Olympic Region Clean Air Agency
ORCAA

2940 Limited Lane NW
Olympia, WA 98502

1-800-422-5623 or
(360) 539-7610
Fax: (360) 491-6308

www.ORCAA.org

Executive Director
Francea L. McNair

PRELIMINARY DETERMINATION to APPROVE:

Construct a 3rd can production line

Crown Cork & Seal
1202 Fones Road, Olympia

20NOC1451

Prepared on July 20, 2021

Serving Clallam, Grays Harbor, Jefferson, Mason, Pacific, and Thurston counties.

Table of Contents

NOTICE OF CONSTRUCTION
PRELIMINARY DETERMINATION TO APPROVE

Olympic Region Clean Air Agency

Issued to:	Crown Cork & Seal	**County:**	67
Location:	1202 Fones Road Olympia, WA 98501	**Source:** **RC:**	8 OP1
Application #:	20NOC1451	**File:**	152
Prepared on:	July 20, 2021		

1. Summary

Crown Cork & Seal (Crown) is an existing aluminum beverage can manufacturing facility located at 1202 Fones Road in Olympia, Washington. The facility emits criteria air pollutants, certain Hazardous Air Pollutants (HAP) and has been in existence since 1959. Crown is a “major source” of volatile organic compounds and has operated under an Air Operating Permit (AOP) since 1998.

With this current application, Notice of Construction (NOC) No. 20NOC1451, Crown requests approval to construct a third can manufacturing line to produce aluminum beverage cans ranging from approximately 7-ounce to 16-ounce sizes. The can manufacturing line will include equipment to form, clean, decorate, and coat the cans to be sold for beverage packaging. Emissions of volatile organic compounds (VOCs), hazardous air pollutants (HAPs), and toxic air pollutants (TAPs) from the can coating equipment (and associated combustion emissions from curing equipment) will be controlled by the existing regenerative thermal oxidizer (RTO). In addition to the third line, Crown will also construct a new wastewater pretreatment plant and three natural gas-fired hot water heaters.

ORCAA’s preliminary determination is to conditionally approve Crown’s application. Recommended conditions of approval are detailed in Section 17 of this Preliminary Determination and include emission limits, operating requirements, and monitoring, recordkeeping, and reporting requirements. These conditions were determined necessary to ensure air emissions from the new can manufacturing line meet federal, state and local air quality standards.

2. Regulatory Background

Pursuant to the Washington Clean Air Act under chapter 70A.15 of the Revised Code of Washington (formerly chapter 70.94 RCW), ORCAA’s Rule 6.1 requires New Source Review (NSR) for new stationary sources of air pollution in ORCAA’s jurisdiction. NSR entails evaluating air quality implications prior to constructing, installing or otherwise establishing any new stationary source of air pollution, modifying an existing stationary source or replacing or substantially altering air pollution control technology. The goal of NSR is to implement air pollution control technology that meets the standard of “Best

Available Control Technology" (referred to as BACT), and to assure projects comply with other applicable air regulations and standards, including equipment performance standards and ambient air quality standards.

NSR is initiated by a project proponent submitting a Notice of Construction (NOC) application, which includes information on the proposed project of sufficient detail to characterize air impacts. NOC applications are posted on ORCAA's website and may undergo a public notice and comment period if requested by the public or if emissions increases trigger an automatic public notice. Approval of a NOC is contingent on verifying the proposed new source or modification meets the following criteria for approval from ORCAA's Rule 6.1:

1. ***Performance Standards -*** Any new stationary source or modification will likely comply with applicable air performance standards such as the federal new source performance standards (NSPS), national emission standards for hazardous air pollutants (NESHAPs), and any performance standards adopted under chapter 70A.15 RCW (formerly chapter 70.94 RCW);
2. ***BACT -*** The new or modified stationary source is controlled to a level that meets the standard of "Best Available Control Technology" (BACT);
3. ***Ambient Air Quality –*** Emissions from the new or modified stationary source will not cause or contribute to a violation of any ambient air quality standard;
4. ***Federal Air Permitting Requirements –*** All applicable federal air permits, if required, are secured;
5. ***Washington Air Toxics Regulations –*** If there are emissions of toxic air pollutant (TAP) from the new or modified stationary source, the requirements of Washington's Controls for New Sources of Toxic Air Pollutants under Chapter 173-460 WAC are met; and,
6. ***Public Outreach –*** Public notice and comment requirements in WAC 173-400-171 and ORCAA's regulations are met.

Emissions from the can production line include acid fume emissions from can washing, Volatile Organic Compound (VOC) and particulate emissions from can coating, and combustion emissions from dryers and curing ovens. VOC emissions from can coating results from evaporation of the non-water, volatile content of the coating as it dries or cures and includes Hazardous Air Pollutants (HAPs) or Toxic Air Pollutants (TAPs), which are regulated under Washington's Controls for New Sources of Toxic Air Pollutants, Chapter 173-460 WAC. Spray application of coatings can also be a source of particulate emissions to the air through atomization of solids in the coating being spray applied. The fraction of particulate generated which passes through the filters is emitted to the ambient air as particulate pollution. Combustion of fuels in dryers, curing ovens, the thermal oxidizer, and hot water heaters, are sources of byproducts of combustion such as nitrogen oxides, carbon monoxide, sulfur oxides, HAPs, and TAPs. The wastewater pretreatment can be a source of toxic air pollutants from the wastewater or added treatment chemicals or particulate from the handling of dewatered sludge.

Therefore, a third can manufacturing line, a new wastewater pretreatment plant, and three natural gas-fired hot water heaters are regulated as new stationary sources of air emissions. Except as indicated in Table 1, these units require New Source Review. The

natural gas-fired hot water heaters are replacing two natural gas-fired hot water heaters and are exempt from air permitting due to their size per ORCAA Rule 6.1(c)(26)(ii). The natural gas-fired dryer associated with the can washer is also exempt due to its size per ORCAA Rule 6.1(c)(26)(ii). This dryer is used to dry the aluminum cans after the final rinsing and therefore only water vapor and minor products of combustion are emitted. Although the natural gas-fired curing ovens (PIN and inside bake ovens) have heat inputs less than 5 MMBtu/hr (ORCAA's exemption threshold for natural gas-fired units), they are not exempt as emissions from the units include VOCs and toxic air pollutants from the curing process in addition to products of combustion.

Table 1. NSR Applicability

Emission Unit	Quantity/Size (as applicable)	NSR Determination
Natural gas-fired hot water heaters	Three units at 3.25 MMBtu/hr each Each can washer will be provided hot water from one of the hot water heaters; the third unit is a stand-by unit	Exempt under ORCAA Rule 6.1(c)(26)(ii)
Wastewater pretreatment plant	Two 60 GPM treatment trains with enclosed tanks, no aeration processes, liquid reagents, and an enclosed sludge disposal unit.	Exempt under ORCAA Rule 6.1(b)(2) based on system design and negligible partial vapor pressures
Line 3 Can Production Line		
Cupping Press (Cupper)	One unit	Exempt under ORCAA Rule 6.1(c)(81)
Bodymaker	Nine units	Exempt under ORCAA Rule 6.1(c)(81)
Can washer		NSR required
Natural gas-fired dryer	2.59 MMBtu/hr	Exempt under ORCAA Rule 6.1(c)(26)(ii) as the dryer is only used to remove water vapor
Rim Coating		NSR required
Exterior coating decorators	2 units	NSR required
Natural gas-fired pin ovens	2 units at 2.59 MMBtu/hr each	NSR required
Solvent Cleaning (decorators)		NSR required
Natural gas-fired inside bake oven	3.93 MMBtu/hr	NSR required
Necking System		Exempt under ORCAA Rule 6.1(c)(81)

Public notice and an opportunity to express interest in a NOC application is required for all NOC applications ORCAA receives. ORCAA accomplishes this by posting NOC fact sheets for all applications received on ORCAA's website. NOC fact sheets include a brief summary of the proposal and how to submit comments and/or request a public hearing. During the NOC application noticing period, interested persons may request a formal 30-day public comment period and may also request a public hearing. A formal 30-day public comment period is required if a NOC application generates significant public interest during the application noticing period, or if the project triggers an automatic 30-day comment period. ORCAA is required to hold a public hearing before ORCAA taking final action on any NOC application that generates significant public concern. This case triggers

an automatic public comment period and public hearing due to a significant increase in Volatile Organic Compound (VOC) emissions.

3. Facility Background

Crown commenced operations in Olympia in 1959 as a two-piece can manufacturing plant and registered as an air contaminant source in 1972. Crown has received numerous Notice of Construction (NOC) approvals from ORCAA for various equipment installations and operational changes. Table 2 provides a summary of all NOC applications submitted and their status.

Table 2. Permitting History with ORCAA

Permit # (date)	Description	Status
Regulatory Order – 1972	A Regulatory Order was issued in 1972 for installation of a fume incinerator. The fume incinerator was removed from service in the 1980s.	EQUIPMENT REMOVED
PSD-87-1	In 1987 Crown received approval for a major modification subject to federal air regulations for Prevention of Significant Deterioration (PSD). The modification entailed expanding the existing can coating operations and adding two can end manufacturing lines. PSD-87-1 was rescinded by Ecology after ORCAA issued a 249 ton/yr VOC limit in 00MOD063.	RESCINDED
91NOC455	On December 23, 1991, under NOC# 91NOC455, Crown received approval to install a 3rd can end line. Crown discontinued use of the end line in 1998.	EQUIPMENT REMOVED
95NOC641	On June 20, 1995, under NOC# 95NOC641, Crown received approval to install a new can washer. This order was superseded when Crown requested to change these limits under 16MOD1178.	SUPERSEDED
95NOC662	On October 5, 1995, under NOC# 95NOC662, Crown received approval to install a new gas fired boiler. Since issuance of this NOC, ORCAA has determined that natural gas boilers less than 5 MMBtu/hr are insignificant and do not require NSR. Crown requested rescission of this NOC on March 24, 2016 and ORCAA issued the rescission on April 1, 2016.	RESCINDED
97NOC040	In 1997 under NOC# 97NOC040, Crown received approval to install a new printing and over-varnish unit and PIN oven. This NOC was no longer valid after the issuance of 98NOC021 to replace all existing can lines with two new lines. The new printing and overvarnish unit installed in 1997 qualified as a new effected facility under 40 CFR Part 60 and triggered requirements in Subpart WW of 40 CFR Part 60.	EQUIPMENT REMOVED
98-ERC-018	In May of 1998, Crown received approval of emission reduction credits (ERC) for discontinuing use of end line #3. The ERC is no longer valid.	SUPERSEDED
98NOC021	In June of 1998, under NOC# 98NOC021, Crown received approval to replace the existing can coating lines at their facility in Olympia, Washington with two new lines. This action subjected all the can coating lines to requirements under 40 CFR Part 60, Subpart WW. This order was superseded by NOC# 21NOC1483.	SUPERSEDED

99NOC029	On April 27, 1999 Crown submitted an application for emission reduction credits for the closure of End Lines 1 and 2. On July 22, 1999 the request was withdrawn.	WITHDRAWN
99NOC033	On May 19, 1999, Crown submitted a request to retain a third can line as a swing line. The swing line was disabled in 2000 and was removed.	EQUIPMENT REMOVED
00MOD063	In August of 2000, under NOC# 00MOD063 Crown requested, and received approval of a 249 ton per year limit for facility wide emission of VOC. This limit established Crown as a minor stationary source with respect to PSD. As a result of this permitting action and at Crown's request, the Washington Department of Ecology rescinded PSD-87-1.	Applies facility-wide, will be rescinded by this Order of Approval on April 29, 2022
00NOC027	In July of 2000, under NOC# 00NOC027 Crown gained approval to use a 78% - 100% sulfuric acid in the can washer. The request for the use of concentrated sulfuric acid solution was in addition to their existing sulfuric acid and hydrogen fluoride usage. Crown requested that the concentrated sulfuric acid be limited to 5000 gallons per 12-month period.	EQUIPMENT REMOVED
00NOC034	In June 2000, under NOC# 00NOC034 Crown gained approval to replace three inside lacquer spray machines (6 units / line) with two new inside lacquer spray machines (7 units / line). This order was superseded by NOC# 21NOC1483.	SUPERSEDED
00NOC059	In August 2000, under NOC# 00NOC059 Crown gained approval to replace two cupping presses with two new cupping presses. At the time, the cupping presses were the bottleneck of the facility. The can production bottleneck then became the can washer, with a capacity of 3960 cans/min. This order was superseded by NOC# 21NOC1483.	SUPERSEDED
02NOC273	In May of 2003, under NOC# 02NOC273 Crown gained approval to install five rooftop stacks meant to exhaust air from equipment that previously exhausted to the building interior. This order was superseded by NOC# 21NOC1483.	SUPERSEDED
05NOC420	Through NOC# 05NOC420, Crown established a federally enforceable limit on emission of Hazardous Air Pollutants (HAPs). This limit establishes emissions of all HAPs to less than 10 tons per year of any single HAP and less than 25 tons per year of all combined HAPs.	Applies facility-wide, will be rescinded by this Order of Approval on April 29, 2022
08NOC622	On October 8, 2008, NOC# 08NOC622 was approved and granted approval to Crown to replace one of the two can washers with a new unit. The bodymakers now limit the production capacity of the plant to 3960 cans/min (18 units at 220 cans/min). This order was superseded when Crown requested to change these limits under 16MOD1178.	SUPERSEDED
16MOD1178	Crown received approval to modify their can washing solution limits.	Will be superseded by this Order of Approval
17NOC1261	Crown received approval to use a new inside spray lacquer and three specialty matte overvarnishes. This order was superseded by 19NOC1336.	SUPERSEDED
19NOC1336	Crown received approval for two new inside spray lacquers. This order was superseded by 20NOC1454.	SUPERSEDED
20NOC1454	Crown received approval to modify the % by weight of 2-butoxyethanol in overvarnish. This order was superseded by NOC# 21NOC1483.	SUPERSEDED

21NOC1483	Crown requests to replace three existing curing ovens, make modifications to the exhaust on Lines 1 and 2 LSM and Line 1 Printer Oven, an install a regenerative thermal oxidizer.	Will be superseded by this Order of Approval

4. Facility Description

Crown Cork & Seal Company (USA), Inc. is an aluminum beverage can manufacturing facility located at 1202 Fones Road in Olympia, Washington.

This description of the can coating process is primarily taken from Crown's NOC application, as indicated by the passages in italics.

4.1 Can Forming

The can forming steps begin when aluminum sheet metal is uncoiled and a cupper lubricant (a synthetic lubricant) is spread on the sheet with a roll applicator. The lubricated sheet is fed into a cupper press, which stamps out shallow aluminum cups sized for the desired can style being produced. The scrap aluminum left over from the punch press patterns is collected, bailed, and sent for recycling at a secondary aluminum smelter.

Cups from the initial can forming step are continuously fed through an extrusion process (bodymakers) that draws the can to a smaller diameter and irons the walls to the appropriate length for the can style being manufactured. This D&I process is facilitated by application of a drawing lubricant aqueous solution, which aids in the reshaping process (lubricating and cooling the aluminum can and bodymaker dies).

At the exit of the bodymaker, excess aluminum is trimmed from the top of the can body to level the uneven edge and obtain the desired height of the cans. This trimming operation is completed with a knife-like cutting tool that slices off approximately 1/4-inch of excess aluminum.

4.2 Can Washing

Once formed, the can bodies are processed in a can washer to remove any drawing lubricant solution and to treat the metal surface for improved adhesion of inks and coatings. The aluminum surface of the can body is slightly etched, and then a proprietary surfactant surface treatment (containing no VOC) is applied that improves adhesion of the coatings. The can washer is a multi-stage process where dilute acid wash and surface treatment aqueous solutions are sprayed on the cans via a series of nozzles within enclosed sections of the washer. Water rinse stages, including a final rinse with deionized water, follow the acidic washes and surfactant surface treatment stages. In the last stage, the cans pass through a natural gas-fired dryer. The cans exiting the dryer section ("bright cans") are then conveyed to the rim coater for application of a UV varnish to the bottom rim of the can prior to the decoration process step. The can washer stages that spray acidic or surface treatment aqueous solutions are vented to the atmosphere. The can dryer and one of the water rinse stages are ventilated, but this exhaust only contains products of combustion from the dryer burners, water vapor, and possibly minute amounts of acid fume / mist.

4.3 Exterior Decorating and Coating Process

Bright cans from the can washer are conveyed to a bottom rim coater where the bottom of the can body is coated with an ultra-violet (UV) rim varnish which reduces friction and improves the can mobility through the rest of the process. The rim varnish is cured with UV lamps before proceeding to the next step.

The exterior label and decoration are applied in the first section of the decorators. Inks are transferred from an ink well to a series of rollers and then applied to a rubber printing blanket roll. This printing blanket roll and the cans rotate on a mandrel at the same speed in opposite directions to print the individual color onto the can, which forms the exterior label. Isopropyl alcohol (IPA) is used as solvent to clean decorator units.

Over varnish is roll coated directly over the inks to provide a protective coating over the printed can label. This is a wet-on-wet coating application operation, with no curing step occurring between the printing and over varnish application stations on the decorator. Decorated cans are then transferred to a pin chain conveyer and fed to a curing oven. Once the ink and varnish has cured in the printing pin ovens, the cans are ready for the interior coating.

4.4 Interior Decorating and Coating Process

Decorated cans from the pin oven are conveyed into a bank of LSMs that apply the inside spray coating to the interior of the can. The function of this inside spray coating is to eliminate any contact between the beverage and the aluminum can surface. The inside spray coating is applied with spray nozzles positioned within the spinning can.

Lacquer is applied in three different weights (from lowest to highest): beer weight, beverage weight, and import weight.

Coated cans are conveyed from the LSMs to an in-feed table at the IBO. In the IBO, the cans proceed through the tunnel style oven on an open mesh conveyor to cure the interior coating. The inside spray VOCs driven off in the IBOs are collected and vented to the RTO for control.

4.5 Neck/Flanging Operations

As the final manufacturing step, the top section of the can is necked down to a smaller diameter and flanged to prepare the can to receive the end (lid). Necker machines decrease the diameter of the open end of the can by forcing it through two successive dies (one type on each machine). The spin flanger machines form the can shoulder into a smooth, slightly concave transition between the neck and can body, and then turns the neck back to create a mating surface for the can end during packaging of the beverage. Quality control, packaging, and shipping operations follow the manufacturing process.

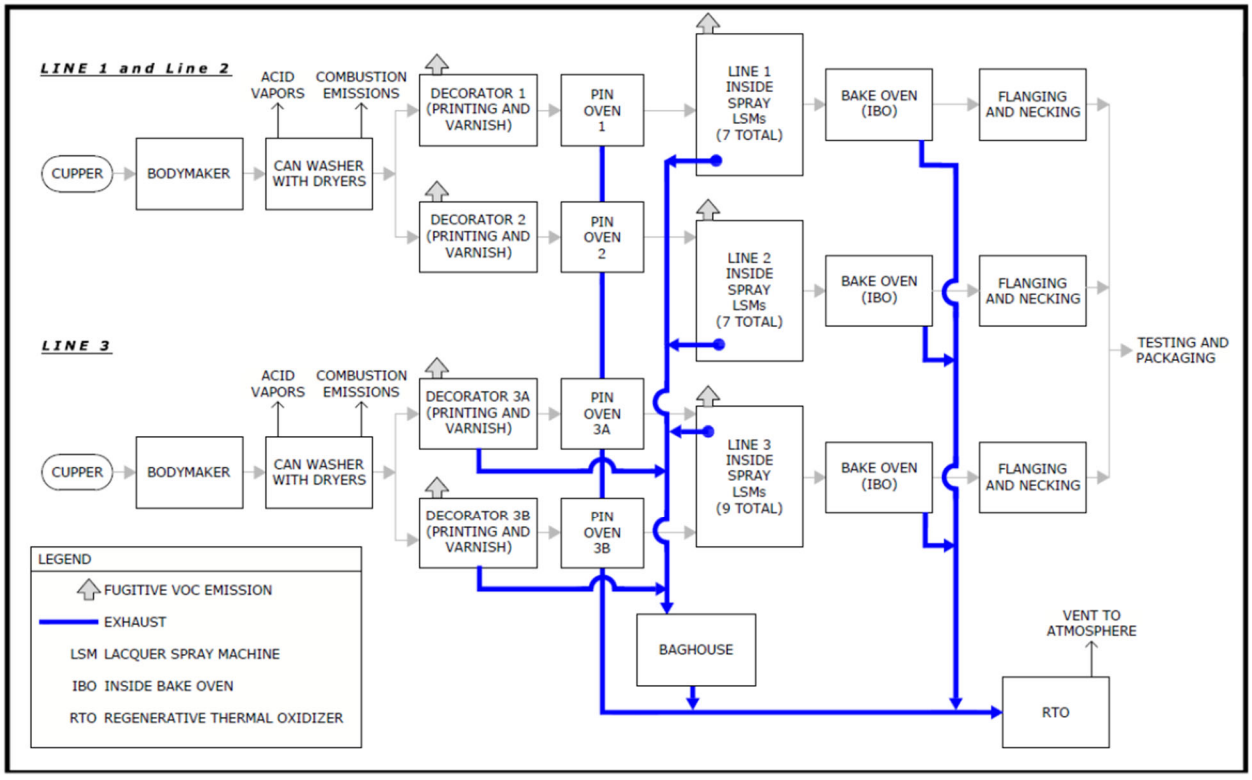
5. Project Description

Crown requests approval to install and operate a third can manufacturing line (Line 3) capable of producing 7-ounce to 16-ounce beverage cans at rate of up to 3,000 cans-per-minute. Line 3 will be a standalone can manufacturing line from the can forming process through the neck/flanging operations, as described in Section 4. The new line will include, but is not limited to: a can washer and natural gas-fired dryer, two exterior coating decorators, two natural gas-fired pin ovens, nine interior lacquer spray machines (LSMs), and one natural gas-fired inside bake oven. Crown proposes to capture emissions from the decorators, pin ovens, lacquer spray machines, and the inside bake oven and exhaust to the recently installed regenerative thermal oxidizer.

Crown also proposes to replace the two existing natural gas-fired boilers with three natural gas-fired hot water heaters (3.25 MMBtu/hr each) and remove the back-up washer and dryer. Crown will replace the existing wastewater pretreatment plant with a new pretreatment plant with two treatment trains. Crown is not proposing any changes to Can Coating Lines 1 and 2 or other existing equipment beyond that previously reviewed in NOC# 21NOC1483.

Crown currently has approval to operate the existing can coating lines on a limited basis when the RTO is undergoing maintenance. Captured emissions are allowed to bypass the RTO during these maintenance periods and be exhausted uncontrolled. This is referred to as “bypass operations” or “bypass” throughout this document. Crown proposes that Line 3 also be allowed to operate during these RTO bypass periods.

Figure 1. Process Flow Diagram (Normal RTO Scenario) (*From application for 20NOC1451)*



5.1 Can Coating Line 3 – Can Washer

Crown proposes to install a new can washer and natural gas-fired dryer (2.59 MMBtu/hr) serving the Line 3 only. The can washer and dryer will be installed in the location of the current backup can washer (a.k.a. the Line A or Line 1 can washer) which will be removed. The Line 3 Can Washer will be a Greenbank Torrent One washer with a capacity to process up to 3000 cans-per-minute. The washer has one stack for the etching zone. The Line 3 Can Washer has a separate Greenbank Tornado drying oven with a 2.59 MMBtu/hr natural gas-fired dryer.

> *The can washer stages that spray acidic or surface treatment aqueous solutions are vented to the atmosphere. The can dryer and one of the water rinse stages are ventilated, but this exhaust only contains products of combustion from the dryer burners, water vapor, and possibly minute amounts of acid fume / mist.* [NOC application]

Crown proposes to use the same can washing solutions it currently uses in the Line 1 and 2 can washer. The proposed can washing solutions (as purchased) contain up to 60% by weight sulfuric acid and up to 5% by weight hydrogen fluoride. The can washing solutions are applied in Stage 2 of the can washer which is equipped with a mist elimination system that condenses into the effluent or back into the tank.

5.2 Can Coating Line 3 – Rim Coater

Crown proposes to install a new rim coater for Can Manufacturing Line 3. The rim coater will be an UVio 36” Rim-Up Integrated Mass Rim Coating System that will roll apply a low-VOC rim varnish and cure the varnish using ultraviolet light.

> *Most of the organic materials in the rim varnish cross link in the UV curing step and are transformed into the cured coating film on the bottom rim. The rim varnish SDS is included in Appendix D. The maximum VOC emission rate of this UV coating is estimated to be less than 0.01 pounds of VOC per gallon (lbs VOC/gal) rim varnish applied. VOC emissions from the rim coat will be minimal, and thus are not directed to the proposed VOC air pollution control system.* [NOC application]

5.3 Can Coating Line 3 – Exterior Coating Decorators (two units)

Crown proposes to install two new exterior coating decorators serving Can Coating Line 3. The two units will operate in parallel. The decorators will be a Stolle Concord 24MRT-8 Color Decorator and CMbE Reformat Decorator that can process up to 2,000 cans-per-minute each.

Emissions from the decorators include volatile organic compounds (VOCs), hazardous air pollutants (HAPs), toxic air pollutants (TAPs) from any evaporation of the ink and overvarnish that occurs during application and prior to entering the curing oven.

> *A minor amount of ink mist generated by the Line 3 decorators is collected by a close capture system (the “ink mist collection system”) that also vents to the RTO. Fugitive*

ink/overvarnish emissions from the decorators are released uncontrolled through building rooftop vents." [NOC application]

During bypass of the RTO, emissions captured by the close capture system will be vented through a rooftop stack.

5.4 Solvent Cleaning – Decorators

Isopropanol (IPA) is used for wash-up of the printing heads on the decorators and in parts washers to clean parts removed from the decorators.

Crown estimates that up to 40% of the IPA dispensed for this wash-up is retained in shop towels used to wipe clean printing rolls. This estimate was based on data from another Crown plant that centrifuges solvent from shop towels for recovery in a distillation system.

During a changeover, the Line 3 decorator close capture hoods are required to be lifted open as they would prevent Crown employees from completing the printing head changeover. The capture system is still operating during the changeover and would capture some of the IPA solvent emissions, but it is difficult to quantify how much IPA would be collected and controlled by the RTO.

To be conservative, Crown's emission calculations assume that 100% of the isopropanol dispensed for washup is emitted as fugitive and none is retained in the shop towels or collected by the control system. Fugitive IPA emissions are released through two rooftop vents.

5.5 Can Coating Line 3 – PIN ovens (two units)

Crown proposes to install two natural gas-fired PIN ovens serving Can Coating Line 3. The two units will operate in parallel and each have burners with a rated capacity of 2.59 MMBtu/hr.

PIN ovens are used to cure the inks and overvarnish applied to the exterior of the cans in the decorator. In addition to products of combustion from the combustion of natural gas, emissions include volatile organic compounds (VOCs), hazardous air pollutants (HAPs), toxic air pollutants (TAPs) from the evaporation and curing of the ink and overvarnish. Previous stack testing has shown that, in addition to the VOC, HAP, and TAP components found in the inks and overvarnish, formaldehyde is created during the curing process.

All the exhaust from the PIN ovens will be routed to the RTO during normal operations or through the PIN oven stacks when the RTO is bypassed (bypass operations).

5.6 Can Coating Line 3 – Lacquer Spray Machines (nine units)

Crown proposes to install nine interior lacquer spray machines serving Can Coating Line 3. The units will operate in parallel. The lacquer spray machines (LSMs) will be CMB Engineering 3200 Dual Turret LSM which can process up to 350 cans-per-minute each. The lacquer will be applied using Nordson Airless Spray Technology and particulate overspray will be controlled by fabric filters with a minimum 99% filtration efficiency. The

fabric filters will be installed on the LSM housing exhaust duct as described by the NOC application below:

> *The inside spray coating is applied with spray nozzles positioned within the spinning can. This application technique yields a very high transfer efficiency, which is estimated to be in excess of 94%. The minor amount of overspray generated in this process step is pulled through fabric filters on the LSM housing exhaust duct to filter the overspray PM.*
>
> *Crown conservatively estimates that 95% of this overspray is directed to the LSM filters for control, with the remaining 5% dropping out in the LSM enclosure as overspray deposition. These filtration devices remove dried coating droplets before directing the exhaust to the RTO for VOC control. The very high overspray PM control is achieved between the high transfer efficiency, 95% capture of overspray, and high filtration efficiency of the LSM filters. Moreover, since the majority of the overspray PM either remains on filtration media in the PM control devices vented to the VOC control system, almost all VOCs evaporating from the overspray are still collected and directed to the RTO for final VOC destruction.*
>
> *Coated cans are conveyed from the LSMs to an in-feed table at the IBO. The conveyors have a hood and vacuum upender that prevents the cans from falling off the conveyer. Fugitive emissions from the LSM overspray, the conveyer hood, and vacuum blower are vented to the atmosphere.*

Emissions from the LSMs include volatile organic compounds (VOCs), hazardous air pollutants (HAPs), toxic air pollutants (TAPs) from any evaporation of the lacquer that occurs during application and prior to entering the curing oven.

Line 3 will be equipped with a respray function to touch up minor defects on the interior spray. The respray process uses a “super sorter” in conjunction with some of the Line 3 lacquer spray machines. Therefore, when the respray operation is in service, Line 3 will not operate at full production speeds.

5.7 Can Coating Line 3 – Inside Bake Oven (IBO) (one unit)

Crown proposes to install one natural gas-fired inside bake oven serving Can Coating Line 3. The unit will have burners with a rated capacity of 3.93 MMBtu/hr.

Inside bake ovens (IBOs) are used to cure the inside spray lacquer applied to the interior of the cans. Each IBO has three heating zones and one cooling zone. In addition to products of combustion from the combustion of natural gas, emissions include volatile organic compounds (VOCs), hazardous air pollutants (HAPs), toxic air pollutants (TAPs) from the evaporation and curing of the inside spray lacquer. Previous stack testing has shown that, in addition to the VOC, HAP, and TAP components found in the inside spray lacquer, formaldehyde is created during the curing process and is exhausted from the IBOs.

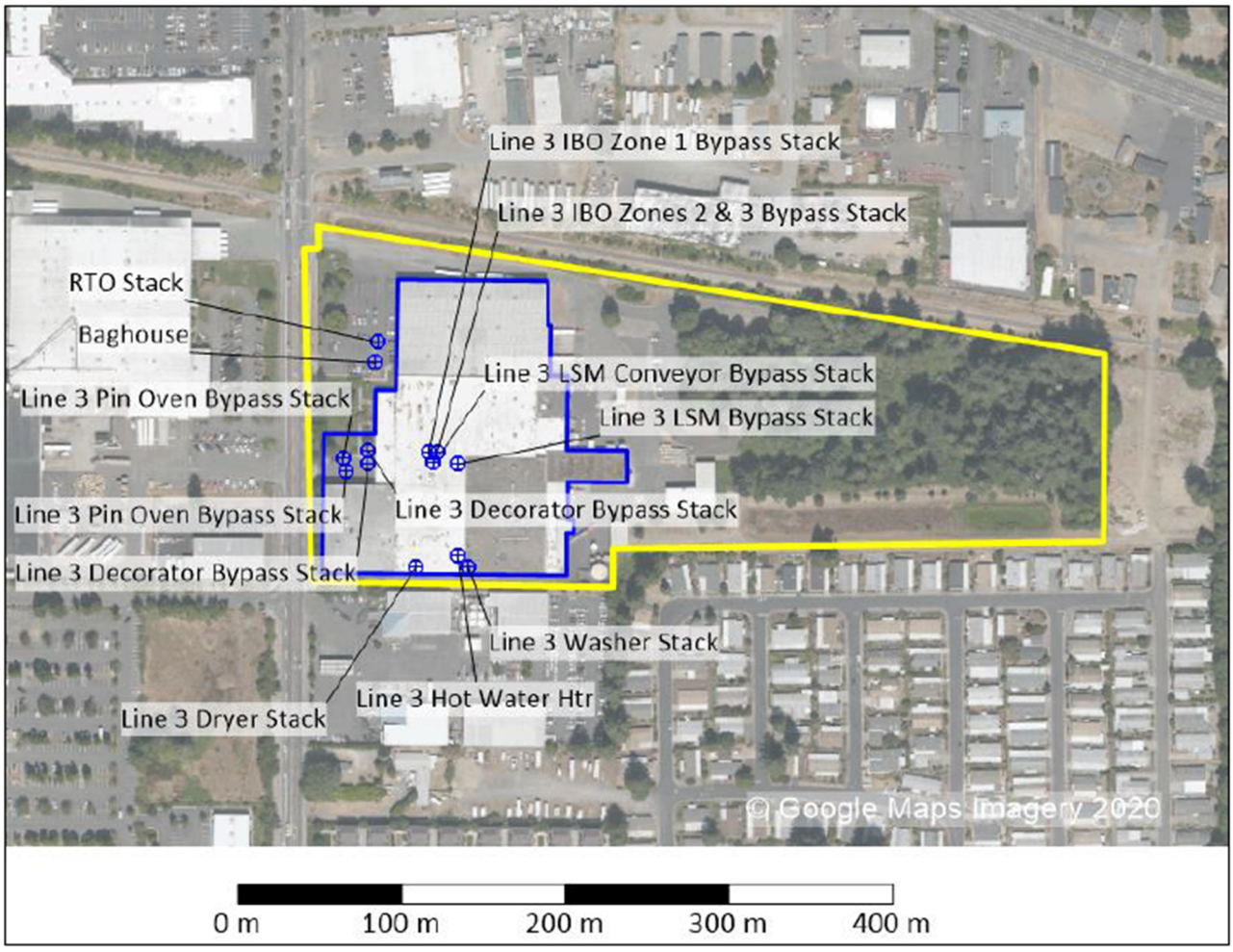
All the exhaust from the IBO will be routed to the RTO during normal operations or through the oven stacks during bypass operations (the IBO has two exhaust stacks).

5.8 Regenerative Thermal Oxidizer with Baghouse

Crown proposed to use the recently installed regenerative thermal oxidizer (RTO) to reduce emissions of volatile organic compounds (VOCs) and toxic air pollutants (TAPs) from the new Line 3 can coating operations including the decorators, PIN ovens, lacquer spray machines and associated conveyors, and the inside bake oven. The ventilation system will capture all VOC emissions from the curing ovens and direct them to the RTO. Overall, Crown states that a minimum of 84% of all VOC emissions from the Line 3 exterior can coating process (ink/overvarnish) and interior can coating process (inside lacquer) will be captured and sent to the RTO.

The existing RTO is sufficiently sized to control emissions from Line 3 can coating operations. The RTO is equipped with a natural gas-fired burner (up to 15 MMBtu/hr) and the system includes a particulate cartridge filter system (baghouse) to prevent solids build-up in the RTO heat exchange media as a fire safety precaution.

Figure 2: Crown Cork and Seal – Location of Line 3 Equipment
(*From application addendum for 20NOC1451)*



6. Emissions

Emission estimates for the proposed new can production line were provided in Crown's application and are summarized in Table 5. The emissions rates reflect:

- Can production is based on maximum line speed of 3,000 cans-per-minute for each line and a 90% production efficiency to account for changeovers and other downtime (Line 3 maximum of 1.419120 billion cans per year).
- Emissions of hydrofluoric acid and sulfuric acid from can washing were calculated using emission factors developed from a stack test of the Reynolds Torrance Can Plant in California circa 1992.
- Usage limits and composition limits are listed in Table 3 as provided in Crown's application. Emissions were calculated based on worst-case composition of each coating type. These are reflected as limits in Condition 11 of the Order of Approval as as-reviewed limits. Line 3 annual usage limits were added to existing Line 1 and 2 usage limits.
- Formaldehyde is created when the inks, overvarnish, and inside spray lacquer are cured in the curing oven (cure HAP). Crown used an emission factor in terms of pounds of formaldehyde per million cans based on the more recent source test from this facility (2017).
- Bypass emission rates in Tables 5-8 are reflective of Can Coating Line 3 operating at 2,000 cans-per-minute (as proposed in the application addendum) and formaldehyde emissions from curing of no more than 8.9 lbs per million cans (1.07 lb/hr). This formaldehyde emission rate is lower than previously tested; therefore, Crown will be required to conduct a source test on Line 3 to verify emissions are not greater than 1.07 lb/hr prior to operating Line 3 when the RTO is in bypass mode.
- Crown determined that the maximum solvent usage for cleaning the decorators on Line 3 would be 2.6 gallons of isopropanol per hour. Crown conservatively assumed 100% of the isopropanol used is emitted as fugitive although a portion of the isopropanol is retained in the shop towels and a portion will be captured by the decorators capture system which vents to the RTO.
- Emission calculations from Lines 1 and 2 curing oven replacement project and installation of the RTO reviewed under NOC# 21NOC1483 are described in the Final Determination and NOC application for that NOC.

Facility-wide potential emissions are summarized in Table 6. Facility-wide emissions of VOC, ethylene glycol monobutyl ether, and formaldehyde during both normal and bypass operations will decrease (on both an annual an hourly basis) in comparison to historical emissions due to the addition of the regenerative thermal oxidizer. Facility-wide limits on VOC and formaldehyde are proposed in Conditions 3 and 4 of the Order of Approval.

7. Administrative Requirements for NOC Applications

NOC applications are subject to filing fees according to ORCAA Rule 3.3(b) and may incur additional NOC processing fees at an hourly rate according to ORCAA Rule 3.3(c). Applicable NOC filing fees for Crown's NOC application were paid prior to ORCAA commencing processing of the application. Additional NOC processing fees may apply and will be determined and assessed prior to issuing a Final Determination and the Approval Order (aka: Air Permit).

NOC applications are subject to a 15-day public notice and comment period. Public notice on Crown's NOC application was posted on ORCAA's website on August 12, 2020. The timeframe for filing comments expired on August 27, 2020. ORCAA received an email regarding odors from existing operations on the bike trail. The email was forwarded to compliance staff to be responded to as a complaint.

As emissions from the proposed can manufacturing line will cause a significant net increase in emissions (ORCAA Rule 6.1.3(b)(1)), this Preliminary Recommendation is being noticed for a 30-day public comment period in accordance with ORCAA Rule 6.1.3(c). If significant public interest is expressed during the public comment period, a public hearing will be scheduled by ORCAA and the public comment period will be extended through the hearing date.

Table 3. Line 3 Coating Usage and Composition

	Pollutant Class	Units	Limit or Maximum Proposed	Inks[3]	Over-varnishes	Inside Lacquers
Application Rate		Gal/1000 cans		0.0089	0.07	0.2
Annual Usage		Gals/Yr	Limit	12,332	97,070	277,344
Maximum volume % solids			Maximum proposed	83.9%	35.4%	18.5%
Subpart WW limit		lb/ gal solids	Limit	NA	3.84	7.43
VOC	Criteria	lb/ gal solids	Maximum proposed	1.5	2.9	6.5
Ethylene glycol monobutyl ether	TAP	Wt %	Limit	None	7.4%	6.8%
Ethylene glycol monohexyl ether	HAP[2]	Wt %	Limit	None	None	0.5%
Formaldehyde[1]	HAP & TAP	Wt %	-	Trace	-	-

[1] Formaldehyde is not a constituent of the coatings (except for trace amounts found in the inks) but is formed during the curing process.
[2] Ethylene glycol monohexyl ether is a glycol ether on EPA's HAP list.
3 Inks do not contain any HAPs or TAPs.

8. SEPA Review

The State Environmental Policy Act (SEPA) under Chapter 197-11 WAC is intended to provide information to agencies, applicants, and the public to encourage the development of environmentally sound proposals. The goal of SEPA is to assure that significant impacts are mitigated.

The City of Olympia issued a SEPA Determination of Nonsignificance on August 28, 2020.

Table 4. Emission Unit[1] Specifications (new equipment in bold)

EU#	Emission Units	Approved Specifications	Air Pollution Controls	Alternative Operating Scenario	Stack/Exhaust
CAN COATING LINES 1 AND 2					
EU1	Line B Can Washer (Line 1 and 2)	Cincinnati Industrial Machinery (CIM) Model #BS1122422-88 C40-2 5000 cans per minute[2]	Can washing solution limitations	N/A	Washer 1A
EU2	Line B Can Washer Natural Gas-Fired Dryer (Line 1 and 2)	Eclipse 440 AH dryer 2 Natural gas-fired burners 8.8 MMBtu/hr maximum heat input	None	N/A	Washer/Oven 1A Washer/Oven 1B Stack Height: 13.7 m
~~EU3~~	~~Line A Washer (backup)~~	~~▪ Cincinnati Industrial Machinery (CIM) Model BS112528 C87~~ ~~▪ 4000 cans per minute[2]~~ ~~Integrated 7.2 MMBtu/hr natural gas-fired dryer~~	~~Can washing solution limitations~~	~~Backup unit; Not operational at same time as Line B washer~~	~~Washer 2~~ ~~Washer/Oven 2A~~ ~~Washer/Oven 2B~~
EU4	Rim Coater with UV Cure (Line 1 and 2)	U.V. Fusion U.V. System Model DRR-120	▪ Use of 40 CFR Part 60 Subpart WW-compliant coatings and low-VOC coatings. ▪ Use of UV curing.	N/A	None
EU5	Solvent Cleaning	▪ Parts Washers (isopropanol) ▪ Hand cleaning of decorator units (isopropanol) ▪ Machine/Millwright shops (naphtha)	Pollution prevention	N/A	Roof vent
CAN COATING LINE 1					
EU6	Line 1 Decorator Unit	Concord Decorator-Alcoa Serial # D3008 1900 cans-per-minute[2]	▪ Use of low-VOC inks. ▪ Use of low-VOC, 40 CFR Part 60 Subpart WW-compliant over-varnish. ▪ Roll on application.	N/A	Roof vent

EU7	Line 1 Printer Oven (PIN)	▪ OSI Model# 1600-CPM SINGLE ZONE ▪ 2 Natural gas-fired burners ▪ 5 MMBtu/hr maximum heat input	All exhaust routed to RTO	RTO bypass allowed for RTO maintenance purposes up to 200 hours per year; cannot operate with any other PIN in RTO bypass mode	Normal operation: RTO Stack During bypass: PIN 1A PIN 1B Height: 14.3 m Diameter: 0.38 m Flowrate: ~5,000 CFM Temp: ~448 K
EU8	Line 1 Lacquer Spray Machines (LSM)	▪ Fisher Model 102MSH MARK3 ▪ 7 units @ 350 cans per minute[2] ▪ High transfer efficiency spray technique (>94%)	▪ Use of 40 CFR Part 60 Subpart WW-compliant coatings. ▪ Filters with 99% filtration efficiency on exhaust ▪ Capture systems on LSM boxes and conveyor to IBO. Both routed to RTO, except during bypass.	N/A	Normal operation: RTO Stack During bypass: LSM 1A
EU9	Line 1 Internal Bake Oven (IBO)	▪ Greenbank NIBO Serial# 15241 ▪ High efficiency natural gas-fired burners - 3.93 MMBtu/hr maximum heat input ▪ 3,000 cans-per-minute[2] ▪ Operating Temp – 395-400F ▪ 3 heating zones – 60 seconds each ▪ Cooling zone – 30 seconds	All exhaust routed to RTO	RTO bypass allowed for RTO maintenance purposes up to 200 hours per year; cannot operate with any other IBO in RTO bypass mode	Normal operation: RTO Stack During bypass: Zone 1 Bypass Stack Height: 14.0 m Diameter: 0.3 m Flowrate: ~3,000 CFM Temp: ~383 K Zone 2 Bypass Stack Height: 14.0 m Diameter: 0.45 m Flowrate: ~5,900 CFM Temp: ~453 K

CAN COATING LINE 2					
EU10	Line 2 Decorator Unit	Concord Decorator-Alcoa Serial# 307301 1900 cans-per-minute[2]	▪ Use of low-VOC inks. ▪ Use of low-VOC, 40 CFR Part 60 Subpart WW-compliant over-varnish. ▪ Roll on application ink and overvarnish.	N/A	Roof vent
EU11	Line 2 Printer Oven (PIN)	▪ Greenbank "Pintec One – Omega" ▪ High efficiency natural gas-fired burner - 2.59 MMBtu/hr maximum heat input ▪ 2,400 cans-per-minute[2] ▪ Operating Temp – 395 – 415 F ▪ Time in oven - 9.16 seconds	All exhaust routed to RTO	RTO bypass allowed for RTO maintenance purposes up to 200 hours per year; cannot operate with any other PIN in RTO bypass mode	Normal operation: RTO Stack During Bypass: Bypass Stack Height: 14.3 m Diameter: 0.38 m Flowrate: ~5,000 CFM Temp: ~448 K
EU12	Line 2 Lacquer Spray Machines (LSM)	▪ Fisher Model 102MSH MARK3 ▪ 7 units @ 350 cans per minute[2] ▪ High transfer efficiency spray technique (>94%)	▪ Use of 40 CFR Part 60 Subpart WW-compliant coatings. ▪ Filters with 99% filtration efficiency on exhaust ▪ Capture systems on LSM boxes and conveyor to IBO. Both routed to RTO, except during bypass.	N/A	Normal operation: RTO Stack During bypass: LSM 2A

EU13	Line 2 Internal Bake Oven (IBO)	▪ Greenbank Serial# 15241 ▪ High efficiency natural gas-fired burners - 3.93 MMBtu/hr maximum heat input ▪ 3,000 cans-per-minute[2] ▪ Operating Temp – 395-400F ▪ 3 heating zones – 60 seconds each ▪ Cooling zone – 30 seconds	All exhaust routed to RTO	RTO bypass allowed for RTO maintenance purposes up to 200 hours per year; cannot operate with any other IBO in RTO bypass mode	Normal operation: RTO Stack During Bypass: Zone 1 Bypass Stack Height: 14.0 m Diameter: 0.3 m Flowrate: ~3,000 CFM Temp: ~383 K Zone 2 Bypass Stack Height: 14.0 m Diameter: 0.45 m Flowrate: ~5,900 CFM Temp: ~453 K
REGENERATIVE THERMAL OXIDIZER					
EU14	Regenerative Thermal Oxidizer	▪ Anguil Model 550 ▪ Three-bed regenerative thermal oxidizer ▪ Natural-gas fired – up to 15 MMBtu/hr ▪ Guaranteed 98 control efficiency for VOC[3] ▪ Combustion chamber temperature: 1550 – 1700 F	-Low NOx Burners -Supplemental Fuel Injection System	N/A	Height: 18.3 m Diameter: 1.83 m Flow: 55,000 SCFM Temp: 350 F
	Baghouse/Dust Collector (part of RTO system)	▪ Donaldson Torit CFE 5-80 ▪ 25,000 SCFM ▪ Pulse jet cartridge filter system for EU8 & EU12		Not operational during bypass	Exhausts to RTO
CAN COATING LINE 3					
EU15	**Line 3 Can Washer**	**▪ Greenbank Torrent One ▪ 3000 cans per minute**	**▪ Can washing solution limitations ▪ Mist elimination system (Stage 2)**	N/A	**Stack: Height: 17.4 m Diameter: 0.46 m Exit Velocity: 12.36 m/s**
EU16	**Line 3 Rim Coater with UV Cure**	**UVio 36” Rim-Up Integrated Mass Rim Coating (IMRC) System**	**▪ Use of 40 CFR Part 60 Subpart WW-compliant coatings and low-VOC coatings. ▪ Use of UV curing.**	**N/A**	**None**

EU17	**Line 3 Decorator Unit #31**	▪ **Stolle Concord 24MRT-8 Color Decorator** ▪ **2,000 cans-per-minute** ▪ **8-gallon overvarnish tank**	▪ **Use of low-VOC inks.** ▪ **Use of low-VOC, 40 CFR Part 60 Subpart WW-compliant over-varnish.** ▪ **Roll on application ink and overvarnish.** ▪ **Close capture system on ink and overvarnish application areas routed to RTO**	**RTO bypass allowed for RTO maintenance purposes up to 200 hours per year; cannot operate with any other decorator in RTO bypass mode**	**Normal operation: RTO Stack** **During Bypass: Line 3 Decorator Bypass Stack** **Normal/bypass: Fugitives through two decorator room vents: Height: 13.7 m Diameter: 0.91 m Exit velocity: 3.59 m/s**
EU18	**Line 3 Decorator Unit #32**	▪ **CMbE Reformat** ▪ **2,000 cans-per-minute** ▪ **8-gallon overvarnish tank**	▪ **Use of low-VOC inks.** ▪ **Use of low-VOC, 40 CFR Part 60 Subpart WW-compliant over-varnish.** ▪ **Roll on application ink and overvarnish.** ▪ **Close capture system on ink and overvarnish application areas routed to RTO**	**RTO bypass allowed for RTO maintenance purposes up to 200 hours per year; cannot operate with any other decorator in RTO bypass mode**	**Normal operation: RTO Stack** **During Bypass: Line 3 Decorator Bypass Stack** **Normal/bypass: Fugitives through two decorator room vents: Height: 13.7 m Diameter: 0.91 m Exit velocity: 3.59 m/s**
EU19	**Line 3 Decorator Solvent Cleaning**	▪ **Parts Washers (isopropanol)** ▪ **Hand cleaning of decorator units (isopropanol)**	▪ **Pollution prevention** ▪ **Capture system operating during cleaning**	**N/A**	**Two decorator room vents: Height: 13.7 m Diameter: 0.91 m Exit velocity: 3.59 m/s**

EU20	**Line 3 Printer Oven (PIN) #31**	▪ **Greenbank Pintec One – Omega** ▪ **High efficiency natural gas-fired burner - 2.59 MMBtu/hr maximum heat input** ▪ **2,400 cans-per-minute[2]** ▪ **Operating Temp – 395 – 415 F** ▪ **Time in oven - 9.16 seconds**	**All exhaust routed to RTO**	**RTO bypass allowed for RTO maintenance purposes up to 200 hours per year; cannot operate with any other PIN in RTO bypass mode**	**Normal operation:** **RTO Stack** **During Bypass:** **PO311** **Bypass Stack** **Height: 14.3 m** **Diameter: 0.38 m** **Flowrate: ~5,000 CFM** **Temp: ~448 K**
EU21	**Line 3 Printer Oven (PIN) #32**	▪ **Greenbank Pintec One – Omega** ▪ **High efficiency natural gas-fired burner - 2.59 MMBtu/hr maximum heat input** ▪ **2,400 cans-per-minute[2]** ▪ **Operating Temp – 395 – 415 F** ▪ **Time in oven - 9.16 seconds**	**All exhaust routed to RTO**	**RTO bypass allowed for RTO maintenance purposes up to 200 hours per year; cannot operate with any other PIN in RTO bypass mode**	**Normal operation:** **RTO Stack** **During Bypass:** **PO312** **Bypass Stack** **Height: 14.3 m** **Diameter: 0.38 m** **Flowrate: ~5,000 CFM** **Temp: ~448 K**
EU22	**Line 3 Lacquer Spray Machines (LSM)**	▪ **CMbE – 3200 Dual Turret LSM** ▪ **9 units @ max 350 cans per minute** ▪ **Nordson Airless spray technology** ▪ **Includes Respray/Supersorter**	▪ **Use of 40 CFR Part 60 Subpart WW-compliant coatings.** ▪ **Filters with 99% filtration efficiency on exhaust** ▪ **Capture systems on LSM boxes and conveyor to IBO. Both routed to RTO, except during bypass.**	**N/A**	**Normal operation:** **RTO Stack** **During bypass:** **Line 3 LSM Bypass Stack** **Line 3 LSM Conveyor Bypass Stack**

EU23	**Line 3 Internal Bake Oven (IBO)**	**▪ Greenbank NIBO Serial# 15241 ▪ High efficiency natural gas-fired burners - 3.93 MMBtu/hr maximum heat input ▪ 3,000 cans-per-minute[2] ▪ Operating Temp – 395-400F ▪ 3 heating zones – 60 seconds each ▪ Cooling zone – 30 seconds**	**All exhaust routed to RTO**	**RTO bypass allowed for RTO maintenance purposes up to 200 hours per year; cannot operate with any other IBO in RTO bypass mode**	**Normal operation: RTO Stack During Bypass: IBO321 Zone 1 Bypass Stack Height: 14.0 m Diameter: 0.3 m Flowrate: ~3,000 CFM Temp: ~383 K IBO322 Zone 2 Bypass Stack Height: 14.0 m Diameter: 0.45 m Flowrate: ~5,900 CFM Temp: ~453 K**
INSIGNIFICANT EMISSION UNITS[1]					
	Diesel Emergency Fire Pump Engine	▪ Clarke Model JUGH-UFG8 149 hp, 9.5 gal/hr	None		Fire Pump Stack
	Line 1 and 2 Bodymakers	-18 units at 220 cans/min -3960 cans/minute			
	Propane Gas Tank	500 gallons			
	Space Heating	Eighteen natural gas-fired space heaters 80,000 Btu/hr each			
	Storage and Dispense of Acid Solution	Stored in 200-gallon, enclosed, plastic totes			
	Line 3 Can Washer Drying Oven	**Greenbank "Tornado" 2.59 MMBtu/hr natural gas-fired dryer 3,000 cans-per-minute**			**DRY361 Height: 13.7 m Diameter: 0.45 m**
	Hot Water Heater Line 1/2	**Unilux QCCS-SKI-200828A-D-NS Natural gas-fired hot water heater 3.25 MMBtu/hr**			**HWH151 Height: 13.7 m Diameter: 0.4 m**
	Hot Water Heater Standby[4]	**Unilux QCCS-SKI-200828A-D-NS Natural gas-fired hot water heater 3.25 MMBtu/hr**			**HWH251 Height: 13.7 m Diameter: 0.4 m**

	Hot Water Heater Line 3	**Unilux QCCS-SKI-200828A-D-NS Natural gas-fired hot water heater 3.25 MMBtu/hr**	**HWH351 Height: 13.7 m Diameter: 0.4 m**
	~~Cleaver Brooks Boiler~~	~~4.0 MMBtu/hr Natural gas-fired~~	
	~~Bryan Boiler~~	~~Model RV400-W-FDG, Serial# 68319 3.2 MMBtu/hr natural gas-fred~~	
	Cupper Press System	**Minster Stolle DACH-165**	
	Bodymakers & Trimmers	**CMB 5610 – Fixed 24.5" Stroke**	
	Necker	**CMB 3400**	
	Lacquer storage tank	10,000 gallons	
	Over-varnish storage tank	10,000 gallons	
	~~Wastewater Treatment System~~		
	Wastewater Pretreatment System	**Two treatments trains: -60 GPM each -No aeration processes. The process units includes oil coalescing separator, reaction tanks, clarifiers, neutralizing tanks, and filter press. -Additives/reagents will all be in liquid form. -Sludge disposal unit will be completely enclosed.**	
	Waste Oil Tank	8000 gallons	
	Lime Storage Silo	1963 ft^3	

[1]Emission unit designations above are specific to the New Source Review and do not affect emission unit designations in Crown's Air Operating Permit. For example, the diesel fire pump engine did not require New Source Review due to its size and are therefore designated as insignificant emission units for the purposes of this permit. However, emergency engines are significant emission units under the Title V Air Operating Permit program as they are subject to federal applicable requirements.
[2]Per email from Michael Herron, Crown on 4/6/21 – The production capacity of Lines 1 and 2 are limited by the printers at 1900 cans per minute for each line.
[3]Guarantee is for total gaseous organic concentration as measured by Method 25A.
[4]Standby hot water heater only used when one of the other hot water heaters is not operating. Changes to this operational schedule may require additional modeling to assure compliance with NAAQS (see Section 11).

Table 5: Project Emissions at PTE

	PM (tpy)	NOx (tpy)	CO (tpy)	SO2 (tpy)	VOC (tpy)	Form-aldehyde (lb/yr)	Iso-propanol (lb/yr)	EGBE[4] (lb/yr)	EGHE[5] (lb/yr)	Hydro-fluoric acid (lb/yr)	Sulfuric acid (lb/yr)	Total TAPs[1] (tpy)	Total HAPs (tpy)
20NOC1451 PROJECT – Installation of 3rd can production line													
Line 3 Can Washer	0	0	0	0	0	0	0	0	0	126.3	369.0	0.25	0.25
Rim Coater	0	0	0	0	0.01	0	0	0	0	0	0	0	0
Line 3 Coating & Curing[3]	0.22	0	0	0	44.8	2,294	0	43,379	2,227	0	0	22.8	2.5
Line 3A PIN Oven[2]	0.08	1.1	0.93	0.007	0.06							0.07	0.07
Line 3B PIN Oven[2]	0.08	1.1	0.93	0.007	0.06								
Line 3 IBO[2]	0.13	1.7	1.41	0.010	0.09								
Solvent Cleaning	0	0	0	0	32.7	0	65,442	0	0	0	0	32.7	0
PROJECT TOTAL	0.5	3.9	3.3	0.023	77.7	2,294	65,442	43,379	2,227	126.3	369.0	55.9	2.6
21NOC1483 PROJECT – Replacement of three curing ovens in Can Coating Lines 1 and 2 and installation of RTO													
Line 1 & 2 Coating & Curing[3]	0.25	0	0	0	66.7	2,299	0	71,249	3,811	0	0	36.8	3.1
Line 2 PIN Oven[2]	0.08	1.1	0.93	0.007	0.06							0.21	0.21
Line 1 IBO[2]	0.13	1.7	1.41	0.007	0.09								
Line 2 IBO[2]	0.13	1.7	1.41	0.010	0.09								
RTO	0.49	4.7	2.4	0.038	0.35								
PROJECT TOTAL	1.1	9.2	6.2	0.07	67.3	2,299	0	71,249	3,811	0	0	37.0	3.3
OVERALL TOTAL	1.6[6]	13.0	9.4	0.1	140.7	4,378	65,442	111,301	5,910	126.3	369.0	91.1	5.7

[1]Totals emissions from pollutants designated as TAPs in Chapter 173-460 WAC except nitrogen dioxide, carbon monoxide, sulfur dioxide.
[2]Emissions from combustion of natural gas. Curing emissions from the ovens are included in the coating line emissions.
[3]Coating & Coating includes application of ink, overvarnish, inside spray lacquer and emissions associated with curing.
[4]EGBE – Ethylene glycol monobutyl ether (TAP)
[5]EGHE – Ethylene glycol monohexyl ether (HAP)
[6]Overall Total does not equal project totals for all pollutants as the overall totals were calculated assuming worst-case bypass scenario overall. Project totals were calculated assuming worst-case bypass for that project.

Table 6: Facility-Wide Potential to Emit (Tons/Year)

Proposed Facility-wide Emissions by Process Type						Facility-wide Emissions	
Pollutant	**Combustion Units[1]**	**Can Washing**	**Can Coating Lines**	**Solvent Usage**	**Total**	**Historical (2020)[2]**	**Current (Post-21NOC1483)[3]**
CO	17.7	-	-	-	**17.7**	11.2	11.1
NO_x	21.0	-	-	-	**21.0**	13.3	15.0
PM	1.9	-	0.5	-	**2.3**	17.8	1.6
SO_2	0.15	-	-	-	**0.1**	0.1	0.1
VOC	1.3	-	108.0	71.1	**180.5**	249	110.3
HAP	0.5	0.6	5.1	-	**6.2**	19.2	3.9
Formaldehyde	0.02	-	2.2	-	**2.2**	9.9	1.3
Ethylene glycol monobutyl ether	-	-	55.7	-	**55.7**	115	37.3
Isopropyl alcohol	-	-	-	71.1	**71.1**	42.6	42.6
Hydrofluoric acid	-	0.14	-	-	**0.14**	0.08	0.08
Sulfuric acid	-	0.42	-	-	**0.42**	0.23	0.23
Phenol	-	-	0	-	**0**	2.5	0

[1] Combustion unit emissions include NSR exempt units to accurately compare to pre-proposal PTE. Only emissions from two hot water heaters are included as one is a backup unit.

[2] Potential to emit prior to changes proposed in 20NOC1451 or 21NOC1483. NSR exempt units included in facility-wide totals. As one can washer and one hot water heater are backup units, the larger of each unit is included in the PTE calculations.

[3] Potential to emit incorporating changes proposed in 21NOC1483 for existing Can Coating Lines 1 and 2 (replacement of three of four existing curing ovens, modification of exhaust system on remaining curing oven and lacquer spray machine, and installation of a regenerative thermal oxidizer)

Table 7: Results of First Tier Review - TAP Emission Rates & Net Emissions Increases (pounds/averaging time)

Toxic Air Pollutant	CAS	SQER Averaging Time	Past Actuals	Operating Scenario	Potential To Emit[1]		Net Change[10]	SQER[11]	Modeling Required?[12]
					Line 1 & 2 Project	Line 3			
Arsenic	-	Year	NA[3]	Normal/Bypass	0.043	0.016	0.06	0.049	Yes
Cadmium	-	Year	NA[3]	Normal/Bypass	0.239	0.086	0.32	0.039	Yes
Chromium VI	-	Year	NA[3]	Normal/Bypass	0.012	0.004	0.017	0.00065	Yes
Copper[2]	-	1-hr	NA[3]	Normal/Bypass	0.000021	0.000008	0.000021	0.19	No
7,12-Dimethylbenz[a]anthracene	57-97-6	Year	NA[3]	Normal/Bypass	0.0035	0.0012	0.0047	0.0014	Yes
Ethylene glycol monobutyl ether (EGBE)	111-76-2	24-hr	798.5[4]	Normal	211.6	123.1	-463.8	6.1	No
				Bypass[8]	399.2	**464.1**	-334.4		No
Formaldehyde	50-00-0	Year	15,551[5]	Normal/Bypass[9]	2,299	2,294	-10,958	27	No
Hydrofluoric acid	7664-39-3	24-hr	NA	Normal[7]	NA	0.38	0.38	1.00	No
Isopropyl alcohol	67-63-0	1-hr	NA	Normal[6]	NA	26.9	17.1	5.9	Yes
Nitrogen dioxide	10102-44-0	1-hr	NA[3]	Normal/Bypass	2.09	0.88	2.97	0.87	Yes
Sulfuric acid	7664-93-9	24-hr	NA	Normal[4]	NA	1.12	1.12	0.074	Yes
Vanadium[2]	7440-62-2	24-hr	NA[3]	Normal/Bypass	0.0014	0.0005	0.00137	0.0074	No

[1] Potential to emit for First Tier Review includes emissions from both projects, as required by ORCAA.
[2] See Crown's NOC application for all TAPs from natural gas combustion. TAPs included above are those that required modeling. Copper and vanadium are included as Crown did not include these compounds in their First Tier Review. ORCAA used Crown's emission calculations to verify these two TAPs were below their SQERs.
[3] For TAPs from natural gas combustion, Crown conservatively chose not to account for reductions in TAPs from existing emission units as allowed by WAC 173-460-080(3) in the First Tier Review.
[4] Actual emissions form EGBE, the 24-hour actual emission rate was based on the calculated 24-hr emission rate from existing Lines 1 and 2.
[5] Actual emissions from formaldehyde is the average of annual emissions reported on Crown's emission inventory for calendar years 2018 and 2019.
[6] Isopropyl alcohol is emitted only from solvent cleaning of the decorators. Emissions are fugitive in nature and are exhausted through rooftop vents at all times. Therefore, no bypass scenario needs to be evaluated.
[7] Hydrofluoric acid and sulfuric acid are emitted only from can washing operations. Emissions are exhausted through rooftop stacks at all times. Therefore, no bypass scenario needs to be evaluated.
[8] For EGBE increase during bypass, only one line will be in operation during bypass of the RTO: Line 1, Line 2, or Line 3 operating at 2,000 cans-per-minute (maximum 1.07 lb formaldehyde/hr). Therefore, Line 3 PTE was used to calculate the net change as it results in the highest emissions.
[9] As the formaldehyde SQER averaging time is annual, the potential to emit includes emissions from both normal and bypass operations.
[10] Net change calculated by subtracting past actual emissions from proposed increase, as allowed under WAC 173-460-080(3).

[11] SQER is the Small Quantity Emission Rate found in WAC 173-460-150.
[12] If net TAP emission are less than their corresponding SQER, emissions of that particular TAP are considered sufficiently low to ensure compliance with the ASIL without further analysis. Otherwise, modeling is required to demonstrate that the modeled impact does not exceed its corresponding ASIL. See Section 12 for more information.

Table 8: Results of First Tier Review – Modeling[1]

Toxic Air Pollutant	CAS	ASIL Averaging Time	Operating Scenario	Net Change (lbs)	g/s	Modeled stack	Modeled Impact (µg/m^3)	ASIL (µg/m^3)	Tier 2 Required (yes/no)
Arsenic	-	Year	Normal/Bypass[2]	0.06	8.49E-07	RTO[3]	5.9E-06	3.0E-04	No
Cadmium	-	Year	Normal/Bypass[2]	0.32	4.67E-06	RTO[3]	3.3E-05	2.4E-04	No
Chromium VI	-	Year	Normal/Bypass[2]	0.017	2.38E-07	RTO[3]	1.7E-06	4.0E-06	No
7,12-Dimethylbenz[a]anthracene	57-97-6	Year	Normal/Bypass[2]	0.0047	6.79E-08	RTO[3]	4.7E-07	8.5E-06	No
Isopropyl alcohol	67-63-0	1-hr	Normal[4]	17.1	1.07443	Line 3 Room Vents (2)	3.1E+03	3.2E+03	No
Nitrogen dioxide	10102-44-0	1-hr	Normal	2.97	3.74E-01	RTO[3]	3.4E+01[6]	4.7E+02	No
Sulfuric acid	7664-93-9	24-hr	Normal[5]	1.12	5.90E-03	Washer 3	9.0E-01	1.0E+00	No

[1]Only includes emission rates for the TAPs requiring modeling. See Table 7 and the application for more details.
[2] As ASIL averaging times is yearly, the net change includes emissions from both normal and bypass operations.
[3] Crown modeled emissions increases from the RTO stack only. As Crown historically operated two lines without controls and they are proposing to operate only one line while bypassing the RTO, there will be no net emissions increase during bypass.
[4] Isopropyl alcohol is emitted only from solvent cleaning of the decorators. Emissions are fugitive in nature and are exhausted through the rooftop vents at all times. Therefore, no bypass scenario needs to be evaluated.
[5] Sulfuric acid is emitted only from can washing operations. Emissions are exhausted through the can washer stack at all times. Therefore, no bypass scenario needs to be evaluated.
[6] ORCAA corrected Crown's results to 3.4E+01 as 2017 model results were 33.5 ug/m^3.

9. Applicable Performance Standards (Summary)

ORCAA's Rule 6.1.4(a)(1) requires a finding that any new or modified stationary source will likely comply with applicable state, federal and local performance standards for air emissions including emission standards adopted under chapter 70A.15 RCW (formerly chapter 70.94 RCW), emissions standard of ORCAA, and federal emission standards including New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), and National Emission Standards for Hazardous Air Pollutants for Source Categories (MACT standards). The performance standards in Table 9 were determined applicable. The performance standards in Table 10 were determined relevant but inapplicable performance standards. Generally applicable state, federal, and local standards are listed in the Appendix. ORCAA staff's conclusion is that the proposal to install a third can manufacturing line will not cause the source to exceed applicable performance standards. This conclusion satisfies the criteria of approval required under ORCAA Rule 6.1.4(a)(1).

Table 9: Applicable performance standards with respect to proposed new can manufacturing line 3

Title Citation	Brief Description (Consult rule/regulation for specific requirements)	Applies to
Particulate Standards for Combustion Units ORCAA Rule 8.3(a) WAC 173-400-050(1)	Prohibits emissions from any combustion unit in excess of 0.1 grain/dscf. EPA test methods from 40 CFR Part 60 Appendix A shall be used should demonstration of compliance be required.	Applies to emissions from all the combustion units including the can washer dryer, hot water heaters, curing ovens, and RTO.
Particulate Standards for Process units ORCAA Rule 8.3(a) WAC 173-400-060	Prohibits emissions from any process unit in excess of 0.1 grain/dscf. EPA test methods from 40 CFR Appendix A shall be used should demonstration of compliance be required.	Applies to all general process operations onsite including the can washer, lacquer spray machines, and sludge disposal unit.
Sulfur Dioxide WAC 173-400-040(7)	No person shall cause or allow the emission from any emissions unit in excess of one thousand ppm of sulfur dioxide on a dry basis, corrected to seven percent oxygen for combustion sources, and based on the average of any period of 60 consecutive minutes.	Applies to all emission units onsite including the new can production line
40 CFR Part 60, Subpart WW	New Source Performance Standards - Standards of Performance of the Beverage Can Surface Coating Industry. Applies to beverage can surface coating lines with the following affected facilities: new, modified, or reconstructed exterior base coat operation, overvarnish coating operation, and inside spray coating operation.	Applies to the overvarnish and inside spray coating operations including those that are part of the new can production line (see below).
State Greenhouse Gas Reporting Chapter 173-441 WAC	Requires annual reporting of Greenhouse Gas (GHG) emissions to Ecology for facilities that emit at least 10,000 metric tons per year of GHG in terms of carbon dioxide equivalents (CO_2e).	Applies. Potential emissions of CO_2e are approx. 26,000 metric tons, so reporting may be required if actuals exceed 10,000 metric tons.

Table 10: Relevant performance standards determined inapplicable with respect to proposed new can manufacturing line 3

Regulation Title Citation	Relevant Performance Standard Determined Inapplicable	Basis
40 CFR Part 63 Subpart T	National Emission Standards for Hazardous Air Pollutants: Halogenated Solvent Cleaning	Not applicable. Crown is not proposing to use halogenated solvents for cleaning.
40 CFR Part 63 Subpart EEEE	National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)	Not applicable. Crown has a federally enforceable voluntary limit on emissions of hazardous air pollutants that established Crown as a minor source of HAPs.
40 CFR Part 63 Subpart KKKK	National Emission Standards for Hazardous Air Pollutants: Surface Coating of Metal Cans	Not applicable. Crown has a federally enforceable voluntary limit on emissions of hazardous air pollutants that established Crown as a minor source of HAPs.
40 CFR Part 63 Subpart MMMM	National Emission Standards for Hazardous Air Pollutants: Surface Coating of Miscellaneous Metal Parts and Products	Not applicable. Crown has a federally enforceable voluntary limit on emissions of hazardous air pollutants that established Crown as a minor source of HAPs.
40 CFR Part 63, Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Industrial Commercial and Institutional Boilers and Process Heaters (Major Sources of HAPs)	Not applicable. Crown has a federally enforceable voluntary limit on emissions of hazardous air pollutants that established Crown as a minor source of HAPs.
40 CFR Part 63, Subpart HHHHHH	National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources	Not applicable. Crown is not engaged in: a. Paint stripping with methylene chloride; b. Autobody refinishing operations; or c. Spray application of coatings containing chromium, lead, manganese, nickel, or cadmium.
40 CFR Part 63, Subpart JJJJJJ	National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers at Area Sources	Not applicable. Crown operates only boilers fueled by natural gas therefore the requirements of Subpart JJJJJJ do not apply (§63.11195(e)).

9.1 40 CFR Part 60 Subpart WW – Standards of Performance of the Beverage Can Surface Coating Industry

Subpart WW applies to new, modified, or reconstructed facilities at beverage can surface coating lines including each exterior base coat operations, each overvarnish coating operations, and each inside spray coating operation provided the modification or reconstruction is commenced after November 26, 1980.

Crown Cork and Seal coating operations have been subject to this requirement since 1997 and 1998 (97NOC040 and 98NOC021) for its existing can coating lines. The proposed

new can production line includes overvarnish and inside spray coating operations which are each designated as affected facilities with respect to Subpart WW.

After installation of Line 3, Crown will have nine affected facilities subject to Subpart WW. six overvarnish coating operations (two UV bottom varnish and four body varnish) and three inside spray coating operations. The UV bottom coat operations consist of a roll coat application and UV curing system. Each inside and outside coating operation consists of the coating application station, flashoff area, and curing oven. Crown does not have any exterior base coating operations at this facility; therefore, the exterior base coating limits are not currently applicable.

Subpart WW requirements include compliance with emissions standards and monthly performance tests. Volume weighted calendar-month average emissions shall not exceed:

1. 0.46 kilogram of VOC per liter of coating solids from each over-varnish coating operation.
2. 0.89 kilogram of VOC per liter of coating solids from each two-piece can inside spray coating operation.

Crown stated in their application that all the overvarnishes and inside spray lacquers included in this proposal are Subpart WW-compliant and Condition 16 in the Recommended Conditions of Approval prohibits use of coatings that are not Subpart WW-compliant. Crown currently complies with the monthly performance tests by determining the VOC content of the coatings based on manufacturer-supplied formulation data on a monthly basis. Crown does not use a capture system and control device to show compliance with Subpart WW.

9.2 40 CFR Part 63 Subpart KKKK – National Emission Standards for Hazardous Air Pollutants: Surface Coating of Metal Cans

The National Emission Standards for Hazardous Air Pollutants: Surface Coating of Metal Cans was promulgated on November 13, 2003 and applies to all metal can surface coating operations at major sources. This rule applies to owners or operators of metal can surface coating operations that use at least 5,700 liters (1,500 gallons) of coatings per year and are major sources of HAPs or are part of a major source.

Crown Cork & Seal USA, Inc. (Crown) currently has a federally enforceable, voluntary limit (established through 05NOC420) on emission of hazardous air pollutants (HAPs). This limit established Crown as minor source of HAPs. As a minor source of HAPs Crown is not subject to the requirements of 40 CFR Part 63 Subpart KKKK.

Although installation of a third coating line will increase emissions of HAPs, Crown does not propose to increase its emissions of HAPs above their existing limit. Formaldehyde is the primary HAP emitted from the facility and almost all formaldehyde emissions are created in the curing ovens. Crown's recent installation of a regenerative thermal oxidizer to control 100% of emissions from the existing curing ovens as well as the proposed curing ovens on the new can production line is expected to sufficiently reduce formaldehyde emissions that they will remain major source thresholds. *(Note: Ethylene*

glycol monobutyl ether (2-butoxyethanol) (CAS 111-76-2) was removed from the list of hazardous air pollutants in November 2004.)

See the Technical Support Document for Crown's Air Operating Permit for more details on what other federal standards apply to this facility.

10. Best Available Control Technology (BACT)

ORCAA Rule 6.1.4(a)(2) requires the finding that a new source or modification to an existing source of air pollution will employ best available control technology for all pollutants (BACT) not previously emitted or whose emissions would increase as a result of the new source or modification. ORCAA Rule 6.1.4(a)(2) applies to Crown's proposed new curing ovens and regenerative thermal oxidizer.

10.1 Overview of BACT

New sources of air pollution and modifications to existing 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 Chapter 173-400-030 WAC as, *"an emission limitation based on the maximum degree of reduction for each air pollutant subject to regulation under chapter 70.94 RCW* (now chapter 70A.15 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."*

10.2 Overview of t-BACT

New or modified air pollution sources that emit TAP above small quantity thresholds are required to control those emissions using BACT for Toxic Air Pollutant emissions (referred to as t-BACT). Specifically, t-BACT is triggered for any TAP emitted above its de minimis rate, which is the threshold used to distinguish TAP sources requiring controls from small, insignificant sources. De minimis emission rates are established in Washington's regulations titled, CONTROLS FOR NEW SOURCES OF TOXIC AIR POLLUTANTS, under Chapter 173-460 WAC.

10.3 BACT and t-BACT Evaluation

ORCAA staff's conclusion is that the air pollution control technologies and measures proposed by Crown meet both the BACT and t-BACT requirements. Conditions requiring ongoing use of the air pollution control technologies and measures proposed by Crown are included in the Recommended Conditions of Approval.

Table 11. Can Manufacturing Line 3 - BACT and T-BACT Summary as proposed in NOC# 21NOC1483

Emission Unit	BACT Applicable?	BACT & T-BACT Description
Line 3 Can Washer	Hydrofluoric acid Sulfuric acid	Mist elimination system (Stage 2) Low concentration can washing solutions ≤ 60% sulfuric acid ≤ 5% hydrogen fluoride
Line 3 Rim Coating	VOC	Use of low-VOC rim coating varnishes that are 40 CFR Part 60 Subpart WW-compliant. Ultraviolet curing
Line 3 Decorators, LSMs, and LSM conveyor	VOC, TAP (including cure TAP)	-Use of waterborne low-VOC coatings (inks, overvarnish, and inside spray lacquer) that are 40 CFR Part 60 Subpart WW-compliant. -Store coatings, solvents and other VOC-containing materials in covered containers and promptly cleaning up spills. -Operate decorator capture system during cleaning.
Line 3 Curing Ovens (PIN and IBO)		-**Curing Ovens:** Permanent total enclosure (100% capture efficiency) -Minimum overall system VOC capture efficiency of 84% -Captured exhaust controlled by regenerative thermal oxidizer with minimum 98% control efficiency for VOC
	PM, NOx, CO, SO2, VOC, HAPs/TAPs	-Use of low sulfur fuel (natural gas) -80 ppm NOx at 3% oxygen - Proper operation and maintenance, tune-ups every 61 months
Line 3 LSMs	Particulate	Spray coating application with a very high transfer efficiency (>94%). LSM boxes equipped with fabric filters with a minimum 99% filtration efficiency.

11. Ambient Impact Analysis (Criteria Pollutants)

Ambient Air Quality Standards (AAQS) that apply in Thurston County include both the National Ambient Air Quality Standards (NAAQS) and Washington Ambient Air Quality Standards (WAAQS). ORCAA's Rule 6.1.4(a)(3) requires demonstration that any new stationary source of air pollution or modification to an existing stationary source of air pollution not delay the attainment date for an area not in attainment, or cause or contribute to a violation of any AAQS. This is typically accomplished through an Ambient Air Quality Impacts Analysis (Impacts Analysis). Typically, an Impacts Analyses requires use of air dispersion models to predict concentrations of air pollutants at the fence line of a facility and beyond. Air dispersion models take into account the air pollutant emissions rate of the new source being evaluated, characteristics of the new source, topography and local meteorological data, and use this information to predict the maximum concentrations of pollutants outside the property line of the facility.

Regulatory standards for conducting Impacts Analyses are largely dictated by EPA through formal guidance on ambient air dispersion modeling techniques. EPA's Guideline on Air Quality Models in 40 CFR 51 Appendix W (The Guideline) addresses the regulatory application of air quality models for assessing air pollutant impacts under the Clean Air Act. The objective of EPA's guidance on air dispersion modeling is to ensure consistent Impacts Analyses under the Clean Air Act. EPA's guidelines also help ensure Impacts Analyses provide reliable results that can be used to protect air quality and maintain compliance with the NAAQS. ORCAA is responsible for reviewing all modeling decisions and data used in the Impacts Analysis with respect to the regulatory standards and

practices recommended by EPA. Any deviation from recommendations in The Guideline must be justified for a particular Impacts Analysis.

Crown provided an Impacts Analysis in their NOC application for nitrogen dioxide (NO_2) that demonstrates the facility will not cause or contribute to violation of the NO_2 AAQSs. Table 13 below provides a summary of results. Only NO_2 impacts were analyzed as it is the only pollutant whose maximum potential emissions were greater than ORCAA's significant emissions levels (see Table 12).

Table 12: Ambient Impacts Screening Summary

Pollutant	Emissions Attributable to Project[1] (tpy)	Significance Thresholds Criteria Pollutants (tpy)	Model?
PM (Total Particulate)	1.3	2.5	No
PM-10 (Particulate <= 10 micrometers in diameter)	1.3	1.5	No
PM 2.5 (Particulate <=2.5 micrometers in diameter)	1.3	1.5	No
SO2 (Sulfur Dioxide)	0.1	4.0	No
NOX (Nitrogen Oxides)	13.1	4.0	Yes
CO (Carbon Monoxide)	9.3	10.0	No

[1]Cumulative totals from 20NOC1451 and 21NOC1483 applications

Crown's Impacts Analysis reflect worst case NO_2 impacts from the facility and includes NO_2 emissions from all emissions units at the facility including the seven curing ovens, the hot water heaters and dryers for the two can washers, and the RTO. Crown modeled NOx using EPA's Ambient Ratio Method (ARM2) that "incorporates a variable ambient ratio that is a function of model predicted 1-hr NOx concentration based on an analysis of hourly ambient NOx monitoring data from approximately 580 stations over the period 2001-2010" (Application page 22).

Crown modeled emissions for two operating scenarios:

1. Normal operation – in which the curing ovens are exhausted to the RTO.
2. Line 3 RTO Bypass – in which part of Line 3 is operating in bypass mode and two Line 3 curing ovens (one PIN and one IBO) are vented through their bypass stacks. Lines 1, 2, and the other Line 3 PIN oven are not operational.

In both operating scenarios, the can washer hot water heater and dryer and the RTO were assumed to be operating. The modeling results are presented in Table 13 and indicate that in both scenarios, NO_2 emissions are not expected to cause or contribute to violations of the NO_2 AAQSs. (*Note: The operating scenarios for operating Lines 1 and 2 during RTO bypass were evaluated in the application for NOC# 21NOC1483.)*

ORCAA staff reviewed Crown's Impacts Analysis including emissions calculations, modeling input files, and supporting information provided in Crown's NOC application, and concludes it conforms to regulatory standards and provides results that can be relied on for air regulatory determinations. Crown's Impact Analysis conservatively predicts NO_2

impacts from the project, reflects NO_2 impacts from other emissions units at the facility that are not subject to NSR, and adequately incorporates local background ambient air concentration. ORCAA staff's conclusion is that Crown's Impacts Analysis provides sufficient demonstration that the operation of the facility will not cause or contribute to violation of either the WAAQS or NAAQS for NO_2.

Table 13: Predicted Facility-Wide NO_2 Concentrations

Pollutant	Operating Scenario	Averaging Period	Concentrations (µg/m^3)				Over AAQS?
			Facility Impact[1]	Back-ground	Total	AAQS (µg/m3)	
NO_2	Normal operation	1-hour	50.5	79.7	130.2	188	No
	Line 3A RTO Bypass		81.1		160.8		No
	N/A	Annual	8.0	22.3	30.0	100	No

[1]Maximum 5-year average of the 98th percentile modeled concentration at each receptor.
[2]Background concentrations provided by NW AirQuest (http://lar.wsu.edu/nw-airquest/lookup.html).
[3]Total concentration is the sum of the facility impact and the background concentration.
[4]AAQS = Ambient Air Quality Standards. Currently, the Washington AAQS (Chapter WAC 173-476 WAC) and the National AAQS for NO_2 are identical.

12. Ambient Impact Analysis (Toxic Air Pollutants)

Washington's regulations titled Controls for New Sources of Toxic Air Pollutants (Air Toxics Rule) under Chapter 173-460 of the Washington Administrative Code apply to new stationary sources of Toxic Air Pollutants (TAP). The purpose of this Rule is to, "… maintain such levels of air quality as will protect human health and safety." The TAP covered under the Rule include carcinogens and non-carcinogens. The Rule allows for a multi-tiered approach to assess potential health and safety impacts from TAP increases.

The "First Tier Review" involves comparing estimated ambient TAP impacts with Acceptable Source Impact Levels (ASIL), which are established in the Air Toxics Rule on a pollutant-by-pollutant basis. If the modeled impact of the increase in emissions of a TAP does not exceed its corresponding ASIL, the First Tier Review is met for that TAP. This analysis typically involves using an ambient air quality model to predict ambient concentrations of a TAP and then comparing the impact with the TAP's corresponding ASIL. However, the Air Toxics Rule also provides that, if an emission rate for a TAP is less than it's "Small Quantity Emission Rate" (SQER), then it can be concluded that emissions are sufficiently low to ensure compliance with its ASIL without further analysis (WAC 173-460-020(7)).

For pollutants with ambient concentration found to be greater than their ASIL, a "Second Tier Review" is required. Second Tier Reviews involve more refined modeling analyses and approval by the Washington Department of Ecology in addition to ORCAA's review. Lastly, for TAP that cannot pass a Second Tier Review, the Air Toxics Rule requires an even more refined "Third Tier Review."

As presented previously in Tables 5 and 6, TAPs will be emitted from the proposed Line 3 can manufacturing line from the can washing, coating and curing processes (including combustion), and solvent cleaning. Crown performed a First Tier Review on TAP emissions from all these processes. Crown calculated maximum potential emissions for each of the TAPs at the TAP-specific averaging period in Chapter 173-460 WAC (1-hour, 24-hour, or annual).

12.1 Natural Gas Combustion

Maximum potential emissions for all TAPs related to natural gas combustion (Line 1 IBO, Line 2 PIN oven and IBO, Line 3 PIN ovens and IBO, and RTO) were below their respective SQERs except for arsenic, cadmium, chromium VI, 7,12-Dimethylbenz[a]anthracene, and nitrogen dioxide.

Although Crown calculated emissions for copper and vanadium from natural gas combustion, they did not include these compounds in their First Tier Review. ORCAA used Crown's emission calculations to verify these two TAPs were below their SQERs (see Table 7). The First Tier results for all other TAPs are included in their application.

Crown modeled emissions for arsenic, cadmium, chromium VI, 7,12-Dimethylbenz[a]anthracene, and nitrogen dioxide and determined that the modeled impact was less than corresponding ASIL (see Table 8). Although Crown modeled nitrogen dioxide emissions during bypass operations for compliance with the ambient air quality standards (see Section 11), they did not include the results in their First Tier Review. ORCAA used Crown's modeling results to verify nitrogen dioxide emissions during bypass were below the ASIL (see Table 8).

12.2 Can Manufacturing (Washing, Coating, and Solvent Cleaning)

Maximum potential emissions for all TAPs related to can manufacturing (washing, coating, or solvent cleaning) were below their respective SQERs except for isopropyl alcohol and sulfuric acid (see Table 7).

WAC 173-460-080(3) allows for the applicant to include proposed reductions in actual emissions of a particular TAP for purpose of offsetting emissions of that TAP caused by the new or modified source. Crown has proposed some reductions in their Can Coating Lines 1 and 2 in addition to venting the new Line 1 IBO and Line 2 PIN oven and IBO to the RTO. Crown is also routing the existing Line 1 PIN oven and existing Line 1 and 2 lacquer spray machines to the RTO. In addition, only one can coating line (either Line 1, Line 2, or half of Line 3) will operate when the RTO is being bypassed. These changes will provide reductions in TAP emissions from can coating operations. Therefore, Crown used reductions in past actual emissions in its First Tier analysis for can coating TAPs. These reductions in TAPs from existing units offsets the TAP emissions from the new can manufacturing line and no additional TAP review is necessary. Further documentation is provided in Crown's application. ORCAA has included enforceable emission limits and associated monitoring, recordkeeping, and reporting in the Recommended Conditions of Approval for these reductions in TAP emissions as required by WAC 173-460-080(3).

Based on Crown's First Tier Review, the requirement in WAC 173-460-070 to conduct an acceptable source impact analysis is satisfied.

13. ORCAA Formaldehyde Performance Standard - ORCAA Rule 8.6(b)

ORCAA's Rule 8.6(b) does not allow any person to cause or allow the emission of formaldehyde into the ambient air beyond such person's property line which will result in a concentration exceeding 61 micrograms per cubic meter 1-hour average.

Formaldehyde is formed in the curing ovens during the curing of the inks, overvarnish, and inside lacquers. All exhaust from the curing ovens is routed to the RTO during normal operation. However, Crown currently has approval to operate the existing can coating lines on a limited basis when the RTO is undergoing maintenance. Captured emissions are allowed to bypass the RTO during these maintenance periods and be exhausted uncontrolled. Crown proposes that Line 3 also be allowed to operate during these RTO bypass periods. Therefore, Crown conducted modeling for two operating scenarios to assess compliance with ORCAA Rule 8.6(b):

1. Normal operation – in which the curing ovens (all three lines) are controlled by the RTO.
2. Line 3 RTO Bypass – in which Line 3 is operating during bypass mode at up to 2,000 cans-per-minute (one decorator and PIN oven) and at a formaldehyde emission rate not to exceed 8.9 lb/MM cans (1.07 lb/hr) and the Line 3 curing ovens (PIN 3A and IBO3) are vented through their bypass stacks. Lines 1, 2, and the other Line 3 PIN oven are not operational.

Impacts were determined for the maximum hourly emission rate for each operating scenario to verify compliance (see Table 14). When operating Line 3 in bypass mode, Crown proposes to only operate half the line (one decorator and one PIN oven) at a formaldehyde emission rate not to exceed 1.07 lb/hr while bypassing the RTO in order to assure compliance with this requirement. Crown will not operate Line 3 in bypass mode if Line 1 or 2 are operating in bypass mode. The Order issued in conjunction with this approval shall include requirements for operating Line 3 in bypass mode to limit the formaldehyde emission rate and to limit operation of the line to only one decorator and PIN oven at a time. In addition, Crown will be required to conduct a performance test to confirm that the emission rate from Line 3 does not exceed 1.07 lb/hr in bypass mode before they can operate Line 3 in bypass mode. (*Note: The operating scenarios for Lines 1 and 2 bypass were evaluated in the application for NOC# 21NOC1483.)*

Table 14: Results of ORCAA Formaldehyde 1-hour Standard

Emission Point	1-hour Maximum Modeled Impact (µg/m3)	1-hour Standard (ug/m3)	Compliance Likely (yes/no)
Scenario 1 (Controlled)	6.7	61	Yes
Scenario 2 (Line 3 RTO Bypass[1])	59.3		Yes

[1] During Line 3 Bypass only one decorator and one PIN oven would be operational at a production rate up to 2,000 cans-per-minute. Crown proposed an emission limit of 1.07 lb/hr in order to assure compliance.

14. Permitting Requirements for Major Stationary Sources and Major Modifications to Major Stationary Sources

Projects that are major stationary sources and major modifications to major stationary sources may be subject to permitting requirements under WAC 173-400-700 through 173-400-860.

Crown was previously permitted under the federal Prevention of Significant Deterioration (PSD) program, which is now administered by Ecology. In 1987 Crown received approval for a major modification subject to federal air regulations for Prevention of Significant Deterioration (PSD). The modification entailed expanding the existing can coating operations and adding two can end manufacturing lines. The modifications were reviewed and approved by ORCAA and the Washington State Department of Ecology under PSD-87-1. A PSD Approval Order was issued on November 4, 1987 which contained several conditions of approval including a condition that limited facility-wide VOC emissions to 291 tons per year. In August of 2000, Crown requested and received approval of a 249 ton per year limit for facility wide emission of VOC. This limit established Crown as a minor stationary source with respect to PSD. Ecology rescinded PSD-87-1 on September 13, 2000. Ecology's PSD 87-1 rescission was approved on condition that any future exceedance of actual or potential to emit above 249 ton per year would constitute a violation of PSD applicability. In addition, any future application for a PSD permit to allow VOC emissions above 249 tons per year must treat Crown as a new project in its totality.

Crown is not currently a "Major Stationary Source" under the permitting program required by WAC 173-400-700 through WAC 173-400-860. Crown is not one of the listed source categories in 40 CFR 52.21(b)(1)(i)(a) and its potential to emit of all PSD regulated pollutants is below the 250 tons per year (40 CFR 52.21(b)(1)(i)(b)). Therefore, these permitting requirements do not apply. As detailed in Section 16, facility-wide allowable VOC emissions are being established at 180.5 tons per consecutive 12-month period in the Recommended Conditions of Approval; therefore, the voluntary limit issued in 2000 will be rescinded.

15. Title V Air Operating Permit (AOP) Implications

The State of Washington program pursuant to Title V of the federal Clean Air Act is governed under Chapter 173-401 WAC, the Washington Air Operating Permit Program. Chapter 173-401 WAC requires existing major stationary sources to operate in compliance with an approved Air Operating Permit (AOP). Major stationary sources are those stationary sources with a potential to emit which is greater than 100 tons per year of any criteria pollutant, greater than 10 tons per year of any hazardous air pollutants (HAP), or greater than 25 tons per year of any combination of HAP.

Based on "Potential to Emit" (PTE) the facility is a "Major Source" under Title V of the federal Clean Air Act for volatile organic compound (VOC) emissions and, therefore, is subject to the requirement that the facility operate under an Air Operating Permit (AOP) issued by ORCAA. PTE refers to the highest amounts of pollutants that a facility could release into the air based on physical and regulatory limitations.

Crown is subject to the ORCAA's Title V Air Operating Permit program and has operated under an AOP since 1998. The current AOP for the facility was issued on September 1, 2016 and will expire September 1, 2021. Crown has submitted a renewal application and requirements for the new can manufacturing line will be added to Crown's AOP through the AOP renewal process after the units are constructed.

16. Superseding Previous Orders of Approval

The Order of Approval, when issued, will supersede the previously issued Orders of Approval described below.

00NOC027 (EQUIPMENT REMOVED)

The Order of Approval for NOC# 00NOC034 was issued in June 2000 for approval use a 78% - 100% sulfuric acid solution in the can washer (Line 1/Line 1 can washer). Crown will be removing this can washer to install the Line 3 can washer.

16MOD1178

The Order of Approval for NOC# 16MOD1178 was issued on December 12, 2016 to modify their can washing solution limits with respect to hydrogen fluoride. The order superseded Orders of Approval for NOC# 641 and NOC# 08NOC622.

Crown requests to modify this Order of Approval to incorporate the additional volumes of can washing solution for the proposed Line 3 can washer by doubling the can washing solution limits for low and high concentration sulfuric acid. However, Crown also proposed that the use of low concentration can washing solutions is BACT for the can washing.

Crown has used higher concentration sulfuric acid in the past so that they could reduce the volume of sulfuric acid stored. The higher concentration sulfuric acid solution is diluted more when used in the can washer so that the actual concentration of the acid in the can washer does not change.

The amount of can washing solution used does not affect emissions as much as the concentration of sulfuric acid and hydrogen fluoride in the can washing solution as the Ambient Source Impact Levels for sulfuric acid and hydrogen fluoride are on a 24-hour average (see Section 12). Therefore, ORCAA proposes to limit the concentration of sulfuric acid and hydrogen fluoride in the can washing solutions, as applied. Higher concentration can washing solutions may be purchased if they are diluted prior to use.

Table 15: Recommended Incorporation of Conditions from 16MOD1178

Condition	Brief description	Incorporation action
1	Approved stationary sources	Condition 1
2	Can Washing Solution Requirements	Condition 7
3	Monitoring	Condition 8
4	Recordkeeping	Condition 9
5	Operation and Maintenance Plan	Condition 10

21NOC1483

The Order of Approval for NOC# 21NOC1483 was issued for replacement of three curing ones, modification to the exhaust system on existing equipment, and installation of a regenerative thermal oxidizer (RTO).

ORCAA is proposing to supersede the Order of Approval for NOC# 21NOC1483 as some of the conditions of approval for this project are identical to those in NOC# 21NOC1483.

Table 16: Recommended Incorporation of Conditions from 21NOC1483

Condition	Brief description	Incorporation action
1	Approved stationary sources	Condition 1
2	Facility-Wide Emission Limits	Condition 3 and 4
3	Facility-Wide Emission Limits Monitoring	Condition 5
4	Facility-Wide Emission Limit Recordkeeping	Condition 6
5	VOC Coating Limits	Condition 16
6	VOC Coating Limit Compliance Methods	Condition 17
7	VOC Coating Limit Quarterly Reports	Condition 18
8	VOC Coating Limit Recordkeeping	Condition 19
9	Approved Coatings / Material Limits	Condition 11
10	Material Use Limit Monitoring	Condition 12
11	Material Use Limit Recordkeeping	Condition 13
12	Reformulated or New Coating Materials Monitoring	Condition 14
13	Reformulated or New Coating Materials Recordkeeping	Condition 15
14	Curing Ovens	Condition 23
15	Exhaust Stack Requirements	Condition 46
16	Curing Oven Capture Requirement	Condition 30
17	Regenerative Thermal Oxidizer	Condition 35
18	RTO Bypass	Condition 36
19	Line 1 and 2 Capture Efficiency	Condition 32
20	Capture System Monitoring Plan	Condition 34
21	Inside Lacquer Filters	Condition 24
22	RTO Temperature Monitoring	Condition 37
23	Operations and Maintenance Plan	Condition 38
24	Capture and Control Systems Recordkeeping	Condition 39
25	Initial Performance Testing Required	Condition 40
26	Ongoing Performance Testing Required	Condition 42
27	Performance Testing Requirements	Condition 44
28	Performance Testing Notifications, Plans and Reports	Condition 45

The following Orders of Approval will <u>not</u> be superseded and will continue to apply to this facility after issuance of the Order of Approval until April 29, 2022 as described below.

00MOD063

The Order of Approval for NOC# 00MOD063 was issued in August 2000 under WAC 173-400-091 to establish a voluntary limit on facility-wide VOC emissions of 249 tons per year. The purpose of the voluntary limit was to establish Crown as a minor source for with respect to the PSD program. WAC 173-400-091 and ORCAA Rule 6.1.12 allow for voluntary limits less than the 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. As facility-wide allowable VOC emissions are currently 110.3 tons per consecutive 12-month period (Order of Approval for NOC# 21NOC1483 Condition 2) and will increase to 180.5 tons per consecutive 12-month period (Recommended Conditions of Approval Condition #2), this voluntary limit is no longer less than the source's allowable annual emissions. As the new VOC limits only apply to emissions released on and after April 29, 2021, ORCAA is proposing to retain the 249 tons per year VOC limit until the new VOC limits are in full effect. Condition 2 of the Recommended Conditions of Approval will rescind Order of Approval for NOC# 00MOD063 on April 29, 2022.

05NOC420

The Order of Approval for NOC# 05NOC420 was issued in July 2006 under WAC 173-400-091 and ORCAA Rule 6.1.12 (formerly ORCAA 1.7.21(c)) to establish a voluntary limit on facility-wide HAP emissions of 9.9 tons of any single HAP and less than 24.9 tons of combined HAPs during any 12-consecutive month period. The purpose of the voluntary limit was to establish Crown as a minor source for with respect to the National Emission Standards for Hazardous Air Pollutants. WAC 173-400-091 and ORCAA Rule 6.1.12 allow for voluntary limits less than the 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 two primary HAPs emitted are glycol ethers (specifically ethylene glycol monohexyl ether (EGHE)) and formaldehyde with a potential to emit of 3.0 and 2.2 tons per year respectively. As facility-wide allowable glycol ethers and formaldehyde emissions are currently 1.9[1] and 1.1 tons per consecutive 12-month period, respectively (Order of Approval for NOC# 21NOC1483 Condition 9 and 2) and will increase to 3.0[1] tons and 2.2 tons per consecutive 12-month period, respectively (Recommended Conditions of Approval Conditions 11 and 4); this voluntary limit is no longer less than the source's allowable annual emissions. As the new glycol ethers and formaldehyde limits only apply to emissions released after April 29, 2021, ORCAA is proposing to retain the current HAP voluntary limit until the new glycol ether and formaldehyde limits are in full effect. Condition 2 of the Recommended Conditions of Approval will rescind Order of Approval for NOC# 05MOD420 on April 29, 2022.

17. Recommended Conditions of Approval

[1] Glycol ethers applied are limited by Condition 9 in NOC# 21NOC1483 which allows up to 0.5% by weight glycol ethers in the inside lacquer with a limit on lacquer of 297,000 gallons per consecutive 12-month period. Additional conditions requiring minimum capture efficiency and control efficiency further limit the glycol ethers to the tons per year values referenced.

The following conditions of approval below were determined necessary for assuring long term compliance with applicable air regulations and standards and protecting air quality.

1. **Approved Stationary Sources:** The equipment and activities described in the following table are conditionally approved by this Order. Deviations from conditions in this Order, or from operating specifications documented in either the application or Final Determination for Notice of Construction No. 98NOC021, 00NOC034, 00NOC059, 02NOC273, 16MOD1178, 17NOC1261, 19NOC1336, 20NOC1451, 20NOC1454, and 21NOC1483 may constitute violation of this Order and ORCAA's regulations unless prior approval is granted.

Table 1. Approved Stationary Source

Stationary Source	Equipment Specifications
Line 1 and 2 Can Washer	▪ Cincinnati Industrial Machinery (CIM) Model #BS1122422-88 C40-2
Line 1 and 2 Can Washer Dryer	▪ Eclipse 440 AH dryer ▪ 2 Natural gas-fired burners, 8.8 MMBtu/hr maximum heat input
Lines 1 and 2 Rim Coating	▪ U.F. Fusion U.V. System Mode DRR-120 ▪ Ultraviolet curing
Line 1 Printer and Decorator	▪ Line 1 - Concord Decorator-Alcoa Serial # D3008
Line 2 Printer and Decorator	▪ Concord Decorator-Alcoa Serial# 307301
Line 1 Printer Oven	▪ OSI Model# 1600-CPM Single Zone ▪ 2 Natural gas-fired burners, 5 MMBtu/hr max. heat input ▪ Exhaust Flowrate: ~5000 CFM ▪ Exhaust routed to RTO
Line 2 Printer Oven	▪ Greenbank "Pintec One – Omega" ▪ High efficiency natural gas-fired burner - 2.59 MMBtu/hr max. heat input ▪ Exhaust Flowrate: ~5,000 CFM ▪ Operating temperature: 395 – 415 F ▪ Exhaust routed to RTO
Line 1 Lacquer Spray Machines (LSM)	▪ Fisher Model 102MSH MARK3 ▪ 7 units per line ▪ High transfer efficiency spray technique (>94% efficiency) ▪ Enclosed LSM housings with capture system ▪ Each housing equipped with particulate filter system with at least 99% filtration efficiency ▪ LSM conveyor to the IBO will be equipped with a capture system consisting of a hood and enclosed on all sides ▪ All capture systems routed to RTO
Line 2 Lacquer Spray Machines (LSM)	

Line 1 Inside Bake Oven	▪ Greenbank NIBO Serial# 15241 ▪ High efficiency natural gas-fired burners - 3.93 MMBtu/hr max. heat input ▪ Operating Temp – 395-400F ▪ Exhaust Flowrate: ~8,900 CFM ▪ Exhaust routed to RTO
Line 2 Inside Bake Oven	▪ Greenbank NIBO Serial# 15241 ▪ High efficiency natural gas-fired burners - 3.93 MMBtu/hr max. heat input ▪ Operating Temp – 395-400F ▪ Exhaust Flowrate: ~8,900 CFM ▪ Exhaust routed to RTO
Line 3 Can Washer	▪ Greenbank Torrent One ▪ Mist elimination system in Stage 2
Line 3 Rim Coating	▪ UVio 36” Rim-Up Integrated Mass Rim Coating System ▪ Ultraviolet curing
Line 3 Decorator Unit #31	▪ Stolle Concord 24MRT-8 Color Decorator ▪ 2,000 cans-per-minute ▪ Room vent exhaust flowrate: ~4950 CFM ▪ Close capture system on ink and overvarnish application areas routed to RTO
Line 3 Decorator Unit #32	▪ CMbE Reformat ▪ 2,000 cans-per-minute ▪ Room vent exhaust flowrate: ~4950 CFM ▪ Close capture system on ink and overvarnish application areas routed to RTO
Line 3 Printer Oven #31	▪ Greenbank “Pintec One – Omega” ▪ High efficiency natural gas-fired burner - 2.59 MMBtu/hr max. heat input ▪ Exhaust Flowrate: ~5,000 CFM ▪ Operating temperature: 395 – 415 F ▪ Exhaust routed to RTO
Line 3 Printer Oven #32	▪ Greenbank “Pintec One – Omega” ▪ High efficiency natural gas-fired burner - 2.59 MMBtu/hr max. heat input ▪ Exhaust Flowrate: ~5,000 CFM ▪ Operating temperature: 395 – 415 F ▪ Exhaust routed to RTO
Line 3 Lacquer Spray Machines (LSM)	▪ CMbE 3200 Dual Turret LSM ▪ 9 units ▪ High transfer efficiency spray technique (>94% efficiency) ▪ Enclosed LSM housings with capture system ▪ Each housing equipped with particulate filter system with at least 99% filtration efficiency ▪ LSM conveyor to the IBO will be equipped with a capture system consisting of a hood and enclosed on all sides

	▪ All capture systems routed to RTO
Line 3 Inside Bake Oven	▪ Greenbank NIBO Serial# 15241 ▪ High efficiency natural gas-fired burners - 3.93 MMBtu/hr max. heat input ▪ Operating Temp – 395-400F ▪ Exhaust Flowrate Zone 1: ~2,995 CFM ▪ Exhaust Flowrate Zone 2: ~6000 CFM ▪ Exhaust routed to RTO
Line 3 Decorator Solvent Usage	▪ Isopropanol (decorator cleaning and parts washer) ▪ Room vent exhaust flowrate (two): ~4950 CFM each
Regenerative Thermal Oxidizer (RTO)	▪ Anguil Model 550 ▪ Three-bed regenerative thermal oxidizer ▪ Natural-gas fired – up to 15 MMBtu/hr ▪ Guaranteed 98 control efficiency for VOC ▪ Dust collector pre-filter for Line 1 & 2 LSMs

[Regulatory Basis: ORCAA Rule 6.1.4(a)(1); ORCAA Rule 6.1.2(l)]

2. **Voluntary Limits Rescinded.** On April 29, 2022, the following Orders of Approval are hereby rescinded:
   a. Order of Approval for NOC# 00MOD063 (issued August 24, 2000); and
   b. Order of Approval for NOC# 05NOC420 (issued July 26, 2006).

[Regulatory basis: WAC 173-400-091; ORCAA 6.1.12]

3. **Facility-Wide VOC Emission Limits.** The following emission limits apply to total facility-wide emissions released on or after April 29, 2021:
   a. Until initial startup of Can Manufacturing Line 3, emissions of volatile organic compounds must not exceed 110.3 tons per 12-month rolling period.
   b. After initial startup of Can Manufacturing Line 3, emissions of volatile organic compounds must not exceed 180.5 tons per 12-month rolling period.

[Regulatory Basis: ORCAA Rule 6.1.2(l)]

4. **Annual Formaldehyde Emission Limits.** The following emission limits apply to emissions released on or after April 29, 2021:
   a. Emissions of formaldehyde from Can Coating Lines 1 and 2 must not exceed 2,299 pounds per 12-month rolling period; and

[Regulatory Basis: ORCAA Rule 6.1.2(l); ORCAA Rule 6.1.4(a)(5); WAC 173-460-080(3)]

   b. Facility-wide emissions of formaldehyde must not exceed 4,378 pounds per 12-month rolling period.

[Regulatory Basis: ORCAA Rule 6.1.2(l)]

5. **Annual Emission Limits Monitoring.** Compliance with the emission limits in Conditions 3 and 4 must be monitored at least monthly by computing the actual amount of emissions over the previous month and consecutive 12-month period.

Emissions must be calculated using the following methods or alternative method if approved by ORCAA:

a. **Material Use and Composition.** Monthly use of inks, lacquers, varnishes, cleaning solvents, and other materials containing VOCs and formaldehyde must be monitored as follows:
   i. Usage of each material must be monitored at least monthly in terms of totals pounds used, total gallons used, or both.
   ii. Material usage records must be sufficient to determine the amount of each material applied during bypass of the RTO.
   iii. The VOC and HAP composition of each unique material must be determined based on safety data sheets (SDS) and/or Certificates of Analysis specific to each material.

b. **Can Coating Emissions.** Emissions from coating application (including rim coat, ink, overvarnish, and inside lacquer) must be calculated as follows:
   i. VOC emissions must be calculated based on actual usage and composition for each material and using material balance methods and capture and control efficiency of the RTO, if applicable.
   ii. Formaldehyde emissions which are formed in the curing ovens must be calculated based on the actual amount of cans processed through each can coating line or the amount of coating or coating solids applied and using emission factors based on the most recent performance test or other factors as approved by ORCAA. Formaldehyde emissions from curing must be included in the total VOC emissions calculated for the can coating lines. Prior to the first performance test, Crown may apply a 90% control efficiency for formaldehyde to the 2017 source test emission factor unless required monitoring in Condition 37 indicate that the RTO is not operating normally.
   iii. Emission calculations based on the actual amount of cans produced or coating material applied must include spoilage. Spoilage means the cans processed in the can coating line that are discarded for defects or other reasons and are not included in the facility can production count.
   iv. VOC emission calculations based on capture and control efficiency of the RTO must use the capture and control efficiency of the most recent performance test, unless required monitoring in Condition 34 and Condition 37 indicate that the capture and control efficiency determined during the most recent performance test was not continuously maintained. Prior to the first performance test, Crown may use the following in emission calculations (unless monitoring indicates that the units are not operating normally):
      (1) a 75% capture efficiency for Lines 1 and 2;
      (2) an 84% capture efficiency for Line 3;
      (3) and 98% RTO control efficiency.

c. **Solvent Usage.** VOC emissions from solvent cleaning must be calculated based on material balance and actual usage and composition of each material.

d. **Combustion Emissions.** VOC and formaldehyde emissions from combustion of natural gas or other fuels must be calculated based on the amount of fuel combusted during the period and emission factors from the most current version of the EPA document, Compilation of Air Pollutant Emission Factors, AP-42.

e. **Storage Tanks.** VOC emissions from storage tanks containing VOC compounds must be calculated based on the actual throughput during the period and emission calculation methods from the most current version of the EPA document, Compilation of Air Pollutant Emission Factors, AP-42.
f. **Credit for Waste.** The permittee may credit shipments of waste in the mass balance calculations in (b) and (c) only when a characterization test has been performed on each container of waste, or on a container representing a group of containers filled from one batch of waste.

[Regulatory Basis: ORCAA Rule 8.11]

6. **Annual Emission Limit Recordkeeping:** The following records must be maintained for at least five years from the date the record originated, or as specified, and made available for inspection upon request:
   a. Records of monthly and 12-month rolling totals for VOC and formaldehyde emissions as required by Condition 5;
   b. Records of material and fuel usage, composition data, and any other data used to calculate emissions; and
   c. Safety data sheets (SDS) for all VOC-containing materials used in the process.

[Regulatory Basis: ORCAA Rule 8.11]

7. **Can Washing Solution Requirements.** Can coating solutions that meet the following criteria are approved for use by the permittee:
   a. The can washing solutions must not contain any TAPs (as defined by Chapter 173-460 WAC) except for sulfuric acid and hydrogen fluoride;
   b. The can washing solutions must not contain more than 60 percent sulfuric acid by weight, as applied; and
   c. The can washing solutions must not contain more than 5 percent hydrogen fluoride by weight, as applied.

[Regulatory Basis: (a) ORCAA Rule 6.1.2(l); (b) and (c) ORCAA Rule 6.1.4(a)(2)]

8. **Reformulated or New Can Washing Solution Monitoring.** The permittee must review each new or reformulated can washing solution prior to use to assure it meets the criteria in Condition 7. The permittee may show compliance with Condition 7 by documenting that the can washing solution as purchased meets the criteria.

[Regulatory Basis: ORCAA Rule 8.11]

9. **Reformulated or New Can Washing Solutions Recordkeeping.** Records of all determinations for reformulated or new can washing solutions under Condition 8 must be maintained for at least five years from the date the record originated and made available or inspection upon request.

[Regulatory Basis: ORCAA Rule 8.8]

10. **Can Washing Operation and Maintenance Plan.** Prior to startup of the Line 3 Can Washer, the owner or operator shall develop an Operations and Maintenance (O&M) plan to include procedures specific to operation and maintenance of the Line 1 and 2 Can Washer, Line 1 and 2 Can Washer Dryer, and the Line 3 Can Washer.

[Regulatory Basis:

Both can washers - ORCAA Rule 8.8;
Line 1 and 2 Washer – WAC 173-460-040(9)]

11. Approved Coatings / Material Limits. Coatings that meet the following criteria are approved for use by the permittee:

a. Rim coat varnish must be applied using roll on application and cured by ultraviolet lamps. The varnish must not contain any HAPs or TAPs; and VOC content must be less than 0.01 pounds per gallon.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)

b. Inks must be applied via using roll on application and contain no TAPs or HAPs except for formaldehyde.

[Regulatory Basis: ORCAA Rule 6.1.2(l)]

c. Overvarnish and inside lacquer must meet the applicable VOC limits in Condition 16 and:

Coating Type	Overvarnish	Inside Lacquer
i. The coating must not contain any TAPs[1] except for…	2-butoxyethanol; formaldehyde	2-butoxyethanol; formaldehyde
ii. The coating must not contain any HAPs[2] except for…	formaldehyde	formaldehyde; glycol ethers
iii. The 2-butoxyethanol (CAS 111-76-2) content of the coating must be no more than…	7.4% by weight	6.8% by weight
iv. The coating contains…	no glycol ethers	no more than 0.5% by weight glycol ethers
v. Total amount of coating used shall not exceed…	187,000 gallons per consecutive 12-month period	574,344 gallons per consecutive 12-month period
vi. The coating…	Is applied by roll on application	May be spray applied

[1] as defined by Chapter 173-460 WAC
[2] as defined by the Federal Clean Air Act

[Regulatory Basis:
i, ii, v, vi - ORCAA Rule 6.1.2(l);
iii. ORCAA Rule 6.1.2(l); ORCAA Rule 6.1.4(a)(5); WAC 173-460-080;
iv. - Overvarnish - ORCAA Rule 6.1.2(l), ORCAA Rule 6.1.4(a)(2);
iv. - Inside Lacquer – ORCAA Rule 6.1.2(l)]

12. Material Use Limit Monitoring: Compliance with the material use limits in Condition 11(c)(v) must be monitored at least monthly by calculating the actual amount of inside lacquer and overvarnish used during the previous month and 12-consecutive month period.

[Regulatory Basis: ORCAA Rule 8.11]

13. Material Use Limit Recordkeeping. Records of monthly and 12-month rolling totals of material usage as required by Condition 12 must be maintained for at least five years from the date the record originated and made available or inspection upon request.

[Regulatory Basis: ORCAA Rule 8.8]

14. **Reformulated or New Coating Materials Monitoring.** The permittee must review each new or reformulated coating material prior to use to assure it meets the criteria in Condition 11.

[Regulatory Basis: ORCAA Rule 8.11]

15. **Reformulated or New Coating Materials Recordkeeping.** Records of all determinations for reformulated or new materials under Condition 14 must be maintained for at least five years from the date the record originated and made available or inspection upon request.

[Regulatory Basis: ORCAA Rule 8.8]

16. **VOC Coating Limits.** The permittee must not discharge or cause the discharge of VOC emissions to the atmosphere that exceed the following volume-weighted calendar-month average emissions:
    a. 0.46 kilogram of VOC per liter of coating solids (3.84 pounds of VOC per gallon of coating solids) from each over-varnish coating operation; and,
    b. 0.89 kilograms of VOC per liter of coating solids (7.43 pounds of VOC per gallon of coating solids) from each two-piece can inside spray coating operation.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(1); ORCAA Rule 6.1.4(a)(2); 40 CFR Part 60.492]

17. **VOC Coating Limit Compliance Methods.** The permittee must conduct a performance test each calendar month using the procedures described in §60.493(b) to monitor compliance with the emission limits in Condition 16.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(1); ORCAA Rule 6.1.4(a)(2); 40 CFR Part 60.493(b)]

18. **VOC Coating Limit Quarterly Reports.** The permittee must identify, record, and submit quarterly reports to ORCAA of each instance in which the volume weight average of the total mass of VOC per volume of coating solids, is greater than the limit specified in Condition 16. The reports must be submitted no later than 30 days after the end of each calendar quarter. If no such instances occur during a particular quarter, a report stating this must be submitted to ORCAA semiannually.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(1); ORCAA Rule 6.1.4(a)(2); ORCAA Rule 8.11; 40 CFR Part 60.495(b)]

19. **VOC Coating Limit Recordkeeping.** Records of all data and calculations used to determine VOC emissions for purposes of the monthly compliance demonstrations required by Condition 17 must be maintained at the plant site for a period of at least five years.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(1); ORCAA Rule 6.1.4(a)(2); ORCAA Rule 8.11; 40 CFR Part 60.495(d)]

20. **Line 1 and 2 EGBE Limits.** Upon initial startup of Can Manufacturing Line 3, the following ethylene glycol monobutyl ether (EGBE) (CAS 111-76-2) emission limits apply to Can Coating Lines 1 and 2:

a. Emissions of EGBE during normal operation must not exceed 211.6 pounds per day; and
b. Emissions of EGBE during bypass must not exceed 399.2 pounds per day.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(5); WAC 173-460-080(3)]

21. **Line 1 and 2 EGBE Limits Monitoring.** Prior to startup of Can Manufacturing Line 3, the permittee must develop an ethylene glycol monobutyl ether (EGBE) monitoring plan that describes the methods the permittee will use to assure continuous compliance with the limit in Condition 20. The plan must be revised, if needed, and must be implemented at all times Can Manufacturing Line 3 is operating.

[Regulatory Basis: ORCAA Rule 8.11; ORCAA Rule 6.1.4(a)(5); 173-460-080(3)]

22. **Line 1 and 2 EGBE Limits Recordkeeping.** Records of monitoring conducted per the monitoring plan in Condition 21 must be maintained for at least five years from the date the record originated and be made available for inspection by ORCAA upon request.

[Regulatory Basis: ORCAA Rule 8.8; ORCAA Rule 6.1.4(a)(5); 173-460-080(3)]]

23. **Curing Ovens.** The following limits and requirements apply to the Line 2 Pin Oven, Line 1 Inside Bake Oven, Line 2 Inside Bake Oven, Line 3 Printer Oven #31 and #32, and Line 3 Inside Bake Oven at the facility:
    a. **Approved Fuel:** The curing ovens may combust only natural gas unless prior approval is granted by ORCAA.
    [Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]
    b. **Operation and Maintenance:** Operation and maintenance procedures recommended by the manufacturer for maintaining proper combustion must be followed. A copy of the recommended operation and maintenance procedures shall be kept on-site.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); ORCAA Rule 8.8]

    c. **Tune-ups:** Combustion systems must be tuned-up to meet the NO_x and CO emissions levels stated below or the manufacturer's recommended or guaranteed operating emissions levels, whichever levels result in the least emissions of NO_x and CO. The ovens must be tuned in the first month of operation and according to the minimum frequency stated below.

Fuel	Tune-up Frequency	NO_x (ppm @ 3% O_2)	CO (ppm @ 3% O_2)
Natural Gas	Every 61 months	80	100

[Regulatory Basis: ORCAA Rule 6.1.4(a)(3); ORCAA Rule 6.1.4(a)(2); ORCAA Rule 8.8]

    d. **Tune-up Procedures**:
        i. Tune-up must include measuring concentrations of NOx, CO and O_2 under normal operating load, making any needed adjustments to combustion systems, and re-measuring emissions levels to confirm the prescribed emissions levels in Condition 14(c) are met.
        ii. A record of all measurements, adjustments and maintenance actions must be retained.
        iii. Emissions must be measured using an electrochemical cell combustion analyzer or another analyzer pre-approved by ORCAA;

iv. The analyzer(s) response to span (calibration) gas of a known concentration (reference) must be determined before and after testing. No more than 12 hours may elapse between span gas response checks. Test results are invalid if the analyzer zero or span drift exceeds 10% of the span value.
v. The CO and NO_x span gas concentrations must be no less than 50% and no more than 200% of the target emission concentrations per Condition 23(c). A lower concentration span gas may be used if it is more representative of measured concentrations. Ambient air may be used to zero the CO and NO_x cells/analyzer(s) and span the oxygen cell/analyzer.
vi. Sampling and measurement must consist of at least 5 minutes of data collection. Data must not be collected until after the analyzer readings have stabilized.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); ORCAA Rule 8.8]

24. Lacquer Spray Machine Filters. The Line 1, Line 2, and Line 3 Lacquer Spray Machines overspray control system must be designed and operated according to the following requirements:
a. Each lacquer spray machine must be equipped with a particulate filter with a rated filtration efficiency of at least 99%.
b. Inside spray lacquer must be applied within the approved lacquer spray machines and only when the exhaust and filtration system is fully operating.
c. Exhaust filters must be properly seated and must cover all openings of the exhaust air intakes.
d. The permittee must develop, implement and update when necessary an Operations and Maintenance (O&M) plan for the lacquer spray machines. At a minimum, the plan must include procedures and a schedule for inspecting and replacing the filters.
e. Filters must be replaced whenever damaged or loaded with particulate build-up to an extent that jeopardizes the effectiveness of the ventilation system to capture emissions.

[Regulatory Basis:
Line 1 and 2 - ORCAA Rule 6.1.10(b);
Line 3 – ORCAA Rule 6.1.4(a)(2)]]

25. Line 3 Solvent Usage Limit. The permittee must not use more than 2.6 gallons of isopropanol per hour on Line 3 Can Manufacturing Line.

[Regulatory Basis: ORCAA Rule 6.1.2(l); ORCAA Rule 6.1.4(a)(5); WAC 173-460-070]

26. Line 3 Solvent Cleaning BACT. The Line 3 decorator capture system must be operating during cleaning of the decorators (the close capture hoods may be opened as needed for cleaning).

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]

27. Line 3 Solvent Monitoring. Prior to startup of Line 3 Decorator, the permittee must develop an isopropanol monitoring plan to detail the methods the permittee will use to assure continuous compliance with the limit in Condition 25 and operating requirements in Condition 26. The plan must be made available for inspection by

ORCAA upon request. The plan must be revised, if needed, and must be implemented at all times isopropanol is used on Can Manufacturing Line 3.
[Regulatory Basis: ORCAA Rule 8.11; ORCAA Rule 6.1.4(a)(2); ORCAA Rule 6.1.4(a)(5); WAC 173-460-070]

28. **Line 3 Solvent Recordkeeping.** Records of all monitoring conducted per the monitoring plan in Condition 26 must be maintained for at least five years from the date the record originated and be made available for inspection by ORCAA upon request.
[Regulatory Basis: ORCAA Rule 8.8; ORCAA Rule 6.1.4(a)(5); 173-460-070]

29. **Pollution Prevention.** All coatings, solvents, and other VOC-containing materials or cloths must be stored in closed, airtight containers. All volatile material spills must be cleaned up promptly.
[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]

30. **Curing Oven Capture Requirement:** All emissions from the Lines 1, 2, and 3 Printer Ovens (PIN Ovens) and Lines 1, 2, and 3 Inside Bake Ovens (IBOs) must be routed to the regenerative thermal oxidizer at all times except during bypass as allowed by Condition 36.
[Regulatory Basis:
All ovens – ORCAA Rule 8.6(b);
Lines 1 and 2 Ovens – ORCAA Rule 6.1.4(a)(5); WAC 173-460-080(3);
Line 2 and 3 PIN Ovens, Lines 1, 2, and 3 IBOs – ORCAA Rule 6.1.4(a)(2);
Line 1 PIN Oven – ORCAA Rule 6.1.10(b)(1)]

31. **Coating Application Capture Requirement:** The lacquer spray machines (all lines), the conveyors between the lacquer spray machines and the inside bake oven (all lines), and the Line 3 decorators must each be equipped with a system to capture volatile emissions. The capture systems must be operating at all times the coating lines are operating. Captured emissions must be routed to the regenerative thermal oxidizer at all times except during bypass as allowed by Condition 36.
[Regulatory Basis:
Lines 1 and 2 – ORCAA Rule 6.1.4(a)(5); WAC 173-460-080(3);
Line 3 - ORCAA Rule 6.1.4(a)(2)]

32. **Line 1 and 2 Capture Efficiency.** The capture and collection systems for the Line 1 and Line 2 Can Coating Lines must operate with a minimum overall organic compound capture efficiency of 75% when the can coating lines are operating. For purposes of this condition, the can coating lines include all processes beginning with and including the printer/decorators and ending with and including the inside bake ovens.
[Regulatory Basis: ORCAA Rule 6.1.10(b)(1); ORCAA Rule 6.1.4(a)(5); WAC 173-460-080(3)]

33. **Line 3 Capture Efficiency.** The capture and collection systems for the Line 3 Can Coating Line must operate with a minimum overall organic compound capture efficiency of 84% when the can coating line is operating. For purposes of this condition,

the can coating lines include all processes beginning with and including the printer/decorators and ending with and including the inside bake oven.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]

34. **Capture System Monitoring.** The permittee must monitor each capture system that exhausts to the RTO according the facility's capture system monitoring plan. Prior to startup of Can Manufacturing Line 3, the permittee must revise the existing capture system monitoring plan to include the capture systems in Line 3. The plan must be made available for inspection by ORCAA upon request. At a minimum, the permittee must review and update the capturing system monitoring plan after each capture system performance test or annually, whichever is more frequent. At a minimum the monitoring plan must:
    a. Identify the operating parameter(s) to be monitored to ensure that each capture system is operated under negative pressure and the capture efficiency determined during the last performance test is continuously maintained;
    b. Explain why the parameter(s) is appropriate for demonstrating ongoing compliance; and
    c. Identify the procedures that will be used to monitor the operating parameter(s) (including method and frequency).

[Regulatory Basis:
Line 1 and 2 - ORCAA Rule 6.1.10(b); ORCAA Rule 6.1.4(a)(5); WAC 173-460-080(3);
Line 3 – ORCAA Rule 6.1.4(a)(2)]]

35. **Regenerative Thermal Oxidizer (RTO).** The following limits and requirements apply to the regenerative thermal oxidizer:
    a. **Design.** The RTO must be a three-chamber design with a design exhaust rate of at least 55,000 ACFM, which may be demonstrated through written documentation on the regenerative thermal oxidizer provided by the manufacturer.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]

    b. **Approved Fuel.** The RTO may combust only natural gas unless prior approval is granted by ORCAA.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]

    c. **Destruction Efficiency.** The RTO must have a minimum destruction efficiency of 98% for organic compounds as measured by EPA Method 25A.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); ORCAA Rule 6.1.4(a)(5); WAC 173-460-080(3)]

    d. **Formaldehyde Emission Limit.**
        i. Emissions of formaldehyde from the RTO stack must not exceed 0.53 pounds per hour at all times.
        ii. Emissions of formaldehyde from the RTO stack must not exceed 0.26 pounds per hour when controlling emissions from Can Coating Lines 1 and 2 only.

[Regulatory Basis: ORCAA Rule 6.1.2(l); ORCAA Rule 8.6(b)]

    e. **Opacity Limit.** There must be no visible emissions from the Regenerative Thermal Oxidizer as determined in accordance with EPA 40 CFR Part 60 Appendix A, Method 9. This limit does not apply during periods of cold start-up. For compliance with this condition, cold start-up is defined as the period beginning when the RTO is started and ending when the RTO reaches normal operating temperature. This

opacity limit is in addition to the state-wide general opacity standard of 20% required under WAC 173-400-040(1) and ORCAA Rule 8.2.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]

f. **Tune-ups.** Combustion systems must be tuned-up to meet the NO_x and CO emissions levels stated below or the manufacturer's recommended or guaranteed operating emissions levels, whichever levels result in the least emissions of NO_x and CO. The RTO must be tuned in the first month of operation and according to the minimum frequency stated below. Tune-ups shall be conducted according to the procedures in Condition 23(d).

Fuel	Tune-up Frequency	NO_x (ppm @ 3% O_2)	CO (ppm @ 3% O_2)
Natural Gas	Every 61 months	60	50

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]

36. RTO Bypass: The following limits and requirements apply:

a. The regenerative thermal oxidizer may be bypassed for maintenance purposes only.

[Regulatory Basis: ORCAA Rule 6.1.2(l)]

b. The regenerative thermal oxidizer must not be bypassed for more than 200 hours on a 12-month rolling period.

[Regulatory Basis: ORCAA Rule 6.1.2(l)]

c. When bypassing the RTO, only one of the following may be operational:
   i. Coating Line 1; or
   ii. Coating Line 2; or
   iii. Coating Line 3 at a rate not to exceed 2000 cans-per-minute with no more than one decorator and one PIN oven operating.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(3); ORCAA Rule 8.6(b); ORCAA Rule 6.1.4(a)(5); WAC 173-460-080(3)]

d. Total emissions of formaldehyde from Line 1 or 2 bypass stacks must not exceed 1.3 pounds per hour.

[Regulatory Basis: ORCAA Rule 8.6(b)]

e. Total emissions of formaldehyde from Line 3 bypass stacks must not exceed 1.07 pounds per hour.

[Regulatory Basis: ORCAA Rule 8.6(b)]

f. Coating Line 3 must not operate in bypass mode until a performance test has been conducted to verify compliance with Condition 36(e). If necessary, Coating Line 3 may operate in bypass mode for the purposes of the performance test.

[Regulatory Basis: ORCAA Rule 8.6(b)]

g. Visible emissions from the bypass stacks must not exceed ten percent opacity, six-minute average, as determined in accordance with EPA 40 CFR Part 60 Appendix A, Method 9. This limit does not apply during periods of cold start-up. For compliance with this condition, cold start-up is defined as the period beginning when the oven is started and ending when the oven reaches normal operating temperature. This opacity limit is in addition to the state-wide general opacity standard of 20% required under WAC 173-400-040(1) and ORCAA Rule 8.2.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]

h. The permittee must monitor bypasses of the RTO. Bypass monitoring must be conducted on each bypass line using one of the following procedures:
    i. Install, calibrate, maintain, and operate according to the manufacturer's specifications a flow control position indicator that provides a record indicating whether the exhaust stream from the emission unit was directed to the control device or was diverted from the control device. The time and flow control position must be recorded at least once per hour as well as every time the flow direction is changed. A flow control position indicator must be installed at the entrance to any bypass line that could divert the exhaust stream away from the control device to the atmosphere.
    ii. Install, maintain, and operate a bypass line valve or damper indicator to continuous monitor valve or damper position. The monitoring system must be inspected at least once every month to verify that the monitor will indicate valve or damper position.
    iii. Secure the bypass line valve in the nondiverting position with a car-seal or a lock-and-key type configuration and visually inspect the seal or closure mechanism at least once a month. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve or damper is maintained in the closed position, and the exhaust stream is not diverted through the bypass line.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]

37. RTO Temperature Monitoring. The permittee must monitor the combustion chamber temperature of the RTO as follows:
a. Each RTO combustion chamber must be equipped with a sensor that continuously measures and records the temperature of each combustion chamber (or in the duct immediately downstream of the combustion chamber before any substantial heat exchange occurs). The combustion chamber temperature sensor must be accurate to within ± 1% of the temperature being monitored in degrees Fahrenheit or ± 1.8 degrees Fahrenheit, whichever is greater.
b. Temperature sensors must be installed, maintained, and operated according to manufacturer specifications.
c. The permittee must develop, implement, and update when necessary a quality control plan to verify that the temperature sensor is still functioning properly. At a minimum, the plan must include the verification method and frequency. Methods may include, but are not limited to, comparisons of sensor output to redundant temperature sensors, to calibrated temperature measurement devices, or to temperature simulation devices. The temperature sensor must be replaced with a new sensor either if the sensor looks damaged and/or broken or the sensor no longer meets the accuracy requirement specified in Condition 37(a).
d. The permittee must conduct temperature monitoring at all times the RTO is operating, except during bypass, monitoring malfunctions, associated repairs, and required quality assurance or control activities,
e. The temperature must be recorded at least once for each successive 15-minute period and the average determined of all recorded readings for each successive 3-hour period.

f. Prior to the initial performance test, the combustion chamber temperature setpoint must be established at a minimum of 1550 degrees Fahrenheit. The combustion chamber temperature (three-hour average) must not fall below 1500 degrees Fahrenheit.
g. After the initial performance test, the average combustion chamber temperature measured at the most recent performance test must be established as the minimum combustion chamber temperature setpoint. The combustion chamber temperature (three-hour average) must not fall more than 50 degrees Fahrenheit below the average combustion chamber temperature measured at the most recent performance test.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); ORCAA Rule 6.1.4(a)(5); WAC 173-460-060]

38. **Operations and Maintenance Plan:** The Permittee must develop, implement, and update when necessary an operation and maintenance (O&M) plan to assure the capture and control systems are in continuous compliance with all applicable air regulations and standards. The O&M plan must be retained on site and made available to ORCAA for review when requested. Operating instructions must be established and posted such that they are available for all RTO operators.

[Regulatory Basis: ORCAA Rule 8.8]

39. **Capture and Control Systems Recordkeeping:** The following records must be maintained for at least five years from the date the record originated, or as specified, and made available for inspection upon request:
    a. Documentation of RTO design specification per Condition 35(a).
    b. Records of RTO tune-ups required by Condition 35(f).
    c. Records of all RTO bypass monitoring including start time and end time, reason for the bypass, emission units venting to the atmosphere during bypass, and amount of each coating material applied during the bypass.
    d. Capture system monitoring plan and all associated capture system monitoring.
    e. Records of LSM filter efficiency per Condition 24(a).
    f. LSM O&M plan required by Condition 24(d). The permittee must keep an inspection and maintenance log for the LSM filter system including the date of each inspection, the name of the inspector, and any repairs and/or maintenance work performed.
    g. RTO combustion chamber temperature monitoring records including all temperature readings and 3-hour averages.
    h. RTO temperature sensor quality control plan and all associated monitoring and maintenance activities.
    i. RTO and capture system O&M plan required by Condition 38. The permittee must keep an inspection and maintenance log for the RTO and its capture systems including the date of each inspection, the name of the inspector, and any repairs and/or maintenance work performed.
    j. Records of maintenance conducted on the equipment listed in Condition 1.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]

40. **Line 1 and 2 Initial Performance Testing Required.** The permittee must conduct an initial performance test on Can Manufacturing Lines 1 and 2 no later than October 16, 2021 to:

a. Verify the destruction efficiency of the RTO meets the minimum destruction efficiency required in Condition 35(c);

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); ORCAA Rule 1.5(i)]

b. Verify the short-term (maximum hourly) formaldehyde emission rate from the RTO is less than or equal to the limit in Condition 35(d)(i) and establish an emission factor for formaldehyde from the RTO;

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); ORCAA Rule 6.1.2(l); ORCAA Rule 1.5(i)]

c. Verify the short-term (maximum hourly) formaldehyde emission rate during bypass of Lines 1 and 2 is less than or equal to the limit in Condition 36(d) and establish an emission factor for formaldehyde during bypass;

[Regulatory Basis: ORCAA Rule 8.6(b); ORCAA Rule 6.1.2(l); ORCAA Rule 1.5(i)]

d. Determine the RTO combustion chamber operating temperature needed to meet the measured destruction efficiency. The operating temperature shall be based on a 3-hour rolling average; and

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); ORCAA Rule 1.5(i)]

e. Verify the capture systems on Lines 1 and 2 meet the minimum capture efficiency as specified on Condition 32. The permittee may elect to delay the initial performance test of the Line 1 and 2 capture system to conduct the test in conjunction with the initial performance test of Line 3 (as allowed by Condition 44(b)). The initial performance test of the Line 1 and 2 capture system must occur no later than April 16, 2022.

[Regulatory Basis: ORCAA Rule 6.1.10(b); ORCAA Rule 6.1.4(a)(5); WAC 173-460-080(3); ORCAA Rule 1.5(i)]

41. **Line 3 Initial Performance Testing Required.** The permittee must conduct an initial performance test on Can Manufacturing Line 3 no later than 180 days from startup to:
    a. Verify the destruction efficiency of the RTO meets the minimum destruction efficiency required in Condition 35(c);

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); ORCAA Rule 1.5(i)]

b. Verify the short-term (maximum hourly) formaldehyde emission rate from the RTO is less than or equal to the limit in Condition 35(d)(ii) and establish an emission factor for formaldehyde from the RTO;

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); ORCAA Rule 6.1.2(l); ORCAA Rule 1.5(i)]

c. Determine the RTO combustion chamber operating temperature needed to meet the measured destruction efficiency. The operating temperature shall be based on a 3-hour rolling average; and

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); ORCAA Rule 1.5(i)]

d. Verify the capture systems on Line 3 meets the minimum capture efficiency as specified on Condition 33.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); ORCAA Rule 1.5(i)]

42. **Ongoing Performance Testing Required.** Following the initial performance testing required in Condition 40 and 41, the permittee must conduct performance testing as follows:
    a. A performance test of RTO destruction efficiency must be performed at least once every 61 months or whenever required by ORCAA.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); ORCAA Rule 1.5(i)]

b. A performance test for compliance with formaldehyde emission limits in Condition 35(d) and Condition 36(d) must be conducted when required by ORCAA.

[Regulatory Basis: ORCAA Rule 6.1.2(l); ORCAA Rule 8.6(b); ORCAA Rule 1.5(i)]

c. A subsequent performance test for capture efficiency testing is required within 61 months of the initial test or whenever requested by ORCAA. After that, additional testing may be required if significant changes have been made to the capture system or when required by ORCAA.

[Regulatory Basis: ORCAA Rule 6.1.10(b); ORCAA Rule 1.5(i)]

43. Line 3 Bypass Performance Test. As required by Condition 36(f), the permittee must conduct a performance test prior to operating Coating Line 3 when the RTO is in bypass mode. The performance test shall be conducted to verify the short-term (maximum hourly) formaldehyde emission rate during bypass of Line 3 is less than or equal to the limit in Condition 36(e) and establish an emission factor for formaldehyde during bypass. Following the initial performance test, the permittee must conduct a performance test for compliance with Condition 36(e) when required by ORCAA.

[Regulatory Basis: ORCAA Rule 8.6(b); ORCAA Rule 6.1.2(l); ORCAA Rule 1.5(i)]

44. Performance Testing Requirements. All performance testing must be conducted as follows unless an alternative has been approved by ORCAA:

a. Testing must be conducted when all can coating lines are operating at maximum production rate and applying the ink, overvarnish, and inside spray combination that will result in the maximum emissions.
b. Capture system performance testing must be conducted by determining the weight and VOC content of each material applied according to EPA Method 204A and inlet mass of VOC to the RTO by Method 25A or alternative methods if approved by ORCAA. As an alternative to conducting separate performance tests to demonstrate compliance with Conditions 32 and 33, the permittee may conduct a compliance test to demonstrate that the overall organic compound capture efficiency of the capture and collection systems of Lines 1, 2, and 3 is at least 80%.
c. Performance testing for RTO destruction efficiency must be conducted according to EPA Method 25A or alternative method if approved by ORCAA.
d. Performance testing for formaldehyde must be conducting according to EPA Method 320 or alternative method approved by ORCAA.
e. Performance testing to determine the volumetric flowrate must be conducted according to EPA Methods 1-3 or alternative method if approved by ORCAA.
f. A performance test must consist of three runs. Each run must be a minimum of one hour (or longer if the test method requires).
g. During the performance test, the permittee must monitor and record the RTO combustion chamber temperature(s) at least once every 15 minutes during each of the three test runs. The temperature must be monitored in the combustion chamber or immediately downstream before any substantial heat exchange occurs.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]

45. Performance Testing Notifications, Plans and Reports. Whenever performance testing is required:

a. The permittee must submit a notification of the intent to conduct a performance test and a site-specific test plan to ORCAA at least 60 calendar days before the scheduled date of a performance test.
b. At a minimum, the test plan must include the following:
   i. Test program summary;
   ii. Test schedule;
   iii. Data quality objectives;
   iv. Internal and external quality assurance program;
   v. Identify the operating parameters to be monitored to ensure that the capture efficiency of the capture system and the control efficiency of the RTO determined during the performance test are maintained at all times; and
   vi. Identify the operating parameters and ink, overvarnish, and inside spray that will be used to meet the objective in Condition 44(a).
c. The permittee must submit a performance test report to ORCAA no later than 60 days after completion of the test. The performance test must be certified as true and accurate by responsible officials from the testing contractor and the permittee. At a minimum, the performance test report must contain the following information:
   i. A description of the source and sampling location;
   ii. The date and time of each test;
   iii. A summary of test results reported in units and averaging period appropriate to the applicable standard;
   iv. A description of the test methods and quality assurance procedures used;
   v. The types and amounts of coating materials;
   vi. Operating parameters of the emission units and control equipment during each test;
   vii. Raw field data and sample calculations; and
   viii. Deviations from approved test plans or the O&M Plan.

[Regulatory Basis: ORCAA Rule 8.11; ORCAA Rule 1.5(d)&(i)]

46. Exhaust Stack and Vent Requirements. Exhaust stacks and vents must meet the following requirements:

a. There must be no flow obstructions at the point of discharge from the exhaust stacks or vents (i.e. cap) for the Line 2 Pin Oven, Line 1 and 2 Inside Bake Oven, Regenerative Thermal Oxidizer, or any Line 3 stack/vent. However, a weatherproof stack exhaust configuration that does not obstruct the air flow as it exits the stack is acceptable.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2)]

b. Each stack or vent listed below must have a height above ground that is equal to or greater than the following:

Stack or Vent	**Height equal to or greater than…**
Line 1 Pin Oven Bypass Stack	14.3 meters
Line 2 Pin Oven Bypass Stack	14.3 meters
Line 1 Inside Bake Oven Bypass Stacks	14.0 meters
Line 2 Inside Bake Oven Bypass Stacks	14.0 meters
Regenerative Thermal Oxidizer Stack	18.3 meters

Line 3 Can Washer Stack	17.4 meters
Line 3 Rooftop Vents	13.7 meters
Line 3 Pin Oven Bypass Stacks	14.3 meters
Line 3 Inside Bake Oven Bypass Stacks	14.0 meters

[Regulatory Basis: ORCAA Rule 6.1.2(l); ORCAA Rule 6.1.4(a)(3); ORCAA Rule 6.1.4(a)(5); WAC 173-460-070]

c. No later than 90 days from the startup of Can Manufacturing Line 3, the permittee shall measure the velocity or volumetric flowrate of the following exhaust stacks or vents listed below to verify rate is as listed in Condition 1 or higher. ORCAA must be notified of the test date, planned test method, and operational parameters that will be monitored (i.e. fan speed, damper settings) at least seven days prior to the testing. After the initial test, subsequent verification of volumetric flowrates from stacks or vents may be required if significant changes have been made to the exhaust system or when required by ORCAA.
   i. Line 3 Can Washer stack
   ii. Line 3 Decorator room vents
   iii. Line 3 Printer Oven Bypass Stacks
   iv. Line 3 Inside Bake Oven Bypass Stacks

[Regulatory Basis: ORCAA Rule 6.1.2(l); ORCAA Rule 1.5(i); ORCAA Rule 6.1.4(a)(3); ORCAA Rule 6.1.4(a)(5); WAC 173-460-070]

47. Exhaust Stack and Vent Monitoring Plan. No later than 30 days after measuring velocity or volumetric flowrate as required by Condition 46(c), the permittee must develop and implement an exhaust stack and vent monitoring plan. The plan must be made available for inspection by ORCAA upon request. At a minimum, the monitoring plan must:

a. Identify the operating parameter(s) to be monitored to assure that the flowrate from the exhaust stacks or vents are continuously maintained as listed in Condition 1;
b. Explain why the parameter(s) is appropriate for demonstrating ongoing compliance;
c. Identify the procedures that will be used the monitor the operating parameter(s) (including method and frequency); and
d. If ongoing monitoring is not necessary for a specific stack, documentation of that determination (i.e. fixed speed fan).

[Regulatory Basis: ORCAA Rule 6.1.2(l); ORCAA Rule 6.1.4(a)(5); WAC 173-460-070]

48. Exhaust Stack and Vent Recordkeeping. Records of all exhaust stack and vent testing and monitoring must be maintained for at least five years from the date the record originated and be made available for inspection by ORCAA upon request.

[Regulatory Basis: ORCAA Rule 8.8; ORCAA Rule 6.1.4(a)(5); 173-460-070]

PREPARED BY: Jennifer A. DeMay, P.E.

REVIEWED BY: Mark V. Goodin, P.E.

APPENDIX

Generally Applicable Requirements

Title Citation	Brief Description (Consult rule/regulation for specific requirements)
New Source Review (NSR) **ORCAA Rule 6** **Chapter 173-460 WAC**	Approval by ORCAA through a NOC application is required prior to establishing or constructing any new source of emissions or modifying an existing source. This includes removal of a control device or substantial modification of an existing control device.
Demolition and Asbestos Requirements **ORCAA Rule 6.3**	Requires notification prior to certain demolition or asbestos projects as well as requirements for asbestos projects and disposal.
Interference or Obstruction **ORCAA Rule 7.1**	Prohibits willfully interfering with or obstructing the Control Officer or any Agency employee in performing any lawful duty.
False or Misleading Statements **ORCAA Rule 7.2**	Prohibits any person from willfully making a false or misleading statement to the Board or its representative as to any matter within the jurisdiction of the Board.
Unlawful Reproduction or Alteration of Documents **ORCAA Rule 7.3**	Prohibits reproducing or altering, or causing to be reproduced or altered, any order, registration certificate or other paper issued by the Agency if the purpose of such reproduction or alteration is to evade or violate any provision of these Regulations or any other law.
Display of Orders and Certificates **ORCAA Rule 7.4**	Any order or registration certificate required to be obtained by these Regulations shall be available on the premises designated on the order or certificate. In the event that the Agency requires order or registration certificate to be displayed, it shall be posted. No person shall mutilate, obstruct or remove any order or registration certificate unless authorized to do so by the Board or the Control Officer.
Concealment and Masking **ORCAA Rule 7.5** **WAC 173-400-040(8)**	Prohibits installation or use of any device or means to conceal or mask emissions of an air contaminant, which causes detriment to health, safety, or welfare of any person, or causes damage to property or business.
Emissions Detrimental to Persons or Property **ORCAA Rule 7.6** **WAC 173-400-040(6)**	Prohibits causing or allowing the emission of any air contaminant from any source if it is detrimental to the health, safety, or welfare of any person, or causes damage to property or business.
Visible Emissions **ORCAA Rule 8.2(a)** **WAC 173-400-040(2)**	Prohibits emissions with opacity of greater than 20% for more than three (3) minutes in any one hour.
General Requirements **ORCAA Rule 8.3** **WAC 173-400-040(1)(c)**	All emissions units are required to use reasonably available control technology (RACT).
Fugitive Emissions **ORCAA Rule 8.3(c)** **WAC 173-400-040(4)(a)**	The owner or operator of any emissions unit engaging in materials handling, construction, demolition or other operation which is a source of fugitive emission shall take reasonable precautions to prevent the release of air contaminants from the operation.
Fallout **ORCAA Rule 8.3(e)** **WAC 173-400-040(3)**	Prohibits particulate emissions 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 was deposited.
Odor **ORCAA Rule 8.5** **WAC 173-400-040(5)**	ORCAA Rule 8.5 contains general requirements for controlling odors and a general prohibition of odors that unreasonably interfere with the use or enjoyment of a person's property.
Excess Emissions Provisions **ORCAA Rule 8.7** **WAC 173-400-107**	Requires excess emissions be reported to the Authority as soon as possible and within 24 hours and establishes criteria qualifying excess emissions as unavoidable.

Title Citation	Brief Description (Consult rule/regulation for specific requirements)
Equipment Maintenance and Repair **ORCAA Rule 8.8**	ORCAA Rule 8.8 requires that all air contaminant sources keep any process and/or air pollution control equipment in good operating condition and repair.
Record Keeping and Reporting **ORCAA Rule 8.11**	Requires the following: 1. Maintenance of records on the nature and amounts of emissions and other related information as deemed necessary by ORCAA; 2. Reporting of emissions to ORCAA upon request.
Sulfur Dioxide **WAC 173-400-040(7)**	No person shall cause or allow the emission from any emissions unit in excess of one thousand ppm of sulfur dioxide on a dry basis, corrected to seven percent oxygen for combustion sources, and based on the average of any period of sixty consecutive minutes.
Fugitive Dust **WAC 173-400-040(9)**	The owner or operator of a source or activity that generates fugitive dust must take reasonable precautions to prevent that fugitive dust from becoming airborne and must maintain and operate the source to minimize emissions.