	0.0430	0.0059	0.0059	1.19E-03	1.19E-03
Tetrahydrofuran	0.60%	YES	YES	0.0430	0.0430	0.0059	0.0059	1.19E-03	1.19E-03
Toluene	12.90%	YES	YES	0.9245	0.9245	0.1278	0.1278	0.03	0.03
Trichloroethane, 1,1,1-	0.40%	YES	YES	0.0287	0.0287	0.0040	0.0040	7.93E-04	7.93E-04
Trichloroethylene	0.30%	YES	YES	0.0215	0.0215	0.0030	0.0030	5.95E-04	5.95E-04
Xylene	21.60%	YES	YES	1.5480	1.5480	0.2141	**0.2141**	**0.04**	0.04
	100.00%		**Totals**	**6.71**	**4.97**	**0.93**	**0.69**	**0.19**	**0.14**

Notes:
(a) 1995 Protocol for Equipment Leak Emission Estimates, U.S. EPA, November 1998, EPA-453/R-95-017, Table 2-2, control efficiencies are from Table 5-2, emission rates are from Table 2-2 for a refinery. Where a control efficiency or emission rate was not available, IDEM used the most conservative value listed.
(b) PTE (TPY) = emission factor ((lb/hr)/source) x number of sources x 4.38 ton-hr/lb-yr
(c) Controlled PTE (TPY) = PTE (TPY) x (1 - control efficiency), carbon canister has 80% VOC control efficiency.
(d) PTE (HAP/VOC) = PTE Emitted (TPY) x Mass % Pollutant
(e) Controlled (HAP/VOC) = Controlled PTE (TPY) x Mass % Pollutant
(f) Similar to Diethylamine
(g) Similar to Butyl Benzene

Appendix A to the Technical Support Document (TSD)
Tank Farm Fugitive HAP and Fugitive VOC Emissions from Valves, Fittings, Etc.

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Potential to Emit - Liquid Waste Derived Fuel - Fugitive Emissions Mass Basis									
Equipment Type	Service	Emission Factor		Emission Factor		Number of Sources	PTE (TPY)	Control Efficiency	Controlled PTE (TPY)
Valves	light liquid	0.0109	(kg/hr) / source	0.02403	(lb/hr) / source	507	53.36	95%	2.67
Pump Seals	light liquid	0.114	(kg/hr) / source	0.25132	(lb/hr) / source	2	2.20	88%	0.26
Pressure Relief Valve	light liquid	0.00025	(kg/hr) / source	0.00055	(lb/hr) / source	26	0.06	95%	3.14E-03
Connectors	light liquid	0.00025	(kg/hr) / source	0.00055	(lb/hr) / source	988	2.39	81%	0.45
Grinders	light liquid	0.00025	(kg/hr) / source	0.00055	(lb/hr) / source	4	9.66E-03	81%	1.83E-03
Agitators	light liquid	0.114	(kg/hr) / source	0.25132	(lb/hr) / source	10	11.01	81%	2.09
Open Ended Valves	light liquid	0.0023	(kg/hr) / source	0.00507	(lb/hr) / source	0	0.00	81%	0.00
Door Seals	light liquid	0.00025	(kg/hr) / source	0.00055	(lb/hr) / source	11	2.66E-02	81%	5.05E-03
						Total	**69.06**		**5.48**

Pollutant	Mass %	VOC	HAP	PTE VOC (TPY)	PTE HAP (TPY)	Controlled PTE VOC (TPY)	Controlled PTE HAP (TPY)	
Acetone	5.30%	NO	NO					
Aliphatics (non-HAP) [f]	4.30%	YES	NO	2.9694		0.2358		
Alkyl Benzenes [g]	20.40%	YES	YES	14.0875	14.0875	1.1189	1.1189	
Butanol	1.40%	YES	NO	0.9668		0.0768		
Butyl Acetate	2.70%	YES	NO	1.8645		0.1481		
Cresol-m	2.20%	YES	YES	1.5192	1.5192	0.1207	0.1207	
Cyclohexanone	4.40%	YES	NO	3.0385		0.2413		
Ethanol	1.60%	YES	NO	1.1049		0.0878		
Ethyl Benzene	2.00%	YES	YES	1.3811	1.3811	0.1097	0.1097	
Glycol Ethers [h]	1.20%	YES	YES	0.8287	0.8287	0.0658	0.0658	
Hexane	1.90%	YES	YES	1.3121	1.3121	0.1042	0.1042	
Isopropyl Alcohol	8.70%	YES	NO	6.0079		0.4772		
Methyl Alcohol	2.30%	YES	YES	1.5883	1.5883	0.1261	0.1261	
Methyl Ethyl Ketone	2.30%	YES	NO	1.5883		0.1261		
Methyl Isobutyl Ketone	0.90%	YES	YES	0.6215	0.6215	0.0494	0.0494	
Methyl t-Butyl Ether	0.90%	YES	YES	0.6215	0.6215	0.0494	0.0494	
Methylene Chloride	1.10%	NO	YES		0.7596		0.0603	
Naphthalene	0.60%	YES	YES	0.4143	0.4143	0.0329	0.0329	
Tetrahydrofuran	0.60%	YES	YES	0.4143	0.4143	0.0329	0.0329	
Toluene	12.90%	YES	YES	8.9083	8.9083	0.7075	0.7075	
Trichloroethane, 1,1,1-	0.40%	YES	YES	0.2762	0.2762	0.0219	0.0219	
Trichloroethylene	0.30%	YES	YES	0.2072	0.2072	0.0165	0.0165	
Xylene	21.60%	YES	YES	14.9162	14.9162	1.1847	**1.1847**	**Single HAP**
	100.00%		**Totals**	**64.64**	**47.86**	**5.13**	**3.80**	

Notes:
(a) 1995 Protocol for Equipment Leak Emission Estimates, U.S. EPA, November 1998, EPA-453/R-95-017, Table 2-2, control efficiencies are from Table 5-2, emission rates are from Table 2-2 for a refinery. Where a control efficiency or emission rate was not available, IDEM used the lowest efficiency listed and the emission rate for a connector.
(b) PTE (TPY) = emission factor ((lb/hr)/source) x number of sources x 4.38 ton-hr/lb-yr
(c) Controlled PTE (TPY) = PTE (TPY) x (1 - control efficiency)
(d) PTE (HAP/VOC) = PTE Emitted (TPY) x Mass % Pollutant
(e) Controlled (HAP/VOC) = Controlled PTE (TPY) x Mass % Pollutant
(f) Similar to Diethylamine
(g) Similar to Butyl Benzene
(h) Similar to Ethylene Glycol

Appendix A to the Technical Support Document (TSD)
Fugitive Emissions from Paved Roads

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Average Vehicle Weight

Vehicle Type	Vehicles per Day	Average Weight (tons)	Trips per Year	Miles per Trip	Vehicle Miles Traveled (VMT) (miles/year)	Traffic Component	Component Weight (tons)
Solid Waste to Plant	10	27.50	3,650	0.5	1,825.00	50.00%	13.75
Solid Waste from Plant	10	27.50	3,650	0.5	1,825.00	50.00%	13.75
				totals	3,650.00	100.00%	27.50

Unmitigated Emissions

Unmitigated Emission Factor = k * [(sL)^0.91] * [(W)^1.02] : Equation 1 from AP-42, Chapter 13.2.1, 01/2011
Unmitigated Emissions = E (lb/VMT) * VMT (miles)/year * 1 ton/2,000 lb
sL is for concrete batching, AP-42, Ch 13.2.1, Table 13.2.1-3, 01/2011

Unmitigated Emissions		PM	PM10	PM2.5
Where k =	particle size multiplier (lb/VMT)	0.011	0.0022	0.00054
sL =	silt content (grains/square meter)	12	12	12
W =	component weight (ton)	27.50	27.50	27.50
E =	unmitigated emission factor (lb/VMT)	3.1015	0.6203	0.1523
VMT =	vehicle miles traveled (miles/yr)	3,650.00	3,650.00	3,650.00
	Unmitigated Emissions =	5.66	1.13	0.28

Mitigated Emissions

Mitigation Factor = [1 - (P/4N)], Equation 3 from AP-42, Chapter 13.2.1, 01/2011
P (days) = 125
N (days) = 365
Mitigation Factor (unitless) = 0.9144

Mitigated Emissions (TPY) = Unmitigated Emissions * Mitigation Factor
mitigated PM = 5.18 TPY
mitigated PM10 = 1.04 TPY
mitigated PM2.5 = 0.25 TPY

Controlled Emissions

Controlled Emissions = Mitigated Emissions (TPY) * (1 - Dust Control Efficiency (%))
Fugitive Dust Plan Control Efficiency (%) = 50%
controlled PM = 2.59
controlled PM10 = 0.52
controlled PM2.5 = 0.13

Appendix A to the Technical Support Document (TSD)
Potential to Emit - Miscellaneous LPG Combustion - Trivial Activity

Company Name: Lone Star Industries, Inc. dba Buzzi Unicem USA
Address: 3301 South CR 150 West, Greencastle, Indiana 46135
Significant Source Modification No.: 133-35865-00002
Significant Permit Modification No.: 133-35884-00002
Reviewer: David Matousek
Date: February 25, 2016

Heat Input Capacity				
Heated Bays	0.075 MMBtu/hr	94,000	Btu/gallon	Propane Heating Value
		6.99	Kgallon/year	Potential Throughput
Total Heat Input Capacity	0.075 MMBtu/hr			

Pollutant	Throughput	Emission Factor	PTE (TPY)	Source
PM	6.99 kgallons/yr	0.2 lb/kgallon	6.99E-04	AP-42, Ch. 1.5, 7/08
PM10	6.99 kgallons/yr	0.7 lb/kgallon	2.45E-03	AP-42, Ch. 1.5, 7/08
Direct PM2.5	6.99 kgallons/yr	0.7 lb/kgallon	2.45E-03	AP-42, Ch. 1.5, 7/08
SO2 (15 grains/100 CF)	6.99 kgallons/yr	1.5 lb/kgallon	5.24E-03	AP-42, Ch. 1.5, 7/08
VOC as TOC	6.99 kgallons/yr	1 lb/kgallon	3.50E-03	AP-42, Ch. 1.5, 7/08
CO	6.99 kgallons/yr	7.5 lb/kgallon	0.03	AP-42, Ch. 1.5, 7/08
NOx	6.99 kgallons/yr	13 lb/kgallon	0.05	AP-42, Ch. 1.5, 7/08
CO2	62.87 kg/MMBtu	0.075 MMBtu/hr	45.53	40 CFR 98, Subpart C, Table C-1
CH4	3.00E-03 kg/MMBtu	0.075 MMBtu/hr	2.17E-03	40 CFR 98, Subpart C, Table C-2
N2O	6.00E-04 kg/MMBtu	0.075 MMBtu/hr	4.35E-04	40 CFR 98, Subpart C, Table C-2
CO2e			45.71	Calculated, GWP CH4 -25, GWP N2O-298

Methodology:
1) Throughput (kgallon/yr) = Input (MMBtu/hr) x 8,760 hr/yr x 1 gallon/94,000 Btu x 1E06 Btu/MMBtu x 1 kgallon/1,000 gallons
2) PTE (TPY) = Emission Factor (lb/kgallon) x input (kgallon/yr) x 1 ton/2,000 lb
3) PTE CO2e (TPY) = emission factor (kg/MMBtu) x 2.2046 lb/kg x heat input (MMBtu/hr) x 4.38 ton-hr/lb-yr
4) CO2e (TPY) = TPY CO2 x 1 +TPY CH4 x 25 + TPY N2O x 298

Indiana Department of Environmental Management
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(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov

Michael R. Pence
Governor

Carol S. Comer
Commissioner

April 13, 2016

Mr. Robert West
Lone Star Industries, Inc.
P. O. Box 482
Greencastle, Indiana 46135

Re: Public Notice
Lone Star Industries, Inc.
Permit Level: Significant Source Modification
Permit Number: 133-35865-00002
Permit Level: Significant Permit Modification
Permit Number: 133-35884-00002

Dear Mr. West:

Enclosed is a copy of your drafts, Technical Support Documents, emission calculations, and the Public Notices which will be printed in your local newspaper.

The Office of Air Quality (OAQ) has prepared two versions of the Public Notice Document. The abbreviated version will be published in the newspaper, and the more detailed version will be made available on the IDEM's website and provided to interested parties. Both versions are included for your reference. The OAQ has requested that the Banner Graphic in Greencastle, Indiana publish the abbreviated version of the public notice no later than April 16, 2016. You will not be responsible for collecting any comments, nor are you responsible for having the notice published in the newspaper.

OAQ has submitted the draft permit package to the Putnam County Public Library, 103 East Poplar Street in Greencastle, Indiana. As a reminder, you are obligated by 326 IAC 2-1.1-6(c) to place a copy of the complete permit application at this library no later than ten (10) days after submittal of the application or additional information to our department. We highly recommend that even if you have already placed these materials at the library, that you confirm with the library that these materials are available for review and request that the library keep the materials available for review during the entire permitting process.

Please review the enclosed documents carefully. This is your opportunity to comment on the draft permit and notify the OAQ of any corrections that are needed before the final decision. Questions or comments about the enclosed documents should be directed to David Matousek, Indiana Department of Environmental Management, Office of Air Quality, 100 N. Senate Avenue, Indianapolis, Indiana, 46204 or call (800) 451-6027, and ask for extension 2-8253 or dial (317) 232-8253.

Sincerely,

Vicki Biddle

Vicki Biddle
Permits Branch
Office of Air Quality

Enclosures
PN Applicant Cover letter 2/17/2016

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ATTENTION: PUBLIC NOTICES, LEGAL ADVERTISING

April 13, 2016

Banner Graphic
P. O. Box 509
Greencastle, Indiana 46135

Enclosed, please find one Indiana Department of Environmental Management Notice of Public Comment for Lone Star Industries, Inc. d/b/a Buzzi Unicem USA, Putnam County, Indiana.

Since our agency must comply with requirements which call for a Notice of Public Comment, we request that you print this notice one time, no later than April 16, 2016.

Please send a notarized form, clippings showing the date of publication, and the billing to the Indiana Department of Environmental Management, Accounting, Room N1345, 100 North Senate Avenue, Indianapolis, Indiana, 46204.

To ensure proper payment, please reference account # 100174737.

We are required by the Auditor's Office to request that you place the Federal ID Number on all claims. If you have any conflicts, questions, or problems with the publishing of this notice or if you do not receive complete public notice information for this notice, please call Vicki Biddle at 800-451-6027 and ask for extension 3-6867 or dial 317-233-6867.

Sincerely,

Vicki Biddle

Vicki Biddle
Permit Branch
Office of Air Quality

Permit Level: Title V–Significant Source Modification - &- Title V–Significant Permit Modification
Permit Number: 133-35865-00002 and 133-35884-00002

Enclosure

PN Newspaper.dot 2/17/2016

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Carol S. Comer
Commissioner

April 13, 2016

To: Putnam County Public Library

From: Matthew Stuckey, Branch Chief
Permits Branch
Office of Air Quality

Subject: **Important Information to Display Regarding a Public Notice for an Air Permit**

Applicant Name: Lone Star, Industries d/b/a Buzzi Unicem USA, Inc.
Permit Number: 133-35865-00002 and 133-35884-00002

Enclosed is a copy of important information to make available to the public. This proposed project is regarding a source that may have the potential to significantly impact air quality. Librarians are encouraged to educate the public to make them aware of the availability of this information. The following information is enclosed for public reference at your library:

- Notice of a 30-day Period for Public Comment
- Request to publish the Notice of 30-day Period for Public Comment
- Draft Permit and Technical Support Document

You will not be responsible for collecting any comments from the citizens. Please refer all questions and request for the copies of any pertinent information to the person named below.

Members of your community could be very concerned in how these projects might affect them and their families. **Please make this information readily available until you receive a copy of the final package.**

If you have any questions concerning this public review process, please contact Joanne Smiddie-Brush, OAQ Permits Administration Section at 1-800-451-6027, extension 3-0185. Questions pertaining to the permit itself should be directed to the contact listed on the notice.

Enclosures
PN Library.dot 2/17/2016

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Carol S. Comer
Commissioner

Notice of Public Comment

April 13, 2016
Lone Star Industries, d/b/a Buzzi Unicem, USA, Inc.
133-35865-00002 and 133-35884-00002

Dear Concerned Citizen(s):

You have been identified as someone who could potentially be affected by this proposed air permit. The Indiana Department of Environmental Management, in our ongoing efforts to better communicate with concerned citizens, invites your comment on the draft permit.

Enclosed is a Notice of Public Comment, which has been placed in the Legal Advertising section of your local newspaper. The application and supporting documentation for this proposed permit have been placed at the library indicated in the Notice. These documents more fully describe the project, the applicable air pollution control requirements and how the applicant will comply with these requirements.

If you would like to comment on this draft permit, please contact the person named in the enclosed Public Notice. Thank you for your interest in the Indiana's Air Permitting Program.

Please Note: *If you feel you have received this Notice in error, or would like to be removed from the Air Permits mailing list, please contact Patricia Pear with the Air Permits Administration Section at 1-800-451-6027, ext. 3-6875 or via e-mail at PPEAR@IDEM.IN.GOV. If you have recently moved and this Notice has been forwarded to you, please notify us of your new address and if you wish to remain on the mailing list. Mail that is returned to IDEM by the Post Office with a forwarding address in a different county will be removed from our list unless otherwise requested.*

Enclosure
PN AAA Cover.dot 2/17/2016

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Carol S. Comer
Commissioner

AFFECTED STATE NOTIFICATION OF PUBLIC COMMENT PERIOD
DRAFT INDIANA AIR PERMIT

April 13, 2016

A 30-day public comment period has been initiated for:

Permit Number: **133-35865-00002 and 133-35884-00002**
Applicant Name: **Lone Star Industries, Inc. d/b/a Buzzi Unicem USA, Inc.**
Location: **Greencastle, Putnam County, Indiana**

The public notice, draft permit and technical support documents can be accessed via the **IDEM Air Permits Online** site at:
http://www.in.gov/ai/appfiles/idem-caats/

Questions or comments on this draft permit should be directed to the person identified in the public notice by telephone or in writing to:

Indiana Department of Environmental Management
Office of Air Quality, Permits Branch
100 North Senate Avenue
Indianapolis, IN 46204

Questions or comments regarding this email notification or access to this information from the EPA Internet site can be directed to Chris Hammack at chammack@idem.IN.gov or (317) 233-2414.

Affected States Notification.dot 2/17/2016

Mail Code 61-53

Putnam Co.

IDEM Staff	VBIDDLE 4/13/2016 133-35884-00002 DRAFT Lone Star Industries, Inc. 133-35865-00002 DRAFT			AFFIX STAMP HERE IF USED AS CERTIFICATE OF MAILING
Name and address of Sender	▶	Indiana Department of Environmental Management Office of Air Quality – Permits Branch 100 N. Senate Indianapolis, IN 46204	Type of Mail: **CERTIFICATE OF MAILING ONLY**	

Line	Article Number	Name, Address, Street and Post Office Address	Postage	Handing Charges	Act. Value (If Registered)	Insured Value	Due Send if COD	R.R. Fee	S.D. Fee	S.H. Fee	Rest. Del. Fee Remarks
1		Robert West Lone Star Industries, Inc. PO Box 482 Greencastle IN 46135 (Source CAATS)									
2		John Kass Plant Manager Lone Star Industries, Inc. PO Box 482 Greencastle IN 46135 *(RO CAATS)*									
3		Mr. Charles Butler 1312 Bloomington St Greencastle IN 46135 *(Affected Party)*									
4		Mr. William Moore 84 South Greencastle IN 46135 *(Affected Party)*									
5		Heritage House Convalescent Ctr of Putnam Co 1601 Hospital Dr Greencastle IN 46135 *(Affected Party)*									
6		Putnam County Commissioners One West Washington Street Greencastle IN 46135 *(Local Official)*									
7		Greencastle City Council and Mayors Office 1 N. Locust St. PO Box 607 Greencastle IN 46135 *(Local Official)*									
8		Putnam Co Public Library 103 E Poplar Street Greencastle IN 46135-0116 *(Library)*									
9		Putnam County Health Department P.O. Box 507 Greencastle IN 46135-0507 *(Health Department)*									
10		Mr. Richard Monday 545 E. Margaret Dr. Terre Haute IN 47801 *(Affected Party)*									
11		J.P. Roehm PO Box 303 Clinton IN 47842 *(Affected Party)*									
12											
13											
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