Notice of Construction (NOC) Worksheet

PUGET SOUND
Clean Air Agency

Source: Vigor Shipyards, LLC	**NOC Number:** 12022
Installation Address: 1801 16th Ave SW | Seattle, WA 98134	**Registration Number:** 12539
Contact Name: John Rosevear	**Contact Email:** john.rosevear@vigor.net
Applied Date: 07/29/2020	**Contact Phone:** (206) 623-1635 x325
Engineer: Madeline Camp (NOC)	**Inspector:** Walter Voegtlin

A. DESCRIPTION

For the Order of Approval:

Modification of NOC 10267 Conditions #5, #12, and #13 to adjust composition of abrasive blast media, particulate control for abrasive blasting, and usage limits for abrasive blast media for the ten (10) temporary dry abrasive blasting operations permitted under NOC 10267.

Additional Information (if needed):

Facility

Vigor Shipyards is a full service shipyard specializing in commercial and military repair, overhaul and construction. The shipyard is comprised of three dry docks and associated piers.

Repair and overhaul services are mainly performed on vessels with hulls constructed of steel. Services include electrical, mechanical, carpentry, steel fabrication, pipe-fitting, painting, abrasive grit blasting and pressure washing. Operational facilities include shops for abrasive grit blasting, painting, pipe fabrication, carpentry, welding, machining, plate bending, and electrical work.

Proposed Equipment/Activities

Vigor is an existing shipyard facility operating under Air Operating Permit 12539. This proposal is to modify NOC 10267 to allow for increased operational flexibility in the abrasive blasting permitted under 10267, specifically conditions 12 and 13. The facility is still limited to up to 10 temporary abrasive blasting operations at any one time. An operation is defined as a project done under a single contractor and on a single vessel. It can consist of one large enclosure or several smaller enclosures with one or more dust collectors.

Conditions 12 and 13 as written in 10267 are:

12. The abrasive material shall not contain cadmium, lead, nickel, or crystalline silica in amounts greater than or equal to 0.1 percent by weight (of the metal), as shown in formulation data provided by the manufacturer or supplier, such as the Material Safety Data Sheet for the material.
13. Usage of abrasive blast material that contains more than 0.1 percent by weight chromium and/or 1.0 percent by weight manganese shall be limited to 37 tons per 12 consecutive month period. Within 60

days of the end of each month, the owner or operator shall record the amount of abrasive blast material that meets one or both of these criteria and was used during the previous month and over the previous consecutive 12-month period.

The applicant's proposed changes to the permit conditions included an adjustment to the 37 ton throughput limit and an adjustment to the nickel and crystalline silica content limits in abrasive blast media. The applicant's originally proposed red-lined version of the conditions are shown below:

12. The abrasive material shall not contain cadmium or lead, ~~nickel, or crystalline silica~~ in amounts greater than or equal to 0.1 percent by weight (of the metal), as shown in formulation data provided by the manufacturer or supplier, such as the ~~Material~~ Safety Data Sheet for the material.
13. Usage of abrasive blast material shall be limited to the following per 12 consecutive month period:
    a. **6,000** tpy for abrasive blast material that contains more than 0.1 percent by weight of nickel,
    b. 8,000 tpy for abrasive blast material that contains more than 0.1 percent by weight ~~chromium or~~ crystalline silica and/or 1.0 percent by weight manganese, **and**
    c. 37 tpy for abrasive blast material that contains more than 0.1 percent by weight chromium.

Within 60 days of the end of each month, the owner or operator shall record the amount of abrasive blast material that meets one or both of these criteria and was used during the previous month and over the previous consecutive 12-month period.

As the applicant is proposing to increase the nickel and crystalline silica content of the abrasive blast media used, this proposal would result in an emissions increase in toxic air pollutants (TAP) and therefore is subject to New Source Review.

While the total amount of abrasive blast media to be applied and the nickel and crystalline silica maximum content of the blast media are being increased, there are several differences between the abrasive blasting emission calculation methodologies between NOC 10267 and this NOC which are summarized below. This is consistent with the updated information used by the Agency for review of more recent NOC permits. The change in methodology results in project emissions lower than those reviewed under 10267.

1. Particulate emissions:
    a. 10267 utilized the AP-42 13.2.6-1 controlled emission factor for PM of 0.69 lb/1000 lbs abrasive (1.38 lb/ton abrasive). NOC 10267 review notes the controlled factor is based on 1990s control efficiency with actual efficiencies expected to be higher. 10267 assumed total PM was equal to PM10.
    b. This NOC calculates PM using San Diego County uncontrolled emission factors (similar to NOC 11922) and applies 99.97% as effective control for MERV 15 filtration (the effective control efficiencies are based on shipyard abrasive blast size distribution data discussed further in Section F).
    Additionally, the BACT determination for MERV 15 (99.97% control for 0.5 micron and higher) to control particulate results in higher control than the MERV 13 calculations from 10267.
2. Hexavalent chromium emissions:
    a. 10267 assumed all chromium emissions were hexavalent chromium emissions

b. 12022 review looks at 0.1% SDS chromium content blast media. Analyses of spent blast media from shipyards indicates presence of chromium even in blast media that does not contain chromium; a portion of the metallic emissions can come from the substrate in addition to the blast media itself. 12022 utilizes the SJVAPCD assumption of 5% hexavalent chromium to total chromium

3. Trivalent chromium emissions:
   a. 10267 predated the inclusion of trivalent chromium on the WAC 173-460-150 table of toxic air pollutants and did not quantify trivalent chromium emissions.
   b. 100% chromium emissions are assumed to be trivalent chromium for NOC 12022 (5% of the total chromium emissions are still assumed to be hexavalent chromium).
4. Abrasive blast media composition
   a. 10267 looks to have utilized the blast media safety data sheets.
   b. 12022 utilizes a collection of spent abrasive blast media analyses which includes any emissions from the blasted substrate in the emission calculations.

Permit History and Existing Operations

This NOC will cancel and supersede NOC 10267. Vigor is an existing Title V source which has the following existing permits and equipment:

Emission units addressed in the facility operating permit are summarized below (transferred from NOC 10267):

1. Dry abrasive blasting operations in Buildings T-206 and T-72 are permitted by the Agency under Orders of Approval Nos. 2452, 10267. In addition, outdoor abrasive blasting has been permitted under 10267. Existing activities as identified in the facility operating permit are listed in Table 1.

Table 1: Vigor Shipyard Abrasive Blasting Operations

Location	**Description**	**Control Equipment**	**NOC #**
Building T-206	Abrasive blast booth - steel shot (1984)	Two Baghouses	NOC 2452, 6/13/83
Building T-72	Abrasive blasting in temporary enclosures	Portable Dust Collector	NOC 10267 11/17/15 (replaced by 12022)
Three Floating Dry Docks (#1 Vigilant), #3, and #10) Onshore portion of shipyard	Abrasive blasting in temporary enclosures	Portable Dust Collector	NOC 10267 11/17/15 (replaced

Table 1: Vigor Shipyard Abrasive Blasting Operations			
Location	**Description**	**Control Equipment**	**NOC #**
Vessels pierside (5 piers)			by 12022)

The facility also conducts abrasive blasting with hydroblasting equipment using exclusively water as the abrasive and portable vacuum blasting equipment using steel shot and vented to a fabric filter. These emission units are categorically exempt from Notice of Construction requirements.

2. Spray coating operations in Buildings T-199, T-206, T-230 and T-72 and six mobile surface coating operations are permitted by the Agency under Orders of Approval Nos. 2452 and 10267. Older NOC permits pertaining to these operations have been canceled and superseded. Outdoor spray coating operations that occur on vessels in dry dock are not subject to NOC requirements since this is an existing activity that has been in place prior to our NOC requirements and has remained unchanged. Spray coating operations are subject to Regulation I, Section 9.16 and the EPA NESHAP for Shipbuilding and Repair (40 CFR 63, Subpart II). Existing activities are listed in Table 2.

Table 2: Spray Coating Operations		
Location	**Description**	**NOC Order of Approval**
Building T-72	Spray painting operations with filtered exhaust rated at 22,000 cfm	Orders of Approval No. 9541 and No. 9621
Building T-230, Shop #2	One dry filter spray coating room (complete enclosure) with filtered exhaust rated at 100,000 cfm	Order of Approval No. 10267
Building T-206 #1	Paint Room with 3 AAF Type V spray booths with overspray controlled by dry filter	Order of Approval No. No.2452
Floating Dry Dock #3	Outdoor spray coating and abrasive blasting	Portable Dust Collector
Two floating dry docks	Outdoor Spray Coating	
On-shore portion of shipyard	Up to 6 temporary spray coating operations at any one time conducted in a complete enclosure with filtered exhaust (no greater than 20,000 cfm each)	Order of Approval No. 10267

There are also 3 natural gas boilers that provide industrial steam to the facility that are subject to the EPA Boiler NESHAP (Initial notification submitted 6/4/13). Order of Approval 4213 dated December 19,

1991 authorized the use of one of these boilers – the portable Cleaver-Brooks CB 428-150 gas-fired boiler. A Notice of Construction was not required for other existing boilers. Vigor staff verified that 11.3 MMBtu/hr standby water tube boiler that is on our registration list has been permanently disconnected (3/2/15 e-mail). Three new water heaters had been installed, but these units are exempt from NOC permitting requirements under Regulation I, Section 6.03(c)(1). These units meet the definition of hot water heater and are exempt from NESHAP requirements (9/10/15 e-mail). There are no proposed changes to the boiler operation as part of this NOC review.

There are also wood working operations included in the facility operating permit – there are no changes to these operations.

B. DATABASE INFORMATION

No new equipment has been added to the database associated with this NOC. The abrasive blasting equipment will be linked to the new NOC 12022.

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

Vigor Shipyards has been subject to 40 CFR Part 63, Subpart II NESHAP. There is no change in applicability with this review. Therefore, no NESHAP charge is assessed.

C. NOC FEES AND ANNUAL REGISTRATION FEES

NOC Fees:

Fees have been assessed in accordance with the fee schedule in Regulation I, Section 6.04. All fees must be paid prior to issuance of the final Order of Approval.

Fee Description	Cost	Amount Received (Date)
Filing Fee	$ 1,150	
Equipment (abrasive blasting and dust collector modification)	$1,200	
Filing received		$ 1,150 (7/29/20)
Additional fee received		
Total		

Registration Fees:
Registration fees are assessed to the facility on an annual basis. Fees are assessed in accordance with Regulation I, Section 7.07. No changes to registration fee associated with this project.

Invoice for Year 2020 Operating Permit Fees

Bill To:
Vigor Shipyards, Inc **John Rosevear** **1801 16th Sve SW** **Seattle, WA 98134**

Invoice Date:	Invoice #:
November 18, 2019	20200024
Due Date:	**Terms:**
January 02, 2020	Net 45 Days
Facility ID (Permit #):	
12539	

Site Address: ***Vigor Shipyards, Inc***
1801 16th Ave SW, Seattle, WA 98134

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 2018.

Facility Fees and Applicable Regulations			**Charges**
Facility Fee for Operating Permit Sources. Reg I, 7.07(b)(1)(iii)			**$ 28,600.00**
NAICS 336611 -- Ship Building and Repairing			
Emission Surcharges - Reg I, 7.07(b)(2)	**Tons in 2018**	**Per Ton**	
CO (Carbon Monoxide)	1	$ 30	$ 30.00
HAP (Hazardous Air Pollutants)	9	$ 60	$ 540.00
NOx (Nitrogen Oxides)	1	$ 60	$ 60.00
VOC (Volatile Organic Compounds)	23	$ 60	$ 1,380.00
			$ 2,010.00
Fee Totals			
Operating Permit Fee (After February 16, 2020, the fee is $37,110.00).			**$ 30,610.00**
The Total Fee is due by January 02, 2020. If unpaid after February 16, 2020, 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 $6,500 (Reg I, 7.07(b)).			
WA State Department of Ecology surcharge, Reg I, 7.07(d)			**$ 693.96**
For further information regarding the WDOE surcharge, please call 1-360-407-7530.			
TOTAL FEE			**$ 31,303.96**

D. TRIBAL CONSULTATION

This NOC 12022 application was reviewed to determine whether the proposal would meet the criteria in the Agency's Interim Tribal Consultation Policy (Board RES 1410, approved November 21, 2019). In that policy, Section II.A identified the criteria that were to be used to identify when consultation would occur. In this application, the provisions in II.A.4 and II.A.5 were considered (see language extracted below).

4. Establishes a new registered source that meets any of the following equipment or activity descriptions:
   - Asphalt batch plants
   - Commercial composting with materials from offsite
   - Concrete batch plants
   - Iron or steel foundries
   - Rendering plants
   - Sewage treatment plants with odor control equipment
   - Shipyards
   - Steel mills; or
5. Modifies an existing source that meets the description in Criteria 4 above to increase the production capacity of that source or replaces the primary production equipment for that described operation.

Vigor Shipyards is among the source categories in II.A.4. NOC 12022 is an application to modify conditions in NOC Order of Approval No. 10267 issued November 17, 2015. More specifically, it seeks to modify the amount and types of abrasive blasting materials that were identified in OA 10267. It does not appear that the requested change would increase the overall production capacity for the facility, and thus, does not meet the language or intent of Section II.A.5 of the policy. More detailed review of the application also indicates that the emission increase requested with this modification is small. Furthermore, the review of the SEPA record for NOC 10267 indicates that a new SEPA determination is not required for this application because the potential impacts from this project were reviewed under SEPA for NOC 10267.

E. STATE ENVIRONMENTAL POLICY ACT (SEPA) REVIEW

State Environmental Policy Act (SEPA) review was conducted in accordance with 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 (10 temporary abrasive blasting tents) were reviewed under SEPA by PSCAA during the review of NOC 10267 and a DNS was issued by Puget Sound Clean Air Agency on 10/29/2015. A copy of this DNS is included below and is being relied upon for this project.

10267-dns.pdf

F. BEST AVAILABLE CONTROL TECHNOLOGY (BACT) REVIEW

Best Available Control Technology (BACT)

New stationary sources of air pollution are required to use BACT to control all pollutants not previously emitted, or those for which emissions would increase as a result of the new source or modification. BACT is defined in WAC 173-400-030 as, “an emission limitation based on the maximum degree of reduction for each air pollutant subject to regulation under Chapter 70.94 RCW emitted from or which results from any new or modified stationary source, which the permitting authority, on a case-by-case

basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each pollutant."

An emissions standard or emissions limitation means "a requirement established under the Federal Clean Air Act or Chapter 70.94 RCW which limits the quantity, rate, or concentration of emissions of air contaminants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction and any design, equipment, work practice, or operational standard adopted under the Federal Clean Air Act or Chapter 70.94 RCW."

Best Available Control Technology for Toxics (tBACT)

New or modified sources are required to use tBACT for emissions control for TAP. Best available control technology for toxics (tBACT) is defined in WAC 173-460-020 as, "the term defined in WAC 173-400-030, as applied to TAP."

For this permitting action, the modification of the nickel and crystalline silica contents, and the increase in nickel, manganese, crystalline silica and total abrasive blast media application will increase emissions of particulate matter (PM) and toxic air pollutants (TAPs) which are reviewed for BACT and tBACT.

Recently issued BACT determinations from PSCAA, Massachusetts Department of Environmental Protection (MassDep), Maine Department of Environmental Protection (MaineDep), Sacramento Metropolitan Air Quality Management District (SMAQMD), Bay Area Air Quality Management District (BAAQMD), South Coast Air Quality Management District (SCAQMD) and Texas Commission on Environmental Quality (TCEQ) are presented below.

Similar Permits

Summary of recent Agency PM BACT determinations for abrasive blasting:

Permitting Action	Project	BACT for Abrasive Blasting
NC#11922 (2020)	Dry abrasive blasting and spray coating operations at a new shipyard	▪ 99.97% reduction for 0.5 micron particle or larger and no visible emissions ▪ No visible emissions from enclosure containing abrasive blasting ▪ Abrasive material must not contain manganese, arsenic, cadmium or lead or any individual compound containing manganese greater than 1.35% percent by weight; arsenic, cadmium or lead in amounts greater than 0.1 percent by weight; or total chromium in amounts greater than 0.08 percent by weight
NC#11517 (2018)	Dry abrasive blasting and spray coating operations at a shipyard	▪ The abrasive blasting operation shall be conducted in a full enclosure that vents all the exhaust to a dust collector system ▪ No visible emissions shall be allowed from the enclosure containing the abrasive blasting operations, the dust collection system and any associated ductwork

Permitting Action	Project	BACT for Abrasive Blasting
		▪ Dust collector system – 99.4% efficiency for particle 0.5 micron or larger; or MERV 16 filters based on the emissions analysis that indicates chromium emissions associated with this type of blasting. ▪ Abrasive material must not contain manganese, arsenic, cadmium or lead or any individual compound containing manganese greater than 1 percent by weight; arsenic, cadmium or lead in amounts greater than 0.1 percent by weight; or total chromium in amounts greater than 0.08 percent by weight. Safety data sheets showing average trace metal analytical for department of transportation requirements. ▪ The abrasive material storage areas and dust collector system holding bins shall be fully enclosed ▪ Dust collector system must be equipped with a pressure gauge
NC#11330 (2017)	Dry abrasive blasting and spray coating operations in temporary containment systems – new ship repair facility	▪ The abrasive blasting operation shall be conducted in a full enclosure that vents all the exhaust to a dust collector system ▪ No visible emissions shall be allowed from the enclosure containing the abrasive blasting operations, the dust collection system and any associated ductwork ▪ Dust collector system must be designed with MERV 16 or HEPA filtration ▪ Abrasive material must not contain manganese, arsenic, cadmium or lead or any individual compound containing manganese, arsenic, cadmium or lead in amounts greater than 0.1 percent by weight ▪ Blasted metal substrates must not contain chromium in amounts greater than 3 percent by weight ▪ The abrasive material storage areas and dust collector system holding bins shall be fully enclosed ▪ Dust collector system must be equipped with a pressure gauge.
NC#11263 (2017)	Dry abrasive blasting and spray coating operations in temporary containment systems conducted throughout shipyard	▪ Total enclosure to control particulate matter ▪ Abrasive blasting material shall not contain MFHAP specified ▪ Conduct abrasive blasting in properly sized enclosure controlled by dust collector ▪ Dust collector MERV 15 or higher per ASHRAE 52.2-2007 ▪ No visible emissions from enclosure or dust collector ▪ Minimize emissions from stockpiles of new/and or spent abrasive materials ▪ Pressure gauge across dust collector or filter system
NC#11313 (2017)	Increase in emissions from abrasive blasting and spray coating activities in temporary enclosures. Modification	▪ Total enclosure to control particulate matter ▪ Abrasive blasting material shall not contain MFHAP specified ▪ Conduct abrasive blasting in properly sized enclosure controlled by dust collector

Permitting Action	Project	BACT for Abrasive Blasting
	to requirements for spray coating operations.	▪ Dust collector MERV 15 or higher per ASHRAE 52.2-2007 ▪ No visible emissions from enclosure or dust collector ▪ Minimize emissions from stockpiles of new/and or spent abrasive materials ▪ Pressure gauge across dust collector or filter system
NC#11264 (2016)	SAFE Boats – Abrasive blasting and spray coating operations in temporary enclosure	▪ Total enclosure to control particulate matter ▪ Abrasive blasting material shall not contain MFHAP specified ▪ Conduct abrasive blasting in properly sized enclosure controlled by dust collector ▪ Dust collector MERV 15 or higher per ASHRAE 52.2-2007 ▪ No visible emissions from dust collector ▪ Minimize emissions from stockpiles of new/and or spent abrasive materials ▪ Pressure gauge across dust collector
NC#10918 (2016)	PSNS – 9 Abrasive blasting and surface coating	▪ The abrasive blasting operation shall be conducted in a full enclosure that vents all the exhaust to a dust collector ▪ No visible emissions from enclosure, ductwork, equipment or stacks ▪ Ventilation system designed to ensure inward flow – at least 4 air changes per hour ▪ Non-silica based blasting media including; steel grit, mineral slag, steel shot, garnet, aluminum oxide, coal slag, copper slag, water, baking soda, or organic materials such as walnut shells and plastic media, are acceptable. No other blasting media shall be used ▪ MERV 14 or better filters for abrasive blasting ▪ For blasting that involves more than 0.1 percent by weight chromium, 1.0 percent by weight manganese, filters shall have at least have a rating of at least MERV 16 per ASHRAE 52.2-2007
NC#10267 (2015)	Vigor – 10 concurrent abrasive blasting operation and up to six temporary spray coating operations	▪ Abrasive blasting material shall not contain MFHAP specified ▪ Conduct abrasive blasting in properly sized enclosure controlled by dust collector ▪ Dust collector MERV 13 or higher – ASHRAE 52.2-2007 Dust collector MERV 16 if chromium in blast media ▪ No visible emissions from dust collector ▪ Minimize emissions from stockpiles of new/and or spent abrasive materials ▪ Pressure gauge across dust collector

Permitting Action	Project	BACT for Abrasive Blasting
NC#11195 (2016)	Vigor Marine Tacoma – 4 concurrent abrasive blasting/surface coating operations	▪ Total enclosure to control particulate matter ▪ Abrasive blasting material shall not contain MFHAP specified ▪ Conduct abrasive blasting in properly sized enclosure controlled by dust collector ▪ Dust collector MERV 15 or higher per ASHRAE 52.2-2007 ▪ No visible emissions from dust collector ▪ Minimize emissions from stockpiles of new/and or spent abrasive materials ▪ Pressure gauge across dust collector

Other Regulatory Agencies BACT

Regulatory Agency and Permitting Action	**Emissions Limitation**	**Operational and Design Limitation**
MassDep (No. CE-12-038)	PM – 0.0002 gr/acf Metallic HAPs – 0.001 lbs/hour Chromium – 0.0005 lbs/hour	▪ Torit cartridge reverse jet dust collector (Model No. DFO-3-24) equipped with ultra-web synthetic nanofiber filter cartridges or equivalent to control inorganic hazardous air pollutants and particulate matter.
SMAQMD (No. 97) (2014)	PM – 0.01 gr/dscf	▪ Handling: enclosure of equipment and conveyors and transfer points to baghouse ▪ Storage: enclosed storage vented to baghouse
MaineDep (No. A-702-71-J-M) (2015)	PM – 99% removal efficiency and a 5% opacity 6-minute block average limit	▪ Transfer, storage and processing vented to baghouse
BAAQMD (2012) (No. B8478)	PM – 0.006 gr/dscf	▪ Jet pulse baghouse
SCAQMD (No. 468736-8 and 473945-48)	PM – 99% control efficiency Metallic HAPs - metal processed shall not have toxic compound concentrations (in percent by weight) exceeding the following:	▪ Handte-Umwelttechnik dust collector (Model No. Mf-l 25/5/1) with five filters and 269 sq. ft. total filter area

Regulatory Agency and Permitting Action	Emissions Limitation	Operational and Design Limitation
	arsenic 0.09% beryllium 0.09% cadmium 0.09% chromium 3% copper 1% lead 0.1% manganese 2.2% nickel 2% selenium 0.9% vanadium pentoxide 0.9%	
TCEQ Tier 1 BACT requirement (dust collector control device) (2018)	PM – 0.01 gr/dscf or 99.9% removal efficiency	▪ Use of a fabric filter system such as a baghouse or cartridge filter system ▪ Air to cloth ratio should be based on manufacturers' recommendations for the solids being controlled and the fabric filter cleaning method used

Analysis

Operation vented to a dust collector/baghouse particulate control system is consistently required across all of the BACT determinations for abrasive blasting associated with shipyards permitted by PSCAA and by determinations from other agencies.

In combination with the requirement to utilize a dust collector, all BACT determinations imposed specific emissions limitations and filtration efficiencies. The form of emission limitation (MERV rating, outlet grain loading, and % removal) has varied across determinations.

MERV Rating – most stringent to least stringent
1. MERV 16 or HEPA (NOC 11922, NOC 11330, NOC 10267)
2. MERV 15 (NOC 11263, NOC 11313, NOC 11264, NOC 11195)
3. MERV 14 (NOC 10918)

Outlet Grain Loading – most stringent to least stringent
1. 0.0002 gr/dscf (Mass DEP, NOC 11330)
2. 0.002 gr/dscf (NOC 11517)
3. 0.006 gr/dscf (BAAQMD)
4. 0.01 gr/dscf (TCEQ, SMAQMD)

% Removal – most stringent to least stringent
1. 99.9% (TCEQ)
2. 99% (MaineDEP, SCAQMD)

As discussed in NOC 11517, and NOC 11922 in most previous PSCAA permits for abrasive blasting at shipyards, BACT determinations have not specified a grain loading emission limit, instead requiring dust collectors with minimum MERV ratings or control efficiencies. The MERV rating requirements have trended toward increasing stringency (with MERV 14 being the least stringent, permitted in 2014, and MERV 16/HEPA being the most stringent, permitted in 2017). When these abrasive blasting activities were last reviewed under 10267 (in 2015) the BACT determination was MERV 13 for control of PM from abrasive blasting, except for higher composition crystalline silica, nickel and/or chromium containing blast media which was required to use MERV 16. The 11517 analysis also notes that an emission limitation of 0.0002 gr/dscf was established in NOC 11330. Implementation of this standard for NOC 11330 was with use of HEPA as proposed by applicant, but MERV 16 would also have been acceptable to meet BACT requirements.

NOC 11517 and NOC 11922 required use of either the MERV 16 rating or the 99.97% filter efficiency for 0.5 micron or larger since filter manufacturers may use either one of these to identify the filter efficiency. The 99.97% efficiency and MERV 16 are not directly comparable, and in support of this application, the applicant submitted manufacturer documentation specifying control of 99.99% at 0.5 micron and larger for MERV 15 filters. MERV Rating was established by the American Society of Heating, Refrigeration and Air Conditioning Engineers to rate a filter's ability to capture and hold particles and pollutants. MERV ratings were established to test efficiency of static air filters used in general ventilation system, such as room and building air filtration system. The MERV rating system assigns a single number to a filter to identify its minimum performance in removing particulate from the airstream. In previously issued NOCs, the Agency has specified either MERV 15 or MERV 16 filters to be equivalent to the higher efficiencies.

The MERV 16 is more effective at capturing the very small particles (0.3 – 1.0 microns), but either MERV 15 or 16 could be considered BACT depending on the proposed operations. Information presented in the Emission Inventory section of this worksheet indicates only a very small percentage of the mass of the particles are less than 1 micron with the highest percentage associated with steel grit at 0.33%. Given the additional information about the size distribution of the spent abrasive blast media from shipyards and the shift to specifying a required control efficiency of 99.97% control at 0.5 micron or larger, both MERV 15 or MERV 16 would be acceptable to meet BACT for abrasive blasting activities. (NOC 10267 specified MERV 16 filtration; however, this review will modify the requirement to be linked to a control efficiency, expected to be achieved through either MERV 15 or MERV 16). For dust collectors, the efficiency of the system is going to increase over time as a dust cake coats the filter.

In addition to control efficiency for BACT and tBACT, NOC 10267 included composition limits for abrasive blast media. The review from 10267 indicates that the composition limits were included to ensure emissions were below the Small Quantity Emission Rates (SQER) in WAC 173-460-150. The composition limits have been updated to reflect the updated emission estimates but still correspond to ensuring emissions are below the respective SQER for each pollutant. (See the discussion in Section H, "Ambient Toxics Impact Analysis", of this worksheet.)

The following components of BACT and tBACT for PM and inorganic toxic air pollutants (TAP) apply:

1. The abrasive blasting operations shall be conducted in a complete enclosure (e.g., tarpaulins, plastic barriers, shrink wrap, mobile enclosures, physical barriers or similar methods) such that all the air exhausted from the enclosure shall be controlled by a dust collector. The enclosure shall fully surround the blast operation such that there is continuous inward flow except for the exhaust to the dust collector. If dust leaks are noted, repairs must be made.
2. Enclosures shall be vented to dust collection system with minimum filter efficiency specified in permit. The exhaust flow of the dust collectors varies depending on the project and equipment selected by the contractor. Most common baghouse sizes are 12,000, 20,000, and 45,000 cfm. In most previous permits for abrasive blasting at shipyards, we have not specified a grain loading emission limit, but an emission limitation of 0.0002 gr/dscf was established in NOC 11330. Implementation of this standard for NOC 11330 was with use of HEPA as proposed by applicant; based on the specification sheets from the applicant, MERV 15 would also have been acceptable to meet BACT requirements. I am recommending portable dust collectors be equipped with filters that meet or exceed the following criteria: MERV 15 filter rating or an efficiency of 99.97% efficiency for 0.5 micron particles and larger. The basis of this determination is provided below:
    a. Shipyard jobs can vary and often necessitate flexibility of operation. Emissions were estimated based on use of steel grit as the abrasive blast material to blast mild steel. However, the applicant is not limited to this scenario. In particular, we would be concerned about the chromium and other metals potentially emitted from this operation and have limited metallic HAP content in blast media used. The amount of chromium is depended on the blast media used and the base alloy. Requiring the higher MERV 15 rating provides assurances of adequate control for a range of activities.
    b. Although a HEPA filter was specified in NOC 11330, this was based on the applicant's proposed usage of this type of filter. HEPA filtration is considered to be more stringent than BACT and not considered in this determination. Toxic air pollutant emissions are adequately controlled based on information presented in the National Shipbuilding Research Program (NSRP) report which evaluated average metal concentration in airborne PM emitted from dry abrasive blasting. This analysis provides information about toxic air pollutants associated with abrasive blasting at shipyards which includes both the base alloy or working piece and the media blast material. BACT for composition of abrasive blast media is further addressed below.
    c. Another option considered is to include a grain loading emission limit in the permit instead of filter efficiency which would look more comprehensively at effectiveness of the dust collector system. However, the abrasive blasting operations are conducted on a very intermittent basis and the applicant is requesting flexibility to have different dust collectors brought in by contractors – different makes, models and sizes. Therefore, establishing a grain loading and requiring compliance testing is not a practical condition for this proposed operation.
3. No visible emissions from the enclosure or dust collector. Keeping the enclosure volume under a negative pressure with sufficient capture velocities on all open areas can be an effective method to control contaminants. The actual airflow required is based on the type of contaminant and the geometry of the blasting enclosure. It is important to draw only enough air to capture just the airborne dust and not the blast material.

4. The facility shall clean up used abrasive daily or as soon as possible after blasting has finished.
5. The facility shall minimize emissions from stockpiles of new and/or spent abrasive material. Measures shall include covering stockpiled material, wetting stockpiled material; or keeping stockpiled material in containers.

Summary PM BACT & non-volatile tBACT determination – abrasive blasting

Pollutant	Emissions Limitation
PM TAC	• 99.97% reduction for 0.5 micron particle or larger and no visible emissions • No visible emissions from enclosure containing abrasive blasting

The condition pertaining to recordkeeping for abrasive blast material usage was updated since this information if provided to Vigor by contractors by the end of the month. The current permit allows 60 days to record and this has not changed, but the condition has been reworded for clarity.

Original language:
Within 60 days of the end of each month, the owner or operator shall record the amount of abrasive blast material that meets one or both of these criteria and was used during the previous month and over the previous consecutive 12-month period.

Updated language:
The owner or operator shall record the amount of abrasive blast material that meets one or both of these criteria and was used during the calendar month and over the previous consecutive 12-month period. Total usage to demonstrate compliance with this condition must be calculated and recorded within 60 days of the end of the month.

G. EMISSION ESTIMATES

Proposed Project Emissions

Emission estimates were provided by applicant, reviewed, and adjusted by PSCAA. The applicant assumed the following:

- Emissions from abrasive blasting are particulate matter (PM) and toxic air contaminants (TAC) listed in WAC 173-460-150 were based on compiled lab analyses of the spent abrasive blast media and the worst case SDS composition of the blast media. The applicant assumed 1.2% hexavalent chromium based on a single sample lab analysis for the facility. The lab analysis did not appear to meet EPA method QA standards (the matrix spike and matrix spike duplicate both were outside the acceptable recovery range) so PSCAA utilized the SJVAPCD standard of 5% hexavalent chromium content for updated calculations.

- Emission factors and methodology used by the applicant were derived from an NOC for abrasive blasting at PSNS (NOC 10918). The expected size distribution of blast media from abrasive blasting utilized National Shipbuilding Research Program (NSRP), report titled "Residual Risk from Abrasive Blasting Emissions: Particle Size and Metal Speciation" by Bhaskar Kura, PhD., P.E. (Dec 2005) (copy of this paper included in electronic file for this NOC) and was the basis for applying a 99.97% control efficiency (NSRP report indicates that less than 1% of total particulate is below 1 micron steel shot has the highest composition of blast media below 1 micron, with 0.33%). This report provides size distributions of airborne particles from dry abrasive blasting and indicates that less than 1% of the mass is attributable to smaller particles (PM2.5) shown below:

Table 2: Size Distribution of Airborne Particles from Dry Abrasive Blasting Single Particle Optical Scanning (SPOS) Method

Particle Size, Micron	Cumulative Mass % (all particles less than the size indicated)					
	Barshot	Coal Slag	Copper Slag	Garnet	Steel Grit	Sp. Sand
1.01	0.16	0.19	0.22	0.16	0.33	0.17
2.46	0.37	0.63	0.54	0.37	0.92	0.57
3.93	0.56	1.28	0.85	0.56	1.56	1.13
6.99	1.16	3.89	2.42	1.16	4.56	3.06
10.07	2.11	8.87	7.27	2.11	9.92	6.19
15.29	4.09	18.74	21.47	4.09	17.62	12.00
19.86	6.02	25.59	30.62	6.02	23.15	16.30
24.47	8.46	31.13	36.18	8.46	28.82	20.67
30.16	12.54	36.62	40.98	12.54	35.94	26.89
400	100.00	100.00	100.00	100.00	100.00	100.00

- The PM emission factors from San Diego County APCD used by the applicant initially of 10 lb/ton PM 10 emissions for miscellaneous abrasive blast media was updated to 15 lb/ton for aluminum oxide since aluminum oxide was the abrasive blast media with the highest emission factor from San Diego APCD which also was proposed to be used by the applicant. For the steel shot calculations, the applicant utilized the steel shot 8 lb/ton emission factor which PSCAA did not adjust.

Actual Emissions

The applicant did not submit actual emissions as a point for comparison, however based on the annual emissions reporting of abrasive blasting throughput (which is tracked using spent abrasive blast media) for 2019 was 2,050 tons of abrasive, which is about 25% of the potential emissions linked to throughput limits of 8,000 ton/yr.

Potential Emissions

The permitted potential to emit calculations are based on a 12 month rolling period limit of 8,000 ton/yr of abrasive blast media, using the San Diego County Air Pollution Control District emission

factors for aluminum oxide (the highest particulate matter emission factor of 15 lb/ton of the non-steel shot abrasive blast used at the facility) and the 8 lb/ton particulate emission factor of steel shot for the steel emissions. The PM emissions were speciated based on the average lab data from spent abrasive blast media and the maximum composition of the safety data sheets for the blast media. The BACT limit of 99.97% control at 0.5 micron (an effective control of 99.96% assuming the size distribution of particulate from the shipyard as described above) was applied to the PM emissions.

Controlled PM emissions are estimated at 36 lb/yr using the 99.97% control, a throughput of 8,000 ton/yr and an emission factor of 15 lb/ton for aluminum oxide (worst case PM emission factor).

Pollutant	TAP Averaging Period	Maximum SDS Concentration [a]	Maximum Emission Rate [b] (lb/averaging period)	SQER [c] (lb/averaging period)	Below SQER?
Cadmium	Year	0.0007%	1.31E-06	3.90E-02	Yes
Chromium III [d,e]	24-hr	0.065%	6.53E-05	7.40E-03	Yes
Chromium VI [e]	Year	0.0033%	5.95E-04	6.50E-04	Yes
Crystalline Silica	24-hr	5%	9.890E-03	2.20E-01	Yes
Lead	Year	0.003%	9.800E-04	1.40E+01	Yes
Manganese	24-hr	5%	1.203E-03	2.20E-02	Yes
Nickel [f]	Year	0.20%	2.74E-02	6.20E-01	Yes

Facility-wide Emissions

Vigor is an existing Title V source and reporting source. The facility-wide emissions are expected to be very similar to the emissions reported historically since the increase in PM10 emissions is less than 1 ton per year:

Actual Emissions
The actual emissions (ton/year) reported for 2015-2018 are listed below as pulled for PSCAA database:

12539 - Vigor Shipyards, Inc : 1801 16th Ave SW, Seattle

	2018	2017	2016	2015
CO	0.628000	0.971500	0.071500	0.035500
NO2	0.748000		0.085000	0.041500
HAP	8.831500	7.193500	11.966500	11.414500
TAC	11.096000	9.051500	12.113000	11.417500
VOC	23.296000	21.577000	26.322000	19.300500
PM10	0.289000	0.150000	0.057500	0.112000
PM2.5	0.080000	0.094000	0.010000	0.014000
SO2	0.004500	0.007000	0.000500	

Potential Emissions

The facility's potential emissions exceed the HAP thresholds of Title V; the facility is an existing Title V source.

H. OPERATING PERMIT OR PSD

The facility is a Title V "**air operating permit source**".
The Title V Air Operating Permit (AOP) program applicability for the entire source has been reviewed.

This change cannot be processed as an off-permit change because it does not meet the criteria of WAC 173-401-724, specifically, the adjustment of nickel and crystalline silica content, and the use of 99.97% control at 0.5 micron rather than MERV 16 would be in violation of the existing conditions of 10267 as incorporated into the Title V permit (specifically conditions B.9, B.13, and B.14). As such, this NOC issuance will be incorporated into either a major modification of the Title V Permit or in the next renewal of the Title V Permit.

Emission increases associated with this project were reviewed for Prevention of Significant Deterioration (PSD) Program applicability. The facility is not an existing PSD major source and the increase in emissions from this permitting action is below PSD thresholds.

I. AMBIENT TOXICS IMPACT ANALYSIS

The estimated potential toxic air pollutant (TAP) emissions at operating at 100% rated capacity and 8760 hour per year for each new or modified emission unit (*or based on limit in permit*). The table below includes estimated potential emissions of all TAP and compares those to the Small Quantity Emission Rates (SQER) in WAC 173-460-150.

The upper limits for SDS composition corresponding to toxics emissions at or below the SQER at 8,000 ton/yr throughput are as follows:

TAP	Maximum Theoretical	Maximum Composition SDS

	Composition	
Chromium (total)	0.1%*	0.065%
Crystalline Silica	100%	5%
Manganese	11%	1.2%
Nickel	1.7%	0.2%
Cadmium	0.1%	0%

*for chromium content of 0.1% annual usage is limited to 5,700 ton abrasive/yr; for <0.1% chromium content limit is the 8,000 tpy consistent with the other compounds; assumes 100% chromium is chromium III and 5% chromium is chromium VI.

The toxics emissions corresponding to the actual composition of the blast media proposed and the spent blast media analyses at 8,000 ton/yr are below:

Pollutant	**TAP Averaging Period**	**Maximum SDS Concentration [a]**	**Maximum Emission Rate [b] (lb/averaging period)**	**SQER [c] (lb/averaging period)**	**Below SQER?**
Cadmium	Year	0.0007%	1.31E-06	3.90E-02	Yes
Chromium III [d,e]	24-hr	0.065%	6.53E-05	7.40E-03	Yes
Chromium VI [e]	Year	0.0033%	5.95E-04	6.50E-04	Yes
Crystalline Silica	24-hr	5%	9.890E-03	2.20E-01	Yes
Lead	Year	0.003%	9.800E-04	1.40E+01	Yes
Manganese	24-hr	5%	1.203E-03	2.20E-02	Yes
Nickel [f]	Year	0.20%	2.74E-02	6.20E-01	Yes
Beryllium	Year	0%	2.27E-04	6.80E-02	Yes
Arsenic	Year	0%	4.65E-04	4.9E-02	Yes
Selenium	24-hr	0%	1.84E-07	1.5	Yes
Copper	1-hr	0%	2.02E-04	1.9E-01	Yes

J. APPLICABLE RULES & REGULATIONS

Puget Sound Clean Air Agency Regulations

SECTION 7.09(b)): Operation and Maintenance Plan. Owners or operators of air contaminant sources subject to Article 7 of this regulation shall develop and implement an operation and maintenance plan to assure continuous compliance with Regulations I, II, and III. A copy of the plan shall be filed with the Control Officer upon request. The plan shall reflect good industrial practice and shall include, but not be limited to, the following: (1) Periodic inspection of all equipment and control equipment; (2) Monitoring and recording of equipment and control equipment performance; (3) Prompt repair of any defective equipment or control equipment; (4) Procedures for start up, shut down, and normal operation; 02/17 7-5 Regulation I (5) The control measures to be employed to assure compliance with Section 9.15 of this regulation; and (6) A record of all actions required by the

plan. The plan shall be reviewed by the source owner or operator at least annually and updated to reflect any changes in good industrial practice.

SECTION 6.09: Within 30 days of completion of the installation or modification of a stationary source subject to the provisions of Article 6 of this regulation, the owner or operator or applicant shall file a Notice of Completion with the Agency. Each Notice of Completion shall be submitted on a form provided by the Agency, and shall specify the date upon which operation of the stationary source has commenced or will commence.

SECTION 9.03: (a) It shall be unlawful for any person to cause or allow the emission of any air contaminant for a period or periods aggregating more than 3 minutes in any 1 hour, which is:
(1) Darker in shade than that designated as No. 1 (20% density) on the Ringelmann Chart, as published by the United States Bureau of Mines; or
(2) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in Section 9.03(a)(1).
(b) The density or opacity of an air contaminant shall be measured at the point of its emission, except when the point of emission cannot be readily observed, it may be measured at an observable point of the plume nearest the point of emission.
(c) This section shall not apply when the presence of uncombined water is the only reason for the failure of the emission to meet the requirements of this section.

SECTION 9.09: General Particulate Matter (PM) Standard. It shall be unlawful for any person to cause or allow the emission of particulate matter in excess of the following concentrations:
Equipment Used in a Manufacturing Process: 0.05 gr/dscf

SECTION 9.11: It shall be unlawful for any person to cause or allow the emission of any air contaminant in sufficient quantities and of such characteristics and duration as is, or is likely to be, injurious to human health, plant or animal life, or property, or which unreasonably interferes with enjoyment of life and property.

SECTION 9.13: It shall be unlawful for any person to cause or allow the installation or use of any device or use of any means designed to mask the emission of an air contaminant which causes detriment to health, safety or welfare of any person.

SECTION 9.15: It shall be unlawful for any person to cause or allow visible emissions of fugitive dust unless reasonable precautions are employed to minimize the emissions. Reasonable precautions include, but are not limited to, the following:
(1) The use of control equipment, enclosures, and wet (or chemical) suppression techniques, as practical, and curtailment during high winds;
(2) Surfacing roadways and parking areas with asphalt, concrete, or gravel;
(3) Treating temporary, low-traffic areas (e.g., construction sites) with water or chemical stabilizers, reducing vehicle speeds, constructing pavement or rip rap exit aprons, and cleaning vehicle undercarriages before they exit to prevent the track-out of mud or dirt onto paved public roadways; or
(4) Covering or wetting truck loads or allowing adequate freeboard to prevent the escape of dust-bearing materials.

SECTION 9.16(c): General Requirements for Indoor Spray-Coating Operations. It shall be unlawful for any person subject to the provisions of this section to cause or allow spray-coating inside a structure, or spray-coating of any motor vehicles or motor vehicle components, unless all of the following requirements are met:
(1) Spray-coating is conducted inside an enclosed spray area;
(2) The enclosed spray area employs either properly seated paint arresters, or water-wash curtains with a continuous water curtain to control the overspray; and
(3) All emissions from the spray-coating operation are vented to the atmosphere through an unobstructed vertical exhaust vent.

REGULATION I, SECTION 9.20(a): It shall be unlawful for any person to cause or allow the operation of any features, machines or devices constituting parts of or called for by plans, specifications, or other information submitted pursuant to Article 6 of Regulation I unless such features, machines or devices are maintained in good working order.

Washington State Administrative Code

WAC 173-400-040(3): Fallout. No person shall cause or allow the emission of particulate matter from any source to be deposited beyond the property under direct control of the owner or operator of the source in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited.

WAC 173-400-040(4): Fugitive emissions. The owner or operator of any emissions unit engaging in materials handling, construction, demolition or other operation which is a source of fugitive emission:

(a) If located in an attainment area and not impacting any nonattainment area, shall take reasonable precautions to prevent the release of air contaminants from the operation.

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.

Federal

NA

K. PUBLIC NOTICE

This project does not meet the criteria for mandatory public notice under WAC 173-400-171(3). Criteria requiring public notice includes, but is not limited to, a project that exceeds emission threshold rates as defined in WAC 173-400-030 (e.g. 40 tpy NOx, VOC, or SO_2, 100 tpy CO, 15 tpy PM_{10}, 10 tpy $PM_{2.5}$, 0.6 tpy lead), includes a WAC 173-400-091 synthetic minor limit, has a toxic air pollutant emission increase above the acceptable source impact level in WAC 173-460-150, or has significant public interest. A notice of application was posted on the Agency's website for 15 days. No requests or responses were received. A copy of the website posting is below:

New Construction Projects

Company	Address	Project Description	Date Posted	Contact Engineer
Vigor Shipyards, Inc	1801 16th Ave SW, Seattle, WA 98134	Application for changes to abrasive blasting media content and allowable quantity of abrasive blasting to be conducted at an existing shipyard.	8/3/20	Maggie Corbin

L. RECOMMENDED APPROVAL CONDITIONS

Standard Conditions:

1. Approval is hereby granted as provided in Article 6 of Regulation I of the Puget Sound Clean Air Agency to the applicant to install or establish the equipment, device or process described hereon at the installation address in accordance with the plans and specifications on file in the Engineering Division of the Puget Sound Clean Air Agency.

2. This approval does not relieve the applicant or owner of any requirement of any other governmental agency.

Specific Conditions:
This Order replaces Order of Approval No. 10267 Conditions #5, #12 and #13 as described below:

3. This condition cancels and supersedes Order of Approval No. 10267 Condition #5 and replaces Order of Approval No. 10267 Condition #5 with the following:

   The exhaust from each abrasive blasting operation shall be controlled by a dust collector with a minimum control efficiency of 99.97% for 0.5 micron sized particulate and larger or meet American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 52.2. Minimum Efficiency Reporting Value (MERV) 15. Filtration efficiency information or MERV information shall be maintained to demonstrate compliance with the control efficiency requirement.

4. This condition cancels and supersedes Order of Approval No. 10267 Condition #12 and replaces Order of Approval No. 10267 Condition #12 with the following:

   The abrasive material shall meet the following composition limits, as shown in formulation data provided by the manufacturer or supplier, such as the Safety Data Sheet for the material:

a. Chromium content must not exceed 0.1% by weight;

b. Manganese content must not exceed 11% by weight;

c. Nickel content must not exceed 1.7% by weight; and

d. Cadmium content must not exceed 0.1% by weight.

e. Lead content must not exceed 0.1% by weight.

5. This condition cancels and supersedes Order of Approval No. 10267 Condition #13 and replaces Order of Approval No. 10267 Condition #13 with the following:

   Usage of abrasive blast material shall be limited to the following per 12 consecutive month period:

   a. 8,000 tpy for total abrasive blast material applied in the ten temporary outdoor abrasive blasting enclosures; and

   b. 5,700 tpy for abrasive blast material that contains chromium up to 0.1% according to Safety Data Sheets.

   The owner or operator shall track and record the amount of abrasive blast material used during the calendar month and over the previous consecutive 12-month period that meets one or both of these criteria. Total usage to demonstrate compliance with this condition must be calculated and recorded within 60 days of the end of the month.

6. Upon issuance, this Order of Approval cancels and supersedes Order of Approval No. 10267 Conditions #5, #12, and #13, dated November 17, 2015. The updated conditions in this Order of Approval also apply to the reference in Order of Approval No. 11416 Condition #3 dated January 2, 2018.

M. CORRESPONDENCE AND SUPPORTING DOCUMENTS

N. REVIEWS

Reviews	Name	Date
Engineer:	Madeline McFerran	11/13/2020
Inspector:	Walter Voegtlin	11/23/2020
Second Review:	John Dawson	11/18/2020
Applicant Name:	John Rosevear	2/4/2021