



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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217/785-1705

CONSTRUCTION PERMIT NESHAP SOURCE

PERMITTEE

Stepan Company Millsdale Plant
Attn: Michael Schmidt
22500 Stepan Drive
Elwood, Illinois 60421

Application No.: 20040025

I.D. No.: 197800AAE

Applicant's Designation:

Date Received: April 28, 2020

Subject: Limit on Volatile Organic Material Emissions from Wastewater Treatment

Date Issued: October 30, 2020

Source Location: 22500 Stepan Drive, Elwood, Will County

This Construction Permit is hereby granted to the above-designated Permittee for the source at the above location setting a limit on its annual emissions of volatile organic material from wastewater treatment pursuant to the above-referenced permit application. This Permit is subject to standard conditions attached hereto and the following conditions.

If you have any questions on this permit, please contact Daniel Rowell.

A handwritten signature in cursive script that reads "Raymond E. Pilapil".

Raymond E. Pilapil
Manager, Permit Section
Bureau of Air

REP:DBR:tan

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1. Introduction

- a.
 - i. This permit limits the emissions of volatile organic material (VOM) from handling and treatment of wastewater at this source to below 100 tons/year. This permit also limits the mass of VOM compounds in the wastewater generated by process operations at this source, with a limit for methanol, which is the predominant VOM compound emitted from the handling and treatment of wastewater at this source, and another limit for other VOM compounds that also contribute to the VOM emissions of the source from handling and treatment of wastewater.
 - ii. This permit also establishes compliance procedures for these emission and operational limits. Among other matters, these procedures address how the destruction of VOM compounds in the wastewater during treatment from biodegradation is to be addressed when determining VOM emissions. These procedures are accompanied by requirements for operational monitoring, recordkeeping and reporting by the Permittee to address compliance with these limits.
- b. This permit does not authorize changes to this source that would increase its production capacity or its emissions of VOM.
- c. For purposes of this permit:
 - i. A wastewater stream from process unit(s), other operation(s) or control device(s) at this source that contains water that is discarded, including either process wastewater or maintenance wastewater, at the point where the wastewater exits such unit(s), operation(s) or device(s), is referred to as an "affected wastewater stream."
 - ii. Equipment, structures and/or devices at this source that are used to convey, store, treat or dispose of wastewater streams or wastewater residuals are referred to as "affected wastewater management units."
 - iii. The collection of wastewater management units at this source are referred to as the "affected facility."

2. Existing Regulatory Requirements

- a.
 - i. This permit does not affect the applicability of existing emission standards for the source or the affected facility and associated regulatory requirements for testing, monitoring, recordkeeping and reporting related to emissions, as are addressed in other permits.
 - ii. In particular, for the affected facility, this permit does not affect applicability of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Miscellaneous Organic Chemical Manufacturing, 40 CFR 63 Subpart FFFF,

which contains requirements that currently apply to wastewater streams from the various process areas at the source to reduce emissions of methanol and other hazardous air pollutants.

- b. This permit does not relieve the Permittee of the responsibility to comply with all Local, State and Federal Regulations which are part of the applicable Illinois State Implementation Plan, as well as other applicable Federal, State and Local requirements.

3. Emissions Limits

- a. i. The total annual emissions of VOM from the affected facility, i.e., the collection of wastewater management units at this source, shall not exceed 97.8 tons/year, rolling total of 12 consecutive months, with compliance with this limit determined in accordance with the relevant provisions of this permit.

Note: The provisions of this permit that address how compliance with the limits for VOM emissions set by this permit are to be determined do not address how emissions are to be determined for other purposes, such as determining compliance with applicable emission standards.

- ii. In addition, for the first 11 full months that this permit is in effect, the VOM emissions of the affected facility shall not exceed the following limits, with compliance determined on a cumulative basis beginning with the first whole month in which this permit is in effect, with compliance with this limit determined in accordance with the relevant provisions of this permit.

Limits (tons)					
Months 1 thru 4		Months 5 thru 8		Months 9 thru 11	
1	12.0	1 thru 5	45.0	1 thru 9	77.0
1 and 2	21.0	1 thru 6	53.0	1 thru 10	84.0
1 thru 3	29.0	1 thru 7	61.0	1 thru 11	91.0
1 thru 4	37.0	1 thru 8	69.0	-	(97.8)

- b. Compliance with the above emission limits shall be determined from the input VOM (i.e., the mass of VOM in the wastewater sent to the affected facility excluding the VOM compounds listed in Condition 3(c) reduced by the mass of this input VOM that is not emitted from the affected facility as it is either destroyed by biodegradation during treatment of the wastewater or, if the Permittee installs and operates an air pollution control device on the affected facility to comply with Condition 4(a) or 40 CFR 63 Subpart FFFF, is controlled or destroyed by such device, as addressed and provided for below:
 - i. To determine the mass of input VOM that is not emitted because it is destroyed by biodegradation during wastewater treatment, the Permittee shall use Toxchem® or other

similar nationally recognized assembly of computer programs to calculate the masses of different VOM compounds in the wastewater sent to the affected facility that are available for biodegradation during treatment and the efficiency with which those compounds are destroyed by biodegradation (i.e., Fractions Biodegraded) as follow:

- A. As wastewater is treated in three aeration tanks in the affected facility (two primary aeration tanks, Tanks T-15 and T-16, and a secondary aeration tank, Tank T-02), except as provided by Conditions 3(b)(i)(B) or (C), the Permittee shall calculate the Fractions Biodegraded in these tanks using the default rate constants for individual compounds in Table 1, which conservatively address the extent of biodegradation during aerobic treatment of wastewater, and Toxchem® or other similar nationally recognized assembly of computer programs to address the biodegradation that occurs in these tanks.
 - B. Beginning for Calendar Year 2022, as an alternative to Condition 3(b)(i)(A), for the specific VOM compound(s) listed in Table I of 40 CFR 63, Appendix C, "Determination of the Fraction Biodegraded (F_{bio}) in a Biological Treatment Unit," the Permittee may consider the fractions of these compounds that are biodegraded in the affected facility with these fractions determined by a site-specific analysis in accordance with the procedures in 40 CFR Part 63, Appendix C, or 40 CFR 63.145, as applied to the masses of such VOM compounds entering the affected wastewater management unit(s) in which biodegradation occurs, with the reduction in VOM emissions calculated on a monthly basis.
 - C. Beginning for Calendar Year 2022, as an alternative to Condition 3(b)(i)(A), for VOM compounds that are not addressed in Table I of 40 CFR Part 63, Appendix C, the Permittee may consider the fractions of those compounds that are biodegraded in the affected facility with these fractions determined by a site-specific analysis in accordance with procedures that are identical or equivalent to those in 40 CFR Part 63, Appendix C, or 40 CFR 63.145, as applied to the masses of such VOM compounds entering the affected wastewater management unit(s) in which biodegradation occurs, with the reduction in VOM emissions calculated on a monthly basis.
- ii. To determine the mass of input VOM that is not emitted because it is destroyed by a control device on the affected facility if the Permittee installs and operates an air pollution control device to comply with Condition 4(a) or 40 CFR 63 Subpart FFFF, the Permittee shall calculate the

mass of the material that is controlled on at least a monthly basis from the mass of VOM entering the control device and the minimum overall control efficiency of the control device (i.e., combination of capture and control efficiency), as provided for by the applicable permit issued by the Illinois EPA that addresses the control device. If the VOM emissions of downstream wastewater management units may be affected by control of certain VOM compounds by the device, the composition of the captured VOM material as it affects the emissions of the downstream wastewater management units shall also be determined and considered when determining VOM emissions of those downstream wastewater management units.

c. The following organic compounds, as they do not materially affect the VOM emissions of the affected facility, shall not be included in the input VOM. For purposes of this permit, the terms "VOM compound" and "VOM compounds" do not include the compounds listed below:

- i. The following three glycol compounds: diethylene glycol (DEG), ethylene glycol and propylene glycol.
- ii. The following five amine compounds: dimethyl amine, trimethyl amine, dimethylaminopropylamine (DMAPA), ethanolamine and triethanolamine.
- iii. The following three organic acids: chloroacetic acid, maleic acid and acetic acid.

4. Operational Limits

a. i. The total annual masses of methanol and of other VOM compounds in wastewater sent to the affected facility shall not exceed the following limits, which limits apply as a rolling total of 12 consecutive months, with compliance with determined in accordance with the relevant provisions of this permit.

A. Methanol: 111.0 tons/year.

B. Other VOM compounds (i.e., VOM compounds other than methanol, and not including the organic compounds listed in Condition 3(c)): 111.6 tons/year

Note: These limits act to restrict VOM emissions of the affected facility to no more than 97.8 tons/year after application of the base level of biodegradation provided by the three aeration tanks in the affected facility, as addressed by Condition 3(b)(i)(A) (i.e., 33 percent for methanol and 79 percent for other VOM compounds).

ii. In addition, for the first 11 full months that this permit is in effect, beginning with the first whole month in which this permit is in effect, the masses of methanol and of

other VOM compounds in wastewater sent to the affected facility shall not exceed the following limits, with compliance determined on a cumulative basis:

- A. The mass of methanol shall not exceed the applicable limit specified below:

Limits (tons)					
Months 1 thru 4		Months 5 thru 8		Months 9 thru 11	
1	14.0	1 thru 5	51.0	1 thru 9	85.5
1 and 2	24.0	1 thru 6	60.0	1 thru 10	94.0
1 thru 3	33.0	1 thru 7	68.5	1 thru 11	102.5
1 thru 4	42.0	1 thru 8	77.0	-	(111.0)

- B. The mass of other VOM compounds shall not exceed the applicable limit below.

Limits (tons)					
Months 1 thru 4		Months 5 thru 8		Months 9 thru 11	
1	14.1	1 thru 5	51.5	1 thru 9	86.1
1 and 2	24.2	1 thru 6	60.6	1 thru 10	94.6
1 thru 3	33.3	1 thru 7	69.1	1 thru 11	103.1
1 thru 4	42.4	1 thru 8	77.6	-	(111.6)

5. Compliance Determinations

- a. The Permittee shall make determinations of compliance with the applicable limits in Condition 3(a) and 4(a), which restrict the mass of VOM emissions of the affected facility ($Mass_{VOM}$) and the masses of methanol ($Mass_M$) and the mass of other VOM compounds ($Mass_o$) in wastewater sent to the affected facility, respectively. These determinations of compliance shall be made from data for whole calendar months or, at the election of the Permittee, either whole fiscal months or whole International Standards Organization months. After this permit has been in effect for 12 full months, each determination of compliance with a limit will consist of the summation of relevant data for 12 consecutive whole months.
- b. If the Permittee compiles relevant data and determines $Mass_M$, $Mass_o$ or $Mass_{VOM}$ of the affected facility for periods that are longer than one month in duration, the resulting $Mass_M$, $Mass_o$ or $Mass_{VOM}$ shall be allocated to individual months as follows:
- i. Once this permit has been in effect for one full calendar year, if the Permittee determines some or all of the mass for an entire calendar year, the Permittee shall divide these determinations by 12 to provide a value for the mass for each whole month in the year.
 - ii. Until this permit has been in effect for one full calendar year, as the Permittee determines some or all of the mass for a period that is more than one month, the Permittee shall divide these determinations by the number of months

addressed by the determination to provide a value for the mass for each whole month in the period addressed by the determination.

- c. If the Permittee compiles data and determines only some of the Mass_{VOM} from periods that are longer than one month in duration, as provided for by Condition 5(b), such allocated emissions and other emissions and adjustments of emissions determined for individual months shall be combined to provide a value for Mass_{VOM} of the affected facility for each whole month.
- d. For the purpose of making determinations of compliance with the limits set by this permit, except as provided below by Conditions 5(d)(i) and (ii), the Permittee shall compile relevant data on at least an annual basis and make determinations of compliance for each month in a particular year by May 1 of the following year. For example, the determinations of compliance for September in a subject year shall address the 12-month period that begins with October of the previous year and ends with September of the subject year.
 - i. For the determinations of compliance for the months of December 2020, January 2021, February 2021 and March 2021 (i.e., the determinations of compliance for the first four full months after this permit takes effect), the Permittee shall compile relevant data and make the determinations of compliance for each month by May 1, 2021. For example, the determinations of compliance for December 2020, the first full month in which this permit is in effect, shall address that month. The determinations of compliance for the month of March 2021 shall address compliance with the applicable limits for the period that begins December 2020 and ends March 2021.
 - ii. For the determinations of compliance for the months of April 2021 through December 2021, the Permittee shall compile relevant data and make determinations of compliance for each month by May 1, 2022. For example, the determinations of compliance for the month of April 2021 shall address compliance with the applicable limits for the period that begins December 2020 and ends April 2021. The determinations of compliance for the month of December 2021 shall address compliance with the applicable limits for the 12-month period that begins January 2021 and ends December 2021.
- d. For the purpose of making determinations of compliance with the limits set by this permit, except as provided below by Conditions 5(d)(i) and (d)(ii), the Permittee shall compile relevant data on at least an annual basis and make determinations of compliance for each month in a particular year by May 1 of the following year. For example, the determinations of compliance for September in a subject year shall address the 12-month period that begins with October of the previous year and ends with September of that year.

- i. For the purpose of the first determinations of compliance after this permit takes effect through March 2021, the Permittee shall compile relevant data and make determinations of compliances by May 1, 2021, for each month through March 2021. For example, the determinations of compliance for the first full month in which this permit is in effect shall address that month. The determinations of compliance for the month of March 2021 shall address compliance with the applicable limits for the period that begins with the first full month in 2020 in which this permit is in effect and ends with March 2021.
- ii. For the purpose of the determinations of compliance for the months of April through December 2021, the Permittee shall compile relevant data and make determinations of compliance for each month by May 1, 2022. For example, the determinations of compliance for the month of April 2021 shall address compliance with the applicable limits for the period that begins with the first full month in 2020 in which this permit is in effect and ends with April 2021. The determinations of compliance for the month of December 2021 shall address compliance with the applicable limits for the 12-month period from January 1, 2021 through December 31, 2021.

6. Sampling and Analysis and Measurements of Flow Rate of Affected Wastewater Streams

- a. For the affected wastewater streams at the source, for the purpose of supporting other data for the amounts of VOM compounds in these streams and the effects of process and operational changes at the source on these streams and to address changes in the mass of VOM compounds in streams that contain significant amounts of VOM, the Permittee shall:
 - i. Collect grab or composite sampling of affected wastewater streams, followed by analysis to determine the amount of different VOM compounds in the streams, as provided by Condition 6(b).
 - ii. Conduct measurements for the flow rates of affected wastewater streams, as provided by Condition 6(c).
- b. The Permittee shall conduct sampling and analysis of affected wastewater streams for their VOM compound content as follows:
 - i. Sampling and analysis shall be conducted in accordance with the procedures in 40 CFR 63.144(b) other than 40 CFR 63.144(b)(2), except that sampling and analysis shall be conducted for VOM compounds in wastewater streams (i.e., not only for compounds that are organic hazardous air pollutants (HAPs) as listed in Table 9 of 40 CFR 63 Subpart FFFF), concentrations of individual VOM compounds shall be determined (not the total concentrations of certain organic

HAPs as listed in Table 8 of 40 CFR 63 Subpart FFFF), and a stream is not required to be analyzed for VOM compounds that are not reasonably expected to be in the stream or for VOM compounds that due to their very low vapor pressure at the temperature of the wastewater stream are reasonably expected to be emitted in at most "minimal amounts" by the affected facility (i.e., emissions of no more than 200 pounds/year).

- ii. Sampling and analysis for specific affected wastewater streams other than wastewater from Scrubber S-201.4 (the scrubber that controls the rotary drum dryer for Area 4) shall be conducted as follows:
 - A. On a regular basis in accordance with the provisions of Attachment 1.
 - B. For streams for which sampling and analysis is required by Attachment 1, sampling and analysis shall be completed at least two more times after the Permittee makes process or operational changes that are intended to reduce the amount of VOM in a wastewater stream so that sampling and analysis would not be required pursuant to Attachment 1, with such samples separated in time by at least 7 days.
 - C. Upon specific written request by the Illinois EPA, with such sampling and analysis conducted for specific wastewater streams and specific VOM compounds, as indicated in the request. Sampling may be required to be conducted up to three times by a single request, with each such sampling event separated by sufficient time to obtain a set of representative measurements for a wastewater stream, which may be averaged together or otherwise used for the purpose of characterizing the stream. For sampling required pursuant to this condition, sampling shall be initiated within 45 days of the request, 15 days of the date that a subject stream is next sent to the affected facility, or the date agreed to by the Illinois EPA, whichever date is later.
- iii. Sampling and analysis for the affected wastewater stream from Scrubber S-201.4 (the scrubber controlling the rotary drum dryer in Area 4) shall be conducted for lauryl alcohol, cetyl alcohol and myristyl alcohol as follows:

- A. Once each calendar year in at least calendar years 2021, 2022 and 2023, provided, however, that the sample for calendar year 2021 shall be taken between December 1, 2020 and March 31, 2021.
 - B. Thereafter, if the above sampling shows that the annual VOM emissions attributable collectively to the presence of lauryl alcohol, cetyl alcohol and myristyl alcohol in this wastewater stream are no more than 5.0 tons, the sampling of this stream shall be conducted at least once in every three calendar years, provided, however, that if annual VOM emissions collectively attributable to these compounds considering this sampling are again more than 5.0 tons, annual sampling at least once each calendar year shall resume until annual VOM emissions considering such sampling for three consecutive years are no more than 5.0 tons, in which case, sampling shall again only be required once every three calendar years.
 - C. Notwithstanding Conditions 6(b)(iii)(A) and (B), if sampling pursuant to those conditions shows that the annual VOM emissions attributable collectively to the presence of lauryl alcohol, cetyl alcohol and myristyl alcohol in this wastewater stream are no more than 2.5 tons, sampling and analysis of this stream for these compounds may be discontinued.
- iv. The Permittee shall maintain records for all sampling and analysis that it conducts for the VOM compound content of wastewater streams.
- c. The Permittee shall conduct measurements of affected wastewater streams for their flow rates as follows:
- i. Measurement for flow rates shall be conducted in accordance with the procedures in 40 CFR 63.144(c), except that determinations of flow rates shall be made for all wastewater streams for which a required determination of the organic compound content is made (i.e., not only for determinations for the content of organic compounds that are hazardous air pollutants).
 - ii. Measurements of flow rates for specific wastewater streams shall be made as follow:
 - A. In conjunction with the sampling of a stream for it pursuant to Condition 6(b)(ii)(A) or (B), which measurements shall be contemporaneous with such sampling so as to provide representative data for flow rate to accompany the data for the organic compound content of the stream.

- B. Upon specific written request by the Illinois EPA, measurements for flow rate of a wastewater stream shall be made in conjunction with the sampling and analysis required pursuant to Condition 6(b)(ii)(C)).
- iii. The Permittee shall keep records for all measurements that it conducts for the flow rate of wastewater streams.
- iv. If the Permittee makes a change to a process unit that necessitates sampling of a wastewater stream pursuant to Condition 6(b) but the process change is not expected to affect flow rate of the stream, if the Permittee does not measure flow rate of the stream after the process change, the Permittee shall will keep a record for its analysis of the expected effect of the process change on the flow rate of the stream.

7. Recordkeeping Requirements

- a. The Permittee shall maintain a diagram or listing that identifies the various affected wastewater streams generated at the source by the process unit, area or operation from which they are generated.
- b. The Permittee shall maintain records of the VOM compound content and flow rate of each affected wastewater stream, from which records the Permittee shall determine the following information. In these records, the Permittee shall record the data that it relies upon to characterize the affected wastewater streams, including the results of required periodic measurements, other measurements conducted by the Permittee to characterize wastewater streams, and the design, engineering, or operational evaluations of the process(es) that generate the wastewater streams. If the Permittee uses multiple measurements to develop the data that it relies upon to characterize certain wastewater stream(s), the records required by this condition need not include the results of individual measurements. For the purpose of these records, the results of individual measurements may be averaged, composited or otherwise analyzed to develop data that accurately represents those stream(s) during a year or other shorter period, if appropriate, which data shall then be included in this record. These records shall initially be prepared by May 1, 2021 to address the VOM compound content and flow rates of affected wastewater streams, beginning with the first full month in which this permit is in effect and updated on at least annually thereafter:
 - i. The mass of methanol input to the affected facility ($Mass_M$).
 - ii. The mass of other organic compound input to the affected facility ($Mass_o$).
- c. In the records required by Condition 7(b), the Permittee shall also identify the following, accompanied with explanation and the nature of the data relied upon to identify the VOM compound(s) that are

reasonably expected to be in the stream but for which such analysis is not required pursuant to Condition 6(b)(ii)(A):

- i. Each affected wastewater stream for which periodic sampling and analysis for its VOM compound content is required pursuant to Condition 6(b)(ii)(A), with the VOM compound(s) for which such analysis is required and the VOM compound(s) that are reasonably expected to be in the stream for which such analysis is not required.
 - ii. Each affected wastewater stream for which periodic sampling and analysis of the stream for its VOM compound content are not required pursuant to Condition 6(b)(ii)(A), with the VOM compound(s) that are reasonably expected to be in such stream for which analysis is not required.
- d. The Permittee shall maintain the following records for the operation of the affected facility as related to biodegradation of VOM compounds:
- i. For Aeration Tanks T-02, T-15 and T-16:
 - A. An operating log or other records to confirm normal operation of with data for the following operational parameters of these tanks: the extent of mixing, the aeration rate and the biomass or suspended solids content in the wastewater.
 - B. Detailed information for upsets in the operation of aeration tanks that would act to the level of biodegradation, with date(s), descriptions and an estimate of the additional VOM emissions that resulted.
 - ii. If the Permittee relies on biodegradation by affected wastewater management units other than by Aeration Tanks T-02, T-15 and T-16, as is provided for by Conditions 3(b)(i)(B) and (C), records for those affected wastewater management units as are required by Condition 7(d)(i) for the Aeration Tanks.
- e. The Permittee shall maintain a log or other records for planned changes to the source (e.g., construction of a new process unit or a process change for an existing unit) that would be likely to increase the amount of VOM compound(s) in affected wastewater stream(s) so that additional periodic sampling and analysis pursuant to Condition 6(b)(i) could need to be implemented, that include the following information:
- i. A description of the change:
 - ii. The projected effect of the change on the sampling and analysis of wastewater stream(s) that is required, with supporting information.

- iii. For a change that is implemented, the actual effect of the change on the sampling and analysis of wastewater stream(s) that is required, with supporting information.
- f. The Permittee shall maintain the records of the following information related to the masses of methanol and of other VOM compounds in wastewater sent to the affected facility ($Mass_M$ and $Mass_O$), which records shall be based on the data in the records required by Condition 7(b), compiled in preparation for making the annual demonstrations of compliance for $Mass_M$ and $Mass_O$, and accompanied by the supporting analysis and calculations:
 - i. Beginning with the demonstrations of compliance for 2021:
 - A. The $Mass_M$ and the $Mass_O$ for each month addressed by the previous demonstration of compliance (tons/month).
 - B. The total $Mass_M$ and the total $Mass_O$ for the year addressed by the current demonstrations of compliance (tons/year).
 - C. The $Mass_M$ and the $Mass_O$ for each month in the year addressed by the current demonstrations of compliance (tons/month).
 - D. For each month in the year addressed by the current demonstrations of compliance, the sums of $Mass_M$ and of $Mass_O$ for that month and for the previous 11 months.
 - ii. For the demonstrations of compliance for 2020:
 - A. The total $Mass_M$ and the total $Mass_O$ for the period addressed by these demonstrations (tons)
 - B. The $Mass_M$ and the $Mass_O$ for each month in the period addressed by these demonstrations (tons/month).
 - C. For each month addressed by these demonstrations, the sum for that month and the previous months of $Mass_M$ and of $Mass_O$ (tons).
- g. If the Permittee considers biodegradation of certain VOM compound(s) by site-specific analysis, as provided for by Conditions 3(b) (i) (B) or (C) when determining the VOM emissions of the affected facility, the Permittee shall maintain the following records:
 - i. A copy of the analysis by which the Fractions Biodegraded relied upon by the Permittee for the affected facility were determined for each of those VOM compounds.
 - ii. Records for the composition and flow rates of affected wastewater streams that contain those VOM compounds as necessary to determine the amounts of those compounds in in

these streams that was destroyed and not emitted due to biodegradation.

- iii. Records for the mass of VOM that was destroyed due to biodegradation and not emitted by the affected facility on a monthly basis (tons/month).
- h. If the Permittee relies on reduction(s) in emissions of certain VOM compound(s) provided by air pollution control equipment when determining the VOM emissions of the affected facility, the Permittee shall maintain the following records:
 - i. A copy of the analysis by which the capture and control efficiencies relied upon by the Permittee were determined for those VOM compounds.
 - ii. Records for the composition and flow rates of affected wastewater streams that contain those VOM compounds as necessary to determine the amounts of those compounds in these streams that were controlled and not emitted.
 - iii. Records for the mass of VOM that was controlled and not emitted by the affected facility on a monthly basis (tons/month).
- i. If the Permittee does not rely on biodegradation for any VOM compound(s) based on site-specific analysis or on control of emissions when determining the VOM emissions of the affected facility, as provided for by Conditions 3(b)(i)(B), (b)(i)(C) or (b)(ii), beginning with the demonstrations of compliance for 2021, the Permittee shall maintain records of the following information related to mass of VOM emitted by the affected facility ($Mass_{VOM}$), which records shall be based on the data in the records required by Conditions 7(b), compiled in preparation for making the annual demonstration of compliance for $Mass_{VOM}$, and accompanied by the supporting analysis and calculations:
 - i. For each month addressed by the previous demonstrations of compliance, the $Mass_{VOM}$ (tons/month).
 - ii. For the year addressed by the current demonstrations of compliance, the total $Mass_{VOM}$ (tons/calendar year).
 - iii. For each month in the year addressed by the current demonstrations of compliance:
 - A. The $Mass_{VOM}$ (tons/month).
 - B. The sum of $Mass_{VOM}$ for that month and the previous 11 months (tons).
- j. If the Permittee begins to rely on a site-specific analysis of biodegradation of certain VOM compound(s) or on control of emissions when determining the VOM emissions of the affected

facility, as provided for by Conditions 3(b)(i)(B), (b)(i)(C) or (b)(ii), the Permittee shall maintain records of the following information related to the mass of VOM emitted by the affected facility ($Mass_{VOM}$), which records shall be based on the data in the records required by Conditions 7(b), (g) and (h), compiled in preparation for making the annual demonstrations of compliance for $Mass_{VOM}$, and accompanied by the supporting analysis and calculations:

- i. For the year addressed by the previous demonstrations of compliance, the $Mass_{VOM}$ for each month addressed by these demonstrations (tons/month).
- ii. For the year addressed by the current demonstrations of compliance, the mass of VOM that is or would be emitted by the affected facility absent the site-specific analysis for biodegradation or control of emissions ($Mass_{VOMbase}$) (tons/calendar year).
- iii. For each month in the year addressed by the current demonstration of compliance:
 - A. The $Mass_{VOMbase}$ (tons/month).
 - B. The mass of VOM that was not emitted by the affected facility due to biodegradation considering the site-specific analysis for biodegradation ($Mass_{VOM-deg}$) (tons/month).
 - C. The mass of VOM that was not emitted by the affected facility due to control of emissions ($Mass_{VOM-control}$) (tons/month).
 - D. $Mass_{VOM}$ calculated from the records required by Conditions 7(j)(iii)(A), (B) and (C) (tons/month), i.e., $Mass_{VOMbase} - Mass_{VOM-deg} - Mass_{VOM-control}$.
 - E. The sum of $Mass_{VOM}$ for that month and the previous 11 months (tons/year).
- k. For the demonstrations of compliance for 2020, the Permittee shall maintain records of the following information related to $Mass_{VOM}$ for the period addressed by the demonstrations, which records shall be based on the data in the records required by Conditions 7(b), compiled in preparation for making these demonstrations, and accompanied by the supporting analysis and calculations:
 - i. The total $Mass_{VOM}$ for the period (tons).
 - ii. The $Mass_{VOM}$ for each month in the period (tons/month).
 - iii. The sum of the $Mass_{VOM}$ for each month in the period and the previous months in the period (tons).

8. Requirements for Retention and Availability of Required Records

- a. The Permittee shall retain all records required by this permit for at least five years from the date of entry unless a longer retention period is specified by a particular provision and keep the records at a location at the facility that is readily accessible to the Illinois EPA and USEPA.
- b. The Permittee shall make records available for inspection and copying by the Illinois EPA or USEPA upon request, including retrieving and printing on paper any records retained in an electronic format (e.g., computer) in response to an Illinois EPA or USEPA request for records during the course of a source inspection, or provide an electronic copy of such information in a format that is acceptable to the agency making the request.

9. Notification Requirements

- a. The Permittee shall provide notifications to the Illinois EPA of deviation(s) from the requirements of this construction permit, which notifications shall include information describing the deviation(s), the probable cause of the deviation(s), the corrective actions taken, and any preventative measures taken to the Illinois EPA, as follows:
 - i. Deviation from the limits in Condition 3(a) and 4(a) shall be reported as part of the submittal of the annual reports, as required by Condition 10(a) (iii).
 - ii. Deviations from the requirements of Condition 6 shall be reported in the semi-annual monitoring reports that the Permittee must submit pursuant to its Clean Air Act Permit Program permit and Section 39.5.7(p) of the Illinois Environmental Protection Act.
 - iii. Unless otherwise provided for by an operating permit for the source that addresses the requirements of this construction permit, notifications for deviations from other requirements of this permit not addressed by reporting pursuant to Condition 9(a) (i) or (ii) above shall be provided at least quarterly, with reports submitted no later than 45 days after the end of the end of the calendar quarter in which a deviation occurred.
- b. If to comply with Condition 3(a), the Permittee plans to begin utilizing a site-specific analysis for biodegradation in the determination of the VOM emissions of the affected facility or to increase its utilization of such an analysis, as provided for by Condition 3(b) (i) (B) and (C), the Permittee shall notify the Illinois EPA at least 60 days in advance of taking such action. This notification shall include the following information related to the planned utilization or increased utilization of a site-specific analysis for biodegradation in the determination of the facility's VOM emissions:

- i. A summary of the analysis and its results, including a list of the different VOM compounds addressed by the analysis with the determinations of Fractions Biodegraded.
- ii. A copy of the analysis.
- iii. A demonstration that the analysis was prepared in accordance with procedures in Appendix C to 40 CFR Part 63, or in 40 CFR 63.145, as applied to the specific circumstances of the affected facility.
- iii. The projected effect of reliance on this analysis for the determination of the annual VOM emissions of the affected facility (tons/year), with supporting information.
- iv. The date on which reliance or increased reliance on biodegradation is expected to begin.

10. Reporting Requirements

- a. The Permittee shall submit annual reports to the Illinois EPA that include the following information. These reports shall be submitted by May 1 of the subsequent year. These reports shall provide information for the entire calendar year, except for the report for 2020, which shall provide information only for the period in 2020 that begins with the first whole month in which this permit was effective.
 - i. The demonstrations of compliance for the mass of VOM emissions of the affected facility ($Mass_{VOM}$), which shall consist of a copy of the records required by Condition 7(i), (j) or (k).
 - ii. The demonstrations of compliance for the masses of methanol and of other VOM compounds in wastewater sent to the affected facility ($Mass_M$ and $Mass_O$), which shall consist of a copy of the records required by Condition 7(f) (i) or (ii), as applicable.
 - iii. If the $Mass_{VOM}$, $Mass_M$ or $Mass_O$ exceeded the applicable limit in Condition 3(a) or 4(a) for any month(s), information describing the deviation(s), the probable cause of the deviation(s), the corrective actions taken, and any preventative measures taken.
 - iv. Measures initiated by the Permittee during the subject year or period with the objective of reducing the amount of methanol or other VOM compounds in affected wastewater streams and the VOM emissions of the affected facility by more than an incidental amount, with description and estimated effect on an annual basis.
 - v. Developments that occurred during the subject year or period, other than variation in product mix and production

levels, that increased the amount of methanol or other VOM compounds in affected wastewater streams and the VOM emissions of the affected facility by more than an incidental amount, with description and estimated effect on an annual basis.

11. Addresses for the Illinois EPA

- a. Notifications and reports required by this permit shall be sent to the following address unless otherwise directed by the Illinois EPA:

Illinois Environmental Protection Agency
Bureau of Air, Compliance Section (#40)
1021 North Grand Avenue, East
P.O. Box 19276
Springfield, Illinois 62794-9276

12. Effective Date of This Permit

- a. This permit will take effect 30 days after the date that it is issued unless the Permittee appeals this permit to the Pollution Control Board and the Board stays the effectiveness of this permit. This condition supersedes Standard Condition 1.

ATTACHMENT 1:

**AFFECTED WASTEWATER STREAMS
FOR WHICH REGULAR SAMPLING IS REQUIRED**

1. General Requirement

Representative sampling of affected wastewater streams that meet the following criteria shall be conducted on a regular schedule as follows. Samples shall be stored and subsequently analyzed in a manner and with timing that is designed to preserve the condition of the samples and the representative nature of the resulting analyses.

Sampling in accordance with Condition 6(a) shall be conducted for VOM compound(s) in an affected wastewater stream as follows if the following criteria are satisfied:

2. Criteria for Required Sampling of Wastewater Streams Through June 30, 2021

Affected Wastewater Stream	VOM Compound To Be Sampled and Schedule
C-103 Column	Methanol, Monthly
T-936/937 Wash Tanks	Methanol, Monthly
S-803 Scrubber	Methanol, Monthly
S-928 Scrubber	Methanol, Quarterly
PTD Hot Well for Batch Reactor	Methanol, Quarterly
S-105 Scrubber	Methanol, Quarterly
Note: Sampling for the wastewater stream from Scrubber S-201.4 is addressed by Condition 6(b)(iii). It requires an initial sample to be taken by March 31, 2021 and analyzed for the lauryl alcohol, cetyl alcohol and myristyl alcohol.	

3. General Criteria for the Required Sampling of Affected Wastewater Streams for July 1, 2021 through June 30, 2022:

Criteria If the VOM Emissions of the Affected Facility for the Compliance Period Ending March 2021 Were No More 33.6 Tons ¹	
Total Mass of VOM Emissions Attributable to a Wastewater Stream (tons/year)	Required Sampling Schedule for a Wastewater Stream for an Individual Compound Based on the Annual VOM Emissions Attributable to the Mass of That Compound in the Stream (tons/year:sampling schedule)
> 10.0	≥ 6.0 : Monthly ≥ 1.0 & < 6.0 : Quarterly < 1.0 : None
≥ 2.5 & < 10.0	≥ 1.0 : Quarterly < 1.0 : None
< 2.5	None

Criteria If the VOM Emissions of the Affected Facility for the Compliance Period Ending March 2021 Were More Than 33.6 Tons ¹	
Total Mass of VOM Emissions Attributable to a Wastewater Stream (tons/year)	Required Sampling Schedule for a Wastewater Stream for an Individual Compound Based on the Annual VOM Emissions Attributable to the Mass of That Compound in the Stream (tons/year:sampling schedule)
≥ 10.0	≥ 4.0 : Monthly ≥ 1.0 & < 4.0 : Quarterly

¹ 33.6 tons is 90 percent of the applicable limit on VOM emissions for the compliance period that begins December 2020 and ends in March 2021.

	< 1.0 : None
≥ 1.0 & < 10.0	≥ 4.0 : Monthly ≥ 1.0 & < 4.0 : Quarterly < 1.0 : None
< 1.0	None

4. General Criteria for the Required Sampling of Affected Wastewater Streams Beginning July 1, 2022:

Criteria If the VOM Emissions of the Affected Facility in the Previous Calendar Year Were No More than 85 Tons	
Total Mass of VOM Emissions Attributable to a Wastewater Stream (tons/year)	Required Sampling Schedule for a Wastewater Stream for an Individual Compound Based on the Annual VOM Emissions Attributable to the Mass of That Compound in the Stream (tons/year:sampling schedule)
≥ 10.0	≥ 6.0 : Monthly ≥ 1.0 & < 6.0 : Quarterly < 1.0 : None
≥ 2.5 & < 10.0	≥ 1.0 : Quarterly < 1.0 : None
< 2.5	None

Criteria If the VOM Emissions of the Affected Facility in the Previous Calendar Year Were More than 85 Tons	
Total Mass of VOM Emissions Attributable to a Wastewater Stream (tons/year)	Required Sampling Schedule for a Wastewater Stream for an Individual Compound Based on the Annual VOM Emissions Attributable to the Mass of That Compound in the Stream (tons/year)
≥ 10.0	≥ 4.0 : Monthly ≥ 1.0 & < 4.0 : Quarterly < 1.0 : None
≥ 1.0 & < 10.0	≥ 4.0 : Monthly ≥ 1.0 & < 4.0 : Quarterly < 1.0 : None
< 1.0	None

5. Requirements for Monthly and Quarterly Sampling Schedules

Monthly Sampling

If monthly sampling is required for an affected wastewater stream for one or more VOM compounds, at least one sample shall routinely be taken during each month with the timing of such sample separated by at least 10 days from the required samples taken in adjacent months. However, a sample need not be taken in a month if: 1) The process generating the subject wastewater stream does not operate during the month or is operated during the month for less than 25 percent of the time that would be considered normal operation in a month; 2) The subject wastewater stream is not generated during the month or is generated during the month for less than 25 percent of the time that would be considered normal in a month; or 3) Other circumstances made it infeasible or impractical to take a sample, provided that this provision is not relied upon for more than twice in any calendar year and at least one sample is taken and successfully analyzed in the calendar year. In addition, monthly sampling may be discontinued after process or operational changes have been taken that reduce the amount of VOM in a wastewater stream such that the criteria for monthly sampling are no longer met, as confirmed by sampling in accordance with

Condition 6(b)(ii)(B). All but one of the required samples that are taken each year for an affected wastewater stream must be successfully analyzed provided however that additional samples may subsequently be taken if necessary to meet this requirement.

Quarterly Sampling

If quarterly sampling is required for an affected wastewater stream for one or more VOM compounds, a least one sample shall routinely be taken during each quarter, with the timing such sample separated by at least 30 days from the required samples taken in adjacent quarters. However, a sample need not be taken in a quarter if: 1) The process generating the subject wastewater stream does not operate during the quarter or is operated during the quarter for less than 25 percent of the time that would be considered normal operation in a quarter; 2) The subject wastewater stream is not generated during the quarter or is generated during the quarter for less than 25 percent of the time that would be considered normal in a quarter; or 3) Other circumstances made it infeasible or impractical to take a sample provided that this provision is not relied upon more than once in any calendar year and at least one sample is taken and successfully analyzed in the calendar year. In addition, quarterly sampling may be discontinued after process or operational changes have been taken that reduce the amount of VOM in a wastewater stream such that the criteria for quarterly sampling are no longer met, as confirmed by sampling in accordance with Condition 6(b)(ii)(B). All of the required samples taken each year for an affected wastewater stream must be successfully analyzed, provided however that additional samples may subsequently be taken if necessary to meet this requirement.

Table 1.

DEFAULT BIODEGRADATION CONSTANTS^a

VOM Compound	First Order Biodegradation Rate Coefficient (k_b)	Half Saturation Constant (K_s)	k_b Reference	K_s Reference
	L/(mg-hr)	mg/L		
Methanol	0.0053	90	1	2
1,4-Dioxane	0.000392715	44.7144	3	3
Lauryl Alcohol ^b	0.00173778	8.80436	3	3
Cetyl Alcohol ^b	0.00173778	8.80436	3	3
Myristyl Alcohol ^b	0.00173778	8.80436	3	3
Isopropyl Alcohol	0.0000750	200	4	4
Diethylene Glycol Monobutyl Ether	0.000927229	16.5008	3	3
References				
1. Barton D. A., McKeown, J.A. 1991. "Field Verification of Predictive Modelling of Organic Compound Removal by Biological Wastewater Treatment Processes", Environmental Progress, 10, 2, pp 96 -103				
2. USEPA 1995. WATER8: Emission Estimation Software, Version 4.0, USEPA, RTP, NC.				
3. Air Emissions Models for Waste and Wastewater, USEPA, Report EPA-453/R-94-080A, 1994				
4. Coburn, J., Allen, C., Green, D. and Leese, K., 1988. Site Visits of Aerated and Non-Aerated Impoundments, Revised Draft Summary Report, Prepared for USEPA, Contract No. 68-03-3253.				

Notes:

- a. Default degradation constants for listed VOM compounds with references for those constants as provided in Toxchem® except for the VOM compounds for which Toxchem currently does not include such constants. For those compounds, as specifically noted and explained below, the constants and references in Toxchem® for similar compounds are provided.
- b. For lauryl alcohol or dodecanol ($C_{12}H_{26}O$), cetyl alcohol or hexadecanol ($C_{16}H_{34}O$), and myristyl alcohol or tetradecanol ($C_{14}H_{30}O$), the constants are those for a similar compound, isodecanol ($C_{10}H_{22}O$)



STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
P. O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

**STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS
ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY**

July 1, 1985

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.
2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act, and Regulations adopted by the Illinois Pollution Control Board.
3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.
4. The Permittee shall allow any duly authorized agent of the Agency upon the presentation of credentials, at reasonable times:
 - a. to enter the Permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,
 - b. to have access to and copy any records required to be kept under the terms and conditions of this permit,
 - c. to inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,
 - d. to obtain and remove samples of any discharge or emission of pollutants, and
 - e. to enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.
5. The issuance of this permit:
 - a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,
 - b. does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities,
 - c. does not release the Permittee from compliance with the other applicable statutes and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations,
 - d. does not take into consideration or attest to the structural stability of any units or parts of the project, and

- e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.
- 6.
- a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Agency before the equipment covered by this permit is placed into operation.
 - b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.
7. The Agency may file a complaint with the Board for modification, suspension or revocation of a permit:
- a. upon discovery that the permit application contained misrepresentations, misinformation or false statements or that all relevant facts were not disclosed, or
 - b. upon finding that any standard or special conditions have been violated, or
 - c. upon any violations of the Environmental Protection Act or any regulation effective thereunder as a result of the construction or development authorized by this permit.