Notice of Construction (NOC) Worksheet

PUGET SOUND Clean Air Agency

Applicant: Starbucks Kent	**NOC Number**: 12121
Project Location: 18411 77th Pl S, Kent WA 98032	**Registration Number**: 10783
Applicant Name and Phone: Joshua Kurtz, (763) 489-3170	**NAICS:** 311920
Engineer: Madeline McFerran	**Inspector**: Rick Woodfork

A. DESCRIPTION

For the Order of Approval:
Facility-wide synthetic minor emission limit of NOx and CO emissions.

Additional Information (if needed):

This review is for a regulatory order under PSCAA Reg I 3.03(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."

Under NOC 11769, Starbucks proposed the addition of roaster line 4a and 4b which results in facility-wide PTE exceeding Title V thresholds for CO and NOx. Following the submittal of NOC 11769 and prior to installation of Roaster lines 4a and 4b Starbucks submitted this synthetic minor permit application and processing fee under Reg I 3.03(e).

Facility

Starbucks Kent is an existing coffee roasting facility. The facility has a total of eight existing roasters: three (3) 525 lb/batch roasters and three (3) 790 lb/batch roasters and two (2) 800 lb/batch roasters. The other combustion equipment on-site consists of one 9.9 MMBtu/hr boiler and a total of 45 heaters for air handling with the maximum heat input of each heater ranging from 0.03 MMBtu/hr to 4.7 MMBtu/hr which all meet the PSCAA Reg I 6.03(c)(1)(a) exemption from New Source Review. The total capacity of the heaters is 32.9 MMBtu/hr. The full list of the heaters was provided in the KFP - List of Misc Nat Gas Heaters excel sheet in the NOC folder.

The facility also has bean handling equipment and associated dust collectors for bean chaff.

Proposed Emission Limitations

The application proposes:

1. 75,000 ton/yr green bean coffee throughput limit facility-wide
2. 25,000 ton/yr green bean coffee throughput limit on roasters controlled by only catalytic oxidizer

The limits are discussed in Section G.

Permit History

In addition to this facility-wide limit of this Order, the facility has the following existing Notice of Construction Order of Approvals which will not be affected by this permitting action:

NOC	Issue Date	Description
11769	2/26/21	Two Scolari 360 model 800 lb/batch 3.96 MMBtu/hr coffee roasters controlled by two Maxon EB6 5,000 acfm 5.94 MMBtu/hr natural gas fired thermal oxidizers with catalyst beds. Combined cooling tray emissions from the two Scolari 360 roasters controlled by one 20,000 scfm 4.9 MMBtu/hr natural gas-fired regenerative thermal oxidizer.
11479	1/11/18	9.9 MMbtu/hr natural gas fired boiler
9544	3/6/07	• 3 Scolari 360 roasters (790 lb/batch) controlled by 3 9 mmbtu/hr natural gas thermal oxidizers • 1 Scolari 240 roasters (525 lb/batch) controlled by 2 9 mmbtu/hr natural gas thermal oxidizers • 1 Scolari 240 roaster (525 lb/batch) controlled by catalytic oxidizer 7,000 acfm with thermal oxidizer preheater
9575	4/20/07	One Scolari Model 240 roaster (525 lb/batch) capacity with one natural gas 9 mmbtu/hr catalytic oxidizer

Note: As part of this application, the applicant provided photo documentation and roaster retirement paperwork for a Probat P25 25 kg/batch roaster which was permitted under NOC 10733 and which has been removed and is not noted in the table above.

B. DATABASE INFORMATION

No new equipment will be added under this OA. Operational limits are to be established based on PSCAA emission factors followed by source specific test data. The lb/ton NOx and CO emission factors will be entered into the operational parameters for the roaster lines following testing.

New NSPS due to this NOCOA?	**No**	**Applicable NSPS: NA**	**Delegated? NA**
New NESHAP due to this NOCOA?	**No**	**Applicable NESHAP: NA**	**Delegated? NA**
New Synthetic Minor due to this NOCOA?	**Yes**		

The boiler permitted under 11805 was derated to 9.9 mmbtu/hr and is therefore below the threshold for 40 CFR 60 Subpart Dc.

C. 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 (3/22/2021)
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 2021 Starbucks Invoice is shown below for reference.

Invoice for Year 2021 Registration Fees

Bill To:
Starbucks Coffee Co 18411 77th Pl S Kent, WA 98032 Attention: Accounts Payable

Invoice Date:	Invoice #:
November 20, 2020	20210034
Due Date:	**Terms:**
January 04, 2021	Net 45 Days
Facility ID (Registration #):	
10783	

Site Address: ***Starbucks Coffee Co***
18411 77th Pl S, Kent, WA 98032

The annual registration fee is required by Washington State law and Puget Sound Clean Air Agency's Regulation I.

Facility Fees and Applicable Regulations			Charges
Base Fee for Registered Sources. Reg I, 5.07(c)			$ 1,150.00
Reg I, 5.03(a)(1) - Facilities subject to federal emission standards (Title 40 CFR)			
Reg I, 5.03(a)(3) - Facilities with annual emissions that meet or exceed thresholds			
Reg I, 5.03(a)(5) - Facilities with gas or odor control equipment (>= 200 cfm)			
Reg I, 5.03(a)(6) - Facilities with particulate control equipment (>= 2,000 cfm)			
Reg I, 5.03(a)(8)(C) - Facilities with coffee roasters			
Additional Fees:			
Reg I, 5.07(c)(1) - 40 CFR 60 Subpart Dc			$ 2,100.00
Reg I, 5.07(c)(4) - Facilities with more than one coffee roaster			$ 2,300.00
Reg I, 5.07(c)(2) - Facilities with annual emissions that meet or exceed thresholds			$ 2,300.00
			$ 7,850.00
Emission Surcharges - Reg I, 7.07(b)(2)	**Tons in 2019**	**Per Ton**	
CO (Carbon Monoxide)	35	$ 30	$ 1,050.00
HAP (Hazardous Air Pollutants)	1	$ 60	$ 60.00
NOx (Nitrogen Oxides)	25	$ 60	$ 1,500.00
PM10 (Particulate Matter < 10 microns)	10	$ 60	$ 600.00
VOC (Volatile Organic Compounds)	12	$ 60	$ 720.00
			$ 3,930.00
Fee Totals			
TOTAL REGISTRATION FEE			**$ 11,780.00**
The Total Registration Fee is due by January 04, 2021. If unpaid after January 04, 2021, the facility may be subject to enforcement action with civil penalties (Reg I, 5.07(b)).			

This Order will adjust the applicable portions of Reg I 5.03(a)(2) will now apply. Reg I 5.07(c)(2) will continue to apply because the facility was already emitting at or above reporting thresholds, however the facility will now also be subject to Reg I 5.07(c)(2) as a source with a federally enforceable limit.

D. 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. The SEPA determinations issued under NOCs 11769, 10733, 11479, 9544, and 9575 reviewed the equipment comprising the facility.

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 new SEPA determination is not required because the potential impacts from this project were reviewed under SEPA by PSCAA and by City of Kent under the previous NOC permits issued for the facility as tabulated below:

Document #	Issuing Agency	Date Issued	Description
8054 DNS	PSCAA	5/5/2000	8054 DNS and checklist covered 6 roasters with associated control devices issued with NOC 8054 which was cancelled and superseded by NOC 9199 (9199 then cancelled and superseded by NOCs 9575 & 9544)
#ENV-2021-19 #RPSW-2122547 ODNS	City of Kent	10/17/2012	warehouse storage space to a coffee processing use; involve coffee grinding, brewing & disposal of spent coffee grounds; dried concentrated coffee will be stored & shipped, SEPA determination covering NOC 10733 and 11805
11769 DNS	PSCAA	2/26/21	2 800 lb/batch roasters, 2 5.94 MMBtu/hr thermal oxidizers one 4.9 MMbtu/hr regenerative thermal oxidizer covering NOC 11769

Each previous SEPA determination can be found in the NOC 12121 project folder.

E. 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 a federally enforceable limit on potential emissions.

F. EMISSION ESTIMATES

Facility-wide Emissions
Without the federally enforceable limits of this Order the facility PTE based on operation of all equipment continuously is presented below. The table shows that potential emissions of NOx and CO (bold) would exceed Title V thresholds. Potential emissions of criteria pollutants and hazardous air pollutants do not exceed Title V thresholds based on continuous operation. Note that NOC 10733's 25 kg roaster is not included as the facility has removed that roaster.

Pollutant	Potential Emissions						
	RT4	NOC 10733	NOC 11805	TO Roasters	CAT Roasters	Heaters	Total
PM (roaster)	3.1	0.0		4.6	1.7		9.4
PM (bean handling)	1.5	0.0		2.2	0.8		4.6
PM Total	4.7	0.0	0.5	6.8	2.5	1.1	15.6
VOC	1.3	0.0	0.2	1.8	0.6	0.8	4.7
CO2	12727.8	0.0	5043.4	18606.2	9303.1	16805.9	62486.5
CO	56.8	0.0	1.6	82.9	30.1	11.8	**183.1**
SO2	0.06	0.0	0.07	0.1	0.0	0.08	0.4
Lead	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NOx (as NO2)	29.4	0.0	0.5	41.1	58.8	14.0	**143.7**
Formaldehyde	0.1	0.0	0.0	0.2	1.4	0.0	1.8
Acetaldehyde	0.1	0.0		0.1	0.3		0.5
Acrolein	0.00192	0.0		0.0	0.1		0.1
benzene[2]			0.0001			0.0003	0.0
vanadium[2]			0.0001			0.0003	0.0
acetaldehyde[3]			0.0004			0.0012	0.0
copper[2]			0.0000			0.0001	0.0
toluene[2]			0.0001			0.0005	0.0
nickel[2]			0.0001			0.0003	0.0

Potential Emissions

The facility compiled the following emissions based on the general emission factors used by PSCAA for coffee roaster permitting and the corresponding production limits of 75,000 ton/yr green bean roasting across all roasters with catalytic oxidizer roaster emissions not to exceed 25,000 ton/yr green bean roasting. Boiler and heater emissions assume continuous operation 8760 hr/yr.

As discussed in Section G, the facility will be subject to a 90 ton/12 month rolling period NOx and 90 ton/12 month rolling period CO limit. The NOx and CO limits will be linked to production limits based on equipment specific throughput limits established through source testing.

The applicant's proposed limited emissions were tied to production limits on lines with catalytic oxidizers controlling roasters and the remaining production on lines controlled by thermal oxidizers. However, following emission testing the NOx and CO limits will be determined based on equipment specific factors rather than generalized emission factors as shown in the table below (note that the unit specific ton/yr emissions can vary based on which units the facility operates, and the emissions of all other pollutants except for NOx and CO are overestimated assuming 8760 hour/year operation of each unit). The applicant's proposed 75,000 ton green beans throughput annually and 25,000 ton green beans throughput on the catalytic oxidizer units would need to be limited to about 68,000total tons

green bean per year with no more than 23,000 ton green beans throughput for catalytic oxidizer units to meet a 90 TPY throughput based on the current emission factors, as shown below:

Pollutant	Expected* Limited Emissions					
	TO Roasters	CAT Roasters	Cooling Tray 4 RTO	NOC 11805	Heaters	Total
PM (roaster)	2.8	1.5				4.3
PM (bean handling)	1.4	0.7				2.1
PM Total	4.2	2.3	0.2	0.5	1.1	8.3
VOC	1.1	0.6	0.1	0.2	0.8	2.8
CO2	18606.2	9303.1	2524.9	5043.4	16805.9	52283.7
CO	51.2	27.3	1.8	1.6	11.8	89.3
SO2	0.09	0.05	0.01	0.1	0.1	0.3
Lead	0.0	0.0	0.0	0.0	0.0	2.17E-04
NOx (as NO2)	25.4	53.3	2.1	0.5	14.0	89.9
Formaldehyde	0.1	1.3	0.0	0.0	0.0	1.4
Acetaldehyde	0.1	0.3				0.3
Acrolein	0.00179	0.07375				0.1
benzene[2]				0.0001	0.0003	3.83E-04
vanadium[2]				0.0001	0.0003	4.19E-04
acetaldehyde[3]				0.0004	0.0012	1.54E-03
copper[2]				0.0000	0.0001	1.55E-04
toluene[2]				0.0001	0.0005	6.19E-04
nickel[2]				0.0001	0.0003	3.83E-04

*The only limits established by this Order will limit NOx to 90 ton/12 month rolling period and CO to 90 ton/12 month rolling period. The table above utilizes the existing average emission factors (to be used prior to site-specific factors) and assumes continuous boiler and heater operation at maximum heat input rate. Actual emissions could vary based on unit-specific emission factors and distribution of bean roasting across those units.

G. LIMIT EVALUATION

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

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

Limits

The applicant proposed a throughput limit linked to the emission factors utilized broadly by PSCAA for permitting of coffee roasters (compilations of source tests across different facilities) with a separate throughput limit for the roaster lines utilizing catalytic oxidizers. There is some variability in the underlying NOx and CO emission factors from source tests of roasters with thermal oxidizers which supports a need for facility specific emission factors to be developed. The tables below summarize the stack test results which are the basis of the general NOx and CO emissions for thermal oxidizer control:

Company	Date of Test	Type of Control	Nox (lb/ton coffee)	CO (lb/ton coffee)
Starbucks	20-Jun-06	Thermal Ox	1.44	Not tested
GMCR	12/28/2012	Thermal Ox	Not tested	Not tested
Peets - R4 (S7)	6/26/2007	Thermal Ox	0.76	0.31
Peets - R3	6/26/2007	Thermal Ox	1.37	2.95
Peets - R2 (S5)	6/26/2007	Thermal Ox	1.06	2.61
Peets - R1 (S-10)	9/11/2008	Thermal Ox	1.93	2.97
Bay Area S1 & S3 roasters and afterburner A-2	9/2/2009	Thermal Ox	0.608	1.261
Bay Area S3 roaster and A-7 afternburner	6/25/2013	Thermal Ox	1.114	6.381
Bay Area S1 & S3 roasters and afterburner A-2	5/8/2012	Thermal Ox	0.787	0.237
Bay Area S1 & S3 roasters and afterburner A-2	7/8/2010	Thermal Ox	0.624	0.742
		Average	**1.08**	**2.18**
		Standard Deviation	**0.44**	**2.04**

There is limited data for NOx emissions from roasters utilizing catalytic oxidizers (the PSCAA factor is from the 2006 test of one of the roasters at Starbucks Kent). The Starbucks Kent roaster lines utilizing catalytic oxidizers will likewise need to have facility-specific emission factors. Given that the last test was conducted in 2006 and is the only test for this dataset, additional testing of those units will be needed.

To ensure that the facility emissions remain below Title V permitting thresholds, rather than utilize the generalized PSCAA emission factors, this OA will require periodic testing to determine facility-specific emission factors for roasters with thermal oxidizers, the new 4A/4B roaster line (utilizing a catalyst bed, thermal oxidizer and regenerative thermal oxidizer for the cooling tray emissions) and each roaster utilizing a catalytic oxidizer.

Rather than a set throughput limit on green bean coffee throughput, this Order will set the following limits:

- 90 ton/12 month rolling period of NOx
- 90 ton/12 month rolling period of CO

This Order will require periodic testing of each roaster (or of one roaster each from a set of identical units) for a unit-specific NOx and CO lb/ton emission factor from each of the roasters and associated control devices. The lb/ton emission factors from equipment-specific testing the facility will be used along with production to meet the NOx and CO 12 month rolling limits at the facility.

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 10% buffer (90 ton/12 month rolling period) will be used for this synthetic minor emission limit because compliance is to be determined on a monthly basis (12-month rolling) calculated using facility specific emission factors from stack testing conducted once every five years. While this monitoring structure does not determine compliance as frequently as other monitoring systems (e.g. continuous emission monitoring system) since testing will utilize worst case (highest emission) roasts, a 10% buffer is determined to be sufficient to ensure that the facility remains below Title V permitting thresholds.

Compliance Demonstration

Prior to the completion of the first emission test for this Order, the facility shall calculate roaster line emissions per 12 month rolling period utilizing the generic emission factors from PSCAA and the natural gas combustion factors utilized during permitting for the heaters and boiler. The first test shall be conducted within 90 days of issuance of this Order.

There are some existing ongoing emission testing requirements which apply at the equipment permitted at Starbucks:

Unit	Permit	Existing Emission Testing Requirements
Roaster 4A, 4B and combined cooling tray	NOC 11769	Testing once/ 5 years for NOx and CO for compliance with NOx and CO limits
9.9 MMBtu/hr Boiler	NOC 11805	Annual boiler servicing with portable analyzer checks or annual testing with Method 3A, 7E and 10 (NOx and CO limits in ppm@ 3% O_2)

Roasters T1 (thermal oxidizer) and Roaster T2 (catalytic oxidizer) were tested as one-time tests under OA 9199 on 6/20/06 and 6/29/06. The results of those source tests are included in the PSCAA compilation of roaster stack test data used to develop the generic emission factors for coffee roasters (the T1 test results are included in the thermal oxidizer data set and the T2 test results are included in the catalytic oxidizer data set).

There are also some existing catalyst health related tests/checks for some equipment permitted at Starbucks:

Unit	Permit Citation	Catalyst Check/Testing Requirement (paraphrased)
Scolari Model 240 (525 lb/batch)	9544 #10, #11	Annual catalyst bed activity test sample with catalyst bed testing once per 6 months when catalyst reaches 90% activity Replacement of catalyst when activity reaches 80% or earlier
Scolari Model 240 (525 lb/batch) Roaster T3 (2B) with Geoenergy Catalytic Oxidizer	9575 #9	Annual catalyst bed activity test sample with catalyst bed testing once per 6 months when catalyst reaches 90% activity

Testing frequency is determined based on the closeness to the permit limit and catalyst bed maintenance considerations for roasters T2 (1A), T3 (2B), and lines 4A and 4B (each of the units at Starbucks Kent which utilize a catalytic oxidizer or, as in the case of lines 4A and 4B have a catalyst bed upstream of a thermal oxidizer). Given that the rolling NOx and CO ton/12 month rolling average emission limits are on the upper end of the buffer recommended by EPA, testing once per five years shall be required.

As a check that the emission factor determined during testing is representative between tests, annual hand-held monitoring is proposed. If concentrations measured during the hand-held check indicate emissions are outside of the 95% confidence interval determined from the most recent compliance test then stack testing will be needed on the unit with elevated readings to update the emissions factor.

The facility operates several roaster-roaster control device lines (e.g. Roaster 4A and 4B) which are the same make, model and design capacity. Following completion of the first two years of annual testing, the facility may request that sets of units be treated as identical units such that stack testing may be completed on a subset of the identical units subject to approval by PSCAA. EPA's 2009 Stack Test Guidance discusses case by case waivers of tests on identical emission units which specify criteria which would be used as part of the evaluation of any future test waivers for identical units.

Roaster and roaster control device testing will utilize the following:

- NOx testing: Method 7E, 3A, 1, 2, 4 for lb/ton emission factor on each unit
- CO testing: Method 10, 3A, 1, 2, 4 for lb/ton emission factor on each unit

Testing will consist of three runs on each unit, with each run testing a minimum of six batches per roaster. Batches shall be completed back-to-back.

Operating conditions during testing must correspond to maximum normal operating conditions (i.e. roasting the darkest possible batch for which batch capacity is equal to maximum batch size).

Recordkeeping and Reporting
The facility will track tons of green coffee production to calculate the associated NOx and CO emissions of each unit utilizing the lb/ton emissions determined from the average of the three most recent stack tests. Use of the most recent lb/ton unit-specific emission factor shall begin with the month following completion of the most recent test.

Within 30 days of the end of each month, the owner or operator shall calculate the facility-wide emissions for CO and NOx for the previous 12 months using the unit specific lb/ton NOx and CO emission factors, tons of green bean roasted production data, and heater and boiler combustion emission factors and online time. The facility may assume continuous operation of the boiler and heaters, or may track online hours of each unit.

The owner or operator shall prepare monthly records that demonstrate that facility-wide emissions do not exceed the emission limits for CO and NOx and the CO and NOx emission limits applicable to coffee roasting equipment.

H. OPERATING PERMIT OR PSD

The Title V Air Operating Permit (AOP) program applicability for the entire source has been reviewed.

The facility is not a Title V air operating permit source because post project PTE remains below Title V applicability thresholds and criteria due to federally enforceable limits of this order 12121. The source is considered a "**synthetic minor**".

I. APPLICABLE RULES & REGULATIONS

This section lists regulations applicable to the issuance of General Orders. The worksheet for NOC 11769 lists applicable regulations for Starbucks Kent more broadly.

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.

WAC173-400-111(7): Construction limitations.

(a) Approval to construct or modify a stationary source becomes invalid if construction is not commenced within eighteen months after receipt of the approval, if construction is discontinued for a period of eighteen months or more, or if construction is not completed within a reasonable time. The permitting authority may extend the eighteen-month period upon a satisfactory showing by the permittee that an extension is justified.

J. 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 X, X, 2021 through X, X, 2021. Notices that the draft materials were open to comment were published in the Seattle Times and Daily Journal of Commerce on X, X, 2021. The Agency posted the application and the draft worksheet on the Agency's website during the comment period.

K. RECOMMENDED APPROVAL CONDITIONS

Emission Limits:

1. The owner or operator shall limit facility-wide emissions of the following pollutants during any consecutive 12 month period to:
    a. 90 tons oxides of nitrogen (NOx); and
    b. 90 tons carbon monoxide (CO).

Compliance Demonstration:

2. Within 30 days of the end of each month, the owner or operator shall calculate and record monthly emissions of NO_x and CO for that month and for the previous 12-month period ending with and including that month.
    a. Emissions of NOx and CO from heaters and boilers shall be calculated using AP-42 and CARB CATEF emission factors or other factors approved in writing by the Agency and the fuel consumption data. In lieu of tracking fuel consumption data, potential emissions can be calculated based on operating each unit 24 hours per day at the maximum rated capacity. The record must identify the method being used.
    b. Emissions of NOx and CO from each roasting line shall be calculated from the tons of green beans processed during the previous month and the most recently Agency-approved unit specific emission factor determined in accordance with Condition #5.

3. The owner or operator shall develop and submit for Agency approval roasting line specific emission factors based on the following criteria:
    a. Prior to the completion of a unit-specific test on the roasting line, the owner or operator shall use the following emission factors:
        i. 1.08 lb/ton emission factor for calculation of NOx emissions from lines 1B, 2A, 3A, 3B, 4A and 4B
        ii. 4.26 lb/ton emission factor for calculation of NOx emissions from lines 1A and 2B
        iii. 2.18 lb/ton emission factor for calculation of all roaster line CO emissions
    b. Once an emission test has been completed on the unit, the owner or operator shall submit the resulting unit-specific emission factors with the emission test report required by Regulation I, Section 3.07. The emission factor shall be the result of the most recent test completed under this Order. The unit-specific emission factors must be used for the next and subsequent monthly emission calculations (Condition #2) beginning in the first month following testing. If results of an emission test are found to be unrepresentative or unusable after PSCAA review, then the previous emission factor will be utilized until corrective testing can be completed.

4. Within 30 days at the end of each month, the owner or operator shall calculate compliance with the emission limits of Condition #1.

5. The facility shall conduct emission tests on each of the roasting lines to develop unit-specific NOx lb/ton and CO lb/ton emission factors. The emission testing must meet the following requirements:
    a. NOx emissions (lb/ton, to two significant figures) shall be measured using EPA Methods 1, 2, 3A, 4, and 7E.
    b. CO emissions (lb/ton, to two significant figures) shall be measured using EPA Methods 1, 2, 3A, 4, and 10.
    c. The initial source test shall be conducted within 180 days after issuance of this Order of Approval and shall follow the test plan as required by Condition #7.a.
    d. Testing on each unit shall consist of at least three runs. Run duration shall be long enough to measure a minimum of six complete batches back-to-back on each roaster.

Batches shall be conducted continuously and measurements shall be taken for the full duration of the preheat, roast, and cooling cycle.

e. Testing shall occur while roasting the darkest roast of coffee for which batch size is equal to the roaster's maximum design batch size, or during maximum normal operations.
f. Testing shall mark the start and end times of each batch and the average NO_x (ppm @3% O_2) and CO (ppm @3% O_2) concentrations from each batch will be calculated. The average NOx ppm @3% O_2 and CO ppm @3% O_2 from each batch will constitute a sample set for determination of the two-tailed 95% confidence interval for each pollutant using the Student t-distribution. The 95% confidence interval for NOx and CO on each tested unit shall be included in the test report.
g. Testing shall be conducted at least once every five years with at least 48 months and no more than 61 months between testing. Following the first year of testing, the owner or operator may request that a subset of identical units be tested as an alternative to testing each unit within a set of identical units, subject to approval of PSCAA. If testing a subset of identical units is approved by PSCAA, the emission factor from the tested unit shall be applied to each of the identical units. The unit(s) from a subset of identical units tested shall rotate with each test such that each unit from the subset is tested over time. If any of the identical units are modified or the operation of those units are modified testing shall revert to testing of each unit.

6. During each year when stack testing as required by Condition #5 is not conducted, the facility shall conduct emission checks of NO_x (ppm), CO (ppm), and O_2 (%) on each of the roasting lines to ensure that emissions are still represented by the most recent source test. The emission checks must meet the following requirements:
    a. Emission checks shall be conducted with at least 6 months and no more than 18 months between the most recent test or check.
    b. Emission checks shall be conducted while roasting the darkest roast of coffee for which batch size is equal to the roaster's maximum design batch size, or during maximum normal operations. Readings must be taken over the full duration of the roasting period with frequency to ensure representative readings.
    c. Emission checks shall be conducted using a portable gas analyzer measuring method (ASTM D6522-00, ANSI/ASME PTC 19.10-1981, EPA CTM-030, or EPA CTM-034), or alternative approved by PSCAA.
    d. For each check, the facility shall record the NOx, CO, and O_2 results, the date of the emission check and the operational parameters specified in Condition #8. The checks are not subject to PSCAA Regulation I 3.07.

In the event that the average NOx (ppm @3% O_2) or CO (ppm @3% O_2) concentrations measured during the emission check are outside of the 95% confidence interval determined from the most recent stack test as specified in Condition #5.f the facility must conduct stack testing of the unit(s) with NOx or CO concentrations outside the 95% confidence interval. Testing must be conducted according to Condition #5, except for the timeline of Condition #5.c. Instead, testing must be completed within 60 days of determination of an emission check exceeding the 95% confidence interval from the most recent stack test.

Recordkeeping and Reporting:

7. The unit-specific emission factor testing required by Condition #5 are subject to PSCAA Regulation I 3.07 as well as the following:
    a. Within 60 days of issuance of this Order, the facility shall submit a source test plan to the Agency for approval. The source test plan shall include a list of the operating parameters to be measured during the test and included in the report. The operating parameters must include the Agtron number(s) (or equivalent measure of darkness of roast) of each roast to be tested, the batch size(s) catalyst pressure drop for all catalyst inlets and outlets, temperature range for each roaster and temperature range for each oxidizer.
    b. If the facility requests to test a subset of identical units, the request must be submitted to the Agency at least 60 days prior to the next test deadline specified in Condition #5.g and must include the unit(s) for which testing a subset of identical units is requested, the make, model, design capacity, coffee bean recipes roasted, and maintenance and modification history for each unit.

8. The facility shall maintain records of the NOx, CO, and O_2 emission checks required by Condition #6 including the date the check was completed, the NOx, CO and O_2 results, the hand-held analyzer method used, the batch size, measure of darkness of the roast, catalyst pressure drop for all catalyst inlets and outlets, temperature ranges for each roaster, temperature range for each oxidizer and hand-held analyzer calibration data.

9. The facility shall maintain the records of NOx and CO emissions as required by Condition #2 which will document the unit-specific emission factor, the tons of green beans processed on each emission unit for the calendar month, the resulting NOx and CO emissions from bean roasting, and the total NOx and CO emissions facility-wide.

10. The owner or operator shall notify 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 NOx or CO exceeded 90 tons. The report shall include a summary of the total 12-month emissions, the unit specific emission factors, and the amount of green beans roasted for the time period for which these thresholds were exceeded. Upon request, the owner or operator shall provide the supporting emission calculations for the reported emission totals.

11. 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.

L. CORRESPONDENCE AND SUPPORTING DOCUMENTS

From: Kurtz, Josh J <Josh.Kurtz@terracon.com>
Sent: Friday, February 26, 2021 1:20 PM
To: Madeline McFerran <MadelineM@pscleanair.gov>
Cc: Jody Maxson <jmaxson@starbucks.com>; Hamzah El-himri <helhimri@starbucks.com>; Reynolds, David C <dave.reynolds@terracon.com>; David Barker <dbarker@stellar.net>; Morris Mahoney <mmahoney@stellar.net>
Subject: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Madeline-

Please see attached for the synthetic minor permit application for the Starbucks Kent Roasting Facility along with the associated calculation spreadsheet.

Let us know if you need any additional information for the synthetic minor permit.

Thank you,

Joshua J. Kurtz, P.E. **(licensed in Minnesota)**
Senior Staff Engineer I Environmental

Terracon
13400 15th Avenue N, Suite A I Minneapolis, MN 55441
D (763) 489-3170 I F (763) 489-3101
Josh.Kurtz@terracon.com I **terracon.com**

From: Madeline McFerran
Sent: Tuesday, April 20, 2021 10:44 AM
To: Kurtz, Josh J <Josh.Kurtz@terracon.com>
Cc: Jody Maxson <jmaxson@starbucks.com>; Hamzah El-himri <helhimri@starbucks.com>; Reynolds, David C <dave.reynolds@terracon.com>; David Barker <dbarker@stellar.net>; Morris Mahoney <mmahoney@stellar.net>; Rick Woodfork <RickW@pscleanair.gov>
Subject: RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Hi Josh and Starbucks Team,

I am working on getting the draft Regulatory Order together (it is just about ready for me to pass along to management for review). I did come across a few follow-up questions during the review:

1. Regarding the heaters at Starbucks, could you please provide the make, model, number, design rating (the Heaters tab looks like it references 31.64 MMBtu/hr boiler) as well as the install date(s) for the heaters. How do the heaters used at the facility?
2. It looks like the Cleaver Brooks boiler may be counted twice in the current facility-wide emissions spreadsheet. (I see it both under NOC 11805 and NOC 10659 although my understanding is that NOC 10659 was cancelled and superseded by NOC 11805). Could you please confirm that only the single boiler derated to 9.9 MMBtu/hr under NOC 11805 is on-site?
3. Regarding the removed roaster under NOC 10733, could you please provide documentation of the removal of the roaster (photo documentation of where the roaster was or currently is, and a bill of sale if applicable) so that our inspector can confirm its removal?

Once these items are addressed I will be passing the NOC along for internal review then along to you all to review before we go to the public comment period.

Please let me know if you have any questions.
Thanks,

PUGET SOUND
Clean Air Agency

Madeline (Camp) McFerran
Engineer II
1904 3rd Ave #105, Seattle, WA 98101
DIRECT 206-689-4063
FAX 206-343-7522
WEBSITE pscleanair.gov

From: Madeline McFerran <MadelineM@pscleanair.gov>
Sent: Monday, May 10, 2021 2:21 PM
To: Kurtz, Josh J <Josh.Kurtz@terracon.com>
Cc: Jody Maxson <jmaxson@starbucks.com>; Hamzah El-himri <helhimri@starbucks.com>; Reynolds, David C <dave.reynolds@terracon.com>; David Barker <dbarker@stellar.net>; Morris Mahoney <mmahoney@stellar.net>; Rick Woodfork <RickW@pscleanair.gov>
Subject: RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Hi Josh,

I wanted to check in about the questions from the email below to be sure I had not missed a response from you. Please let me know if you have any questions about the information needed.

Thanks,

PUGET SOUND
Clean Air Agency

Madeline (Camp) McFerran
Engineer II

1904 3rd Ave #105, Seattle, WA 98101

DIRECT 206-689-4063
FAX 206-343-7522
WEBSITE pscleanair.gov

RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Reply | Reply All | Forward

KJ Kurtz, Josh J <Josh.Kurtz@terracon.com>
To Madeline McFerran
Cc Jody Maxson; Hamzah El-himri; Reynolds, David C; David Barker; Morris Mahoney; Rick Woodfork; Ellen Saboe
Fri 6/25/2021 6:21 AM

Follow up. Start by Monday, June 28, 2021. Due by Friday, July 2, 2021.
You forwarded this message on 6/30/2021 11:28 AM.

From: Kurtz, Josh J <Josh.Kurtz@terracon.com>
Sent: Friday, May 21, 2021 6:56 AM
To: Madeline McFerran <MadelineM@pscleanair.gov>
Cc: Jody Maxson <jmaxson@starbucks.com>; Hamzah El-himri <helhimri@starbucks.com>; Reynolds, David C <dave.reynolds@terracon.com>; David Barker <dbarker@stellar.net>; Morris Mahoney <mmahoney@stellar.net>; Rick Woodfork <RickW@pscleanair.gov>; Ellen Saboe <esaboe@starbucks.com>
Subject: RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Madeline-

Responses to your questions:

1. Starbucks reviewed the natural gas heaters on-site. See attached for the list of heaters along with the capacities. The make and model along with the installation date are provided for the heaters that had this information readily available. Let us know if this is sufficient. The total capacity for the heaters is actually 32.934 MMBtu/hr so I revised this in the facility wide emissions spreadsheet attached. The heaters are make-up air units, roof top units and unit heaters.
2. You are correct that only the single boiler derated to 9.9 MMBtu/hr is on-site. I removed the 12.5 MMBtu/hr boiler from the spreadsheet.
3. See attached for a couple of pictures from 2017 when the roaster was installed in addition to a more recent picture of the area where the P-25 was installed. The reference landmark is the yellow stairway which goes to the top of the ACRS room. Also attached is the P-25 asset retirement form provided by Starbucks.

In addition, Starbucks would like to clarify information that was included in the NOC worksheet for Roaster Train 4. See below for an excerpt from the NOC worksheet on the Title V Air Operating Permit (AOP) program applicability:

> Based on the facility-wide potential emissions, the facility is a Title V "**air operating permit source**" and is subject to the requirements of PSCAA Regulation I Article 7, WAC 173-401 and Title V of the Federal Clean Air Act. The facility may request federally enforceable limits to keep facility-wide PTE below Title V applicability thresholds and has indicated plans to submit such a request. The Agency expects that Starbucks will submit this application for synthetic minor status before the new equipment is placed into service.

Is Starbucks allowed to startup the Roaster Train 4 equipment prior to issuance of the synthetic minor permit without being held to the Title V requirements mentioned above since the application for synthetic minor status has been submitted? If not, what are the additional requirements that the facility must comply with before the synthetic minor permit is issued if the issuance of the synthetic minor permit was delayed and Starbucks would like to startup the Roaster Train 4 equipment?

Let us know if you need any additional information.

Thank you,

Joshua J. Kurtz, P.E. (licensed in Minnesota)
Senior Staff Engineer I Environmental
Terracon
13400 15th Avenue N, Suite A I Minneapolis, MN 55441
D (763) 489-3170 I F (763) 489-3101
Josh.Kurtz@terracon.com I **terracon.com**

RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Reply | Reply All | Forward

MM Madeline McFerran
To Kurtz, Josh J
Cc Jody Maxson; Hamzah El-himri; Reynolds, David C; David Barker; Morris Mahoney; Rick Woodfork; Ellen Saboe

Mon 5/24/2021 8:54 AM

Hi Josh,

Thank you for sending the information about the heaters and the removal of the P-25 roaster. In response to your question about AOP program applicability, as soon as the equipment is installed, bringing the facility-wide PTE above Title V thresholds, the facility is subject to all of the applicable requirements of Title V, PSCAA Reg I Article 7 and WAC 173-401. Until the Regulatory Order is issued, those requirements would apply.
One requirement which would require action from the facility is specified in WAC 173-401-500(c) for submission of a Title V application within twelve months after commencing operation (this requirement would no longer apply when the Regulatory Order is issued). Please review WAC 173-401 and PSCAA Reg I Article 7 for additional requirements (some of which Starbucks may already be doing but which may have some changes associated with Title V applicability e.g. emission reporting and O&M plan requirements).
Regarding the draft Regulatory Order, I have drafted the conditions for the Regulatory Order and the draft is with my manager for internal review before I pass along the draft to you to review. Once the review is complete we will move forward with the public notice period.

Please let me know if you have any additional questions.

Thanks,

PUGET SOUND
Clean Air Agency

Madeline (Camp) McFerran
Engineer II
1904 3rd Ave #105, Seattle, WA 98101
DIRECT 206-689-4063
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WEBSITE pscleanair.gov

From: Madeline McFerran
Sent: Tuesday, June 1, 2021 8:34 AM
To: Kurtz, Josh J <Josh.Kurtz@terracon.com>
Cc: Jody Maxson <jmaxson@starbucks.com>; Hamzah El-himri <helhimri@starbucks.com>; Reynolds, David C <dave.reynolds@terracon.com>; David Barker <dbarker@stellar.net>; Morris Mahoney <mmahoney@stellar.net>; Rick Woodfork <RickW@pscleanair.gov>; Ellen Saboe <esaboe@starbucks.com>
Subject: RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Hi Josh and Starbucks team,

The drafted copy of the Regulatory Order for a synthetic minor at Starbucks Kent is attached. Please let me know if you have any feedback. Once we have addressed any feedback from you we will move forward with the Public Notice.

Thanks,

PUGET SOUND
Clean Air Agency

Madeline (Camp) McFerran
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WEBSITE pscleanair.gov

From: Madeline McFerran <MadelineM@pscleanair.gov>
Sent: Wednesday, June 16, 2021 5:09 PM
To: Kurtz, Josh J <Josh.Kurtz@terracon.com>
Cc: Jody Maxson <jmaxson@starbucks.com>; Hamzah El-himri <helhimri@starbucks.com>; Reynolds, David C <dave.reynolds@terracon.com>; David Barker <dbarker@stellar.net>; Morris Mahoney <mmahoney@stellar.net>; Rick Woodfork <RickW@pscleanair.gov>; Ellen Saboe <esaboe@starbucks.com>
Subject: RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Hi all,
I wanted to check in with you about the draft Regulatory Order for 12121; did you have any feedback, or have any timeline in mind for when you might finish your review?
Thanks,

PUGET SOUND
Clean Air Agency

Madeline (Camp) McFerran
Engineer II
1904 3rd Ave #105, Seattle, WA 98101
DIRECT 206-689-4063
FAX 206-343-7522
WEBSITE pscleanair.gov

RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Reply | Reply All | Forward | ...

KJ Kurtz, Josh J <Josh.Kurtz@terracon.com>
To Madeline McFerran
Cc Jody Maxson; Hamzah El-himri; Reynolds, David C; David Barker; Morris Mahoney; Rick Woodfork; Ellen Saboe
Fri 6/25/2021 6:21 AM

Follow up. Start by Monday, June 28, 2021. Due by Friday, July 2, 2021.
You forwarded this message on 6/30/2021 11:28 AM.

Hi Madeline-

Sorry for the delay in this. The major concern that Starbucks has is the annual testing requirement for all of the roasters because of the cost and short frequency between testing. Based on the regulatory order, it looks like the major driver for the annual testing requirement is that the buffer is only 5% which is on the lower end of the EPA recommendation for synthetic minor permits. After discussing this with Starbucks, they are willing to revise their limit to 90 tons/12 month rolling for both CO and NOx emissions. With the current emission factor, this would limit the total facility green bean throughput to approximately 68,000 tons/12 month with 23,000 tons/12 month of the total going through roasters that only have a catalytic oxidizer (these green bean limits may change depending on the results of the stack testing). With the new limits in place, Starbucks would like to propose the following changes to the required stack testing:

1. Starbucks will perform stack testing on each roaster configuration every five years. The equipment-specific emission factor will be used to calculate the 12-month rolling emissions each month to demonstrate compliance with the limit.
2. Each stack test will only require one roaster be tested for each configuration and the emission results will be applied to each roaster in that configuration. For instance, only one of the three roasters that have a Scolari Model 360 that exhausts through a thermal oxidizer will be tested every five years and the emission factor will be applied to all three Model 360 roasters.

Let us know if you have any questions or would like to have a phone call to discuss.

Thank you,

Joshua J. Kurtz, P.E. (licensed in Minnesota)
Senior Staff Engineer I Environmental
Terracon
13400 15th Avenue N, Suite A I Minneapolis, MN 55441
D (763) 489-3170 I F (763) 489-3101
Josh.Kurtz@terracon.com I terracon.com

RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

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MM Madeline McFerran
To Kurtz, Josh J
Cc Jody Maxson; Hamzah El-himri; Reynolds, David C; David Barker; Morris Mahoney; Rick Woodfork; Ellen Saboe
Thu 7/1/2021 1:33 PM

Already Saved Copy to EMS

You replied to this message on 7/8/2021 1:57 PM.

Hi Josh and Starbucks team,

Thanks for providing the comments on the draft permit; I think it may be helpful for us to have a chance to talk through the proposed changes and alternatives. I am available tomorrow from 10:00-4:00 PM, or July 6 between 9 and 11, July 7 between 10 and 12, or July 8 after 11:00, if any of those times work for you.

Thanks,

PUGET SOUND
Clean Air Agency

Madeline (Camp) McFerran
Engineer II

1904 3rd Ave #105, Seattle, WA 98101

DIRECT 206-689-4063
FAX 206-343-7522
WEBSITE pscleanair.gov

RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Reply | Reply All | Forward | ...

MM Madeline McFerran
To Kurtz, Josh J
Cc Jody Maxson; Hamzah El-himri; Reynolds, David C; David Barker; Morris Mahoney; Rick Woodfork; Ellen Saboe
Thu 7/8/2021 1:57 PM

Already Saved Copy to EMS

Reg Order 12121 MGM.docx
753 KB

Hi Starbucks team,

As mentioned during our call today, attached is an updated version of the draft order reflecting a 90 ton/12 month rolling period limit for NOx and for CO, a corresponding reduction in testing frequency and a hand-held emission check. Please let me know if you have any questions or additional feedback regarding the updates.

Once I have received the information from Starbucks about the catalyst change-out frequency we can determine whether any additional updates need to be made.

Also mentioned during the call were some more details about the timeline for next steps. Once we are on the same page with the draft Regulatory Order, it takes about a week for the public comment period to begin (to get posted on our website and in print). From there, the public comment period follows WAC 173-400-171: https://apps.leg.wa.gov/WAC/default.aspx?cite=173-400-171.
Once the public comment period (and public hearing, if applicable) are complete, then the agency responds to comments before a final permitting decision is made. The response time depends on the quantity of comments and the nature of the comments; I am not sure I have enough information to give a good estimate on that portion of the process if it applies in this case.

Please let me know if you would like to discuss further.
Thanks,

PUGET SOUND
Clean Air Agency

Madeline (Camp) McFerran
Engineer II

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Starbucks Roasting Plant Catalyzers

JM Jody Maxson <jmaxson@starbucks.com>
To Madeline McFerran
Cc josh.kurtz@terracon.com; Lana Georges; dbarker@stellar.net; Jeff Strong

Reply | Reply All | Forward | ...
Thu 7/8/2021 2:06 PM

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You replied to this message on 7/8/2021 2:57 PM.

Hi Madeline,

I reached out to Luis and he confirms we take a sample of the media and send it out for testing, annually. If the media reaches 90% destruction capacity, we increase the testing frequency to semi-annual. If the media is tested near 80% destruction capacity, we replace it before it reaches 80%.

Luis retains records of the testing.

Regards,

Jody Maxson | program manager, Engineering
Starbucks Coffee Company

RE: Starbucks Roasting Plant Catalyzers

MM Madeline McFerran
To Jody Maxson
Cc josh.kurtz@terracon.com; Lana Georges; dbarker@stellar.net; Jeff Strong

Reply | Reply All | Forward | ...
Thu 7/8/2021 2:58 PM

Already Saved Copy to EMS

Hi Jody, thanks for that response, that is consistent with the permit requirements for the roaster lines with catalytic oxidizers. To clarify my question, I am curious about how long typically before the media is at 80% capacity (i.e. after about how many years of getting the catalyst tested does the catalyst need to be fully replaced?)

Thanks,

PUGET SOUND
Clean Air Agency

Madeline (Camp) McFerran
Engineer II

1904 3rd Ave #105, Seattle, WA 98101

DIRECT 206-689-4063
FAX 206-343-7522

WEBSITE pscleanair.gov

RE: Starbucks Roasting Plant Catalyzers

Reply | Reply All | Forward | ...

JM Jody Maxson <jmaxson@starbucks.com>
To Madeline McFerran
Cc josh.kurtz@terracon.com; Lana Georges; dbarker@stellar.net; Jeff Strong
Thu 7/8/2021 3:05 PM

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Hi Madeline,

Got it. Luis said it is "about" ten years before the media needs to be replaced.

Regards,

Jody Maxson | program manager, Engineering
Starbucks Coffee Company

RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Reply | Reply All | Forward | ...

MM Madeline McFerran
To Jody Maxson; Kurtz, Josh J
Cc Hamzah El-himri; Reynolds, David C; David Barker; Morris Mahoney; Rick Woodfork; Lana Georges; Ellen Saboe
Wed 8/4/2021 8:29 AM

Already Saved Copy to EMS

You replied to this message on 8/27/2021 10:27 AM.

Hi Jody, Josh and Starbucks team,

I wanted to check in with you regarding the draft 12121 Regulatory Order. I will be out on vacation starting Monday 8/9 returning Tuesday 8/16, so if you would like to discuss any of the review before I leave, I am available for the rest of this week, otherwise we can pick up the process again when I am back.
As discussed on the phone with Josh on 7/26, given the timeline for the catalyst changeout that Jody provided, it looks like a 5 year schedule will be appropriate for all the units (both thermal and catalytic). I will update that portion of the worksheet along with any other updates that may be needed based on any feedback from you.

Thanks,

PUGET SOUND
Clean Air Agency

Madeline (Camp) McFerran
Engineer II
1904 3rd Ave #105, Seattle, WA 98101
DIRECT 206-689-4063
FAX 206-343-7522
WEBSITE pscleanair.gov

RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Reply | Reply All | Forward | ...

MM Madeline McFerran
To Jody Maxson; Kurtz, Josh J
Cc Reynolds, David C; David Barker; Morris Mahoney; Lana Georges; Ellen Saboe
Fri 8/27/2021 10:28 AM

Already Saved Copy to EMS

You replied to this message on 9/13/2021 1:03 PM.

Hi Jody and Starbucks team,

I am following up regarding the July 8 update to the draft Regulatory Order 12121 and my email from August 4. Do you have any further questions or other feedback before we prep the draft for public comment?

Thanks,

PUGET SOUND
Clean Air Agency

Madeline (Camp) McFerran
Engineer II

1904 3rd Ave #105, Seattle, WA 98101

DIRECT 206-689-4063
FAX 206-343-7522
WEBSITE pscleanair.gov

RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Reply | Reply All | Forward | ...

MM Madeline McFerran
To Jody Maxson; Kurtz, Josh J
Cc Reynolds, David C; David Barker; Morris Mahoney; Lana Georges; Ellen Saboe
Mon 9/13/2021 1:03 PM

Reg Order 12121 MGM.docx
753 KB

Hi Jody and Starbucks team,

I wanted to check in regarding draft regulatory order 12121 to be sure that I did not miss any responses from you and that you have received the updated draft OA. I have attached the draft with changes in track changes which is updated from the draft sent on July 8, 2021. The updates between the July 8 draft and this draft were to require testing once every five years on both thermal oxidizer units and catalytic oxidizer units based on the catalyst lifetime information that Starbucks provided. Was there any additional feedback that you wanted to discuss? Please confirm receipt of the draft and let me know if you are ready to move forward with the public comment period.

Thanks,

PUGET SOUND
Clean Air Agency

Madeline McFerran, P.E.
Engineer II

1904 3rd Ave #105, Seattle, WA 98101

DIRECT 206-689-4063
FAX 206-343-7522
WEBSITE pscleanair.gov

RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

Reply | Reply All | Forward | ...

KJ

Kurtz, Josh J <Josh.Kurtz@terracon.com>
To Madeline McFerran; Jody Maxson
Cc Reynolds, David C; David Barker; Morris Mahoney; Lana Georges; Drew Patterson

Thu 9/30/2021 3:07 PM

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Follow up. Completed on Tuesday, October 5, 2021.
You replied to this message on 10/5/2021 3:02 PM.

Hi Madeline-

Starbucks has reviewed the draft synthetic minor regulatory order and is concerned about the 10% threshold for the annual emissions checks in Item 6h in the draft permit. The variance on the emission checks is expected to be greater than 10% and, as such, it is likely that at least one of the roasters will exceed the threshold each year. For reference, the results of the recent stack test performed by the Dillanos Coffee Roasters facility in 2018 gives us a good indication of the variance we might see. The average CO concentration was 33.4 ppm but the maximum CO concentration from a run was 82.4 ppm. Also, the average NOx concentration was 56.8 ppm with the maximum run measuring 64.5 ppm. So both pollutants had runs that exceeded 10% of the average during the stack test. Starbucks is requesting that the threshold be revised to be two standard deviations above the average concentration during stack testing (proposed language below). With the new proposed language, it is less likely that a single run would exceed two standard deviations if nothing has changed and would be a better indication that emissions have actually increased as opposed to sampling variance.

Proposed change:
"As a check that the emission factor determined during testing is representative between tests, annual hand-held monitoring is proposed. If concentrations measured during the hand-held check indicate emissions more than **two standard deviations** above the average concentration of the batches during the prior stack test, then stack testing will be needed on the unit with elevated readings to update the emissions factor."

Let us know what your thoughts are on this topic or if you have any questions.

Joshua J. Kurtz, P.E. **(licensed in Minnesota)**
Senior Staff Engineer | Environmental

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Josh.Kurtz@terracon.com | terracon.com

RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

MM

Madeline McFerran

Reply | Reply All | Forward | ...

To ○ Kurtz, Josh J; ○ Jody Maxson

Tue 10/5/2021 3:02 PM

Cc ○ Reynolds, David C; ○ David Barker; ○ Morris Mahoney; ○ Lana Georges; ○ Drew Patterson

Hi Josh and Jody,

Could you provide some more details about what you mean by a single run exceeding two standard deviations? How would that be calculated and from what data set? How would two standards of deviation threshold still ensure that the emission factor calculated from testing is still representative to show compliance with the synthetic minor emission limits?

Thanks,

PUGET SOUND
Clean Air Agency

Madeline McFerran, P.E.
Engineer II

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WEBSITE pscleanair.gov

RE: Starbucks Kent Roasting Plant - Synthetic Minor Permit Application

KJ Kurtz, Josh J <Josh.Kurtz@terracon.com>

Reply | Reply All | Forward | ...

To ● Madeline McFerran; ○ Jody Maxson

Mon 10/11/2021 7:28 AM

Cc ○ Reynolds, David C; ○ David Barker; ○ Morris Mahoney; ○ Lana Georges; ○ Drew Patterson

This is the most recent version, but you made changes to another copy. Click here to see the other versions.
Follow up. Start by Wednesday, October 13, 2021. Due by Wednesday, October 13, 2021 3:00 PM.
You forwarded this message on 10/12/2021 3:38 PM.

t-distribution.pdf
509 KB

Suggested Meetings | + Get more add-ins

Madeline-

We have had further discussions and would like to amend the approach. Below is a clarification on the approach and procedure for the annual emissions check.

During the stack tests, the start time of each batch would be recorded so that an average concentration of NOx and CO could be calculated for each batch. We would then calculate the 95% confidence interval (i.e., 95% confidence that the population mean lies within this range). The average concentration recorded from the batch(es) tested during the annual emissions check would be compared to the 95% confidence interval. If the results fall within the range, we would allow that the results are consistent with the stack testing results. Owing to the limited number of samples (i.e., n<30), we would use the t-distribution to determine the 95% confidence interval.

Given the mean, sample standard deviation, and number of samples, we would compute the confidence interval as follows (note that this is just an example):

13.1	mean ($\bar{x}$)
2.6	sample standard deviation (s)
20	number of samples (n)

The degrees of freedom is 19 (i.e., n-1) and we are looking for the 2-tailed, 95% confidence interval (i.e., use $t_{.025}$ in attached table); accordingly, the value for t_α to use in the calculation is 2.093. The formula is shown below and the confidence interval is given by 13.1 ± 1.2 or $\mathbf{11.9 < \mu < 14.3}$

$$\bar{x} - 2.093\frac{s}{\sqrt{n}} < \mu < \bar{x} + 2.093\frac{s}{\sqrt{n}}$$

We feel like this approach would allow us to take into account the sampling variance that will occur while providing a procedure that will show whether the emission factor calculated from the stack test is still representative.

Let us know if you would like to have a phone call to discuss or if we can provide any additional information.

Thank you,

Joshua J. Kurtz, P.E. (licensed in Minnesota)
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MM Madeline McFerran
To Kurtz, Josh J; Jody Maxson
Cc Reynolds, David C; David Barker; Morris Mahoney; Lana Georges; Drew Patterson
Wed 10/13/2021 2:57 PM

Reg Order 12121 MGM.docx
1 MB

Regulatory Order 12121 Draft.pdf
213 KB

Hi Josh and Jody,

Thanks for sending the updated approach and clarifications, I agree that using a two tailed 95% confidence interval makes sense for determining whether additional stack testing of a unit is needed following an emission check. I have updated the conditions to discuss this methodology. I've attached a draft of the Regulatory Order as it stands and the draft worksheet with updates.

Please let me know if you see any inaccuracies with the updates, and if you would like to move forward with the public comment period.

Thanks,

PUGET SOUND
Clean Air Agency

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KJ Kurtz, Josh J <Josh.Kurtz@terracon.com>
To Madeline McFerran; Jody Maxson
Cc Reynolds, David C; David Barker; Morris Mahoney; Lana Georges; Drew Patterson
Tue 11/2/2021 8:32 AM

Madeline-

Starbucks has reviewed the draft Regulatory Order and they have no additional comments. You can move forward with the public comment period.

Let us know if you need anything else at this time.

Thank you,

Joshua J. Kurtz, P.E. (licensed in Minnesota)
Senior Staff Engineer | Environmental

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M. REVIEWS

Reviews	Name	Date
Engineer:	Madeline McFerran	5/21/2021
Inspector:	Rick Woodfork	5/28/2021
Second Review:	John Dawson	5/27/2021
Applicant Name:	Josh Kurtz	11/2/2021