Ohio Environmental Protection Agency
John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

Certified Mail

6/10/2011

Paul Rufener
Koch Knight LLC
5385 ORCHARDVIEW DRIVE
EAST CANTON, OH 44730

No	TOXIC REVIEW
No	PSD
Yes	SYNTHETIC MINOR TO AVOID MAJOR NSR
No	CEMS
No	MACT/GACT
No	NSPS
No	NESHAPS
No	NETTING
No	MAJOR NON-ATTAINMENT
No	MODELING SUBMITTED
Yes	SYNTHETIC MINOR TO AVOID TITLE V
Yes	FEDERALLY ENFORCABLE PTIO (FEPTIO)

RE: FINALAIR POLLUTION PERMIT-TO-INSTALL AND OPERATE
Facility ID: 1576001851
Permit Number: P0104197
Permit Type: Renewal
County: Stark

Dear Permit Holder:

Enclosed please find a final Air Pollution Permit-to-Install and Operate (PTIO) which will allow you to install, modify, and/or operate the described emissions unit(s) in the manner indicated in the permit. Because this permit contains conditions and restrictions, please read it very carefully. Please complete a survey at www.epa.ohio.gov/dapc/permitsurvey.aspx and give us feedback on your permitting experience. We value your opinion.

The issuance of this PTI is a final action of the Director and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of $70.00, made payable to “Ohio Treasurer Josh Mandel," which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General’s Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
309 South Fourth Street, Room 222
Columbus, OH 43215

If you have any questions, please contact Canton City Health Department at (330)489-3385or the Office of Compliance Assistance and Pollution Prevention at (614) 644-3469. This permit can be accessed electronically on the DAPCWeb page,www.epa.ohio.gov/dapc, by clicking the "Issued Air Pollution Control Permits" link.

Sincerely,

Michael W. Ahern

Michael W. Ahern, Manager
Permit Issuance and Data Management Section, DAPC

Cc: Canton

50 West Town Street, Suite 700
P.O. Box 1049
Columbus, OH 43216-1049

614 | 644 3020
614 | 644 3184 (fax)
www.epa.ohio.gov

Response to Comments

Response to comments for: Permit-To-Install and Operate

Facility ID:	1576001851
Facility Name:	Koch Knight LLC
Facility Description:	ceramic mfg.
Facility Address:	5385 ORCHARDVIEW DRIVE East Canton, OH 44730 Stark County
Permit #:	P0104197, Renewal
A public notice for the draft permit issuance was published in the Ohio EPA Weekly Review and appeared in the The Canton Repository on 07/08/2010. The comment period ended on 08/07/2010.	
Hearing date (if held)	
Hearing Public Notice Date (if different from draft public notice)	

The following comments were received during the comment period specified. Ohio EPA reviewed and considered all comments received during the public comment period. By law, Ohio EPA has authority to consider specific issues related to protection of the environment and public health. Often, public concerns fall outside the scope of that authority. For example, concerns about zoning issues are addressed at the local level. Ohio EPA may respond to those concerns in this document by identifying another government agency with more direct authority over the issue.

In an effort to help you review this document, the questions are grouped by topic and organized in a consistent format. PDF copies of the original comments in the format submitted are available upon request.

NO COMMENTS RECEIVED.

Ohio Environmental Protection Agency

FINAL

Division of Air Pollution Control
Permit-to-Install and Operate
for
Koch Knight LLC

Facility ID:	1576001851
Permit Number:	P0104197
Permit Type:	Renewal
Issued:	6/10/2011
Effective:	6/10/2011
Expiration:	6/10/2016

Ohio Environmental Protection Agency

Division of Air Pollution Control
Permit-to-Install and Operate
for
Koch Knight LLC

Table of Contents

Authorization

Facility ID: 1576001851
Application Number(s): A0036274
Permit Number: P0104197
Permit Description: Renewal FEPTIO for Koch Knight LLC, which includes two tunnel kilns and three shuttle kilns, all natural gas-fired. Synthetic Minor based on limiting hydrogen fluoride emissions below 10 tpy. Emissions are controlled by limits on the F & S content in the raw clay, and annual limits on total tons of clay used. This permit renews the 11/10/03 FESOP and incorporates most, but not all of PTI 15-01651 (5/8/07), which increased the capacity of kilns P004-P006, removed emission unit group limits, and modified F & S content limits. The capacities of P005 & P006 are hereby revised back to the FESOP and PTI 15-01344 (5/28/02) levels.
Permit Type: Renewal
Permit Fee: $0.00
Issue Date: 6/10/2011
Effective Date: 6/10/2011
Expiration Date: 6/10/2016
Permit Evaluation Report (PER) Annual Date: Apr 1 - Mar 31, Due May 15

This document constitutes issuance to:

Koch Knight LLC
5385 ORCHARDVIEW DRIVE
East Canton, OH 44730

of a Permit-to-Install and Operate for the emissions unit(s) identified on the following page.

Ohio EPA District Office or local air agency responsible for processing and administering your permit:

Canton City Health Department
420 Market Avenue
Canton, OH 44702-1544
(330)489-3385

The above named entity is hereby granted this Permit-to-Install and Operate for the air contaminant source(s) (emissions unit(s))listed in this section pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the described emissions unit(s) will operate in compliance with applicable State and federal laws and regulations.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Scott J. Nally
Director

Authorization (continued)

Permit Number: P0104197
Permit Description: Renewal FEPTIO for Koch Knight LLC, which includes two tunnel kilns and three shuttle kilns, all natural gas-fired. Synthetic Minor based on limiting hydrogen fluoride emissions below 10 tpy. Emissions are controlled by limits on the F & S content in the raw clay, and annual limits on total tons of clay used. This permit renews the 11/10/03 FESOP and incorporates most, but not all of PTI 15-01651 (5/8/07), which increased the capacity of kilns P004-P006, removed emission unit group limits, and modified F & S content limits. The capacities of P005 & P006 are hereby revised back to the FESOP and PTI 15-01344 (5/28/02) levels.

Permits for the following Emissions Unit(s) or groups of Emissions Units are in this document as indicated below:

Emissions Unit ID:	**P001**
Company Equipment ID:	Tunnel Kiln #3
Superseded Permit Number:	15-01651
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	**P003**
Company Equipment ID:	Tunnel Kiln #2
Superseded Permit Number:	15-01651
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	**P004**
Company Equipment ID:	Shuttle Kiln #5
Superseded Permit Number:	15-01651
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	**P005**
Company Equipment ID:	Shuttle Kiln #6
Superseded Permit Number:	15-01651
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	**P006**
Company Equipment ID:	Shuttle Kiln #7
Superseded Permit Number:	15-01651
General Permit Category and Type:	Not Applicable

A. Standard Terms and Conditions

1. What does this permit-to-install and operate ("PTIO") allow me to do?

This permit allows you to install and operate the emissions unit(s) identified in this PTIO. You must install and operate the unit(s) in accordance with the application you submitted and all the terms and conditions contained in this PTIO, including emission limits and those terms that ensure compliance with the emission limits (for example, operating, recordkeeping and monitoring requirements).

2. Who is responsible for complying with this permit?

The person identified on the "Authorization" page, above, is responsible for complying with this permit until the permit is revoked, terminated, or transferred. "Person" means a person, firm, corporation, association, or partnership. The words "you," "your," or "permittee" refer to the "person" identified on the "Authorization" page above.

The permit applies only to the emissions unit(s) identified in the permit. If you install or modify any other equipment that requires an air permit, you must apply for an additional PTIO(s) for these sources.

3. What records must I keep under this permit?

You must keep all records required by this permit, including monitoring data, test results, strip-chart recordings, calibration data, maintenance records, and any other record required by this permit for five years from the date the record was created. You can keep these records electronically, provided they can be made available to Ohio EPA during an inspection at the facility. Failure to make requested records available to Ohio EPA upon request is a violation of this permit requirement.

4. What are my permit fees and when do I pay them?

There are two fees associated with permitted air contaminant sources in Ohio:

- PTIO fee. This one-time fee is based on a fee schedule in accordance with Ohio Revised Code (ORC) section 3745.11, or based on a time and materials charge for permit application review and permit processing if required by the Director.

  You will be sent an invoice for this fee after you receive this PTIO and payment is due within 30 days of the invoice date. You are required to pay the fee for this PTIO even if you do not install or modify your operations as authorized by this permit.

- Annual emissions fee. Ohio EPA will assess a separate fee based on the total annual emissions from your facility. You self-report your emissions in accordance with Ohio Administrative Code (OAC) Chapter 3745-78. This fee assessed is based on a fee schedule in ORC section 3745.11 and funds Ohio EPA's permit compliance oversight activities. Unless otherwise specified, facilities subject to one or more synthetic minor restrictions must use Ohio EPA's "Air Services" to submit annual emissions associated with this permit requirement.Ohio EPA will notify you when it is time to report your emissions and to pay your annual emission fees.

5. When does my PTIO expire, and when do I need to submit my renewal application?

This permit expires on the date identified at the beginning of this permit document (see "Authorization" page above) and you must submit a renewal application to renew the permit. Ohio EPA will send a renewal notice to you approximately six months prior to the expiration date of this permit. However, it is

very important that you submit a complete renewal permit application (postmarked prior to expiration of this permit) even if you do not receive the renewal notice.

If a complete renewal application is submitted before the expiration date, Ohio EPA considers this a timely application for purposes of ORC section 119.06, and you are authorized to continue operating the emissions unit(s) covered by this permit beyond the expiration date of this permit until final action is takenby Ohio EPA on the renewal application.

6. What happens to this permit if my project is delayed or I do not install or modify my source?

This PTIO expires 18 months after the issue date identified on the "Authorization" page above unless otherwise specified if you have not (1) started constructing the new or modified emission sources identified in this permit, or (2) entered into a binding contract to undertake such construction. This deadline can be extended by up to 12 months, provided you apply to Ohio EPA for this extension within a reasonable time before the 18-month period has ended and you can show good cause for any such extension.

7. What reports must I submit under this permit?

An annual permit evaluation report (PER) is required in addition to any malfunction reporting required by OAC rule 3745-15-06 or other specific rule-based reporting requirement identified in this permit. Your PER due date is identified in the Authorization section of this permit.

8. If I am required to obtain a Title V operating permit in the future, what happens to the operating provisions and PER obligations under this permit?

If you are required to obtain a Title V permit under OAC Chapter 3745-77 in the future, the permit-to-operate portion of this permit will be superseded by the issued Title V permit. From the effective date of the Title V permit forward, this PTIO will effectively become a PTI (permit-to-install) in accordance with OAC rule 3745-31-02(B). The following terms and conditions will no longer be applicable after issuance of the Title V permit: Section B, Term 1.b) and Section C, for each emissions unit, Term a)(2).

The PER requirements in this permit remain effective until the date the Title V permit is issued and is effective, and cease to apply after the effective date of the Title V permit. The final PER obligation will cover operations up to the effective date of the Title V permit and must be submitted on or before the submission deadline identified in this permit on the last day prior to the effective date of the Title V permit.

9. What are my obligations when I perform scheduled maintenance on air pollution control equipment?

You must perform scheduled maintenance of air pollution control equipment in accordance with OAC rule 3745-15-06(A). If scheduled maintenance requires shutting down or bypassing any air pollution control equipment, you must also shut down the emissions unit(s) served by the air pollution control equipment during maintenance, unless the conditions of OAC rule 3745-15-06(A)(3) are met. Any emissions that exceed permitted amount(s) under this permit (unless specifically exempted by rule) must be reported as deviations in the annual permit evaluation report (PER), including nonexempt excess emissions that occur during approved scheduled maintenance.

10. Do I have to report malfunctions of emissions units or air pollution control equipment? If so, how must I report?

If you have a reportable malfunction of any emissions unit(s) or any associated air pollution control system, you must report this to the Canton City Health Department in accordance with OAC rule 3745-15-06(B). Malfunctions that must be reported are those that result in emissions that exceed permitted emission levels. It is your responsibility to evaluate control equipment breakdowns and operational upsets to determine if a reportable malfunction has occurred.

If you have a malfunction, but determine that it is not a reportable malfunction under OAC rule 3745-15-06(B), it is recommended that you maintain records associated with control equipment breakdown or process upsets. Although it is not a requirement of this permit, Ohio EPA recommends that you maintain records for non-reportable malfunctions.

11. Can Ohio EPA or my local air agency inspect the facility where the emission unit(s) is/are located?

Yes. Under Ohio law, the Director or his authorized representative may inspect the facility, conduct tests, examine records or reports to determine compliance with air pollution laws and regulations and the terms and conditions of this permit. You must provide, within a reasonable time, any information Ohio EPA requests either verbally or in writing.

12. What happens if one or more emissions units operated under this permit is/are shut down permanently?

Ohio EPA can terminate the permit terms associated with any permanently shut down emissions unit. "Shut down" means the emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31.

You should notify Ohio EPA of any emissions unit that is permanently shut down by submitting[1] a certification that identifies the date on which the emissions unit was permanently shut down. The certification must be submitted by an authorized official from the facility. You cannot continue to operate an emissions unit once the certification has been submitted to Ohio EPA by the authorized official.

You must comply with all recordkeeping and reporting for any permanently shut down emissions unit in accordance with the provisions of the permit, regulations or laws that were enforceable during the period of operation, such as the requirement to submit a PER, air fee emission report, or malfunction report. You must also keep all records relating to any permanently shutdown emissions unit, generated while the emissions unit was in operation, for at least five years from the date the record was generated.

Again, you cannot resume operation of any emissions unit certified by the authorized official as being permanently shut down without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31.

[1]Permittees that use Ohio EPA's "Air Services" can mark the affected emissions unit(s) as "permanently shutdown" in the facility profile along with the date the emissions unit(s) was permanently removed and/or disabled. Submitting the facility profile update will constitute notifying of the permanent shutdown of the affected emissions unit(s).

13. Can I transfer this permit to a new owner or operator?

You can transfer this permit to a new owner or operator. If you transfer the permit, you must follow the procedures in OAC Chapter 3745-31, including notifying Ohio EPA or the local air agency of the change in ownership or operator. Any transferee of this permit must assume the responsibilities of the transferor permit holder.

14. Does compliance with this permit constitute compliance with OAC rule 3745-15-07, "air pollution nuisance"?

This permit and OAC rule 3745-15-07 prohibit operation of the air contaminant source(s) regulated under this permit in a manner that causes a nuisance. Ohio EPA can require additional controls or modification of the requirements of this permit through enforcement orders or judicial enforcement action if, upon investigation, Ohio EPA determines existing operations are causing a nuisance.

15. What happens if a portion of this permit is determined to be invalid?

If a portion of this permit is determined to be invalid, the remainder of the terms and conditions remain valid and enforceable. The exception is where the enforceability of terms and conditions are dependent on the term or condition that was declared invalid.

B. Facility-Wide Terms and Conditions

1. This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

   a) For the purpose of a permit-to-install document, the facility-wide terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

      (1) None.

   b) For the purpose of a permit-to-operate document, the facility-wide terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

      (2) B.2. – B.8.

2. Definitions - for the purpose of this permit:

   a) *Clay* shall refer to a raw material containing fluorine and/or sulfur (excluding previously-fired or calcined material) that is later blended together with one or more other materials that together comprise the ingredients of a given product manufactured at this facility.

   b) *Type of clay* shall refer to one of the specific "clay" raw materials identified by a code and/or trade name for use as one of the ingredients in products manufactured at this facility.

   c) *Employed* shall mean the same as "used," and with respect to pertinent terms and conditions regarding a given clay material, both shall refer to the time period during which the clay has been fired in a kiln to make a product.

3. Applicable Emissions Limitations and/or Control Requirements

   a) The following emissions limitations and/or control measures apply to emissions units P001 and P003-P006 combined. Emissions from these units shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(D)(1)(b) [Synthetic Minor Limits]	The total emissions of hydrogen fluoride from emissions units P001 and P003-P006 shall not exceed 9.8 tons per year, based upon a rolling, 12-month summation of the monthly emissions. See 3.b)(1) The total emissions of sulfur dioxide from emissions units P001 and P003-P006 shall not exceed 31.9 tons per year, based upon a rolling, 12-month summation of the monthly emissions. See 3.b)(2)

b) Additional Terms and Conditions

(1) The calculation of hydrogen fluoride emissions shall be based on the average fluorine content of the clay(s) employed. See terms 5.c) and 7.a)(1) below.

(2) The calculation of sulfur dioxide emissions shall be based on the average sulfur content of the clay(s) employed. See terms 5.c) and 7.a)(2) below.

4. Operational Restrictions

a) The maximum annual combined clay usage for emissions units P001 and P003 – P006 shall not exceed 13,300 tons, based upon a rolling, 12-month summation of the clay usage figures.

b) The permittee shall not use any clay in emissions units P001 and P003-P006 that would cause either the monthly weighted average of 0.08% fluorine content or the rolling, 12-month average of 0.07% fluorine content to be exceeded. See term 7.a)(4) below for the method of determining the monthly weighted average and the rolling, 12-month average fluorine content.

c) The permittee shall not use any clay in emissions units P001 and P003-P006 that would cause either the monthly weighted average of 0.13% sulfur content or the rolling, 12-month average of 0.12% sulfur content to be exceeded. See term 7.a)(5) below for the method of determining the monthly weighted average and the rolling, 12-month average sulfur content.

5. Monitoring and/or Recordkeeping Requirements

a) The permittee shall keep monthly records of the total amount (in tons) of each type of clay used in each of the emissions units P001 and P003-P006 individually, and the total amount (in tons) of each type of clay used in emissions units P001 and P003-P006 combined.

b) The permittee shall keep monthly records of the rolling, 12-month summation of the total tons of clay used in emissions units P001 and P003-P006 combined. This summation will be used to determine compliance with the annual combined clay usage limit of 13,300 tons shown in operational restriction 4.a).

c) Monitored fluorine and sulfur content: The permittee shall conduct testing and maintain records for both the fluorine and sulfur content (% by weight) of each different type of clay delivered to this facility. This testing shall be conducted at a minimum of once for every 1,000 tons of each different type of clay delivered to the facility, or once per rolling, 24-month period, whichever comes first.

d) The permittee shall calculate and keep monthly records of the monthly weighted average fluorine content of all clays employed in emissions units P001 and P003-P006 combined. This calculation will be used to determine compliance with the monthly weighted average limit of 0.08% fluorine content shown in operational restriction 4.b).

e) The permittee shall calculate and keep monthly records of the monthly weighted average sulfur content of all clays employed in emissions units P001 and P003-P006 combined. This calculation will be used to determine compliance with the monthly weighted average limit of 0.13% sulfur content shown in operational restriction 4.c).

f) The permittee shall calculate the rolling, 12-month average fluorine content using the average of each monthly weighted average fluorine content over the previous twelve months. This calculation will be used to determine compliance with the rolling, 12-month average limit of 0.07% fluorine content shown in operational restriction 4.b).

g) The permittee shall calculate the rolling, 12-month average sulfur content using the average of each monthly weighted average sulfur content over the previous twelve months. This calculation will be used to determine compliance with the rolling, 12-month average limit of 0.12% sulfur content shown in operational restriction 4.c).

h) The permittee shall keep monthly records of the combined hydrogen fluoride emissions from emissions units P001 and P003-P006.

i) The permittee shall keep monthly records of the combined sulfur dioxide emissions from emissions units P001 and P003-P006.

j) The permittee shall keep monthly records of the rolling, 12-month summation of the combined hydrogen fluoride emissions from emissions units P001 and P003-P006. This summation will be used to determine compliance with the annual emissions limitation of 9.8 tons/yr hydrogen fluoride shown in term 3.a)(1) above.

k) The permittee shall keep monthly records of the rolling, 12-month summation of the combined sulfur dioxide emissions from emissions units P001 and P003-P006. This summation will be used to determine compliance with the annual emissions limitation of 31.9 tons/yr sulfur dioxide shown in term 3.a)(1) above.

6. Reporting Requirements

a) Unless other arrangements have been approved by the Director, all notifications and reports shall be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal.

b) The permittee shall submit quarterly deviation (excursion) reports that identify:

(1) All deviations (excursions) of the following emissions limitations, operational restrictions and/or control measures that restrict the potential to emit (PTE) of any regulated air pollutant and have been detected by the monitoring, record keeping and/or testing requirements in this permit:

a. all exceedances of the rolling, 12-month combined clay usage limitation of 13,300 tons for emissions units P001 and P003-P006;

b. all exceedances of each monthly weighted average of the 0.08% fluorine content limit for the clay employed in emissions units P001 and P003-P006;

c. all exceedances of each monthly weighted average of the 0.13% sulfur content limit for the clay employed in emissions units P001 and P003-P006;

d. all exceedances of the rolling, 12-month average of the 0.07% fluorine content limit for the clay employed in emissions units P001 and P003-P006;

e. all exceedances of the rolling, 12-month average of the 0.12% sulfur content limit for the clay employed in emissions units P001 and P003-P006;

f. all exceedances of the rolling, 12-month combined emissions limitation of 9.8 tons/yr for hydrogen fluoride emissions from units P001 and P003-P006; and

g. allexceedances of the rolling, 12-month combined emissions limitation of 31.9 tons/yr for sulfur dioxideemissions from units P001 and P003-P006.

(2) The probable cause of each deviation (excursion);

(3) any corrective actions that were taken to remedy the deviations (excursions) or prevent future deviations (excursions); and

(4) the magnitude and date, time, and duration of each deviation (excursion).

If no deviations (excursions) occurred during a calendar quarter, the permittee shall submit a report that states that no deviations (excursions) occurred during the quarter.

The quarterly reports shall be submitted, electronically through Ohio EPA Air Services, each year by January 31 (covering October to December), April 30 (covering January to March), July 31 (covering April to June), and October 31 (covering July to September), unless an alternative schedule has been established and approved by the Director (the appropriate District Office or local air agency).

c) The permittee shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA. The PER must be completed electronically and submitted via the Ohio EPA eBusiness Center: Air Services by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit. The permittee shall identify the following facility-wide information in the annual permit evaluation report:

(1) the total combined hydrogen fluoride emissions from emissions units P001 and P003-P006; and

(2) the total combined sulfur dioxide emissions from emissions units P001 and P003-P006.

7. Testing Requirements

a) Compliance with the emission limitations in section 3. and the operational restrictions in section 4. of these facility-wide terms and conditions shall be determined in accordance with the following methods:

(1) <u>Emission Limitation:</u>

The total emissions of hydrogen fluoride from emissions units P001 and P003-P006 combined shall not exceed 9.8 tons/yr, based upon a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

Compliance shall be based on the record keeping found in term 5.j) and the following calculation method:

The monthly emissions of hydrogen fluoride (HF) shall be calculated by first determining the total amount of fluorine in the clay(s) employed in emissions units P001 and P003-P006 combined during a given month(*), then multiplying the result by (20/19) based on the ratio of the molecular weight of HF (20) to the molecular weight of F (19). A conservative assumption is made that all fluorine in the clay is emitted as HF.

* The total amount of fluorine in the clay(s) employed in emissions units P001 and P003-P006 combined during a given month shall be calculated by multiplying the amount (in tons) of each type of clay employed times its monitored fluorine content (see term 5.c) above), then summing the products together.

Note: the annual emission limitation of 9.8 tons/yr for hydrogen fluoride was voluntarily accepted by the permittee as a synthetic minor limitation below 10 tons/yr in order to avoid Title V permitting requirements. Related to this limit is the operational restriction of 0.07% maximum fluorine content as a rolling, 12-month average for all of the clay used in emissions units P001 and P003-P006 (term 4.b) above). Further, it should be noted that the operational restriction of 13,300 total tons of clay used as a rolling, 12-month summation (term 4.a) above) was determined by working backwards from the 9.8 tons/yr HF emissions limitation and the 0.07% maximum fluorine content (see more at term 7.a)(3) below).

(2) Emission Limitation:

The total emissions of sulfur dioxide from emissions units P001 and P003-P006 shall not exceed 31.9 tons/yr, based upon a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

Compliance shall be based on the record keeping found in term 5.k) and the following calculation method:

The monthly emissions of sulfur dioxide (SO_2) shall be calculated by first determining the total amount of sulfur in the clay(s) employed in emissions units P001 and P003-P006 combined during a given month(†), then multiplying the result by 2 based on the ratio of the molecular weight of SO_2 (64) to the molecular weight of S (32). A conservative assumption is made that all sulfur in the clay is emitted as SO_2.

†The total amount of sulfur in the clay(s) employed in emissions units P001 and P003-P006 combined during a given month shall be calculated by multiplying the amount (in tons) of each type of clay employed times its monitored sulfur content (see term 5.c) above), then summing the products together.

Note: the annual emissions limitation of 31.9 tons/yr for sulfur dioxide was voluntarily accepted by the permittee as a secondary synthetic minor limit based on the operational

restriction of 13,300 ton/yr total clay usage (term 4.a) above) and the additional operational restriction of 0.12% maximum sulfur content as a rolling, 12-month average for all of the clay used in emissions units P001 and P003-P006 (term 4.c) above). The resulting tons/yr of sulfur was then multiplied by 2 based on the ratio of the molecular weight of SO_2 (64) to the molecular weight of S (32):

(13,300 ton_{CLAY}/yr) × (0.12% ton_S/ton_{CLAY}) = 15.96 ton_S/yr

(15.96 ton_S/yr) × (2) = 31.9 ton_{SO2}/yr

(3) Operational Restriction:

The maximum annual combined clay usage for emissions units P001 and P003-P006 shall not exceed 13,300 tons, based upon a rolling, 12-month summation of the clay usage figures.

Applicable Compliance Method:

Compliance shall be based on the record keeping found in Section 5.b).

Note: the annual restriction for total clay usage in emissions units P001 and P003-P006 combined was determined by first dividing the voluntary synthetic minor limit of 9.8 tons/yr hydrogen fluoride (term 3.a)(1) above) by (20/19) based on the ratio of the molecular weight of HF (20) to the molecular weight of F (19) in order to obtain the corresponding amount of fluorine (a conservative assumption was made that all fluorine in the clay is emitted as HF). The resulting tons/yr of fluorine was then divided by 0.07%, which is the operational restriction for the maximum fluorine content as a rolling, 12-month average for all of the clay used in emissions units P001 and P003-P006 (term 4.b) above):

(9.8 ton_{HF}/yr) ÷ (20/19) = 9.31 ton_F/yr

(9.31 ton_F/yr) ÷ (0.07% ton_F/ton_{CLAY}) = 13,300 ton_{CLAY}/yr

(4) Operational Restrictions:

This facility shall not use any clay in emissions units P001 and P003-P006 that would cause either the monthly weighted average of 0.08% fluorine content or the rolling, 12-month average of 0.07% fluorine content to be exceeded.

Applicable Compliance Method:

Compliance shall be based on the record keeping found in section 5.d) for the monthly weighted average and section 5.f) for the rolling, 12-month average fluorine content and the following calculation method:

The monthly weighted average fluorine content shall be determined by multiplying the amount of each type of clay employed in emissions units P001 and P003-P006 during a given month times its monitored fluorine content (see term 5.c) above), then summing the products together and dividing by the total amount of clay employed in these emissions units during that month. The rolling, 12-month average fluorine content shall

be the average of each monthly weighted average fluorine content over the previous twelve months.

Note: restrictions on the monthly weighted average fluorine content and the rolling, 12-month average fluorine content were voluntarily accepted by the permittee.

(5) Operational Restrictions:

This facility shall not use any clay in emissions units P001 and P003-P006 that would cause either the monthly weighted average of 0.13% sulfur content or the rolling, 12-month average of 0.12% sulfur content to be exceeded.

Applicable Compliance Method:

Compliance shall be based on the record keeping found in section 5.e) for the monthly weighted average and section 5.g) for the rolling, 12-month average sulfur content and the following calculation method:

The monthly weighted average sulfur content shall be determined by multiplying the amount of each type of clay employed in emissions units P001 and P003-P006 during a given month times its monitored sulfur content (see term 5.c) above), then summing the products together and dividing by the total amount of clay employed in these emissions units during that month. The rolling, 12-month average sulfur content shall be the average of each monthly weighted average sulfur content over the previous twelve months.

Note: restrictions on the monthly weighted average sulfur content and the rolling, 12-month average sulfur content were voluntarily accepted by the permittee.

8. Miscellaneous Requirements

a) None.

C. Emissions Unit Terms and Conditions

1. P001, Tunnel Kiln #3

Operations, Property and/or Equipment Description:

1750 lb clay/hr, 12.1 mmBtu/hr natural gas-fired tunnel kiln No. 3.

a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

(1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

a. c)(1)

(2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

a. None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3), as effective 11/30/01 [Best Available Technology (BAT)]	Hydrogen fluoride (HF) emissions shall not exceed 1.47 lb/hr (as a monthly average) and 5.65 tons/yr. Sulfur dioxide (SO_2) emissions shall not exceed 4.55 lb/hr (as a monthly average) and 18.4 tons/yr. Primary particulate matter emissions (primary PM = filterable + condensable) shall not exceed 0.84lb/hr and 3.68 tons/yr. (This supersedes the limit under OAC rule 3745-17-11 in PTI 15-01651, issued 5/8/2007.) Primary particulate matter emissions of 10 microns or less (primary PM10 = filterable + condensable) shall not exceed 0.76 lb/hr and 3.33 tons/yr.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		Nitrogen oxides (NO_x) emissions shall not exceed 1.21 lb/hr and 5.30 tons/yr. Carbon monoxide (CO) emissions shall not exceed 1.02 lb/hr and 4.47 tons/yr. See b)(2)c. and b)(2)d.
b.	OAC rule 3745-31-05(A)(3), as effective 12/01/06 [Less than 10 ton/yr BAT exemption]	See b)(2)e.
c.	OAC rule 3745-17-07(A)	Visible particulate emissions from the stack serving this emissions unit shall not exceed 20 percent opacity, as a six-minute average, except as provided by rule.
d.	OAC rule 3745-17-11 [Restrictions on particulate emissions from industrial processes]	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
e.	OAC rule 3745-18-82(A)(3) [SO_2 emission limits for Stark County]	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).

(2) Additional Terms and Conditions

a. The calculation of hydrogen fluoride emissions for this emissions unit shall be based on the average fluorine content of the clay(s) employed in this emissions unit. See term f)(1)a. below and term B.5.c) in the facility-wide section above.

b. The calculation of hydrogen fluoride emissions for this emissions unit shall be based on the average fluorine content of the clay(s) employed in this emissions unit. See term f)(1)a. below and term B.5.c) in the facility-wide section above.

c. The HF, SO_2, PM, PM10, NO_x and CO emission limitations were established for PTI purposes to reflect the maximum potential to emit for this emissions unit. Therefore, it is not necessary to develop monitoring, record keeping and/or reporting requirements on an individual emissions unit basis to ensure compliance.

d. With the emissions limits mentioned in term b)(1) a. above, the permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001. On December 1, 2006,

paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform with ORC changes effective August 3, 2006 (S.B. 265 changes), such that BAT is no longer required by State regulations for sources having potential to emit, taking into account controls, less than ten tons per year of emissions of an NAAQS pollutant or precursor. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP).

Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirements to satisfy BAT still exist as part of the federally-approved SIP for Ohio for sources having potential to emit, taking into account controls, less than ten tons per year of emissions of an NAAQS pollutant or precursor. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, then the emission limits listed above in b)(1)a. no longer apply to the PM10, NO_x, and CO emissions from this emissions unit since the potential to emit for each of these pollutants is less than ten tons per year. See section b)(2)e. below.

Note: once U.S. EPA approves the December 1, 2006 version of 3745-31-05, the emission limits listed above in b)(1)a. will still apply to the PM and HF emissions from this emissions unit regardless of their potential to emit, because PM and HF are not NAAQS pollutants. For SO_2, (which *is* an NAAQS pollutant), the emission limits listed above in b)(1)a. will still apply because the potential to emit is *not* less than ten tons per year.

e. This term only applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the State Implementation Plan. In that case only, the following Terms and Conditions will apply to the PM10, NO_x, and CO emissions from this emissions unit instead of those listed under b)(1)a.:

i. The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the PM10, NO_x, and CO emissions from this emissions unit since the potential to emit for each of these NAAQS pollutants is less than ten tons per year.

c) Operational Restrictions

(1) The hydrogen fluoride emissions from this emissions unit shall not show an exceedance of the maximum 30-day average ground level concentration of 0.5 microgram/m^3. This is an Ohio EPA Modeling Policy. Compliance with this limit was demonstrated based on the ISCLT3 model dated 12-19-06 and submitted with the application for PTI 15-01651. The following stack parameters were used in this successful model run:

Emission rate (30-day average)	0.185 gram/second or 1.47 lb/hr
Stack height	25.7 meters
Stack inside diameter	0.76 meters
Stack exit velocity	10.4034 meters/second
Stack gas exit temp.	444 degrees Kelvin

The following summarizes the results of the modeling:

Maximum concentration was 0.17 µg/m^3 at a distance of 700 meters, which is less than the 0.5 µg/m^3 limit.

Any change to the emissions unit or its exhaust parameters (e.g., increased emission rate, reduction of exhaust gas flow rate, and decreased stack height) that would result in an exceedance of the maximum 30-day average ground level concentration of 0.5 microgram/m^3 may be deemed a "modification " to the emissions unit, and, as such, prior notification to and approval from the Canton Local Air Agency will be required, including the possible issuance of modifications to this permit.

(2) The only fuel to be used in this emissions unit shall be natural gas.

d) Monitoring and/or Recordkeeping Requirements

(1) The permittee shall keep daily records of the amount of each type of clay fired in this emissions unit.

e) Reporting Requirements

(1) The permittee shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA. The PER must be completed electronically and submitted via the Ohio EPA eBusiness Center: Air Services by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.

f) Testing Requirements

(1) Compliance with the emission limitations in section b) of these terms and conditions, if applicable, shall be determined in accordance with the following methods:

a. Emissions Limitations:

Hydrogen fluoride emissions from this emissions unit shall not exceed 1.47 lb/hr (as a monthly average) and 5.65 tons/yr.

Applicable Compliance Method:

The calculation of short term hydrogen fluoride (HF) emissions (lb/hr) shall be made by first determining the total amount of fluorine in the clay(s) employed in this emissions unit during a given month(*), then dividing by the total number of hours in that month, then multiplying the result by (20/19) based on the ratio of the molecular weight of HF (20) to the molecular weight of F (19). A conservative assumption is made that all fluorine in the clay is emitted as HF.

* The total amount of fluorine in the clay(s) employed in this emissions unit during a given month shall be calculated by multiplying the amount (in lbs) of each type of clay employed times its monitored fluorine content (see term B.5.c) in the facility-wide section above), then summing the products together.

Note: the hourly emissions limitation was determined based upon the maximum process weight rate of 1750 lb/hr for this emissions unit and the operating restriction of 0.08% fluorine content (as a monthly weighted average of the clays employed in emissions units P001 and P003-P006—see term B.4.b) in the facility-wide section above):

(1750 lb_{CLAY}/hr) × (0.08% lb_F/lb_{CLAY}) = 1.4 lb_F/hr

(1.4 lb_F/hr) × (20/19) = 1.47 lb_{HF}/hr

The calculation of annual hydrogen fluoride (HF) emissions shall be made by first determining the rolling, 12-month total amount of fluorine in the clay(s) employed in this emissions unit(**), then multiplying the result by (20/19) based on the ratio of the molecular weight of HF (20) to the molecular weight of F (19). A conservative assumption is made that all fluorine in the clay is emitted as HF.

** The rolling, 12-month total amount of fluorine in the clays employed in this emissions unit shall be calculated as the rolling, 12-month summation of the monthly total amounts of fluorine as calculated above.

Note: the annual emissions limitation was determined based upon the maximum process weight rate of 7665 tons/yr for this emissions unit and the operating restriction of 0.07% fluorine content (as a rolling, 12-month average of the clays employed in emissions units P001 and P003-P006—see term B.4.b) in the facility-wide section above):

(7665 ton_{CLAY}/yr) × (0.07% ton_F/ton_{CLAY}) = 5.366 ton_F/yr

(5.366 ton_F/yr) × (20/19) = 5.65 ton_{HF}/yr

b. Emissions Limitation:

Sulfur dioxide emissions shall not exceed 4.55 lb/hr (as a 30-day average) and 18.4 tons/yr.

Applicable Compliance Method:

The calculation of short term sulfur dioxide (SO_2) emissions (lb/hr) shall be made by first determining the total amount of sulfur in the clay(s) employed in this emissions unit during a given month(†), then dividing by the total number of hours in that month, then multiplying the result by 2 based on the ratio of the molecular weight of SO_2 (64) to the molecular weight of S (32). A conservative assumption is made that all sulfur in the clay is emitted as SO_2.

†The total amount of sulfur in the clay(s) employed in this emissions unit during a given month shall be calculated by multiplying the amount (in lbs) of each type of clay employed times its monitored sulfur content (see term B.5.c) in the facility-wide section above), then summing the products together.

Note: the hourly emissions limitation was determined based upon the maximum process weight rate of 1750 lb/hr for this emissions unit and the operating

restriction of 0.13% sulfur content (as a monthly weighted average of the clays employed in emissions units P001 and P003-P006—see term B.4.c) in the facility-wide section above):

(1750 lb_{CLAY}/hr) × (0.13% lb_S/lb_{CLAY}) = 2.275 lb_S/hr

(2.275 lb_S/hr) × (2) = 4.55 lb_{SO2}/hr

The calculation of annual sulfur dioxide (SO_2) emissions shall be made by first determining the rolling, 12-month total amount sulfur in the clay(s) employed in this emissions unit(††), then multiplying the result by (2) based on the ratio of the molecular weight of SO_2 (64) to the molecular weight of S (32). A conservative assumption is made that all sulfur in the clay is emitted as SO_2.

††The rolling, 12-month total amount of sulfur in the clays employed in this emissions unit shall be calculated as the rolling, 12-month summation of the monthly total amounts of sulfur as calculated above.

Note: the annual emissions limitation was determined based upon the maximum process weight rate of 7665 tons/yr for this emissions unit and the operating restriction of 0.12% sulfur content (as a rolling, 12-month average of the clays employed in emissions units P001 and P003-P006—see term B.4.c) in the facility-wide section above):

(7665 ton_{CLAY}/yr) × (0.12% ton_S/ton_{CLAY}) = 9.198 ton_S/yr

(9.198 ton_S/yr) × (2) = 18.4 ton_{SO2}/yr

c. Emission Limitations:

Primary particulate matter emissions (primary PM = filterable + condensable) shall not exceed 0.84lb/hr and 3.68 tons/yr.

Applicable Compliance Method:

The hourly emissions limit was set equal to the maximum potential to emit, calculated as follows based on the maximum process weight rate of 0.875 ton_{CLAY}/hr times 0.96 lb_{PM}/ton_{CLAY} (emission factor from AP-42, Table 11.3-2, 8/97 for SCC 30500311):

(0.875 ton_{CLAY}/hr) × (0.96 lb_{PM}/ton_{CLAY}) = 0.84 lb_{PM}/hr

The annual emissions limit was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

(0.84 lb_{PM}/hr) × (8760 hr/yr) ÷ (2000 lb/ton) = 3.68 ton_{PM}/yr

If required, primary PM emissions compliance shall be determined according to Method 5 in Appendix A of 40 CFR Part 60 for the filterable portion, and Method 202 in Appendix M of 40 CFR Part 51 for the condensable portion.

d. Emission Limitations:

Primary particulate matter emissions of 10 microns or less (primary PM10 = filterable + condensable) shall not exceed 0.76 lb/hr and 3.33 tons/yr.

Applicable Compliance Method:

The hourly emissions limit was set equal to the maximum potential to emit, calculated as follows based on the maximum process weight rate of 0.875 ton_{CLAY}/hr times 0.87 lb_{PM10}/ton_{CLAY} (emission factor from AP-42, Table 11.3-2, 8/97 for SCC 30500311):

(0.875 ton_{CLAY}/hr) × (0.87 lb_{PM10}/ton_{CLAY}) = 0.76 lb_{PM10}/hr

The annual emissions limit was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

(0.76 lb_{PM10}/hr) × (8760 hr/yr) ÷ (2000 lb/ton) = 3.33 ton_{PM10}/yr

If required, primary PM10 emissions compliance shall be determined according to Method 201A for the filterable portion and Method 202 for the condensable portion, both found in Appendix M of 40 CFR Part 51.

e. Emission Limitations:

Nitrogen oxides (NO_x) emissions shall not exceed 1.21 lb/hr and 5.30 tons/yr.

Applicable Compliance Method:

The hourly emissions limit was set equal to the maximum potential to emit, calculated as follows, based on the maximum rated input capacity of this emissions unit of 12.1 mmBtu/hr times 0.10 lb_{NOX}/mmBtu (emission factor from the kiln manufacturer's documentation):

(12.1 mmBtu/hr) × (0.10 lb_{NOX}/mmBtu) = 1.21 lb_{NOX}/hr

The annual emissions limit was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

(1.21 lb_{NOX}/hr) × (8760 hr/yr) ÷ (2000 lb/ton) = 5.30 ton_{NOX}/yr

If required, nitrogen oxide emissions compliance shall be determined according to Methods 1 – 4 and 7 as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60.

f. Emission Limitations:

Carbon monoxide (CO) emissions shall not exceed 1.02 lb/hr and 4.47 tons/yr.

Applicable Compliance Method:

The hourly emissions limit was set equal to the maximum potential to emit, calculated as follows, based on the maximum rated input capacity of this emissions unit of 12.1 mmBtu/hrtimes 0.084lb_{CO}/mmBtu (emission factor from AP-42, Table 1.4-1, 7/98 for SCC 10100602):

(12.1 mmBtu/hr) × (0.084 lb_{CO}/mmBtu) = 1.02 lb_{CO}/hr

The annual emissions limit was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

(1.02 lb_{CO}/hr) × (8760 hr/yr) ÷ (2000 lb/ton) = 4.47 ton_{CO}/yr

If required, carbon monoxide emissions compliance shall be determined according to Methods 1 – 4 and 10 as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60.

g. Emission Limitation:

Visible particulate emissions from the stack serving this emissions unit shall not exceed 20 percent opacity, as a six-minute average, except as provided by rule.

Applicable Compliance Method:

If required, compliance with the stack visible particulate emissions limitation shall be determined in accordance with the procedure specified in OAC rule 3745-17-03(B)(1)(a), which states that "…'USEPA Method 9' shall be employed." [U.S. EPA Method 9 as set forth in "Appendix on Test Methods" in 40 CFR, Part 60]

h. Emission Limitation – for informational purposes only:

If OAC rule 3745-17-11 were applicable, the limit would be as follows: "Particulate emissions (PE) shall not exceed 3.75 lb/hr."

Applicable Compliance Method:

The permit limit shown above was calculated based on the maximum process weight rate of 0.875 ton_{CLAY}/hr for this emissions unit and the following equation from Table 1 in OAC rule 3745-17-11:

$E_{PE} = (4.10)(P)^{0.67}$, where E_{PE} = allowable particulate emission rate in lb/hr and P = process weight rate in tons/hr.

= (4.10)(0.875 ton_{CLAY}/hr)$^{0.67}$ = 3.75 lb_{PE}/hr

The calculation shown below demonstrates that the emission limitation specified by OAC rule 3745-17-11 is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3)—which in this case also equals the maximum potential to emit for primary PM, not just filterable PE.

Short term (lb/hr) potential to emit for primary PM shall be calculated by multiplying the maximum process weight rate of 0.875 ton_{CLAY}/hr times 0.96 lb_{PM}/ton_{CLAY} (emission factor from AP-42, Table 11.3-2, 8/97):

(0.875 ton_{CLAY}/hr) × (0.96 lb_{PM}/ton_{CLAY}) = 0.84 lb_{PM}/hr

0.84 lb_{PM}/hr< 3.75 lb_{PE}/hr

g) Miscellaneous Requirements

(1) None.

2. P003, Tunnel Kiln #2

Operations, Property and/or Equipment Description:

3125 lb clay/hr, 34.9 mmBtu/hr natural gas-fired tunnel kiln No. 2.

a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

(1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

a. None.

(2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

a. None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3), as effective 11/30/01 [Best Available Technology (BAT)]	Hydrogen fluoride (HF) emissions shall not exceed 2.63 lb/hr (as a monthly average) and 9.8 tons/yr. Sulfur dioxide (SO_2) emissions shall not exceed 8.13 lb/hr (as a monthly average) and 31.9 tons/yr. Primary particulate matter emissions (primary PM = filterable + condensable) shall not exceed 1.50lb/hr and 6.38 tons/yr. (This supersedes the limit under OAC rule 3745-17-11 in PTI 15-01651, issued 5/8/2007.) Primary particulate matter emissions of 10 microns or less (primary PM10 = filterable + condensable) shall not exceed 1.36 lb/hr and 5.79 tons/yr.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		Nitrogen oxides (NO_x) emissions shall not exceed 3.35 lb/hr and 14.67 tons/yr. Carbon monoxide (CO) emissions shall not exceed 2.93 lb/hr and 12.83 tons/yr. See b)(2)c. and b)(2)d.
b.	OAC rule 3745-31-05(A)(3), as effective 12/01/06 [Less than 10 ton/yr BAT exemption]	See b)(2)e.
c.	OAC rule 3745-17-07(A)	Visible particulate emissions from the stack serving this emissions unit shall not exceed 20 percent opacity, as a six-minute average, except as provided by rule.
d.	OAC rule 3745-17-11 [Restrictions on particulate emissions from industrial processes]	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
e.	OAC rule 3745-18-82(A)(3) [SO_2 emission limits for Stark County]	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).

(2) Additional Terms and Conditions

a. The calculation of hydrogen fluoride emissions for this emissions unit shall be based on the average fluorine content of the clay(s) employed in this emissions unit. See term f)(1)a. below and term B.5.c) in the facility-wide section above.

b. The calculation of hydrogen fluoride emissions for this emissions unit shall be based on the average fluorine content of the clay(s) employed in this emissions unit. See term f)(1)a. below and term B.5.c) in the facility-wide section above.

c. The short-term HF and SO_2 emissions limitations (hourly), and both the short and long-term emissions limitations (hourly and annual) for PM, PM10, NO_x and CO were established for PTI purposes to reflect the potential to emit for this emissions unit. Therefore, it is not necessary to develop monitoring, record keeping and/or reporting requirements on an individual emissions unit basis to ensure compliance with the limitations listed in this paragraph. Note: the annual emissions limitations for HF and SO_2 for this emissions unit were established based on voluntary facility-wide synthetic minor limits as described in facility-wide section B above.

d. With the emissions limitations mentioned in term b)(1) a. above, the permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform with ORC changes effective August 3, 2006 (S.B. 265 changes), such that BAT is no longer required by State regulations for sources having potential to emit, taking into account controls, less than ten tons per year of emissions of an NAAQS pollutant or precursor. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP).

Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirements to satisfy BAT still exist as part of the federally-approved SIP for Ohio for sources having potential to emit, taking into account controls, less than ten tons per year of emissions of an NAAQS pollutant or precursor. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, then the emission limits listed above in b)(1)a. no longer apply to the PM10 emissions from this emissions unit since the potential to emit for this pollutant is less than ten tons per year. See section b)(2)e below.

Note: once U.S. EPA approves the December 1, 2006 version of 3745-31-05, the emission limits listed above in b)(1)a. will still apply to the PM and HF emissions from this emissions unit regardless of their potential to emit, because PM and HF are not NAAQS pollutants. For SO_2, NO_x and CO (which *are* NAAQS pollutants), the emission limits listed above in b)(1)a. will still apply because the potential to emit for each of these pollutants is *not* less than ten tons per year.

e. This term only applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the State Implementation Plan. In that case only, the following Terms and Conditions will apply to the PM10 emissions from this emissions unit instead of those listed under b)(1)a.:

i. The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the PM10 emissions from this emissions unit since the potential to emit for this pollutant for this NAAQS pollutant is less than ten tons per year.

c) Operational Restrictions

(1) The only fuel to be used in this emissions unit shall be natural gas.

d) Monitoring and/or Recordkeeping Requirements

(1) The permittee shall keep daily records of the amount of each type of clay fired in this emissions unit.

e) Reporting Requirements

(1) The permittee shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA. The PER must be completed electronically and submitted via the Ohio EPA

eBusinessCenter: Air Services by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.

f) Testing Requirements

(1) Compliance with the emission limitations in section b) of these terms and conditions, if applicable, shall be determined in accordance with the following methods:

a. Emissions Limitations:

Hydrogen fluoride emissions from this emissions unit shall not exceed 2.63 lb/hr (as a monthly average) and 9.8 tons/yr.

Applicable Compliance Method:

The calculation of short term hydrogen fluoride (HF) emissions (lb/hr) shall be made by first determining the total amount of fluorine in the clay(s) employed in this emissions unit during a given month(*), then dividing by the total number of hours in that month, then multiplying the result by (20/19) based on the ratio of the molecular weight of HF (20) to the molecular weight of F (19). A conservative assumption is made that all fluorine in the clay is emitted as HF.

* The total amount of fluorine in the clay(s) employed in this emissions unit during a given month shall be calculated by multiplying the amount (in lbs) of each type of clay employed times its monitored fluorine content (see term B.5.c) in the facility-wide section above), then summing the products together.

Note: the hourly emissions limitation was determined based upon the maximum process weight rate of 3125 lb/hr for this emissions unit and the operating restriction of 0.08% fluorine content (as a monthly weighted average of the clays employed in emissions units P001 and P003-P006—see term B.4.b) in the facility-wide section above):

$(3125\ lb_{CLAY}/hr) \times (0.08\%\ lb_F/lb_{CLAY}) = 2.5\ lb_F/hr$

$(2.5\ lb_F/hr) \times (20/19) = 2.63\ lb_{HF}/hr$

The calculation of annual hydrogen fluoride (HF) emissions shall be made by first determining the rolling, 12-month total amount of fluorine in the clay(s) employed in this emissions unit(**), then multiplying the result by (20/19) based on the ratio of the molecular weight of HF (20) to the molecular weight of F (19). A conservative assumption is made that all fluorine in the clay is emitted as HF.

** The rolling, 12-month total amount of fluorine in the clays employed in this emissions unit shall be calculated as the rolling, 12-month summation of the monthly total amounts of fluorine as calculated above.

Note: the annual emissions limitation was determined based upon the facility-wide operating restriction of 13,300 tons/yr (term B.4.a)) as if it applied to just this emissions unit, and the operating restriction of 0.07% fluorine content (as a

rolling, 12-month average of the clays employed in emissions units P001 and P003-P006—see term B.4.b) in the facility-wide section above):

(13,300 ton_{CLAY}/yr) × (0.07% ton_F/ton_{CLAY}) = 9.31 ton_F/yr

(9.31 ton_F/yr) × (20/19) = 9.8 ton_{HF}/yr

b. Emissions Limitation:

Sulfur dioxide emissions shall not exceed 8.13 lb/hr (as a 30-day average) and 31.9 tons/yr.

Applicable Compliance Method:

The calculation of short term sulfur dioxide (SO_2) emissions (lb/hr) shall be made by first determining the total amount of sulfur in the clay(s) employed in this emissions unit during a given month(†), then dividing by the total number of hours in that month, then multiplying the result by 2 based on the ratio of the molecular weight of SO_2 (64) to the molecular weight of S (32). A conservative assumption is made that all sulfur in the clay is emitted as SO_2.

†The total amount of sulfur in the clay(s) employed in this emissions unit during a given month shall be calculated by multiplying the amount (in lbs) of each type of clay employed times its monitored sulfur content (see term B.5.c) in the facility-wide section above), then summing the products together.

Note: the hourly emissions limitation was determined based upon the maximum process weight rate of 3125 lb/hr for this emissions unit and the operating restriction of 0.13% sulfur content (as a monthly weighted average of the clays employed in emissions units P001 and P003-P006—see term B.4.c) in the facility-wide section above):

(3125 lb_{CLAY}/hr) × (0.13% lb_S/lb_{CLAY}) = 4.063 lb_S/hr

(4.063 lb_S/hr) × (2) = 8.13 lb_{SO2}/hr

The calculation of annual sulfur dioxide (SO_2) emissions shall be made by first determining the rolling, 12-month total amount sulfur in the clay(s) employed in this emissions unit(††), then multiplying the result by (2) based on the ratio of the molecular weight of SO_2 (64) to the molecular weight of S (32). A conservative assumption is made that all sulfur in the clay is emitted as SO_2.

††The rolling, 12-month total amount of sulfur in the clays employed in this emissions unit shall be calculated as the rolling, 12-month summation of the monthly total amounts of sulfur as calculated above.

Note: the annual emissions limitation was determined based upon the facility-wide operating restriction of 13,300 tons/yr (see term B.4.a)) as if it applied to just this emissions unit, and the operating restriction of 0.12% sulfur content (as a rolling, 12-month average of the clays employed in emissions units P001 and P003-P006—see term B.4.c) in the facility-wide section above).

(13,300 ton_{CLAY}/yr) × (0.12% ton_S/ton_{CLAY}) = 15.96 ton_S/yr

(15.96 ton_S/yr) × (2) = 31.9 ton_{SO2}/yr

c. Emission Limitations:

Primary particulate matter emissions (primary PM = filterable + condensable) shall not exceed 1.50lb/hr and 6.38 tons/yr.

Applicable Compliance Method:

The hourly emissions limitation was set equal to the maximum potential to emit, calculated as follows based on the maximum process weight rate of 1.563 ton_{CLAY}/hr times 0.96 lb_{PM}/ton_{CLAY} (emission factor from AP-42, Table 11.3-2, 8/97 for SCC 30500311):

(1.563 ton_{CLAY}/hr) × (0.96 lb_{PM}/ton_{CLAY}) = 1.50 lb_{PM}/hr

The annual emissions limitation was determined based upon the facility-wide operating restriction of 13,300 tons/yr (see term B.4.a)) as if it applied to just this emissions unit, times 0.96 lb_{PM}/ton_{CLAY} (emission factor from AP-42, Table 11.3-2, 8/97), then dividing by 2000 lb/ton:

(13,300 ton_{CLAY}/yr) × (0.96 lb_{PM}/ton_{CLAY}) ÷ (2000 lb/ton) = 6.38 ton_{PM}/yr

If required, primary PM emissions compliance shall be determined according to Method 5 in Appendix A of 40 CFR Part 60 for the filterable portion, and Method 202 in Appendix M of 40 CFR Part 51 for the condensable portion.

d. Emission Limitations:

Primary particulate matter emissions of 10 microns or less (primary PM10 = filterable + condensable) shall not exceed 1.36 lb/hr and 5.79 tons/yr.

Applicable Compliance Method:

The hourly emissions limitation was set equal to the maximum potential to emit, calculated as follows, based on the maximum process weight rate of 1.563 ton_{CLAY}/hr times 0.87 lb_{PM10}/ton_{CLAY} (emission factor from AP-42, Table 11.3-2, 8/97 for SCC 30500311):

(1.563 ton_{CLAY}/hr) × (0.87 lb_{PM10}/ton_{CLAY}) = 1.36 lb_{PM10}/hr

The annual emissions limitation was determined based upon the facility-wide operating restriction of 13,300 tons/yr (term B.4.a)) as if it applied to just this emissions unit, times 0.87 lb_{PM10}/ton_{CLAY} (emission factor from AP-42, Table 11.3-2, 8/97), then dividing by 2000 lb/ton:

(13,300 ton_{CLAY}/yr) × (0.87 lb_{PM10}/ton_{CLAY}) ÷ (2000 lb/ton) = 5.79 ton_{PM10}/yr

If required, primary PM10 emissions compliance shall be determined according to Method 201A for the filterable portion and Method 202 for the condensable portion, both found in Appendix M of 40 CFR Part 51.

e. Emission Limitations:

Nitrogen oxides (NO_x) emissions shall not exceed 3.35 lb/hr and 14.67 tons/yr.

Applicable Compliance Method:

The hourly emissions limitation was set equal to the maximum potential to emit, calculated as follows, based on the maximum rated input capacity of this emissions unit of 34.9 mmBtu/hr times 0.096 lb_{NOX}/mmBtu (emission factor from the kiln manufacturer's documentation):

(34.9 mmBtu/hr) × (0.096 lb_{NOX}/mmBtu) = 3.35 lb_{NOX}/hr

The annual emissions limitation was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

(3.35 lb_{NOX}/hr) × (8760 hr/yr) ÷ (2000 lb/ton) = 14.67 ton_{NOX}/yr

If required, nitrogen oxide emissions compliance shall be determined according to Methods 1 – 4 and 7 as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60.

f. Emission Limitations:

Carbon monoxide (CO) emissions shall not exceed 2.93 lb/hr and 12.83 tons/yr.

Applicable Compliance Method:

The hourly emissions limitation was set equal to the maximum potential to emit, calculated as follows, based on the maximum rated input capacity of this emissions unit of 34.9 mmBtu/hrtimes 0.084lb_{CO}/mmBtu (emission factor from AP-42, Table 1.4-1, 7/98 for SCC 10100602):

(34.9 mmBtu/hr) × (0.084 lb_{CO}/mmBtu) = 2.93 lb_{CO}/hr

The annual emissions limit was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

(2.93 lb_{CO}/hr) × (8760 hr/yr) ÷ (2000 lb/ton) = 12.83 ton_{CO}/yr

If required, carbon monoxide emissions compliance shall be determined according to Methods 1 – 4 and 10 as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60.

g. Emission Limitation:

Visible particulate emissions from the stack serving this emissions unit shall not exceed 20 percent opacity, as a six-minute average, except as provided by rule.

Applicable Compliance Method:

If required, compliance with the stack visible particulate emissions limitation shall be determined in accordance with the procedure specified in OAC rule 3745-17-03(B)(1)(a), which states that "…'USEPA Method 9' shall be employed." [U.S. EPA Method 9 as set forth in "Appendix on Test Methods" in 40 CFR, Part 60]

h. Emission Limitation – for informational purposes only:

If OAC rule 3745-17-11 were applicable, the limit would be as follows: "Particulate emissions (PE) shall not exceed 5.53 lb/hr."

Applicable Compliance Method:

The permit limit shown above was calculated based on the maximum process weight rate of 1.563 ton_{CLAY}/hr for this emissions unit and the following equation from Table 1 in OAC rule 3745-17-11:

$E_{PE} = (4.10)(P)^{0.67}$, where E_{PE} = allowable particulate emission rate in lb/hr and P = process weight rate in tons/hr.

$= (4.10)(1.563\ ton_{CLAY}/hr)^{0.67} = 5.53\ lb_{PE}/hr$

The calculation shown below demonstrates that the emission limitation specified by OAC rule 3745-17-11 is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3)—which in this case also equals the maximum potential to emit for primary PM, not just filterable PE.

Short term (lb/hr) potential to emit for primary PM shall be calculated by multiplying the maximum process weight rate of 1.563 ton_{CLAY}/hr times 0.96 lb_{PM}/ton_{CLAY} (emission factor from AP-42, Table 11.3-2, 8/97):

$(1.563\ ton_{CLAY}/hr) \times (0.96\ lb_{PM}/ton_{CLAY}) = 1.50\ lb_{PM}/hr$

$1.50\ lb_{PM}/hr < 5.53\ lb_{PE}/hr$

g) Miscellaneous Requirements

(1) None.

3. P004, Shuttle Kiln #5

Operations, Property and/or Equipment Description:

300 lb clay/hr, 4.32 mmBtu/hr natural gas-fired shuttle kiln No. 5.

a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

(1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

a. None.

(2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

a. None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3), as effective 11/30/01 [Best Available Technology (BAT)]	Hydrogen fluoride (HF) emissions shall not exceed 0.56 lb/hr (as a monthly average) and 0.69 tons/yr. (These are very minor administrative modifications to the limits in PTI 15-01651, issued 5/8/2007). Sulfur dioxide (SO_2) emissions shall not exceed 1.73 lb/hr (as a monthly average) and 2.25 tons/yr. Primary particulate matter emissions (primary PM = filterable + condensable) shall not exceed 0.22lb/hr and 0.31 tons/yr. (This supersedes the limit under OAC rule 3745-17-11 in PTI 15-01651, issued 5/8/2007.)

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		Primary particulate matter emissions of 10 microns or less (primary PM10 = filterable + condensable) shall not exceed 0.21 lb/hr and 0.29 tons/yr. Nitrogen oxides (NO_x) emissions shall not exceed 0.30 lb/hr and 1.31 tons/yr. Carbon monoxide (CO) emissions shall not exceed 0.36 lb/hr and 1.58 tons/yr. See b)(2)c. and b)(2)d..
b.	OAC rule 3745-31-05(A)(3), as effective 12/01/06 [Less than 10 ton/yr BAT exemption]	See b)(2)e.
c.	OAC rule 3745-17-07(A)	Visible particulate emissions from the stack serving this emissions unit shall not exceed 20 percent opacity, as a six-minute average, except as provided by rule.
d.	OAC rule 3745-17-11 [Restrictions on particulate emissions from industrial processes]	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
e.	OAC rule 3745-18-82(A)(3) [SO_2 emission limits for Stark County]	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).

(2) Additional Terms and Conditions

a. The calculation of hydrogen fluoride emissions for this emissions unit shall be based on the average fluorine content of the clay(s) employed in this emissions unit. See term f)(1)a. below and term B.5.c) in the facility-wide section above.

b. The calculation of hydrogen fluoride emissions for this emissions unit shall be based on the average fluorine content of the clay(s) employed in this emissions unit. See term f)(1)a. below and term B.5.c) in the facility-wide section above.

c. The HF, SO_2, PM, PM10, NO_x and CO emission limitations were established for PTI purposes to reflect the potential to emit for this emissions unit. Therefore, it is not necessary to develop monitoring, record keeping and/or reporting requirements on an individual emissions unit basis to ensure compliance.

d. With the emissions limitations mentioned in term b)(1) a. above, the permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform with ORC changes effective August 3, 2006 (S.B. 265 changes), such that BAT is no longer required by State regulations for sources having potential to emit, taking into account controls, less than ten tons per year of emissions of an NAAQS pollutant or precursor. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP).

Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirements to satisfy BAT still exist as part of the federally-approved SIP for Ohio for sources having potential to emit, taking into account controls, less than ten tons per year of emissions of an NAAQS pollutant or precursor. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, then the emission limits listed above in b)(1)a. no longer apply to the PM10, SO_2, NO_x and CO emissions from this emissions unit since the potential to emit for each of these NAAQS pollutants is less than ten tons per year. See section b)(2)e. below.

Note: once U.S. EPA approves the December 1, 2006 version of 3745-31-05, the emission limits listed above in b)(1)a. will still apply to the PM and HF emissions from this emissions unit regardless of their potential to emit, because PM and HF are not NAAQS pollutants.

e. This term only applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the State Implementation Plan. In that case only, the following Terms and Conditions will apply to the PM10, SO_2, NO_x and CO emissions from this emissions unit instead of those listed under b)(1)a.:

i. The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the PM10, SO_2, NO_x and CO emissions from this emissions unit since the potential to emit for each of these NAAQS pollutants is less than ten tons per year.

c) Operational Restrictions

(1) The only fuel to be used in this emissions unit shall be natural gas.

d) Monitoring and/or Recordkeeping Requirements

(1) The permittee shall keep daily records of the amount of each type of clay fired in this emissions unit.

e) Reporting Requirements

(1) The permittee shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA. The PER must be completed electronically and submitted via the Ohio EPA eBusiness Center: Air Services by the due date identified in the Authorization section of this permit.

The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.

f) Testing Requirements

(1) Compliance with the emission limitations in section b) of these terms and conditions, if applicable, shall be determined in accordance with the following methods:

a. Emissions Limitations:

Hydrogen fluoride emissions from this emissions unit shall not exceed 0.56 lb/hr (as a monthly average) and 0.69 tons/yr.

Applicable Compliance Method:

HF emissions for this shuttle kiln occur only during the 54 hr burn period during each 120 hr total cycle time.

The calculation of short term hydrogen fluoride (HF) emissions (lb/hr) shall be made by first determining the total amount of fluorine in the clay(s) employed in this emissions unit during a given month(*), then dividing by the number of actual burn hours in that month, then multiplying the result by (20/19) based on the ratio of the molecular weight of HF (20) to the molecular weight of F (19). A conservative assumption is made that all fluorine in the clay is emitted as HF.

* The total amount of fluorine in the clay(s) employed in this emissions unit during a given month shall be calculated by multiplying the amount (in lbs) of each type of clay employed times its monitored fluorine content (see term B.5.c) in the facility-wide section above), then summing the products together.

Note: the hourly emissions limitation for this shuttle kiln was determined based not upon the 300 lb/hr rated "push rate," but rather on the maximum rate of clay fired, calculated as follows:

$(300\ lb_{CLAY}/hr)_{RATED\ PWR} \times (120\ hr)_{BATCH\ TIME} \div (54\ hr)_{BURN\ TIME} = 667\ lb_{CLAY}/hr$

The maximum rate of clay fired is multiplied by the operating restriction of 0.08% fluorine content (as a monthly weighted average of the clays employed in emissions units P001 and P003-P006—see term B.4.b) in the facility-wide section above), then converted to HF:

$(667\ lb_{CLAY}/hr) \times (0.08\%\ lb_F/lb_{CLAY}) = 0.534\ lb_F/hr$

$(0.534\ lb_F/hr) \times (20/19) = 0.56\ lb_{HF}/hr$

The calculation of annual hydrogen fluoride (HF) emissions shall be made by first determining the rolling, 12-month total amount of fluorine in the clay(s) employed in this emissions unit(**), then multiplying the result by (20/19) based on the ratio of the molecular weight of HF (20) to the molecular weight of F (19). A conservative assumption is made that all fluorine in the clay is emitted as HF.

** The rolling, 12-month total amount of fluorine in the clays employed in this emissions unit shall be calculated as the rolling, 12-month summation of the monthly total amounts of fluorine as calculated above.

Note: the annual emissions limitation for this shuttle kiln was determined based upon the maximum rate of clay fired, calculated as follows:

$(667\ lb_{CLAY}/hr) \times (54\ hr)_{BURN\ TIME} \times (52\ cycles/yr) \div (2000\ lb/ton) = 936\ ton_{CLAY}/yr$

The maximum rate of clay fired is multiplied by the operating restriction of 0.07% fluorine content (as a rolling, 12-month average of the clays employed in emissions units P001 and P003-P006—see term B.4.b) in the facility-wide section above), then converted to HF:

$(936\ ton_{CLAY}/yr) \times (0.07\%\ ton_F/ton_{CLAY}) = 0.655\ ton_F/yr$

$(0.655\ ton_F/yr) \times (20/19) = 0.69\ ton_{HF}/yr$

b. Emissions Limitation:

Sulfur dioxide emissions shall not exceed 1.73 lb/hr (as a 30-day average) and 2.25 tons/yr.

Applicable Compliance Method:

SO_2 emissions for this shuttle kiln occur only during the 54 hr burn period during each 120 hr total cycle time.

The calculation of short term hydrogen fluoride (SO_2) emissions (lb/hr) shall be made by first determining the total amount of sulfur in the clay(s) employed in this emissions unit during a given month(†), then dividing by the number of actual burn hours in that month, then multiplying the result by 2 based on the ratio of the molecular weight of SO_2 (64) to the molecular weight of S (32). A conservative assumption is made that all sulfur in the clay is emitted as SO_2.

†The total amount of sulfur in the clay(s) employed in this emissions unit during a given month shall be calculated by multiplying the amount (in lbs) of each type of clay employed times its monitored sulfur content (see term B.5.c) in the facility-wide section above), then summing the products together.

Note: the hourly emissions limitation for this shuttle kiln was determined based not upon the 300 lb/hr rated "push rate," but rather on the maximum rate of clay fired, calculated as follows:

$(300\ lb_{CLAY}/hr)_{RATED\ PWR} \times (120\ hr)_{BATCH\ TIME} \div (54\ hr)_{BURN\ TIME} = 667\ lb_{CLAY}/hr$

The maximum rate of clay fired is multiplied by the operating restriction of 0.13% sulfur content (as a monthly weighted average of the clays employed in emissions units P001 and P003-P006—see term B.4.c) in the facility-wide section above), then converted to SO_2:

(667 lb_{CLAY}/hr) × (0.13% lb_S/lb_{CLAY}) = 0.867 lb_S/hr

(0.867 lb_S/hr) × (2) = 1.73 lb_{SO2}/hr

The calculation of annual sulfur dioxide (SO_2) emissions shall be made by first determining the rolling, 12-month total amount sulfur in the clay(s) employed in this emissions unit(††), then multiplying the result by (2) based on the ratio of the molecular weight of SO_2 (64) to the molecular weight of S (32). A conservative assumption is made that all sulfur in the clay is emitted as SO_2.

††The rolling, 12-month total amount of sulfur in the clays employed in this emissions unit shall be calculated as the rolling, 12-month summation of the monthly total amounts of sulfur as calculated above.

Note: the annual emissions limitation for this shuttle kiln was determined based upon the maximum rate of clay fired, calculated as follows:

(667 lb_{CLAY}/hr) × $(54\ hr)_{BURN\ TIME}$ × (52 cycles/yr) ÷ (2000 lb/ton) = 936 ton_{CLAY}/yr

The maximum rate of clay fired is multiplied by the operating restriction of 0.12% sulfur content (as a rolling, 12-month average of the clays employed in emissions units P001 and P003-P006—see term B.4.c) in the facility-wide section above), then converted to SO_2:

(936 ton_{CLAY}/yr) × (0.12% ton_S/ton_{CLAY}) = 1.123 ton_S/yr

(1.123 ton_S/yr) × (2) = 2.25 ton_{SO2}/yr

c. Emission Limitation:

Primary particulate matter emissions (primary PM = filterable + condensable) shall not exceed 0.22lb/hr and 0.31 tons/yr.

Applicable Compliance Method:

PM emissions for this shuttle kiln occur only during the 54 hr burn period during each 120 hr total cycle time.

The hourly emissions limitation for this shuttle kiln was determined based not upon the 300 lb/hr rated “push rate,” but rather on the maximum rate of clay fired, calculated as follows:

$(300\ lb_{CLAY}/hr)_{RATED\ PWR}$ × $(120\ hr)_{BATCH\ TIME}$ ÷ $(54\ hr)_{BURN\ TIME}$ = 667 lb_{CLAY}/hr

The maximum rate of clay fired is multiplied by 0.66 lb_{PM}/ton_{CLAY} (composite emission factor from AP-42, Table 11.3-2, SCC 30500311 for condensable PM, plus Webfire, SCC 30500314 for filterable PM):

(667 lb_{CLAY}/hr) × (0.66 lb_{PM}/ton_{CLAY}) ÷ (2000 lb/ton) = 0.22 lb_{PM}/hr

The annual emissions limitation for this shuttle kiln was determined based upon the maximum rate of clay fired, calculated as follows:

(667 lb_{CLAY}/hr) × (54 hr)$_{BURN\ TIME}$ × (52 cycles/yr) ÷ (2000 lb/ton) = 936 ton_{CLAY}/yr

The maximum rate of clay fired is multiplied by the composite emission factor described above:

(936 ton_{CLAY}/yr) × (0.66 lb_{PM}/ton_{CLAY}) ÷ (2000 lb/ton) = 0.31 ton_{PM}/yr

If required, primary PM emissions compliance shall be determined according to Method 5 in Appendix A of 40 CFR Part 60 for the filterable portion, and Method 202 in Appendix M of 40 CFR Part 51 for the condensable portion.

d. Emission Limitations:

Primary particulate matter emissions of 10 microns or less (primary PM10 = filterable + condensable) shall not exceed 0.21 lb/hr and 0.29 tons/yr.

Applicable Compliance Method:

PM10 emissions for this shuttle kiln occur only during the 54 hr burn period during each 120 hr total cycle time.

The hourly emissions limitation for this shuttle kiln was determined based not upon the 300 lb/hr rated "push rate," but rather on the maximum rate of clay fired, calculated as follows:

(300 lb_{CLAY}/hr)$_{RATED\ PWR}$ × (120 hr)$_{BATCH\ TIME}$ ÷ (54 hr)$_{BURN\ TIME}$ = 667 lb_{CLAY}/hr

The maximum rate of clay fired is multiplied by 0.62 lb_{PM10}/ton_{CLAY} (composite emission factor from AP-42, Table 11.3-2, SCC 30500311 for condensable PM10, plus Webfire, SCC 30500314 for filterable PM10):

(667 lb_{CLAY}/hr) × (0.62 lb_{PM10}/ton_{CLAY}) ÷ (2000 lb/ton) = 0.21 lb_{PM10}/hr

The annual emissions limitation for this shuttle kiln was determined based upon the maximum rate of clay fired, calculated as follows:

(667 lb_{CLAY}/hr) × (54 hr)$_{BURN\ TIME}$ × (52 cycles/yr) ÷ (2000 lb/ton) = 936 ton_{CLAY}/yr

The maximum rate of clay fired is multiplied by the composite emission factor described above:

(936 ton_{CLAY}/yr) × (0.62 lb_{PM10}/ton_{CLAY}) ÷ (2000 lb/ton) = 0.29 ton_{PM10}/yr

If required, primary PM10 emissions compliance shall be determined according to Method 201A for the filterable portion and Method 202 for the condensable portion, both found in Appendix M of 40 CFR Part 51.

e. Emission Limitations:

Nitrogen oxides (NO_x) emissions shall not exceed 0.30 lb/hr and 1.31 tons/yr.

Applicable Compliance Method:

The hourly emissions limit was set equal to the maximum potential to emit, calculated as follows, based on the maximum rated input capacity of this emissions unit of 4.32 mmBtu/hr times 0.070 lb_{NOX}/mmBtu (emission factor from the kiln manufacturer's documentation):

(4.32 mmBtu/hr) × (0.070 lb_{NOX}/mmBtu) = 0.30 lb_{NOX}/hr

The annual emissions limit was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

(0.30 lb_{NOX}/hr) × (8760 hr/yr) ÷ (2000 lb/ton) = 1.31 ton_{NOX}/yr

If required, nitrogen oxide emissions compliance shall be determined according to Methods 1 – 4 and 7 as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60.

f. Emission Limitations:

Carbon monoxide (CO) emissions shall not exceed 0.36 lb/hr and 1.58 tons/yr.

Applicable Compliance Method:

The hourly emissions limit was set equal to the maximum potential to emit, calculated as follows, based on the maximum rated input capacity of this emissions unit of 4.32 mmBtu/hrtimes 0.084lb_{CO}/mmBtu (emission factor from AP-42, Table 1.4-1, 7/98 for SCC 10100602):

(4.32 mmBtu/hr) × (0.084 lb_{CO}/mmBtu) = 0.36 lb_{CO}/hr

The annual emissions limit was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

(0.36 lb_{CO}/hr) × (8760 hr/yr) ÷ (2000 lb/ton) = 1.58 ton_{CO}/yr

If required, carbon monoxide emissions compliance shall be determined according to Methods 1 – 4 and 10 as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60.

g. Emission Limitation:

Visible particulate emissions from the stack serving this emissions unit shall not exceed 20 percent opacity, as a six-minute average, except as provided by rule.

Applicable Compliance Method:

If required, compliance with the stack visible particulate emissions limitation shall be determined in accordance with the procedure specified in OAC rule 3745-17-03(B)(1)(a), which states that "…'USEPA Method 9' shall be employed." [U.S. EPA Method 9 as set forth in "Appendix on Test Methods" in 40 CFR, Part 60]

h. Emission Limitation – for informational purposes only:

If OAC rule 3745-17-11 were applicable, the limit would be as follows: "Particulate emissions (PE) shall not exceed 1.97 lb/hr."

Applicable Compliance Method:

The permit limit shown above was calculated based on the maximum rate of clay fired (i.e., the effective maximum process weight rate) of 0.334 ton/hr for this emissions unit and the following equation from Table 1 in OAC rule 3745-17-11:

$E_{PE} = (4.10)(P)^{0.67}$, where E_{PE} = allowable particulate emission rate in lb/hr, and P = process weight rate in tons/hr.

$= (4.10)(0.334\ ton_{CLAY}/hr)^{0.67} = 1.97\ lb_{PE}/hr$

The calculation shown below demonstrates that the emission limitation specified by OAC rule 3745-17-11 is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3)—which in this case also equals the maximum potential to emit for primary PM, not just filterable PE.

Short term (lb/hr) potential to emit for primary PM shall be calculated by multiplying the maximum rate of clay fired (667 lb/hr = 0.334 ton/hr) times 0.66 lb_{PM}/ton_{CLAY} (composite emission factor from AP-42, Table 11.3-2, SCC 30500311 for condensable PM, plus Webfire, SCC 30500314 for filterable PM):

$(0.334\ ton_{CLAY}/hr) \times (0.66\ lb_{PM}/ton_{CLAY}) = 0.22\ lb_{PM}/hr$

$0.22\ lb_{PM}/hr < 1.97\ lb_{PE}/hr$

g) Miscellaneous Requirements

(1) None.

4. P005, Shuttle Kiln #6, andP006, Shuttle Kiln #7

EU ID	Operations, Property and/or Equipment Description:
P005	272 lb clay/hr, 7.92 mmBtu/hr natural gas-fired shuttle kiln No. 6
P006	272 lb clay/hr, 7.92 mmBtu/hr natural gas-fired shuttle kiln No. 7

a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

(1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

a. None.

(2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

a. None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3), as effective 11/30/01 [Best Available Technology (BAT)]	Hydrogen fluoride (HF) emissions shall not exceed 0.51 lb/hr (as a monthly average) and 0.63 tons/yr. (Supersedes the limits in PTI 15-01651, issued 5/8/2007.) Sulfur dioxide (SO_2) emissions shall not exceed 1.57 lb/hr (as a monthly average) and 2.04 tons/yr. Primary particulate matter emissions (primary PM = filterable + condensable) shall not exceed 0.20lb/hr and 0.28 tons/yr. (This supersedes the limit under OAC rule 3745-17-11 in PTI 15-01651, issued 5/8/2007.) Primary particulate matter emissions of 10 microns or less (primary PM10 =

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		filterable + condensable) shall not exceed 0.19 lb/hr and 0.26 tons/yr. Nitrogen oxides (NO_x) emissions shall not exceed 0.55 lb/hr and 2.41 tons/yr. Carbon monoxide (CO) emissions shall not exceed 0.67 lb/hr and 2.93 tons/yr. See b)(2)c. and b)(2)d.
b.	OAC rule 3745-31-05(A)(3), as effective 12/01/06 [Less than 10 ton/yr BAT exemption]	See b)(2)e.
c.	OAC rule 3745-17-07(A)	Visible particulate emissions from the stack serving this emissions unit shall not exceed 20 percent opacity, as a six-minute average, except as provided by rule.
d.	OAC rule 3745-17-11 [Restrictions on particulate emissions from industrial processes]	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
e.	OAC rule 3745-18-82(A)(3) [SO_2 emission limits for Stark County]	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).

(2) Additional Terms and Conditions

a. The calculation of hydrogen fluoride emissions for this emissions unit shall be based on the average fluorine content of the clay(s) employed in this emissions unit. See term f)(1)a. below and term B.5.c) in the facility-wide section above.

b. The calculation of hydrogen fluoride emissions for this emissions unit shall be based on the average fluorine content of the clay(s) employed in this emissions unit. See term f)(1)a. below and term B.5.c) in the facility-wide section above.

c. The HF, SO_2, PM, PM10, NO_x and CO emission limitations were established for PTI purposes to reflect the maximum potential to emit for this emissions unit. Therefore, it is not necessary to develop monitoring, record keeping and/or reporting requirements on an individual emissions basis to ensure compliance with these limitations.

d. With the emissions limitations mentioned in term b)(1) a. above, the permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform with ORC changes effective August 3, 2006 (S.B. 265 changes), such that BAT is no longer required by State regulations for sources having potential to emit, taking into account controls, less than ten tons per year of emissions of an NAAQS pollutant or precursor. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP).

Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirements to satisfy BAT still exist as part of the federally-approved SIP for Ohio for sources having potential to emit, taking into account controls, less than ten tons per year of emissions of an NAAQS pollutant or precursor. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, then the emission limits listed above in b)(1)a. no longer apply to the PM10, SO_2, NO_x and CO emissions from this emissions unit since the potential to emit for each of these NAAQS pollutants is less than ten tons per year. See section b)(2)e. below.

Note: once U.S. EPA approves the December 1, 2006 version of 3745-31-05, the emission limits listed above in b)(1)a. will still apply to the PM and HF emissions from this emissions unit regardless of their potential to emit, because PM and HF are not NAAQS pollutants.

e. This term only applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the State Implementation Plan. In that case only, the following Terms and Conditions will apply to the PM10, SO_2, NO_x and CO emissions from this emissions unit instead of those listed under b)(1)a.:

i. The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the PM10, SO_2, NO_x and CO emissions from this emissions unit since the potential to emit for each of these NAAQS pollutants is less than ten tons per year.

c) Operational Restrictions

(1) The only fuel to be used in this emissions unit shall be natural gas.

d) Monitoring and/or Recordkeeping Requirements

(1) The permittee shall keep daily records of the amount of each type of clay fired in this emissions unit.

e) Reporting Requirements

(1) The permittee shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA. The PER must be completed electronically and submitted via the Ohio EPA eBusiness

Center: Air Services by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.

f) Testing Requirements

(1) Compliance with the emission limitations in section b) of these terms and conditions, if applicable, shall be determined in accordance with the following methods:

a. Emissions Limitations:

Hydrogen fluoride emissions from this emissions unit shall not exceed 0.51 lb/hr (as a monthly average) and 0.63 tons/yr.

Applicable Compliance Method:

HF emissions for this shuttle kiln occur only during the 54 hr burn period during each 120 hr total cycle time.

The calculation of short term hydrogen fluoride (HF) emissions (lb/hr) shall be made by first determining the total amount of fluorine in the clay(s) employed in this emissions unit during a given month(*), then dividing by the number of actual burn hours in that month, then multiplying the result by (20/19) based on the ratio of the molecular weight of HF (20) to the molecular weight of F (19). A conservative assumption is made that all fluorine in the clay is emitted as HF.

* The total amount of fluorine in the clay(s) employed in this emissions unit during a given month shall be calculated by multiplying the amount (in lbs) of each type of clay employed times its monitored fluorine content (see term B.5.c) in the facility-wide section above), then summing the products together.

Note: the hourly emissions limitation for this shuttle kiln was determined based not upon the 272 lb/hr rated "push rate," but rather on the maximum rate of clay fired, calculated as follows:

$(272\ lb_{CLAY}/hr)_{RATED\ PWR} \times (120\ hr)_{BATCH\ TIME} \div (54\ hr)_{BURN\ TIME} = 604\ lb_{CLAY}/hr$

The maximum rate of clay fired is multiplied by the operating restriction of 0.08% fluorine content (as a monthly weighted average of the clays employed in emissions units P001 and P003-P006—see term B.4.b) in the facility-wide section above), then converted to HF:

$(604\ lb_{CLAY}/hr) \times (0.08\%\ lb_F/lb_{CLAY}) = 0.483\ lb_F/hr$

$(0.483\ lb_F/hr) \times (20/19) = 0.51\ lb_{HF}/hr$

The calculation of annual hydrogen fluoride (HF) emissions shall be made by first determining the rolling, 12-month total amount of fluorine in the clay(s) employed in this emissions unit(**), then multiplying the result by (20/19) based on the ratio of the molecular weight of HF (20) to the molecular weight of F (19). A conservative assumption is made that all fluorine in the clay is emitted as HF.

** The rolling, 12-month total amount of fluorine in the clays employed in this emissions unit shall be calculated as the rolling, 12-month summation of the monthly total amounts of fluorine as calculated above.

Note: the annual emissions limitation for this shuttle kiln was determined based upon the maximum rate of clay fired, calculated as follows:

$(604\ lb_{CLAY}/hr) \times (54\ hr)_{BURN\ TIME} \times (52\ cycles/yr) \div (2000\ lb/ton) = 848\ ton_{CLAY}/yr$

The maximum rate of clay fired is multiplied by the operating restriction of 0.07% fluorine content (as a rolling, 12-month average of the clays employed in emissions units P001 and P003-P006—see term B.4.b) in the facility-wide section above), then converted to HF:

$(848\ ton_{CLAY}/yr) \times (0.07\%\ ton_F/ton_{CLAY}) = 0.594\ ton_F/yr$

$(0.594\ ton_F/yr) \times (20/19) = 0.63\ ton_{HF}/yr$

b. Emissions Limitation:

Sulfur dioxide emissions shall not exceed 1.57 lb/hr (as a 30-day average) and 2.04 tons/yr.

Applicable Compliance Method:

SO_2 emissions for this shuttle kiln occur only during the 54 hr burn period during each 120 hr total cycle time.

The calculation of short term hydrogen fluoride (SO_2) emissions (lb/hr) shall be made by first determining the total amount of sulfur in the clay(s) employed in this emissions unit during a given month(†), then dividing by the number of actual burn hours in that month, then multiplying the result by 2 based on the ratio of the molecular weight of SO_2 (64) to the molecular weight of S (32). A conservative assumption is made that all sulfur in the clay is emitted as SO_2.

†The total amount of sulfur in the clay(s) employed in this emissions unit during a given month shall be calculated by multiplying the amount (in lbs) of each type of clay employed times its monitored sulfur content (see term B.5.c) in the facility-wide section above), then summing the products together.

Note: the hourly emissions limitation for this shuttle kiln was determined based not upon the 272 lb/hr rated "push rate," but rather on the maximum rate of clay fired, calculated as follows:

$(272\ lb_{CLAY}/hr)_{RATED\ PWR} \times (120\ hr)_{BATCH\ TIME} \div (54\ hr)_{BURN\ TIME} = 604\ lb_{CLAY}/hr$

The maximum rate of clay fired is multiplied by the operating restriction of 0.13% sulfur content (as a monthly weighted average of the clays employed in emissions units P001 and P003-P006—see term B.4.c) in the facility-wide section above), then converted to SO_2:

(604 lb_{CLAY}/hr) × (0.13% lb_S/lb_{CLAY}) = 0.785 lb_S/hr

(0.785 lb_S/hr) × (2) = 1.57 lb_{SO2}/hr

The calculation of annual sulfur dioxide (SO_2) emissions shall be made by first determining the rolling, 12-month total amount sulfur in the clay(s) employed in this emissions unit(††), then multiplying the result by (2) based on the ratio of the molecular weight of SO_2 (64) to the molecular weight of S (32). A conservative assumption is made that all sulfur in the clay is emitted as SO_2.

††The rolling, 12-month total amount of sulfur in the clays employed in this emissions unit shall be calculated as the rolling, 12-month summation of the monthly total amounts of sulfur as calculated above.

Note: the annual emissions limitation for this shuttle kiln was determined based upon the maximum rate of clay fired, calculated as follows:

(604 lb_{CLAY}/hr) × $(54\ hr)_{BURN\ TIME}$ × (52 cycles/yr) ÷ (2000 lb/ton) = 848 ton_{CLAY}/yr

The maximum rate of clay fired is multiplied by the operating restriction of 0.12% sulfur content (as a rolling, 12-month average of the clays employed in emissions units P001 and P003-P006—see term B.4.c) in the facility-wide section above), then converted to SO_2:

(848 ton_{CLAY}/yr) × (0.12% ton_S/ton_{CLAY}) = 1.018 ton_S/yr

(1.018 ton_S/yr) × (2) = 2.04 ton_{SO2}/yr

c. Emission Limitation:

Primary particulate matter emissions (primary PM = filterable + condensable) shall not exceed 0.20lb/hr and 0.28 tons/yr.

Applicable Compliance Method:

PM emissions for this shuttle kiln occur only during the 54 hr burn period during each 120 hr total cycle time.

The hourly emissions limitation for this shuttle kiln was determined based not upon the 272 lb/hr rated “push rate,” but rather on the maximum rate of clay fired, calculated as follows:

$(272\ lb_{CLAY}/hr)_{RATED\ PWR}$ × $(120\ hr)_{BATCH\ TIME}$ ÷ $(54\ hr)_{BURN\ TIME}$ = 604 lb_{CLAY}/hr

The maximum rate of clay fired is multiplied by 0.66 lb_{PM}/ton_{CLAY} (composite emission factor from AP-42, Table 11.3-2, SCC 30500311 for condensable PM, plus Webfire, SCC 30500314 for filterable PM):

(604 lb_{CLAY}/hr) × (0.66 lb_{PM}/ton_{CLAY}) ÷ (2000 lb/ton) = 0.20 lb_{PM}/hr

The annual emissions limitation for this shuttle kiln was determined based upon the maximum rate of clay fired, calculated as follows:

(604 lb_{CLAY}/hr) × (54 hr)$_{BURN\ TIME}$ × (52 cycles/yr) ÷ (2000 lb/ton) = 848 ton_{CLAY}/yr

The maximum rate of clay fired is multiplied by the composite emission factor described above:

(848 ton_{CLAY}/yr) × (0.66 lb_{PM}/ton_{CLAY}) ÷ (2000 lb/ton) = 0.28 ton_{PM}/yr

If required, primary PM emissions compliance shall be determined according to Method 5 in Appendix A of 40 CFR Part 60 for the filterable portion, and Method 202 in Appendix M of 40 CFR Part 51 for the condensable portion.

d. Emission Limitations:

Primary particulate matter emissions of 10 microns or less (primary PM10 = filterable + condensable) shall not exceed 0.19 lb/hr and 0.26 tons/yr.

Applicable Compliance Method:

PM10 emissions for this shuttle kiln occur only during the 54 hr burn period during each 120 hr total cycle time.

The hourly emissions limitation for this shuttle kiln was determined based not upon the 272 lb/hr rated "push rate," but rather on the maximum rate of clay fired, calculated as follows:

(272 lb_{CLAY}/hr)$_{RATED\ PWR}$ × (120 hr)$_{BATCH\ TIME}$ ÷ (54 hr)$_{BURN\ TIME}$ = 604 lb_{CLAY}/hr

The maximum rate of clay fired is multiplied by 0.62 lb_{PM10}/ton_{CLAY} (composite emission factor from AP-42, Table 11.3-2, SCC 30500311 for condensable PM10, plus Webfire, SCC 30500314 for filterable PM10):

(604 lb_{CLAY}/hr) × (0.62 lb_{PM10}/ton_{CLAY}) ÷ (2000 lb/ton) = 0.19 lb_{PM10}/hr

The annual emissions limitation for this shuttle kiln was determined based upon the maximum rate of clay fired, calculated as follows:

(604 lb_{CLAY}/hr) × (54 hr)$_{BURN\ TIME}$ × (52 cycles/yr) ÷ (2000 lb/ton) = 848 ton_{CLAY}/yr

The maximum rate of clay fired is multiplied by the composite emission factor described above:

(848 ton_{CLAY}/yr) × (0.62 lb_{PM10}/ton_{CLAY}) ÷ (2000 lb/ton) = 0.26 ton_{PM10}/yr

If required, primary PM10 emissions compliance shall be determined according to Method 201A for the filterable portion and Method 202 for the condensable portion, both found in Appendix M of 40 CFR Part 51.

e. Emission Limitations:

Nitrogen oxides (NO_x) emissions shall not exceed 0.55 lb/hr and 2.41 tons/yr.

Applicable Compliance Method:

The hourly emissions limit was set equal to the maximum potential to emit, calculated as follows, based on the maximum rated input capacity of this emissions unit of 7.92 mmBtu/hr times 0.070 lb_{NOX}/mmBtu (emission factor from the kiln manufacturer's documentation):

(7.92 mmBtu/hr) × (0.070 lb_{NOX}/mmBtu) = 0.55 lb_{NOX}/hr

The annual emissions limit was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

(0.55 lb_{NOX}/hr) × (8760 hr/yr) ÷ (2000 lb/ton) = 2.41 ton_{NOX}/yr

If required, nitrogen oxide emissions compliance shall be determined according to Methods 1 – 4 and 7 as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60.

f. Emission Limitations:

Carbon monoxide (CO) emissions shall not exceed 0.67 lb/hr and 2.93 tons/yr.

Applicable Compliance Method:

The hourly emissions limit was set equal to the maximum potential to emit, calculated as follows, based on the maximum rated input capacity of this emissions unit of 7.92 mmBtu/hrtimes 0.084lb_{CO}/mmBtu (emission factor from AP-42, Table 1.4-1, 7/98 for SCC 10100602):

(7.92 mmBtu/hr) × (0.084 lb_{CO}/mmBtu) = 0.67 lb_{CO}/hr

The annual emissions limit was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

(0.67 lb_{CO}/hr) × (8760 hr/yr) ÷ (2000 lb/ton) = 2.93 ton_{CO}/yr

If required, carbon monoxide emissions compliance shall be determined according to Methods 1 – 4 and 10 as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60.

g. Emission Limitation:

Visible particulate emissions from the stack serving this emissions unit shall not exceed 20 percent opacity, as a six-minute average, except as provided by rule.

Applicable Compliance Method:

If required, compliance with the stack visible particulate emissions limitation shall be determined in accordance with the procedure specified in OAC rule 3745-17-03(B)(1)(a), which states that "…'USEPA Method 9' shall be employed." [U.S. EPA Method 9 as set forth in "Appendix on Test Methods" in 40 CFR, Part 60]

h. Emission Limitation – for informational purposes only:

If OAC rule 3745-17-11 were applicable, the limit would be as follows: "Particulate emissions (PE) shall not exceed 1.84 lb/hr."

Applicable Compliance Method:

The permit limit shown above was calculated based on the maximum rate of clay fired (i.e., the effective maximum process weight rate) of 0.302 ton/hr for this emissions unit and the following equation from Table 1 in OAC rule 3745-17-11:

$E_{PE} = (4.10)(P)^{0.67}$, where E_{PE} = allowable particulate emission rate in lb/hr, and P = process weight rate in tons/hr.

$= (4.10)(0.302\ ton_{CLAY}/hr)^{0.67} = 1.84\ lb_{PE}/hr$

The calculation shown below demonstrates that the emission limitation specified by OAC rule 3745-17-11 is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3)—which in this case also equals the maximum potential to emit for primary PM, not just filterable PE.

Short term (lb/hr) potential to emit for primary PM shall be calculated by multiplying the maximum rate of clay fired (604 lb/hr = 0.302 ton/hr) times 0.66 lb_{PM}/ton_{CLAY} (composite emission factor from AP-42, Table 11.3-2, SCC 30500311 for condensable PM, plus Webfire, SCC 30500314 for filterable PM):

$(0.302\ ton_{CLAY}/hr) \times (0.66\ lb_{PM}/ton_{CLAY}) = 0.20\ lb_{PM}/hr$

$0.20\ lb_{PM}/hr < 1.84\ lb_{PE}/hr$

g) Miscellaneous Requirements

(1) As requested by the permittee in the permit application received December 4, 2008, this federally enforceable permit-to-install and operate returns the rated production input capacity and heat input capacity for emissions units P005 and P006 to the levels approved in PTI 15-01344, issued May 28, 2002. These capacities are 272 lb_{CLAY}/hr and 7.2 mmBtu/hr, respectively.

Although higher capacity levels were approved in PTI 15-01651, issued May 8, 2007 (408 lb_{CLAY}/hr and 11.88 mmBtu/hr), the physical modifications necessary to achieve the increased capacities were not begun within eighteen months of the effective date of PTI 15-01651, nor did the permittee request an extension of the time period (which could

have been up to a maximum of twelve months; i.e., until November 8, 2009). Thus, the terms and conditions in PTI 15-01651 associated with increased capacities for P005 and P006 were terminated effective November 8, 2008. [ref PTI 15-01651, Part I, section A.8.]