



Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

8/15/2012

Mr. Jerry Beckman
Halliburton Energy Services, Inc.
10200 Bellaire Boulevard
Houston, TX 77072

RE: FINALAIR POLLUTION PERMIT-TO-INSTALL AND OPERATE

Facility ID: 0660015015
Permit Number: P0109881
Permit Type: Initial Installation
County: Muskingum

Certified Mail

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

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 Ohio EPA DAPC, Southeast District Office at (740)385-8501 or 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, Manager
Permit Issuance and Data Management Section, DAPC

Cc: Ohio EPA-SEDO



FINAL

**Division of Air Pollution Control
Permit-to-Install and Operate
for
Halliburton Energy Services, Inc.**

Facility ID:	0660015015
Permit Number:	P0109881
Permit Type:	Initial Installation
Issued:	8/15/2012
Effective:	8/15/2012
Expiration:	8/15/2022



Division of Air Pollution Control
Permit-to-Install and Operate
for
Halliburton Energy Services, Inc.

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Authorization

Facility ID: 0660015015
Application Number(s): A0044292
Permit Number: P0109881
Permit Description: This PTIO is for a bulk cement, bulk barite and liquid mud plant with associated roadways that will provide oil and gas field services.
Permit Type: Initial Installation
Permit Fee: \$3,700.00
Issue Date: 8/15/2012
Effective Date: 8/15/2012
Expiration Date: 8/15/2022
Permit Evaluation Report (PER) Annual Date: Oct 1 - Sept 30, Due Nov 15

This document constitutes issuance to:

Halliburton Energy Services, Inc.
4999 East Pointe Drive
Zanesville, OH 43701

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

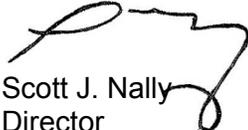
Ohio EPA District Office or local air agency responsible for processing and administering your permit:

Ohio EPA DAPC, Southeast District Office
2195 Front Street
Logan, OH 43138
(740)385-8501

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: P0109881

Permit Description: This PTIO is for a bulk cement, bulk barite and liquid mud plant with associated roadways that will provide oil and gas field services.

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

Emissions Unit ID:	F001
Company Equipment ID:	Facility Fugitive Emissions (in-plant roads)
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P001
Company Equipment ID:	Bulk Cement Plant
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P002
Company Equipment ID:	Bulk Barite Plant
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P901
Company Equipment ID:	Liquid Mud Plant
Superseded Permit Number:	
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 taken by 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 Ohio EPA DAPC, Southeast District Office 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 submitting¹ 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.

¹Permittees 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.
 - (1) None.

C. Emissions Unit Terms and Conditions



1. F001, Paved and unpaved roadways and parking areas

Operations, Property and/or Equipment Description:

In plant roads for bulk cement, bulk barite and liquid mud plant trailers; maximum of 8,817 vehicle miles per year traveled for unpaved roads and 676 vehicle miles per year traveled for paved roads

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.

Table with 2 columns: Applicable Rules/Requirements and Applicable Emissions Limitations/Control Measures. Row a: OAC rule 3745-31-05(A)(3), as effective 11/30/01. Fugitive particulate emissions (PE) shall not exceed 1.16 tons per year. There shall be no visible PE except for 3 minutes during any 60-minute observation period from any unpaved roadways and parking areas. There shall be no visible PE except for 1 minute during any 60-minute observation period from any paved roadways and parking areas. The permittee shall employ best available control measures that are sufficient to minimize or eliminate visible emissions of fugitive dust.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		See b)(2)a. and b)(2)c.- b)(2)k. below.
b.	OAC rule 3745-31-05(A)(3)(b), as effective 12/01/06	See b)(2)b. below.
c.	OAC rule 3745-17-07(B) and 3745-17-08(B)	See b)(2)l. below.

(2) Additional Terms and Conditions

- a. The permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to ORC changes effective August 3, 2006 (S.B. 265 changes), such that BAT is no longer required by State regulation for NAAQS pollutant emissions less than ten tons per year. 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 revision to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05, then these emission limits/control measures no longer apply.
- b. This rule paragraph applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the SIP.

Permit to Install and Operate P0109881 for this air contaminant source takes into account the following voluntary restriction (including the use of any applicable air pollution control equipment) as proposed by the permittee for the purpose of avoiding Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3):

- i. Use of water or other dust suppressants resulting in 95% control efficiency; and
- ii. Fugitive PE shall not exceed 1.16 tons per year.
- c. The paved roadways and parking areas that are covered by this permit and subject to the requirements of OAC rule 3745-31-05 are listed below:

Facility entrance
Facility exit area
- d. The unpaved roadways and parking areas that are covered by this permit and subject to the requirements of OAC rule 3745-31-05 are listed below:

In-plant road to bulk barite/liquid mud

In-plant road to bulk cement plant

In-plant road to exit

- e. The permittee shall employ best available control measures on all paved roadways and parking areas for the purpose of ensuring compliance with the above-mentioned applicable requirements. In accordance with the permittee's permit application, the permittee has committed to treat the paved roadways and parking areas by sweeping and/or watering at sufficient treatment frequencies to ensure compliance. Nothing in this paragraph shall prohibit the permittee from employing other control measures to ensure compliance.
- f. The permittee shall promptly remove, in such a manner as to minimize or prevent resuspension, earth and/or other material from paved streets onto which such material has been deposited by trucking or earth moving equipment or erosion by water or other means.
- g. The permittee shall employ best available control measures on all unpaved roadways and parking areas for the purpose of ensuring compliance with the above-mentioned applicable requirements. In accordance with the permittee's permit application, the permittee has committed to treat the unpaved roadways and parking areas with water and/or any other suitable dust suppression chemicals at sufficient treatment frequencies to ensure compliance. Nothing in this paragraph shall prohibit the permittee from employing other control measures to ensure compliance.
- h. The needed frequencies of implementation of the control measures shall be determined by the permittee's inspections pursuant to the monitoring section of this permit. Implementation of the control measures shall not be necessary for a paved or unpaved roadway or parking area that is covered with snow and/or ice or if precipitation has occurred that is sufficient for that day to ensure compliance with the above-mentioned applicable requirements. Implementation of any control measure may be suspended if unsafe or hazardous driving conditions would be created by its use.
- i. Any unpaved roadway or parking area, which during the term of this permit is paved or takes the characteristics of a paved surface due to the application of certain types of dust suppressants, may be controlled with the control measure specified above for paved surfaces. Any unpaved roadway or parking area that takes the characteristics of a paved roadway or parking area due to the application of certain types of dust suppressants shall remain subject to the visible emission limitation for unpaved roadways and parking areas. Any unpaved roadway or parking area that is paved shall be subject to the visible emission limitation for paved roadways and parking areas.
- j. Open-bodied vehicles transporting materials likely to become airborne shall have such materials covered at all times if the control measure is necessary for the materials being transported.
- k. Implementation of the above control measures in accordance with the terms and conditions of this permit is appropriate and sufficient to satisfy the requirements of OAC rule 3745-31-05(A)(3).



I. This facility is located in Muskingum County, which is not identified in Appendix A of OAC rule 3745-17-08. Therefore, the fugitive dust emissions from this emissions unit are exempt from the fugitive dust control requirements and visible emission limitation established in OAC rules 3745-17-08(B) and 3745-17-07(B), respectively.

c) Operational Restrictions

(1) None.

d) Monitoring and/or Recordkeeping Requirements

(1) Except as otherwise provided in this section, the permittee shall perform inspections of each of the roadway segments and parking areas in accordance with the following frequencies:

Table with 2 columns: paved roadways and parking areas, minimum inspection frequency. Rows include Facility entrance (daily) and Facility exit area (daily).

Table with 2 columns: unpaved roadways and parking areas, minimum inspection frequency. Rows include In-plant road to bulk barite/liquid mud (daily), In-plant road to bulk cement plant (daily), and In-plant road to exit (daily).

(2) The purpose of the inspections is to determine the need for implementing the above-mentioned control measures. The inspections shall be performed during representative, normal traffic conditions. No inspection shall be necessary for a roadway or parking area that is covered with snow and/or ice or if precipitation has occurred that is sufficient for that day to ensure compliance with the above-mentioned applicable requirements. Any required inspection that is not performed due to any of the above-identified events shall be performed as soon as such event(s) has (have) ended, except if the next required inspection is within one week.

(3) The permittee shall maintain records of the following information:

- a. the date and reason any required inspection was not performed, including those inspections that were not performed due to snow and/or ice cover or precipitation;
b. the date of each inspection where it was determined by the permittee that it was necessary to implement the control measures;
c. the dates the control measures were implemented; and
d. on a calendar quarter basis, the total number of days the control measures were implemented and the total number of days where snow and/or ice cover or precipitation were sufficient to not require the control measures.



The information required in d)(3)d. shall be updated on a calendar quarter basis within 30 days after the end of each calendar quarter..

e) Reporting Requirements

- (1) The reports required by this permit may be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal; or they may be mailed as a hard copy to the appropriate district office or local air agency.
- (2) The permittee shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA District Office or Local Air Agency 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. It is recommended that the PER is submitted electronically through the Ohio EPA's "e-Business Center: Air Services" although PERs can be submitted via U.S. postal service or can be hand delivered.

f) Testing Requirements

- (1) Compliance with the emissions limitations and/or control requirements specified in b)(1) of these terms and conditions shall be determined in accordance with the following methods:

a. Emissions Limitation:

Fugitive PE shall not exceed 1.16 tons per year.

Applicable Compliance Method:

Compliance with the annual emissions limit shall be demonstrated based on the following calculations from AP-42 section 13.2.1 (1/11) and AP-42 13.2.2 (11/06):

Paved roadways and parking areas

$$EF = ((k*(sL)^{0.91}*(W)^{1.02})*(1-P/(4*365)))$$

where:

- EF = size-specific emission factor (lb/VMT)
- k = 0.011 (dimension less constant) particle size multiplier
- sL = 12 (dimension less constant) road surface silt loading
- W = 37.72 tons of average vehicle weight
- P = 140 days/yr with >0.01 inch precipitation (130-150)

Therefore, EF = 3.87lbsPE/VMT

Maximum travel = 676 VMT/year (as submitted in application)

$$(676 \text{ VMT/yr})(3.87 \text{ lbs/VMT}) = 2,616 \text{ lbs of PE/year}$$

$$(2,616 \text{ lbs/year})(1 \text{ ton}/2,000 \text{ lbs}) = 1.31 \text{ tons of PE uncontrolled/year}$$

Assume 95% control for roadway watering (Cleveland SIP study)

$$(1.31 \text{ tons/year})(1-0.95) = 0.07 \text{ ton per year}$$

Unpaved roadways and parking areas

$$EF = ((k*(s/12)^a*(W/3)^b)/((365-p)/365))$$

where:

EF = size-specific emission factor (lb/VMT)

s = 4.8% surface material silt content

W = 37.70 tons average vehicle weight (tons)

P = 140 days/yr with >0.01 inch precipitation (130-150)

VMT = 8,817 miles/yr

k = 4.9 (dimension less constant) particle size multiplier

a = 0.7 (dimension less constant)

b = 0.45 (dimension less constant)

Therefore, EF = 4.97lbs particulate/VMT

Maximum travel = 8,817 VMT/year (as submitted in application)

$$(8,817 \text{ VMT/yr})(4.97\text{lbs/VMT}) = 43,820\text{lbs of particulate/year}$$

$$(43,820\text{lbs/year})(1 \text{ ton}/2000 \text{ lbs}) = 21.91 \text{ tons of particulate uncontrolled/year}$$

Assume 95% control for roadway watering (Cleveland SIP study)

$$(21.91 \text{ tons/year}) (1-0.95) = 1.09 \text{ ton of particulate controlled/year}$$

Total emissions from paved and unpaved roadways and parking areas are:

$$0.07\text{ton} + 1.09 \text{ tons} = 1.16 \text{ tons per year}$$

b. Emissions Limitation:

There shall be no visible PE except for 3 minutes during any 60-minute observation period from any unpaved roadways and parking areas.

There shall be no visible PE except for 1 minute during any 60-minute observation period from any paved roadways and parking areas.

Applicable Compliance Method:

If required, visible particulate emissions shall be determined according to USEPA Method 22.

- g) Miscellaneous Requirements
 - (1) None.



2. P001, Bulk Cement Plant

Operations, Property and/or Equipment Description:

Bulk cement plant consisting of fourteen 2,560 cu. ft. cement storage tanks (#1-4, 6-15) and one 2,560 cu. ft. waste tank (#5), all controlled with one 37-bag dust collector (process weight rate is 50 tons per hour, with waste tank to blend tank one time, then from waste tank to truck loading after end process); four 410 cu. ft. blend tanks (B11, B12, B21 and B22), each tank controlled with a separate 30-bag dust collector (process weight rate is 50 tons per hour, with blend tank to scale tank process two times); two 410 cu. ft. scale tanks (SC1 and SC2), each tank controlled with a separate 30-bag dust collector (process weight rate is 50 tons per hour, with scale tank to blend tank process two times); all baghouses with a minimum of 100% capture efficiency and 99.9% control efficiency

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.

Table with 2 columns: Applicable Rules/Requirements and Applicable Emissions Limitations/Control Measures. Row 1: a. OAC rule 3745-31-05(A)(3), as effective 11/30/01. Total particulate emissions (PE) from all stacks combined shall not exceed 0.51 pounds per hour and 2.24 tons per year. Visible PE from any stack serving this emissions unit shall not exceed 0% opacity as a six-minute average. The requirements of this rule also include compliance with the requirements of OAC rule 3745-17-07(A) and 3745-17-11(B)(1).



	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		See b)(2)a. below.
b.	OAC rule 3745-31-05(A)(3)(b), as effective 12/01/06	See b)(2)b. below.
c.	OAC rule 3745-17-07(A)(1)	Visible PE from any stack serving this emissions unit shall not exceed 20 percent opacity as a six-minute average, except as provided by rule. This emission limitation is less stringent than the limitation listed under OAC rule 3745-31-05(A)(3), until such time as U.S. EPA approves the December 1, 2006, version of OAC rule 3745-31-05 as part of the State Implementation Plan.
d.	OAC rule 3745-17-11(B)(1)	Total PE shall not exceed 32.41 pounds per hour. This emission limitation is less stringent than the limitation listed under OAC rule 3745-31-05(A)(3), until such time as U.S. EPA approves the December 1, 2006, version of OAC rule 3745-31-05 as part of the State Implementation Plan.

(2) Additional Terms and Conditions

- a. The permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to ORC changes effective August 3, 2006 (S.B. 265 changes), such that BAT is no longer required by State regulation for NAAQS pollutant emissions less than ten tons per year. 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 revision to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05, then these emission limits/control measures no longer apply.
- b. This rule paragraph applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the SIP.

Permit to Install and Operate P0109881 for this air contaminant source takes into account the following voluntary restriction (including the use of any applicable air pollution control equipment) as proposed by the permittee for the purpose of avoiding Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3):

f) Testing Requirements

- (1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emissions Limitation:

Total PE from all stacks combined shall not exceed 0.51 pounds per hour and 2.24 tons per year.

Total PE shall not exceed 32.41 pounds per hour.

Applicable Compliance Method:

Compliance with the hourly emission limitation is demonstrated by multiplying the maximum process rate of 700 tons per hour (50 tons per hour multiplied by 14 emission points [waste tank to blend tank one time, then blend tank to scale tank two times, then waste tank to truck loading one time]) by the emissions factor 0.73 pound per ton (AP-42 Table 11.12-2 (0/06)) to arrive at uncontrolled emissions of 511.00 pounds per hour. Assuming 99.9% control efficiency of the dust collectors (as submitted in application), multiply 0.001 by 511.00 pounds per hour. To demonstrate compliance with the total annual emission limitation, multiply 0.51 pounds per hour by 8,760 hours per year, then divide by 2,000 tons per year.

If required, particulate emissions shall be determined according to test Methods 1 - 5, as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60 "Standards of Performance for New Stationary Sources", and the procedures specified in OAC rule 3745-17-03(B)(10). Alternative U.S. EPA-approved test methods may be used with prior approval from Ohio EPA, Southeast District Office.

b. Emissions Limitation:

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

Visible PE from any stack serving this emissions unit shall not exceed 0 percent opacity as a six-minute average.

Applicable Compliance Method:

If required, compliance with the visible PE limitation shall be determined according to USEPA Method 9.

g) Miscellaneous Requirements

- (1) None.



3. P002, Bulk Barite Plant

Operations, Property and/or Equipment Description:

Bulk barite plant consisting of four 4,125 cu. ft. storage tanks (#13-16), and one 1,500 cu. ft. scale tank (#12), all tanks controlled by one dust collector with a minimum of 100% capture efficiency and 99.9% control efficiency (bulk barite is pneumatically transferred to one tank at a time, with a process weight rate of 50 tons per hour for loading into the tanks and then loading into truck/rail)

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	Particulate emissions (PE) shall not exceed 0.073 pounds per hour and 0.32 tons per year. Visible PE from any stack serving this emissions unit shall not exceed 0% opacity as a six-minute average. The requirements of this rule also include compliance with the requirements of OAC rule 3745-17-07(A) and 3745-17-11(B)(1). See b)(2)a. below.
b.	OAC rule 3745-31-05(A)(3)(b), as effective 12/01/06	See b)(2)b. below.



	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
c.	OAC rule 3745-17-07(A)(1)	Visible PE from any stack serving this emissions unit shall not exceed 20 percent opacity as a six-minute average, except as provided by rule. This emission limitation is less stringent than the limitation listed under OAC rule 3745-31-05(A)(3), until such time as U.S. EPA approves the December 1, 2006, version of OAC rule 3745-31-05 as part of the State Implementation Plan.
d.	OAC rule 3745-17-11(B)(1)	Total PE shall not exceed 51.2 pounds per hour. This emission limitation is less stringent than the limitation listed under OAC rule 3745-31-05(A)(3), until such time as U.S. EPA approves the December 1, 2006, version of OAC rule 3745-31-05 as part of the State Implementation Plan.

(2) Additional Terms and Conditions

- a. The permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to ORC changes effective August 3, 2006 (S.B. 265 changes), such that BAT is no longer required by State regulation for NAAQS pollutant emissions less than ten tons per year. 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 revision to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally–approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05, then these emission limits/control measures no longer apply.
- b. This rule paragraph applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the SIP.

Permit to Install and Operate P0109881 for this air contaminant source takes into account the following voluntary restriction (including the use of any applicable air pollution control equipment) as proposed by the permittee for the purpose of avoiding Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3):

- i. Use of a dust collector with 100% capture efficiency and a minimum of 99.9% control efficiency; and

- ii. PE shall not exceed 0.32 tons per year.
- c) Operational Restrictions
- (1) None.
- d) Monitoring and/or Recordkeeping Requirements
- (1) The permittee shall perform daily checks, when the emissions unit is in operation and when the weather conditions allow, for any visible particulate emissions from the stack serving this emissions unit. The presence or absence of any visible emissions shall be noted in an operations log. If visible emissions are observed, the permittee shall also note the following in the operations log:
 - a. the color of the emissions;
 - b. whether the emissions are representative of normal operations;
 - c. if the emissions are not representative of normal operations, the cause of the abnormal emissions;
 - d. the total duration of any visible emissions incident; and
 - e. any corrective actions taken to minimize or eliminate the visible emissions.
- If visible emissions are present, a visible emissions incident has occurred. The observer does not have to document the exact start and end times for the visible emissions incident under item (d) above or continue the daily check until the incident has ended. The observer may indicate that the visible emissions incident was continuous during the observation period (or, if known, continuous during the operation of the emissions unit). With respect to the documentation of corrective actions, the observer may indicate that no corrective actions were taken if the visible emissions were representative of normal operations, or specify the minor corrective actions that were taken to ensure that the emissions unit continued to operate under normal conditions, or specify the corrective actions that were taken to eliminate abnormal visible emissions.
- e) Reporting Requirements
- (1) The reports required by this permit may be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal; or they may be mailed as a hard copy to the appropriate district office or local air agency.
 - (2) The permittee shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA District Office or Local Air Agency 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. It is recommended that the PER is submitted electronically through the Ohio EPA's "e-Business Center: Air Services" although PERs can be submitted via U.S. postal service or can be hand delivered.

f) Testing Requirements

- (1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emissions Limitation:

Total PE shall not exceed 0.073 pounds per hour and 0.32 tons per year.

Total PE shall not exceed 51.2 pounds per hour.

Applicable Compliance Method:

Compliance with the hourly emission limitation is demonstrated by multiplying the maximum process rate of 100 tons per hour (50 tons per hour multiplied by 2 emission points [loading into barite tanks and loading into truck/rail]) by the emissions factor 0.73 pound per ton (AP-42 Table 11.12-2 (0/06)) to arrive at uncontrolled emissions of 73 pounds per hour. Assuming 99.9% control efficiency of the dust collector (as submitted in application), multiply 0.001 by 73 pounds per hour. To demonstrate compliance with the total annual emission limitation, multiply 0.073 pounds per hour by 8,760 hours per year, then divide by 2,000 tons per year.

If required, particulate emissions shall be determined according to test Methods 1 - 5, as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60 "Standards of Performance for New Stationary Sources", and the procedures specified in OAC rule 3745-17-03(B)(10). Alternative U.S. EPA-approved test methods may be used with prior approval from Ohio EPA, Southeast District Office.

b. Emissions Limitation:

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

Visible PE from any stack serving this emissions unit shall not exceed 0 percent opacity as a six-minute average.

Applicable Compliance Method:

If required, compliance with the visible PE limitation shall be determined according to USEPA Method 9.

g) Miscellaneous Requirements

- (1) None.

4. P901, Liquid Mud Plant

Operations, Property and/or Equipment Description:

Liquid mud plant consisting of one 500 bbl mix tank, one 500 bbl process mix tank, two additive hoppers, eight 1,000 bbl oil base mud storage tanks, two 1,000 bbl base oil tanks, and one 200 bbl calcium chloride tank, all with no controls (process weight rate is based on 2,920 annual batches [3-hour batches with 8 batches potential per 24-hour period, multiplied by 365 days]

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.	ORC 3704.03(T)	Fugitive PE from this emission unit shall not exceed 20 percent opacity as a three-minute average, except as provided by rule.
b.	OAC rule 3745-31-05(A)(3), as effective 11/30/01	<p>Volatile organic compound (VOC) emissions shall not exceed 5.22 tons per year.</p> <p>See b)(2)a. below.</p>
c.	OAC rule 3745-31-05(A)(3)(a)(ii), as effective 12/01/06	See b)(2)b. below.
d.	OAC rule 3745-17-07(B) and 3745-17-08(B)	See b)(2)c. below.

(2) Additional Terms and Conditions

- a. The permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to ORC changes effective August 3, 2006 (S.B. 265 changes), such that BAT is no longer required by State regulation for NAAQS pollutant emissions less than ten tons per year. 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 revision to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05, then these emission limits/control measures no longer apply.

- b. This rule paragraph applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the SIP.

The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the VOC emissions from this air contaminant source since the uncontrolled potential to emit for VOC is less than 10 tons/yr.

- c. This facility is located in Muskingum County, which is not identified in Appendix A of OAC rule 3745-17-08. Therefore, the fugitive dust emissions from this emissions unit are exempt from the fugitive dust control requirements and visible emission limitation established in OAC rules 3745-17-08(B) and 3745-17-07(B), respectively.

c) Operational Restrictions

- (1) None.

d) Monitoring and/or Recordkeeping Requirements

- (1) None.

e) Reporting Requirements

- (1) The reports required by this permit may be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal; or they may be mailed as a hard copy to the appropriate district office or local air agency.

- (2) The permittee shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA District Office or Local Air Agency 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. It is recommended that the PER is submitted electronically through the Ohio EPA's "e-Business Center: Air Services" although PERs can be submitted via U.S. postal service or can be hand delivered.

f) Testing Requirements

(1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emissions Limitation:

Visible fugitive PE from this emissions unit shall not exceed 20 percent opacity as a three-minute average, except as provided by rule.

Applicable Compliance Method:

If required, compliance with the visible fugitive PE limitation shall be determined according to USEPA Method 9.

b. Emissions Limitation:

VOC emissions shall not exceed 5.05 tons per year.

Applicable Compliance Method:

Compliance with the annual emissions limit shall be demonstrated based on the following calculations from: Equation 1 from AP-42 Section 5.2 (6/08) for Truck Loading; Equation 8.4-22 from EPA's Methods for Estimating Air Emissions from Paint, Ink and Other Coating Manufacturing Facilities (02/2005) for the process mix tank and the mud mix tank; and a one-time calculation using the TANKS Program 4.0.9d or other method acceptable to the Ohio EPA Southeast District Office for the base oil storage tanks and drilling mud storage tanks.

Truck Loading

$$LL = 12.46(S \cdot P \cdot M) / T$$

Where:

LL = 0.006 (Loading loss, pounds of VOC per 1000 gallons (lb/1000 gal) of liquid loaded)

S = 0.5 (A saturation factor, dimensionless (from AP-42 Section 5.2, Table 5.2-1))

P = 0.003 (True vapor pressure of liquid loaded, pounds per square inch absolute (psia) (0.003 psia @ 62.18 F -- from TANKS 4.09 Reports for storage tanks))

M = 175 (Molecule weight of vapors, pounds per pound-mole (lb/lb-mole) (from AP-42 Table 7.1-2))

T = 62.18 (Temperature of bulk liquid loaded (degrees Fahrenheit) (from TANKS 4.09 Reports for storage tanks))

T = 522.18 (Temperature of bulk liquid loaded (degrees Rankine = degrees F + 460))

VOC lb/yr = (0.006 lb VOC per 1,000 gallons) * (43,800 thousand gallons loaded) = 262.8 lb/yr.

Hours Loaded = (43,800,000 gallons loaded per year) divided by 5,000 gallons per hour = 8,760 hours per year

$$\text{VOC lb/hr} = (262.8 \text{ lb/yr}) \text{ divided by } (8,760 \text{ hrs/yr}) = 0.03 \text{ lb/hr}$$

$$\text{VOC ton/yr} = (262.8 \text{ lb/yr}) \text{ divided by } (2,000 \text{ lb/ton}) = 0.01314 \text{ VOC ton/yr}$$

OBT-1 Process Mix Tank

$$E_x = [M_x * K_x * A * P_x * 3600 * H] / [(R)(T)] (B * 0.8)$$

$$K_x = 0.00438 * [(8.6 \text{ mile/hr})^{0.78}] * [(18 / (175 \text{ lb/lb-mole}))^{0.33}] = 0.0111 \text{ ft/sec}$$

0.8 (80% of mix is base oil)

M_x= 175 (molecular weight of VOC (lb/lb-mole))

K_x= 0.0111 (gas-phase mass transfer coefficient for VOC species x (ft./sec))

A= 364.22 (Surface area of tank)

P_x= 0.003 (True Vapor pressure of VOC x (if a pure chemical is used) or the partial pressure of chemical x (if a mixture of VOCs is used) at temperature T (psia))

3600= 3600 sec/hr

H= 3.0 (batch time (hr/batch))

R= 10.73 (universal gas constant at 1 atmosphere of pressure, 10.73 psia-ft.³/°R -lb)

T= 527.75 (temperature of the liquid, °R (°F+460))

B= 584 (number of batches per year (batches/yr))

U= 8.6 (wind speed (mile/hr))

$$[(175 \text{ lb./lb.-mole})(0.0111 \text{ ft/sec})(364.22 \text{ ft.}^2)(0.003 \text{ psia})(3600 \text{ sec/hr})(3 \text{ hr/batch})] / [(10.73 \text{ psia ft.}^3)(527.8 \text{ R})] = 22,922.91414 / 5,662.7575$$

$$22,922.91414 / 5,662.7575 = (4.048012676)(584 \text{ batches/yr})(0.8) = 1,891.232 \text{ VOC lbs/yr}$$

$$(1,891.32 \text{ lbs/yr}) / (2,000 \text{ lbs/ton}) = 0.946 \text{ VOC ton/yr}$$

OBT-2Mud Mix Tank

$$E_x = [M_x * K_x * A * P_x * 3600 * H] / [(R)(T)] (B * 0.8)$$

$$K_x = 0.00438 * [(8.6 \text{ mile/hr})^{0.78}] * [(18 / (175 \text{ lb/lb-mole}))^{0.33}] = 0.0111 \text{ ft/sec}$$

0.8 (80% of mix is base oil)

M_x= 175 (molecular weight of VOC (lb/lb-mole))

K_x= 0.0111 (gas-phase mass transfer coefficient for VOC species x (ft./sec))

A= 364.22 (Surface area of tank)

P_x= 0.003 (True Vapor pressure of VOC x (if a pure chemical is used) or the partial pressure of chemical x (if a mixture of VOCs is used) at temperature T (psia))

3600= 3600 sec/hr

H= 3.0 (batch time (hr/batch))

R= 10.73 (universal gas constant at 1 atmosphere of pressure, 10.73 psia-ft.3/°R -lb)

T= 519.33 (temperature of the liquid, °R (°F+460))

B= 2,336 (number of batches per year (batches/yr))

U= 8.6 (wind speed (mile/hr))

$[(175 \text{ lb./lb.-mole})(0.0111 \text{ ft/sec})(364.22 \text{ ft.}^2)(0.003 \text{ psia})(3600 \text{ sec/hr})(3 \text{ hr/batch})]/[(10.73 \text{ psia ft.}^3)(519.33 \text{ R})] = 22,922.91414/5,572.4109$

$22,922.91414/5,572.4109 = (4.113643906)(2,336 \text{ batches/yr})(0.8) = 7,687.578 \text{ VOC lbs/yr}$

$(7,687.6 \text{ lbs/yr})/(2,000 \text{ lbs/ton}) = 3.844 \text{ VOC ton/yr}$

Base Oil Storage Tanks

Per TANKS Program 4.0.9d, total VOC emissions = 110.53lbs of VOCs per year
 $(110.53\text{lbs/yr VOCs})/(2,000 \text{ tons/yr}) = 0.055265 \text{ ton/yr}$
 $(0.055265 \text{ ton/yr})(2 \text{ tanks}) = 0.11053\text{VOC ton/yr}$

Drilling Mud Storage Tanks

Per TANKS Program 4.0.9d, total VOC emissions = 47.38lbs of VOCs per year
 $(47.38\text{lbs/yr VOCs})/(2,000 \text{ tons/yr}) = 0.02369 \text{ ton/yr}$
 $(0.02369 \text{ ton/yr})(8 \text{ tanks}) = 0.18952\text{VOC ton/yr}$

Total VOC emissions from truck loading, process mix tank, mud mix tank, base oil storage tanks and drilling mud storage tanks are:

$0.1314 \text{ ton} + 0.946 \text{ ton} + 3.844 \text{ tons} + 0.11053 \text{ ton} + 0.18952 \text{ ton} = 5.22 \text{ tons per year}$

g) **Miscellaneous Requirements**

(1) None.