Regulatory Order Worksheet

PUGET SOUND Clean Air Agency

Source: Toray Composites Materials America	**NOC Number:** 12234
Installation Address: 19002 50th Ave E | Tacoma, WA 98446	**Registration Number:** 10762
Contact Name: Jeff Hawkey/ Kris Stanford	**Contact Email:** Kris.Stanford@toraycma.com
Applied Date: 03/28/2022	**Contact Phone:** (253) 846-1777
Engineer: Maggie Corbin	**Inspector:** Wellington Troncoso

A. DESCRIPTION

For the General Order:

Facility-wide synthetic minor emission limit of VOC emissions.

Additional Information (if needed):

Toray Composites Materials America (Toray) manufactures carbon fiber composites used in the manufacture of aircraft and sporting goods. The facility has been in operation since 1992, the first three years of which were dedicated to testing, research, and development. Actual production at the facility began in 1995.

The facility was originally identified as a major source of hazardous air pollutants (HAPs) because emissions of methyl ethyl ketone (MEK) exceeded the major source thresholds of 10 tons per year. In 2005, the Environmental Protection Agency (EPA) delisted MEK so that is no longer classified as a HAP, but it is still a volatile organic compound (VOC), and it is still a toxic air pollutant (TAP) under Chapter 173-460 WAC. Toray Composites remained in the operating permit because potential emissions of VOCs exceed the major source thresholds of 100 tons per year. Actual emissions remain below this level, but there is no federally enforceable limit on potential emissions of VOCs.

Proposed Emission Limitations

On February 15, 2022, Toray submitted a request to voluntarily limit VOC emissions to 95 tons/year in accordance with WAC 173-400-091. Potential emissions of HAPs and other criteria pollutants are below major source thresholds.

Actual emissions are currently below major source levels. The currently permitted equipment could be operated as such to increase VOC emissions to 95 tons/year. However, any new emission sources or modification of existing sources that would result in an increase in emissions would still be subject to the new source review requirements in Regulation I, Article 6 unless categorically exempt. Since this is a facility-wide emission limit, emissions from new sources permitted in the future would still need to be accounted for under this emission limit.

Permit History

Air Operating Permit 10762 was issued on June 11, 2002. A renewal of the operating permit was issued on July 1, 2009, and a second renewal was issued on January 17, 2017. The applicant submitted a complete air operating permit application, but after reviewing historical emissions and projecting any increases in operation in the future, Toray determined a synthetic minor permit would be more appropriate for this facility. Toray is currently operating under the permit application shield (WAC 173-401-705(2)), but will no longer be a chapter 401 operating permit source subject to WAC 173-400-091 after issuance of this Order.

B. FEES AND ANNUAL REGISTRATION FEES

Fees:

Fees have been assessed in accordance with PSCAA Regulation I, 3.03(e) for Regulatory Orders: per Regulation I 3.03(e): "When a regulatory order is requested by an applicant, the Agency shall assess a fee of $4,000 to cover the costs of processing and issuing a regulatory order under this section. The Agency shall also assess a fee equal to the cost of providing public notice in accordance with Section 3.03(b) of this regulation. These fees shall be due and payable within 30 days of the date of the invoice and shall be deemed delinquent if not fully paid within 90 days of the invoice."

Fee Description	Cost	Amount Received (Date)
Reg I 3.03(e)	$4,000	
Public Notice*		
Initial fee received		$4,000 (3/28/22)
Public comment fee received		(TBD)
Total		

*Publication fees to be invoiced following public comment period

Registration Fees:
Registration fees are assessed to the facility on an annual basis. Fees are assessed in accordance with Regulation I, Section 5.07. The 2022 Toray Invoice is shown below for reference.

PUGET SOUND
Clean Air Agency

Invoice for Year 2022 Operating Permit Fees

Bill To:
Toray Composites Materials America **19002 50th Ave E** **Tacoma, WA 98446** **Attention: Accounts Payable**

Invoice Date:	Invoice #:
November 19, 2021	20220020
Due Date:	**Terms:**
January 03, 2022	Net 45 Days
Facility ID (Permit #):	
10762	

Site Address: ***Toray Composites Materials America***
19002 50th Ave E, Tacoma, WA 98446

The annual operating permit fee is required by Washington State law and Puget Sound Clean Air Agency's Regulation I. Your fees are based on your NAICS code and your actual emissions during 2020.

Facility Fees and Applicable Regulations			Charges
Facility Fee for Operating Permit Sources. Reg I, 7.07(b)(1)(iii)			**$ 28,600.00**
NAICS 335991 -- Carbon and Graphite Product Manufacturing			
Emission Surcharges - Reg I, 7.07(b)(2)	**Tons in 2020**	**Per Ton**	
HAP (Hazardous Air Pollutants)	1	$ 60	$ 60.00
VOC (Volatile Organic Compounds)	41	$ 60	$ 2,460.00
			$ 2,520.00
Fee Totals			
Operating Permit Fee (After February 17, 2022, the fee is $37,620.00).			**$ 31,120.00**
The Total Fee is due by January 03, 2022. If unpaid after February 17, 2022, an additional delinquent fee of $6,500.00 will be applied. The delinquent fee is equal to 25% of the Operating Permit Fee, not to exceed $6,500 (Reg I, 7.07(b)).			
WA State Department of Ecology surcharge, Reg I, 7.07(d)			**$ 768.74**
For further information regarding the WDOE surcharge, please call 1-360-407-7530.			
TOTAL FEE			**$ 31,888.74**

The fee structure for this facility will change for 2023 with fees based on Regulation I, Section 5.07(c)(2). The fee will include a base fee, fee for annual emissions exceeding emission reporting thresholds, and emission surcharges.

C. STATE ENVIRONMENTAL POLICY ACT (SEPA) REVIEW

State Environmental Policy Act (SEPA) review was not conducted for the issuance of this Regulatory Order. In this case, the Regulatory Order does not include the establishment of any new source of emissions.

Regulation I, Article 2. The SEPA review is undertaken to identify and help government decision-makers, applicants, and the public to understand how a project will affect the environment. A review under SEPA is required for projects that are not categorically exempt in WAC 197-11-800 through WAC 197-11-890. A new source review action which requires a NOC application submittal to the Agency is not

categorically exempt. A SEPA determination was made for actions that triggered a Notice of Construction permit.

D. TRIBAL CONSULTATION

On November 21, 2019, the Agency's Interim Tribal Consultation Policy was adopted by the Board. Criteria requiring tribal consultation are listed in Section II.A of the policy and include establishment of a new air operating permit source, establishment of a new emission reporting source, modification of an existing emission reporting source to increase production capacity, or establishment or modification of certain equipment or activities. In addition, if the Agency receives an NOC application that does not meet the criteria in Section II.A but may represent similar types and quantities of emissions, the Agency has the discretion to provide additional consultation opportunities.

This project does not meet any of the criteria for consultation listed in Section II.A of the Agency's Interim Tribal Consultation Policy. This order does not authorize an increase in emissions or new equipment. The intent of this Order is to establish federally enforceable limits on potential emissions.

E. EMISSION ESTIMATES

Facility-wide Emissions

Without the federally enforceable limits of this Order, the facility PTE would exceed major source thresholds for VOCs as defined in 40 CFR Part 51.100.

The applicant submitted a spreadsheet summarizing actual VOC and HAP emissions:

	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
HAP	0	0.711	0.748	0.368			1.407	1.2225	1.588	1.0245	0.8
TAC	19.806	30.2695	30.829	34.2455	28.3475	31.1785	44.6895	42.969	37.2385	21.071	25.9
VOC	35.78	40.92	50.29	59.4345	50.045	59.224	67.5815	64.4395	53.4745	29.3165	35.8

RY 2021 Emissions.xlsx

There are two primary solvents used at the facility. N-Methyl-2-Pyrrolidone (NMP, CAS 872-50-4) is not an EPA HAP but is a VOC. Methyl Ethyl Ketone (MEK, CAS 78-93-3) was originally listed as a HAP, but was delisted in 2005. It is a VOC and also listed as a TAC under WAC 173-460-150.

A majority of the solvent usage is associated with the resin mixing operations, cold solvent wash tank cleaning operations, prepreg and filming operations and hand-wipe cleaning operations. The facility has six storage tanks in their tank farm for storing solvents and 4 tanks in the distillation area. The facility

also operates a closed-loop solvent recovery system with water-cooled condenser that is used for solvent generated on-site only. Solvents recovered on-site are used at the facility.

The emission estimates included in the spreadsheet submitted by Toray are based on a mass balance approach to calculate emissions to the air. The applicant provided additional details in an April 6, 2022, and April 15, 2022 e-mails and have been included as a supplement to the application. The facility does reuse NMP so only sent out as waste (and subtracted as part of the mass balance) when unable to successfully recover NMP. Waste sent off-site is further distilled at the receiving company and Toray receives a recycle credit for the waste stream. They do not buy back solvent from the receiving facility. The information provided by the applicant and Southcoast AQMD's "Guidelines for Determination of VO Emissions Factors and Reporting Credits for Recycled Wastes" (copy included in NOC folder). In order to subtract off VOCs from wastes sent off-site, Toray needs to maintain records of the amount of waste sent off-site (gallons) and testing data showing the VOC content of the waste.

Resin Mixing: Bulk deliveries of NMP/MEK are received at tank farm.

The tank farm feeds NMP/MEK via closed loop system when resin mixing vessels are to be cleaned. The cleaning process is programed and does not rely on operator decision to perform cleaning, the process consists of two washes of NMP followed by two rinses of MEK. The tank farm plumbing has some common lines which carry both NMP & MEK, the lines are flushed with nitrogen to minimize the cross contamination. Even with nitrogen purge we do experience cross contamination. The cleaning process uses both solvent that has already been used for cleaning and virgin solvent. Once the solvent is used twice, it is sent to the waste tank for distillation. It would not be subtracted off air emissions unless specifically sent off-site.

Resin is introduced to solvent which increases overall volume (resin loading). The amount of resin left in the waste is dependent on the product (i.e. aerospace grade, sports grade). The residual resin in the mixer dissolves into the first cleaning cycle and is sent to the NMP waste tank, then separated. The distillation waste is sent out as hazardous waste. The waste is not bought back, but Toray is provided with recycle credits at end of calendar year. This waste sent off-site is subtracted from the emissions calculations.

There are no solvent handwipe cleaning activities performed in resin mixing.

Wash tanks

There are two NMP wash tanks, which are fed directly from bulk NMP tank at tank farm. The tanks are used to clean parts of cured resin, by way of submersion. The spent NMP is sent back out to waste tank at tank farm for distillation. Distilled solvent is tested onsite and transferred to virgin solvent tank for reuse. Waste produced from NMP distillation is a mix of MEK, NMP, and resins.

There are two MEK wash tanks, which are fed directly from bulk MEK tank at tank farm. The tanks are used to clean parts of cured resin, by way of submersion. This is the second step of the process after submersion in NMP wash tank. These tanks are pumped into 55-gallon drums, and sent out via waste hauler as Hazardous Product (reused as paint gun cleaner).

Currently wastes are not tested before being sent off-site, but the applicant notes this could be done in on-site lab. Wastes sent off-site is subtracted from emissions calculations.

Hand wipe cleaning.

MEK is used to wipe down filming machines. The MEK is collected from a drum that has been filled from the bulk MEK tank (recycled material). Production techs from filming dispense MEK from this drum into a 2-gallon jug, which is used to fill squeeze bottles, which is then used to dampen towels for hand wiping of the filming machines during clean up. The rags are disposed of in solvent contaminated rag hazardous waste stream. No waste is subtracted from emissions calculation from hand wipe cleaning.

Test Lab NMP (ACS Grade)

The test lab uses ACS grade level NMP (brought in via 55-gallon drums) for testing purposes. This waste is collected in 55-gallon drums and introduced into the NMP waste tank (at tank farm) for recycling and reuse in production operations. No waste is subtracted from emissions calculations for test lab NMP usage.

Boiler Potential Emissions:

The facility operates 4 boilers each rated at 6.0 MMBtu/hr that are fired on natural gas only. I used the spreadsheet we use to calculate emissions for permitting to estimate PTE if all four boilers were operated 24/7. PTE in tons/year is shown below:

Total HAP	0.1
Total VOC	0.3
Total CO_2e	3104
Total TAP	1.2
Total NOx	1.0
Total TSP	0.3
Total CO	1.0
Total $PM_{2.5}$	0.3
Total PM_{10}	0.3
Total SO_2	0.0

PTE Natural Gas Combustion.xlsx

Toray operates 3 emergency RICE engines. PTE is based on 500 hours/year per EPA guidance.

	PTE (tons/year)
NOX	11.7
VOC	0.5

Emergency Engines.xlsx

Toray also has a laboratory where they conduct QA/QC analysis. This includes use of methylene chloride (only solvent that is a HAP). The facility tracks this and reports in their annual emission inventory. Emissions are typically less than 1 ton/year. Methylene chloride is not a VOC.

Based on this evaluation, potential emissions of HAP and criteria pollutants other than VOCs are less than major source thresholds.

F. LIMIT EVALUATION

Based on an evaluation of potential emissions, emissions associated with resin mixing, resin mixing, solvent cleaning operation and other solvent uses are responsible for the majority of the VOC emissions. Potential emissions from combustion sources are less than 1 ton/year. Therefore, the permit focuses on potential emissions associated from solvent use at the facility.

Limits: The federally enforceable limits for this regulatory order must meet the requirements of WAC 173-400-091.

EPA has provided guidance for federally enforceable permit limits in several documents which were utilized in the development of the limits, compliance demonstration, monitoring recordkeeping and reporting requirements of this Order (PDF copies are located in the "NOC Worksheet References" sub-folder of this project folder).

- Options for Limiting the Potential to Emit (PTE) of a Stationary Source Under Section 112 and Title V of the Clean Air Act (Act), 1/25/1995
- Guidance on Enforceability Requirements for Limiting Potential to Emit through SIP and §112 Rules and General Permits, 1/25/1995
- Approaches to Creating Federally-Enforceable Emissions Limits, 11/3/1993
- EPA comments on Lockwood Regional Landfill March 29, 2011

Per EPA guidance (example from EPA comments on Lockwood Regional Landfill March 29, 2011 which can be found in the project folder file "March 29, 2011 Lockwood Landfill" PDF) "EPA encourages a 5-10% buffer between the permitted emission limits and the federal threshold". A 5% buffer will be used for the synthetic minor emission limits. The recommended facility-wide emissions limit is 95.0 tons of volatile organic compounds (VOC).

This limit applies to existing operations at the time of issuance of this Regulatory Order. New or modified sources are required to comply with the requirements of PSCAA Regulation I, Article 6 and increases of emissions are reviewed for compliance with federal, state, and local regulations. Once approved under a Notice of Construction Order of Approval (NOCOA) or determined to be exempt, emission increases associated with new or modified sources operating at the facility would be subject to this facility-wide emission limit.

Monitoring, Recordkeeping and Reporting Requirements

WAC 173-400-091(3) requires that any order issued include monitoring, recordkeeping and reporting requirements sufficient to ensure that the source or stationary source complies with the conditions of the order. Compliance is to be determined on a monthly basis (12-month rolling). Because the monitoring is based on material balance methods, this monitoring structure is sufficient to ensure that the facility remains below Title V permitting thresholds.

G. OPERATING PERMIT

Toray is currently operating under the permit application shield (WAC 173-401-705(2). This action will establish a federally enforceable limit on VOC emissions. Potential emissions of HAP and other criteria pollutants are below major source thresholds. Upon issuance, the facility is not a chapter 401 air operating permit source because PTE will be limited below Title V applicability thresholds and criteria. The source will be considered a "**synthetic minor**".

Since the previous Air Operating Permit expired on January 17, 2022, there is no need to prematurely expire any existing operating permit.

H. APPLICABLE RULES & REGULATIONS

Puget Sound Clean Air Agency Regulations

> ***SECTION 3.03*** GENERAL REGULATORY ORDERS
> (f) When an applicant requests a federally enforceable regulatory order to limit the potential to emit any air contaminant or contaminants pursuant to WAC 173-400-091, or requests a modification to such an order, the Control Officer or a duly authorized representative may issue such order consistent with the requirements of WAC 173-400-091 and 173-400-171 and Section 3.03(e) above. Regulatory orders issued pursuant to this section are effective the day the Control Officer or representative approves the order and may be appealed to the Pollution Control Hearings Board pursuant to Section 3.17 of Regulation I and RCW 43.21B.310.

Washington State Administrative Code

WAC 173:400-091: Voluntary limits on emissions.

(1) Upon request by the owner or operator of a new or existing source or stationary source, the permitting authority with jurisdiction over the source shall issue a regulatory order that limits the potential to emit any air contaminant or contaminants to a level agreed to by the owner or operator and the permitting authority with jurisdiction.

(2) A condition contained in an order issued under this section shall be less than the source's or stationary source's otherwise allowable annual emissions of a particular contaminant under all applicable requirements of the chapter **70.94** RCW and the FCAA, including any standard or other requirement provided for in the Washington state implementation plan. The term "condition" refers to limits on production or other limitations, in addition to emission limitations.

(3) Any order issued under this section shall include monitoring, recordkeeping and reporting requirements sufficient to ensure that the source or stationary source complies with any condition established under this section. Monitoring requirements shall use terms, test methods, units, averaging periods, and other statistical conventions consistent with the requirements of WAC **173-400-105**.

(4) Any order issued under this section must comply with WAC **173-400-171**.

(5) The terms and conditions of a regulatory order issued under this section are enforceable. Any proposed deviation from a condition contained in an order issued under this section shall require revision or revocation of the order.

I. PUBLIC NOTICE

This project meets the criteria for mandatory public notice under WAC 173-400-171(3)(k) for establishing a voluntary limit on emissions. This is due to requesting a voluntary limit on emissions for VOCs. A 30-day public comment period shall be held from May 25, 2022 through June 24, 2022. Notices that the draft materials were open to comment were published in the Tacoma News Tribune on May 25, 2022. The Agency posted the application and the draft worksheet on the Agency's website during the comment period. In addition, the notice was included in Ecology's permit register in accordance with WAC 173-401-805(3).

J. ORDER CONDITIONS

1. Facility-wide emissions of volatile organic compounds (VOC) as defined in 40 CFR Part 51.100 shall not exceed 95.0 tons during any consecutive 12-month rolling period.

2. The owner or operator shall track the usage and VOC content of all VOC-containing materials used in the manufacturing process at the facility that contribute to VOC emissions. Monthly purchase records may be used as a surrogate for monthly usage.

3. Within 30 days of the end of each month, the owner or operator shall calculate and record emissions over the previous month and previous consecutive 12-month period for VOCs based on usage of VOC of all VOC-containing material used in the manufacturing process at the facility (mass balance approach). This includes but is not limited to operations associated with resin mixing, wash tanks, solvent cleaning operations, test lab operations, and hand-wipe cleaning. The owner or operator may choose to subtract the amount of VOC due to disposal or recycling of material sent off-site if records are maintained showing the following:

    a. Quantity of disposed waste shipped off-site (kg or lb);

    b. Date the material was shipped off-site;

    c. The percentage of VOCs in waste sent off-site based on the waste analysis by a lab using EPA Method 8260C or 8260D (or other PSCAA approved test method) to determine VOCs and EPA

Method 8270D or 8270E (or other PSCAA approved test method) to determine semivolatile organic compounds. A baseline percentage of VOCs in each type of waste can be established based on the sampling results from at least three waste totes being sent off-site, as long as the waste composition is verified with one sample from each type of waste in each calendar year and the baseline percentage of VOCs in updated as needed.

The VOC that can be subtracted off equals the quantity of disposed waste sent off-site multiplied by the liquid material fraction (if applicable) and the percentage of VOCs in the waste determined in Condition 3(c).

4. The owner or operator shall provide a one-time notification to the Puget Sound Clean Air Agency in writing, within 60 days after the end of any 12-month period if, during that period, facility-wide emissions of VOC exceeded 90 tons. The report shall include a summary of the total 12-month emissions. Upon request, owner or operator shall provide the supporting emission calculations for the reported emission totals.

5. All records maintained by this Order of Approval must be maintained for five years (in hard copy or electronic format) and must be made available to Puget Sound Clean Air Agency personnel upon request.

6. This Order shall expire upon Puget Sound Clean Air Agency's determination that the owner or operator has submitted a complete application for an operating permit under Article 7 of Puget Sound Clean Air Agency Regulation I.

K. CORRESPONDENCE AND SUPPORTING DOCUMENTS

E-mails filed in Agency EMS under Toray.

RE: Title V operating permit renewal application (Reg Order 12234)

Stanford (US), Kris <Kris.Stanford@toraycma.com>
To Maggie Corbin

Reply | Reply All | Forward

Fri 4/22/2022 2:08 PM

I confirmed with our in house lab, we do have a Gas Chromatography machine and that we can perform a VOC test inhouse.

We are not accredited for the EPA Methods 8260C & 8260D, so we determined that we should pull 3 samples each from our MEK & NMP waste, and have analyzed at an accredited lab. We will determine an average from the results, we will use average to establish VOC content of waste going out.

We will also run in house VOC analysis, and compare our results to the accredited lab, in effort to determine if we are capable of matching the accredited results. Not sure at this point if it is necessary to do this, however we do want to have a plan in place, that we can verify with confidence in the event it is needed to validate VOC content. This would be a part of our plan that may be periodically reviewed.

On your below first sentenced you are correct, I broke it down like this.
Yes, you are correct on the above, I broke it down this way.
NMP Waste = 28% MEK & 26% NMP
MEK Waste = 62% NMP & 23% MEK

Hope all of this makes sense, it has taken me a moment to wrap my mind around the various formulas within the guidance document. Actually, pulled in one of our technical engineers to go over it with me this afternoon, and we feel the above steps, puts us in place how we will meet conditional requirements of new permit.

Let me know if you have any thoughts, on the above. I'll be working toward getting samples for testing next week, our production being what it is, we are not constantly distilling, so the sample retrieval is dependent on when we are distilling.

Thanks again for all your help.
Kris

RE: Title V operating permit renewal application (Reg Order 12234)

Stanford (US), Kris <Kris.Stanford@toraycma.com>
To Maggie Corbin

Reply | Reply All | Forward

Fri 4/22/2022 2:08 PM

From: Maggie Corbin <MaggieC@pscleanair.gov>
Sent: Thursday, April 21, 2022 8:44 AM
To: Stanford (US), Kris <Kris.Stanford@toraycma.com>
Subject: RE: Title V operating permit renewal application (Reg Order 12234)

Thanks Kris,

Yes, that's the analysis we'd be looking for. Do you know how often they test the waste? Is that a test that your lab could do? If I'm reading this correctly, the first sample shows .23 kg/kg MEK and 0.62 kg/kg NMP (.85 kg/kg VOC) and the second shows .28 kg/kg MEK and 0.26 kg/kg NMP (0.54 kg/kg). Hopefully I'm reading that correctly – please correct me if I'm wrong since I'm more used to air samples! 😊

I think we need to have enough testing to either show the waste profile is consistent or enough testing to show you are properly characterizing the waste being sent off-site. I think the place to focus on is the proposed condition 3 in the worksheet I sent. I think getting the weight of the waste sent off-site should be doable. And the liquid material fraction default probably makes sense (that's from the document I sent). But if your waste is relatively consistent, I'm trying to back off from testing every sample unless your lab has the ability to easily run this test. One other option would be to require a plan be in place that we review periodically. This would allow more flexibility. I'm definitely open to suggestions on this since the waste part is outside of my expertise.

3. Within 30 days of the end of each month, Toray shall calculate and record emissions over the previous month and previous consecutive 12-month period for VOCs based on usage of VOC of all VOC-containing material used in the manufacturing process at the facility (mass balance approach). This includes but is not limited to operations associated with resin mixing, wash tanks, solvent cleaning operations, test lab operations, and hand-wipe cleaning. Toray may choose to subtract the amount of VOC due to disposal or recycling of material sent off-site if records are maintained showing the following:

a. Quantity of disposed waste shipped off-site (kg or lb);
b. Date the material was shipped off-site;
c. Liquid material fraction which can be obtained from the waste profile generated by the waste hauler or analytical report performed by a laboratory. If specific information is unavailable, the default liquid fractions are 0.70 by volume for waste solvents and 0.05 by volume for sludge wastes from the bottom of equipment such as solvent stills;
d. The VOC content of material being sent off-site based on the waste analysis by a lab using EPA Method 8260C or 8260D (or other PSCAA approved test method) to determine VOCs and EPA Method 8270D or 8270E (or other PSCAA approved test method) to determine semivolatile organic compounds. If waste composition is consistent based on sampling of at least 3 waste totes (+/-5%), a VOC profile can be used as the default for that waste as long as the waste composition is verified annually.

The VOC that can be subtracted off equals the quantity multiplied by the liquid material fraction and the VOC content (kg/kg or lb/lb).

PUGET SOUND
Clean Air Agency

Maggie Corbin
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1904 3rd Ave #105, Seattle, WA 98101
DIRECT 206-689-4087
FAX 206-343-7522
WEBSITE pscleanair.gov

From: Stanford (US), Kris <Kris.Stanford@toraycma.com>
Sent: Thursday, April 21, 2022 7:17 AM
To: Maggie Corbin <MaggieC@pscleanair.gov>
Subject: RE: Title V operating permit renewal application

Hi Maggie,

I was able to get the attached VOC analysis from our current waste hauler, it appears we had the VOC 8260C & 8270D methods ran in 2019. I'm currently reviewing the guideline you sent along with the technical worksheet. Wanted to send you the attached and get your thoughts on whether we should resample for analysis.

Thanks,
Kris

From: Maggie Corbin <MaggieC@pscleanair.gov>
Sent: Tuesday, April 19, 2022 8:26 AM
To: Stanford (US), Kris <Kris.Stanford@toraycma.com>
Subject: RE: Title V operating permit renewal application

Kris,

As a follow-up to yesterday's e-mail, I've attached the technical worksheet for the synthetic minor permit. I think we could simplify Condition 4 based on what you find out from the laboratory on testing VOC content of wastes. If they have better ideas for establishing VOC content, I'm up for suggestions! I'm just not clear how consistent the waste composition is or if you might get something from your waste hauler that we could use to determine VOCs leaving the site as off-site waste. For liquid fraction of waste, I used the Southcoast AQMD document, but let me know if that makes sense to you.

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RE: Title V operating permit renewal application

Stanford (US), Kris <Kris.Stanford@toraycma.com>
To Maggie Corbin

Reply | Reply All | Forward

Fri 4/15/2022 1:15 PM

Start your reply all with: Sounds good, thanks! | Sounds great, thank you! | Great, thank you so much! | Feedback

Hi Maggie,

I've asked our distillation team members to review and respond to the below Q&A. Thank you again for all your help, if you have anything more you need let me know. I'll be in touch with you toward end of next week.

Kris

From: Maggie Corbin <MaggieC@pscleanair.gov>
Sent: Wednesday, April 13, 2022 12:06 PM
To: Stanford (US), Kris <Kris.Stanford@toraycma.com>
Subject: RE: Title V operating permit renewal application

Kris – This was very helpful and I think we're pretty close. I added a few questions in red below. If you have the weight/volume of the totes, we just need to figure out what documentation would support the percent of MEK, NMP or other VOC in the waste. I think we could just look at total VOC (lb/gal) of waste.

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From: Stanford (US), Kris <Kris.Stanford@toraycma.com>
Sent: Wednesday, April 6, 2022 4:06 PM
To: Maggie Corbin <MaggieC@pscleanair.gov>
Subject: RE: Title V operating permit renewal application

Hi Maggie,

Sorry for the delay, please see below answers to your questions. I have come across emission calculation data sheets, however am not sure they are useful. I can try to refine more the percentages if needed though. I do want to add, I am pretty sure that weight of totes which NMP/MEK are sent out in are included in weight of volume sent out. This would impact to the total volume reported. I've got more digging to do on this.

Thank you for your help on this, it is much appreciated.
Kris

From: Maggie Corbin <MaggieC@pscleanair.gov>
Sent: Monday, April 4, 2022 4:25 PM
To: Stanford (US), Kris <Kris.Stanford@toraycma.com>
Subject: RE: Title V operating permit renewal application

Kris,

Yes, the procedure makes sense. I'm just surprised at the high percentage that is sent off-site as hazardous waste. I thought a significant percentage of the emissions were associated with hand-wipe cleaning so I would not think much would be recovered. I'm looking for more of a description of why it makes sense that such a high percentage is sent off-site – operational more than calculation methodology. Do you have a rough breakdown of where solvents are used (% in resin mixing, % in handwipe cleaning, % in wash tanks, other), then walk me through the process.

Resin Mixing: Bulk deliveries of NMP/MEK are received at tank farm.

- Tank farm feeds NMP/MEK via closed loop system when resin mixing vessels are to be cleaned. The cleaning process is programed and does not rely on operator decision to perform cleaning, the process consists of two washes of NMP followed by two rinses of MEK. Tank farm plumbing has some common lines which carry both NMP & MEK, the lines are flushed with nitrogen to minimize the cross contamination. Even with nitrogen purge we do experience cross contamination.

So once cleaned, I assume the waste NMP and MEK are collected. And then is that all sent off as waste?
This cleaning process uses solvent that has already been used for a cleaning and virgin solvent. Once the solvent has been used twice it is sent to the respective waste tank for distillation.

- Resin loading: Resin is introduced to solvent which increases overall volume, a flat rate of 3% is used due to the impracticality of high number of sampling. Three percent is to be subtracted from waste volume. (I did not perform this adjustment) Note: We have historically produced heavily on the aerospace side and are now producing more on the sports grade side, this switch in resin type does affect the volume of waste. I am told that the sports grade resin does not easily dissolve and therefore results in a higher content of resin left in the waste. Our distillation waste is sent out as hazardous waste and recycled further under disposal method H020. We do not buy back this material, we are though provided with recycle credits at end of calendar year.

For this, I'm assuming the resin mixing process will result in VOC emissions which makes sense. Then the resin mixed with solvent is used. So the waste is whatever is left in the mixing vat and cleaned out per the bullet above? Is that correct?
The residual resin in the mixer dissolves into the first cleaning cycle and is sent to the NMP waste tank. This is later separated during distillation and sent out as hazardous waste. The final step of the automated cleaning process is to burn off residual solvent with heat once all the liquid solvent has been recovered from the vessel.

- There are no solvent handwipe cleaning activities performed in resin mixing.

We have a total of 4 wash tanks.

First step in washing of parts via submersion, is to dip parts into NMP tank, then into MEK tank for removal of any residue NMP leaves behind.

There are two NMP wash tanks, which are fed directly from bulk NMP tank at tank farm. The tanks are used to clean parts of cured resin, by way of submersion. The spent NMP is sent back out to waste tank at tank farm for distillation.

I think I have this, but the spent NMP would be distilled and sent off-site so that would be subtracted off. But it would be all NMP.
Distilled solvent is tested onsite an transferred to our virgin solvent tank for reuse. The waste produced from NMP distillation is a mix of MEK, NMP, and resins.
Note: we will focus on determining the mix of NMP/MEK/resin during our next meeting week of 4/18/22.

There are two MEK wash tanks, which are fed directly from bulk MEK tank at tank farm. The tanks are used to clean parts of cured resin, by way of submersion These tanks are pumped into 55 gallon drums, and sent out via our waste hauler as Hazardous Product (reused as paint gun cleaner). Not sure what that percent is or if it is a range, I can look into it though.

Do you have to sample the percent of MEK before sending off as hazardous waste?
We do not sample this material before it sent offsite. Note: I can have analysis ran on this if needed. Would analysis done by our lab be acceptable?

Hand wiping/cleaning.

We use MEK to wipe down our filming machines, the MEK is collected from a drum that has been filled from our bulk MEK tank (our recycled material). Production techs from filming dispense MEK from this drum into a 2 gallon jug, which is used to fill squeeze bottles, which is then used to dampen towels for hand wiping of the filming machines during clean up. The rags are disposed of in our solvent contaminated rag hazardous waste stream, there are no free liquids in this waste profile.

That makes sense. And that would be reflected in your mass balance that MEK used in hand wipe cleaning would emitted to the atmosphere. There would be some solvent left in rags but I don't think you could account for that in mass balance.

Test Lab NMP (ACS Grade)

Our test lab uses ACS grade level NMP (brought in via 55 gallon drums) for testing purposes, this waste is collected in 55 gallon drums and introduced into our NMP waste tank (at tank farm) for recycling and reuse in our production operations.

That makes sense. All of this would be accounted for in your purchases. Nothing would be sent off-site as waste.

Is the mixed waste collected from all those activities and then sent to distillation unit.
Currently only the Test Lab NMP (ACS grade) is sent through our distillation unit.

Is any of the distilled solvent reused or is it all sent off-site? Is it sent off-site as hazardous waste or other?
We reuse distilled NMP, and send out when we are unable to successfully recover NMP, at which time it is sent out as hazardous waste. The waste is further distilled at the receiving facility, reporting year 2021 returned a 54% recycle credit for this waste stream. We did not buy back this solvent it was disbursed by receiving facility.

We reuse distilled MEK, and send out when we are unable to successfully recover MEK, at which time it is sent out as hazardous waste. The waste is further distilled at the receiving facility, reporting year 2021 returned a 68% recycle credit for this waste stream. We did not by back this solvent it was disbursed by receiving facility.

So does this mean that the receiving facility has determined the 54% and 68% of the waste are NMP/MEK? Is that accounted for in your calculations? And what does that mean that you have a recycling credit?
I was not sure if the percentages given by the receiving facility of our distillation waste was relevant. Thought it might be useful in determining percent of NMP/MEK sent out as waste, in short I was hoping the credit would be sufficient in showing the percentages. The recycle credit is used for filling our annual hazardous waste report, it provides credit toward annual hazardous waste planning fee. That being said this is probably irrelevant in determining the percentage of MEK/NMP.

How do you know how much of the waste sent off-site if NMP and MEK?
I'll need to do some investigation with our distillation team, who are unfortunately unavailable this week. I will speak about this during our next meeting which will be next Wednesday the 13th.

It sounds like you already have the weight/volume of the totes as noted above. We just need to figure out what documentation you have that we can use to determine what percentage of the waste is NMP and MEK.
We were unable to discuss the above question in depth, during our meeting this past week. I'll get you some information on this next week after our distillation team meets again.

How often is waste sent off-site and is the waste always sampled.
My experience thus far is that we do not test prior to sending out, thus far has been monthly to bi-monthly, however this can be dependent on production.
I'm used to operations where the amount of waste sent off-site is mixed and a smaller percentage of solvent purchased. So it would help me to get my hands around this operation! Thanks Kris!!!

PUGET SOUND
Clean Air Agency

Maggie Corbin
Engineer II

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From: Stanford (US), Kris <Kris.Stanford@toraycma.com>
Sent: Monday, April 4, 2022 4:01 PM
To: Maggie Corbin <MaggieC@pscleanair.gov>
Subject: RE: Title V operating permit renewal application

Hi Maggie,

I've reviewed our Air Emissions procedure and recalculated based on the below. Does this look more like what you were expecting to see? I can't be sure this is how Stephanie calculated or not. You will notice performing mass balance calculations using our procedure, significantly drops our emissions. Do the numbers make more sense?

7.0 Procedure

7.1 Air emissions can be calculated for any time period. For the Puget Sound Clean Air Agency air emission report they are calculated on a calendar year basis.

7.2 Air emissions are calculated based on the following mass balance equation:

Step 1 Calculate Total Solvent	Beginning on Hand	+	Volume received	-	Waste volume	=	**Calculated Total Solvent**
	1000	+	10,000	-	5,000	=	6,000
Step 2 Calculate fugitives	**Calculated Total Solvent**	-	Ending on Hand	=	Fugitive emissions		
	6,000	-	4,500	=	1,500		

	NMP
On hand Jan 2021	39031
Purchase RY 2021	64174
Total on hand + purchase	**103205**
Waste sent out	64450
Jan on hand + purchase - waste out	**38755**
Dec 2021 on hand	32224
Emission	**6531**
	MEK
On hand Jan 2021	18259
Purchase RY 2021	48160
Total on hand + purchase	**66419**
Waste sent out	25625
Jan on hand + purchase -waste out	**22237**
Dec 2021 on hand	17,077
Emission RY 2021	**3,388**

From: Maggie Corbin <MaggieC@pscleanair.gov>
Sent: Tuesday, March 29, 2022 8:23 PM
To: Stanford (US), Kris <Kris.Stanford@toraycma.com>
Subject: RE: Title V operating permit renewal application

Kris,

I'm working on finishing up the technical background documentation for your synthetic minor permit, but I had a question on the emissions spreadsheet you submitted back in January. It looks like the annual waste is about 67% of the NMP purchased and 39% of MEK purchased. That seems high so I might be misunderstanding the spreadsheet. The amount in bold for NMP and MEK is that amount on-site in 2021 – either purchases or on-site. So the annual waste is what is sent off-site during the year? Can you give me some more details on how that annual waste is characterized and accounted for? Thanks!

NMP	Gallons	LBS
Test Lab Annual Use	440	3,784
Wash Tank Volume	600	5,160
Bulk Tank Volume	3,147	27,064
Bulk Purchase	9,000	60,390
		96,398

MEK	Gallons	LBS
In use Drum	40	268
Wash Tank Volume	600	4,026
Bulk Tank Volume	1,905	12,783
Bulk Purchase	5,600	48,160
		65,237

MC	Gallons	LBS
Test Lab Annual Use	12	**132**

Annual Waste	LBS	Lost to air
NMP	64,450	**31,948**
MEK	25,625	**39,612**
MC	128	**3**

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From: Stanford (US), Kris <Kris.Stanford@toraycma.com>
Sent: Friday, January 14, 2022 11:57 AM
To: Maggie Corbin <MaggieC@pscleanair.gov>
Cc: Hawkey (US), Jeff <Jeff.Hawkey@toraycma.com>
Subject: RE: Title V operating permit renewal application

Maggie,

I've attached my emissions work sheet for your review, let me know if you have any questions. Jeff and I are available at 1:00pm on Wednesday or Thursday next week, can you make one of these times? I would say that 2021 was not typical, production volumes continue to be low. I believe our efforts towards increasing our distillation yields, have resulted in reduced bulk purchase and waste sent out during 2021.
We can cover the production expectation for the next five years during our phone conversation.

Thank you again for your help.

Kris

L. REVIEWS

Reviews	Name	Date
Engineer:	Maggie Corbin	3/30/22, 4/18/22
Inspector:	Wellington Troncoso	4/18/22, 5/18/22
Second Review:	John Dawson	4/1/22, 5/16/22
Applicant Name:	Kris Stanford	5/13/22