



Serving Island, San Juan, Skagit and Whatcom Counties

Statement of Basis for the Air Operating Permit - Draft

Chemco, Inc.

Ferndale, Washington

5/19/2026



PERMIT INFORMATION
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AIR OPERATING PERMIT NUMBER: 020R3

EXPIRATION DATE: FINAL + 5 YRS

RENEWAL APPLICATION DUE: FINAL + 4 YRS

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1. INTRODUCTION

CHEMCO, INC. (identified herein as the permittee, the facility, or Chemco) is required to obtain and air operating permit (AOP or permit) because the facility has the potential to emit greater than:

- 10 tons per year of methanol, a hazardous air pollutant
- 100 tons per year of volatile organic compounds (VOC)

Facility emissions, including PTE are noted in the facility emission tables, Table 2.3-1 and 2.3-2.

The purpose of this Statement of Basis is to set forth the legal and factual basis for the conditions of the AOP issued to PWC under the authority of the Washington Clean Air Act, Chapter 70A.15 Revised Code of Washington (RCW), Chapter 173-401 of the Washington Administrative Code Act (WAC), and Northwest Clean Air Agency Regulation Section 322. This Statement of Basis is not a legally enforceable document. It includes references to the applicable statutory or regulatory provisions that relate to PWC's air emissions and provides background information to facilitate review of the permit by interested parties.

Note that terms "AOP" and "Title V permit" are used interchangeably throughout this document. The AOP is authorized through Title V of the Federal Clean Air Act, so the use of either term is appropriate.

1.1 Permit Changes in This Renewal

The NWCAA received an application for the renewal of Chemco's AOP on June 13, 2025. The following changes were made to the AOP during this renewal:

1.1.1 Air Operating Permit Changes:

- AOP Section 2: Standard Terms and Conditions
 - Replaced with current NWCAA standard versions, containing any new or modified regulations and updated reference dates.
- AOP Section 3: Standard Terms and Conditions for NSPS and NESHAP
 - Replaced with current NWCAA standard versions, containing any new or modified regulations and updated reference dates.
 - Updated applicability of general provisions for Subpart FFFF, DDDD, and DDDDD with new terms where general provisions did not apply. Note that general provisions unique to each subpart were only included when applicable to equipment at Chemco.
- AOP Section 4: Updates to Generally Applicable Requirements
 - Re-ordered terms to be consistent with NWCAA template groupings by term type and pollutant (nuisance, odor, PM, SO₂, etc.)
 - Updated wording throughout to reflect NWCAA standard template verbiage.
 - Includes SIP approved and state only versions:
 - 4.9 & 4.10
 - 4.14 & 4.15
 - 4.21 & 4.22
 - 4.24 & 4.25
 - Term 4.14, 4.15, & 4.16 – Visible Emissions

- Moved the 0% visible emissions limit (previously term 4.3), which only applies to the boiler stack, to Section 5. Section 5 is where we list equipment-specific requirements. AOP Section 4 lists facility-wide limits. The applicable facility-wide visible emission limit is 20% opacity, now listed in Term 4.14, 4.15, & 4.16. Updated MR&R wording to reflect NWCAA standard template verbiage.
- Term 4.19 – Emission Standards for Combustion and Incineration Units
 - Added verbiage for alternate oxygen correction factor.
- Term 4.20 – Weight/Heat Rate Standard – Emission of Sulfur Compounds
 - Added term as this is still a requirement in NWCAA SIP
- Term 4.20,21,22,23 – Emission of Sulfur Compounds
 - Added recordkeeping requirement to maintain fuel consumption records or monthly bills from fuel supplier to sufficiently demonstrate compliance (gap filling).
- Removed last permit term in Section 4 “Required Monitoring Report” as this is already included in Term 4.1.
- AOP Section 5: Regulatory citations in the permit were revised to reflect new or modified regulations and revision/promulgation dates were updated. Revisions of note include:
 - Chemical Batch Plant:
 - 40 CFR 63 Subpart FFFF Rule Updates, 04/04/2024
 - Term 5.1.8 – Updated leak definition for Pumps in light liquid service. According to updates to §63.2480(b)(5) and (b)(6), the Subpart UU leak requirements now apply: The leak definition is now 1,000 ppm (instead of 10,000 ppm). Pump repair is required at 2,000 ppm or greater.
 - Term 5.1.9 Re-worded for clarity, no content changes.
 - Natural Gas Fired Boiler:
 - 40 CFR 63 Subpart DDDDD Rule Updates, 10/6/2022:
 - Term 5.2.1:
 - Addition of 5 year boiler tune up option for boilers that operate a continuous oxygen trim controller per 63.7540 (a)(12)
 - Removal of one-time, initial requirements that have already been completed.
 - Removal of unnecessary regulatory citations which were not applicable because natural gas fired.
 - Term 5.2.5: Added reference to existing monitoring and recordkeeping requirements established in section 4 for visible emissions for consistency. This falls under sufficiency monitoring for this term.
 - Emergency CI RICE Generator
 - Removed all requirements
 - The emergency generator (what had previously been EU-4) and associated equipment and property sold to Coleman Oil and therefore is no longer equipment owned and operated by Chemco. 40 CFR Subpart ZZZZ requirements have been removed.
- General Updates:
 - Contact names and information for the NWCAA were updated where appropriate and the permit information page reflects the updated permit number and dates for the permit renewal. Note the renewal application is due a year in advance of the permit expiration date.

- Formatting throughout the permit was updated to current NWCAA standards.
- Updated submission addresses in sections 2.4.1.1 and 3.1.1 for notifications and reports. For NWCAA, the preferred method is electronic submission via facilityreports@nwcleanairwa.gov
- Addition of gap filling and sufficiency monitoring regulatory citations where used in section 4 and section 5: WAC 173-401-615(1)(b)&(c) – gap filling and WAC 173-401-630(1) – sufficiency monitoring.
- Moved permit conditions in Section 4 to match NWCAA standard template.
- Removed duplicate NWCAA adoption reference 104.2 citation in each individual regulation as this is already referenced at the beginning of section 5 and covers the entire section.

1.1.2 Statement of Basis Changes:

Factual information was revised to correct for current operation and some text has been revised to add clarification.

- Section 2 - Facility Description:
 - 2.1 – General Facility Description:
 - Added subsections with additional details to general facility description to align with typical NWCAA SOB format:
 - 2.1.1 Commercial Products Produced
 - 2.1.2 Manufacturing Process
 - 2.1.3 Other Processes
 - 2.1.4 Operating Schedule
 - Updated references to emergency generator and diesel loading rack. This equipment and associated property was sold to Coleman Oil in 2023 and is no longer owned by Chemco.
 - 2.3 - Emissions Inventory:
 - Updated emission inventory numbers from 2019-2024
 - 2.4 – Potential to Emit
 - Added this section which includes a summary of kiln PTE calculations classifying this source as a major source for methanol and VOC emissions.
 - 2.5 - Permitting History:
 - Updated OAC 1295 operation status – project cancelled
 - 2.6 – Compliance History:
 - Added NOV details to enforcement history
- Section 3: Basis For Regulatory Applicability
 - 3.1 – NSPS, 40 CFR 60
 - 40 CFR 60 Subpart Dc
 - Added summary of why SO₂ and PM limits do not apply
 - 40 CFR 60 Subpart Kb
 - Listing of tank vapor pressure and capacity for applicability demonstration
 - 3.2 – NESHAP, 40 CFR 63
 - 40 CFR 63 Subpart UU
 - Added this section. Chemco’s batch chemical plant complies with this subpart per 40 CFR 63 Subpart FFFF.
 - 40 CFR 63 Subpart FFFF
 - Removed the exemption for a SSMP as this no longer applies after 8/12/2023 per 63.2525(j)
 - Added more detailed applicability documentation for the relevant equipment.
 - 40 CFR 63 Subpart DDDD

- Clarification on why this facility is an affected facility per 63.2231
- 40 CFR 63 Subpart DDDDD
 - Clarification that the boiler is designed to burn natural gas, as such there are no emission limitations required per Table 1.
- 3.3 – CAM, 40 CFR 64
 - Updated applicability summary and table to match the five criteria for CAM applicability
 - Updated applicability table with PSEU, emission limitation, and pre-control PTE specifics
 - Included reference to pre-control PTE emission calculations.
- 3.4 - 40 CFR Part 68 Chemical Accident Prevention (RMP)
 - Added regulation citation for storage vapor pressure exemption.
- 3.6 – NSR
 - Removed verbiage about previous non-attainment area near Intalco. Chemco is currently in an area designated as attainment.
- Section 4: General Permit Administration & Assumptions
 - Moved the section containing completed permit conditions to Section 6 to be consistent with NWCAA SOB ordering.
 - Gap Filling & Sufficiency monitoring:
 - Updated text to include more clarification around where/why gap filling and sufficiency monitoring is used.
 - Added tables to indicate where gap filling and sufficiency monitoring was included in the AOP.
- Added new sections consistent with NWCAA typical SOB layout:
 - Section 5: Completed Requirements (previously in section 4)
 - Section 12: Changes in previous revisions
 - Section 13: Attachments
- Section 6: Permit Elements & Basis for Terms and Conditions
 - Added information behind generally applicable requirements that were included in the AOP but had not been previously documented in the SOB:
 - 6.7.2: General Nuisance & Odor
 - 6.7.3: Fugitive Emissions

2. FACILITY DESCRIPTION

2.1 General Facility Description

Chemco is a wood treatment facility that produces fire retardant wood products. The fire retardant is manufactured on-site and applied, via pressure treatment, to lumber and plywood. The facility is located at 4191 Grandview Road, Ferndale, WA in Whatcom County as shown in Figure 1.



Figure 1: Chemco Facility Location

A plot plan of Chemco is included in Figure 2 below.

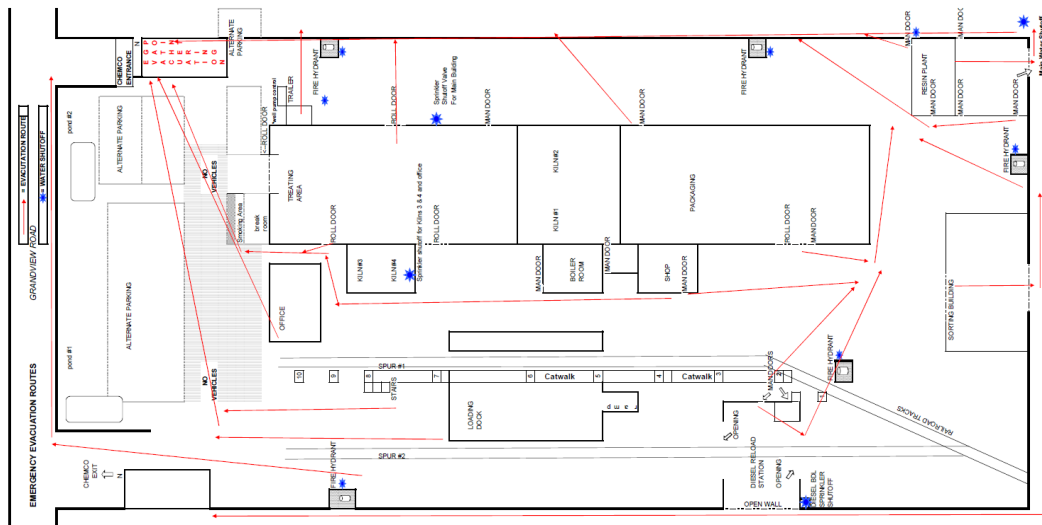


Figure 2: Chemco Plot Plan

2.1.1 Commercial Products Produced

Chemco produces fire retardant treated wood called SaferWood (Thermex-FR) including lumber and plywood for interior and exterior use. In the past, Chemco produced fire retardant shakes and shingles which are no longer produced at this facility.

Chemco also produces the fire retardant solution on-site that is applied to their wood treated products.

2.1.2 Manufacturing Process

Chemco's fire retardant solution for wood treatment is produced in a small chemical batch plant which includes a batch reactor with agitator and a formaldehyde and methanol in water storage tank (T101).

The reactor and formaldehyde & methanol storage tank vents are combined and routed to a condenser and water scrubber that is vented to atmosphere. The finished concentrated fire retardant from the reactor is stored in T105. The concentrated fire retardant is diluted in four dilution tanks that feed autoclaves. The fire retardant is also loaded into totes for shipment off-site.

In the fire retardant treatment process, wood to be treated is loaded into autoclaves. The autoclave vessels are cylindrical steel pressure vessels with an open end for product loading, which is then closed and sealed for pressure treatment. A vacuum is pulled in the autoclaves and fire retardant treatment solution is first pulled from the dilution tanks into the autoclaves using the vacuum. Once the pressure in the autoclave rises, the fire retardant is then pumped from the dilution tanks into the autoclave, bathing the wood products. Once loaded with fire retardant, the autoclave is pressurized and held at pressure for several hours. Treatment occurs at ambient temperature in autoclave 1 (10-ft diameter) and autoclave 2 (6-ft diameter), both located in the wood treatment building. After pressure treatment, autoclaves are vented back to the dilution tanks and the remaining treatment liquid is pumped back to the dilution tanks. The fire retardant solution-soaked wood products are removed from the autoclave and dried in drying kilns.

Chemco operates four production dry kilns that are located in the wood processing building and are heated by steam produced in a natural gas-fired boiler. All four kilns are equipped with ducting for air intake and exhaust routed to atmosphere. Kiln drying cycles are typically 6-7 days. In the past, Chemco would also dry untreated wood in the kilns although this has not been a recent practice.

2.1.3 Other Processes

The following other processes and equipment are onsite:

- A trailer mounted liquid cargo tank used to transfer concentrated fire retardant to the dilution tanks.
- An aqueous glyoxal storage tank (T102) and phosphoric acid storage tank (T103) that are used in the fire retardant reaction process. Chemco used to store green phosphoric acid in T104 that is no longer used since switching to the clear, tech grade phosphoric acid in T103.
- Wood staining using a water-based dye in a stain booth.
- Chemco used to apply a hardening resin to the wood products, however this is no longer being applied.
- Chemco used to operate a diesel transfer station where diesel is transferred from trucks into railcars and includes an emergency generator. The equipment and associated property was sold to Coleman Oil/Blue Heron Properties in 2023 who now owns and operates it.

2.1.4 Operating Schedule

Chemco is in operation 24 hours per day, 7 days per week, 365 days per year with the following special operating considerations:

- The steam generating natural gas fired boiler operates continuously, except for a few days each summer for inspection.
- The autoclaves and kilns operate on an as needed basis. A typical kiln cycle is 6-7 days. There is usually at least one kiln in operation each day.

- The chemical batch plant operates 4-7 times a month with each fire retardant batch taking approximately 5-8 hours to complete.

2.2 **Emission Unit Description**

2.2.1 **Chemical Batch Plant**

Fire retardant resin is manufactured on-site in a batch chemical reactor (agitator). The reactor and the associated 12,000 gal formaldehyde/methanol (0.77 psig) storage tank (T-101) are vented through a condenser and water scrubber, with associated piping and pumps. This equipment is subject to leak detection and repair requirements in 40 CFR 63 Subpart FFFF and 40 CFR 63 Subpart UU. Each batch of fire retardant resin takes ~ 5-8 hours to make. Associated emission units include the storage tank and reactor routed to the scrubber vent and batch plant fugitives identified as EU-1 in the AOP.

2.2.2 **Boiler**

A 12.25 MMBtu/hr Cleaver Brooks boiler produces steam for the facility’s drying kilns. The boiler is natural gas fired and is equipped with flue gas recirculation and a low-NOx burner. The boiler was installed in 2017 under OAC 1271 (later superseded by 1271a) and is subject to requirements in 40 CFR 60 Subpart Dc and 40 CFR 63 Subpart DDDDD. The boiler is identified as EU-2 in the AOP and the emissions inventory.

2.2.3 **Drying Kilns**

Chemco operates four (4) drying kilns used in the fire retardant wood treatment process and one (1) pilot-scale kiln for production research, as noted below.

Table 2.1: Kilns

Kiln Identification	Size (bf capacity)	Process	Emission Control
Kilns 1 & 2	250,000	Fire Retardant	None
Kilns 3 & 4	30,000 – 50,000	Fire Retardant	None
Pilot-Scale Kiln	1,000	Production Research	None

The kilns are subject to 40 CFR 63 Subpart DDDD—National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products. The kilns are identified as EU-3 in the AOP and the emissions inventory.

2.2.4 **Emergency Generator**

Chemo operates and maintains an emergency diesel-fired generator (100 kW, 134 bhp) There is a small emergency generator in a covered area on the east side of the chemical batch plant, which has been permanently decommissioned.

In 2023 Chemco sold the emergency generator (originally EU-4 in the AOP) and diesel loading rack to Coleman Oil who now owns and operates this equipment. The associated requirements in 40 CFR 63 Subpart ZZZZ have been removed from the AOP.

2.2.5 **Tanks with Aqueous Solution and Fire Retardant**

Chemco owns and operates two storage tanks for which there are no specific applicable requirements (e.g., OAC, NSPS, or NESHAPs). However, these tanks don’t qualify as insignificant emission units, so they are identified in Table 1 of the Air Operating Permit:

- T-102 Aqueous Glyoxal Solution – 12,000 gal; vapor pressure 0.08 psia, vented to atmosphere.
- T-105 Concentrated Fire Retardant Solution – 5,000 gal; vapor pressure 0.0025 psia, vented to atmosphere.

2.2.6 Other Operations

The following equipment is classified as an insignificant emission unit and detailed in Section 6:

- Diesel transfer from trucks into railcars
- Some wood is stained with identifying water-based dye prior to packaging and shipment. The dye is applied via a pass-through enclosed spray device located in the sorting and sizing building. The dye contains less than 1 percent VOC.
- Other storage tanks:
 - Dilution Tank 1-4 (each 21,140 gal) for aqueous fire retardant dilution
 - Tank 103, T103 (12,000 gal) for Phosphoric acid storage (clear, tech grade)
 - Tank 104, T104 (12,000 gal) for Phosphoric acid storage (green)
 - Tank 107, T107 for water storage

2.3 Emission Inventory

The facility is a major source subject to the requirements of the Title V program because it has the potential to emit more than 100 tpy of VOC and more than 10 tpy of methanol, a pollutant designated as a HAPs in Section 112(b) of the FCAA. Methanol is the primary VOC emitted from the facility.

The following tables contain actual reported emissions from the Chemco facility for 2019 through 2024.

Table 2.3-1: Facility Total Reported Criteria and GHG Emissions

Year	NO _x (tons)	CO (ton)	SO ₂ (tons)	VOC (tons)	PM ₁₀ (tons)	GHG (MT)*
2019	0	0	0	18	0	BT ¹
2020	0	0	0	14	0	BT ¹
2021	0	0	0	14	0	BT ¹
2022	0	0	0	14	0	BT ¹
2023	0	0	0	16	0	BT ¹
2024	0	0	0	21	0	BT ¹
PTE**	5.47	4.46	0.05	227	0.45	4,692

*Greenhouse gas (GHG) emissions are calculated in metric tons (MT) and are only from the boiler.

¹Below Threshold: Below GHG reporting threshold of 25,000 metric tons of CO₂e

** Potential to Emit (PTE) is estimated based on actual emissions and process data provided to calculate tons per year (tpy), see section 2.4 – PTE for a summary of kiln emissions. PTE for GHG is based on size of boiler and operation 8760 hours.

Table 2.3-2: Toxic Air Pollutant Emissions

Year	Methanol (lbs)	Formaldehyde (lbs)	Acetaldehyde (lbs)
2019	34,370	455	0

2020	25,220	314	0
2021	26,054	283	0
2022	25,668	252	0
2023	29,953	287	0
2024	40,081	324	0
PTE	446,128	732	103

2.4 Potential to Emit

The facility is a major source subject to the requirements of the Title V program because it has the potential to emit more than 100 tons per year (tpy) of VOC and more than 10 tons per year (tpy) of methanol, a pollutant that has been designated as a HAP in Section 112(b) of the Federal Clean Air Act.

Table 2.4-1 contains Chemco’s PTE as estimated in the 2020 AOP renewal:

Table 2.4-1: Annual PTE

Pollutant	Tons/year
NOx	5.47
CO	4.46
SO ₂	0.05
VOC	227
PM ₁₀	0.45
Methanol	223
Formaldehyde	0.37
Acetaldehyde	0.05

The majority of the potential VOC and methanol emission are from the drying of fire retardant treated wood and untreated wood in the four kilns. Chemco’s kiln PTE is based on kiln capacity and kiln drying cycle. For fire retardant treated wood, the PTE assumption for methanol is that all of the methanol applied to treat the wood is emitted in kiln drying. For untreated wood, EPA Region 10 emission factors are applied to the maximum throughput for kiln drying.

The following process data, emission factors, and assumptions were used to determine the PTE from kiln drying:

Treated Wood

- 243 maximum kiln cycles per year based on kiln capacity and 7-day kiln cycle.
- 7,624,743 lb maximum fire retardant concentrate per year. This was determined from the amount of fire retardant concentrate that would be needed to treat the maximum board footage amount of wood. Maximum board footage is based on the maximum amount of wood that could fit in the kilns given the maximum of 243 kiln cycles per year.
- 3 lb formaldehyde per kiln cycle. This is based on Chemco’s 1998 kiln stack emission testing.

- 5.77 wt% methanol in fire retardant concentrate. This is based on the water dilution of the fire retardant solution applied to the wood.

Untreated Wood

- 3,744,000 bf/yr maximum throughput for kiln drying
- 0.00068 lb/Mbf formaldehyde emission factor (*EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, November 2019, Douglas Fir*)
- 0.0215 lb/Mbf methanol emission factor (*EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, November 2019, Douglas Fir*)

Kiln PTE Calculations

Formaldehyde Emissions (Kilns):

- Treated Wood Total= 729 lb/yr
 - 243 kiln cycles/yr * 3 lb / kiln cycle
- Untreated Wood Total = 3 lb/yr
 - 3,744,000 bf/yr * 0.00068 lb/Mbf * Mbf/1000 bf

Methanol Emissions (Kilns):

- Treated Wood Total= 439,948 lb/yr
 - 7,624,743 lbs/yr concentrate * 5.77 wt% methanol
- Untreated Wood Total = 80 lb/yr
 - 3,744,000 bf/yr * 0.0215 lb/Mbf * Mbf/1000 bf

A detailed history and summary of Chemco's kiln PTE is provided in the Attachments in Section 14.1.1 – Kiln PTE Emissions: Methanol & Formaldehyde

2.5 Permitting History

The facility was constructed beginning in the early 1980s and fire treatment operations commenced in 1983. Chemco began operating for the primary purpose of treating wood with a proprietary fire retardant chemical. A facility expansion was approved by the NWCAA on September 19, 1988, that included an insect and decay treatment process. The insect and decay treatment process ceased prior to 2001. In 2001, Chemco installed a chemical batch plant to formulate fire retardant resin on-site; and in 2005, Chemco added a treating process that utilized existing equipment to produce a wood hardening resin. This wood hardening process ceased operation prior to 2011. In 2010, the facility added a diesel fuel transfer operation.

Chemco leased the wood treating building and process to independent operator, American Treating Company, beginning in 2010. American Treating Company filed for bankruptcy in November 2012 and Chemco resumed the treating operation in December 2012.

2.5.1 Approval letter issued September 15, 1981

NWCAA received the Notice of Construction (NOC) application to install a wood pressure treating facility on August 14, 1981. The equipment included in the application were two 24-foot by 80-foot lumber drying kilns, an autoclave, six tanks, pumps, and handling facilities. This Approval contained only the following condition: the ground level concentration of formaldehyde shall not exceed 0.05 parts per million at the property line.

As part of the original facility, a 25.1 MMBtu/hr boiler was installed (Cleaver Brooks serial L-55929 manufactured on 1/26/1973). The boiler was able to fire both natural gas and fuel oil. The 25.1 MMBtu/hr boiler was destroyed in 2017 and replaced with the boiler listed in NOC 1271a, see Section 2.4.5.

2.5.2 Approval letter issued September 19, 1988

On July 6, 1988, Chemco submitted a "Notice of Construction and Application for Approval" to construct and operate an additional process to treat dimensional lumber against decay and insects as well as fireproofing at the facility. The equipment referenced in the application was pressure treating equipment, drying kilns, and shipping facilities. The resulting OAC contained requirements that visible emissions from any source (within the facility) shall not exceed zero percent, limits on ambient concentrations of arsenic, chromium, and copper at the property line, and a requirement that odors shall not be detected offsite by Agency personnel in amounts considered to be a nuisance.

2.5.3 Order of Approval to Construct (OAC) 758 issued April 9, 2001

On February 13, 2001, Chemco submitted a "Notice of Construction and Order for Approval" to install a chemical plant to synthesize chemical fire retardant to be used at the facility. The proposed project consisted of a 2,500-gallon capacity reactor vessel and four 12,000-gallon raw material/product tanks. Vapors emitted from breathing and filling losses from a heated (~77 °F) formaldehyde/methanol/water storage tank (T-101) were to be routed through a packed tower water scrubber before venting to atmosphere. The reactor vessel (R-301) was to be sealed, heated, and agitated during the reaction phase. Vapors emitted from filling and emptying the reactor vessel were to be passively vented through a shell and tube condenser and then routed through a packed water tower scrubber before venting to the atmosphere. Tank T-101 and reactor R-301 were expected to emit "small quantities" of formaldehyde and methanol. The OAC contains requirements that the scrubber be installed and operated as per the application, no visible emissions shall be evident from the fire retardant manufacturing building, emissions shall not cause any exceedance of the acceptable source impact levels in Chapter 173-460 WAC, and formaldehyde emissions be determined and reported.

Condition 5 of the OAC required Chemco to analyze and report to the NWCAA (formerly NWAPA) the free formaldehyde concentration in the fire retardant product (Chemco 1000R) and propose to the Agency a plan to measure formaldehyde and methanol emissions from the entire facility. Based on a review of the plan the Agency may require emissions testing. Chemco submitted scrubber operation testing and operating plans to the NWCAA in February 2002 demonstrating treatment for formaldehyde and methanol emissions from the fire retardant system. Emissions of methanol and formaldehyde from the kilns were determined from mass balances.

2.5.4 OAC 1000 issued January 20, 2009

Chemco modified part of their existing fire retardant wood treating facility to produce a hardened wood product called Alowood. Alowood is produced using a proprietary, starch-based hardening solution in a vacuum/pressure treating process utilizing an existing 3-foot by 34-foot autoclave. All wood is kiln-dried after treatment in Kilns 3 and 4 on the west side of the treatment area. The starch-based hardener contains a dye to color the wood. Nearly every color of dye contains glycol ethers, which are listed federal hazardous air pollutants (HAPs). This process ceased prior to the issuance of the AOP in 2011.

2.5.5 OAC 1271 issued May 16, 2017

In 2017, Chemco replaced the 25.1 MMBtu/hr natural gas-fired boiler that was destroyed in a mechanical failure with a 10.043 MMBtu/hr boiler. The new boiler is more efficient and is equipped with flue gas recirculation and a low-NOx burner.

2.5.6 OAC 1295 issued July 25, 2018

In 2018, Chemco installed equipment to pressure treat pre-dried lumber with waterborne resin to produce hardened wood products. The treatment would take place in the existing autoclave and cure in an existing kiln. The equipment was installed within the 18 months

required by the permit but hasn't been in operation as the hardened wood project was later cancelled.

2.5.7 OAC 1271a issued June 17, 2020

In 2020, Chemco requested a correction to the heat input of the boiler. The correct heat input is 12.248 MMBtu/hr and was revised in this OAC.

2.5.8 Other

- Diesel Transfer Facility:

In 2010, Chemco requested a determination from the NWCAA for the diesel transfer facility. The NWCAA provided a written determination of no New Source Review required on April 5, 2010.

In 2023, Chemco sold the diesel transfer facility, associated emergency generator, and property to Coleman Oil / Blue Heron Properties.

- Replacement Autoclave (replacement in kind):

In 2025 a replacement autoclave was installed. This did not trigger permitting because the autoclave was a direct replacement with the same displacement and treating volume and would not alter production or emission rates. The autoclave system is a closed loop system.

2.6 Compliance History

The Chemco facility has been inspected on a regular basis by the NWCAA. The facility has had no enforcement actions since 2008.

Prior enforcement actions occurred based on 2007 and 2008 inspections and other information from the facility, NWCAA issued 4 violations on October 15, 2008:

NOV 3739 issued 10/15/2008

Chemco, Inc. failed to submit timely, the required notifications for:

(1) 40 CFR Part 63 Subpart DDDD-Plywood and Composite Wood Products NESHAP (Effective date-10/29/2007; Compliance date-10/1/2007; Notification due date-1/26/2005).

(2) 40 CFR Part 63 Subpart EEEE-Organic Liquids Distribution NESHAP (Effective date-2/3/2004; Compliance date-2/3/2007; Notification due date-6/2/2004).

Notifications were received at NWCAA on 6/16/2008.

NOV 3738 issued 10/15/2008

Failed to submit the required notifications for 40 CFR Part 63 Subpart FFFF - Miscellaneous Organic Chemical Manufacturing NESHAP (Final rule date-11/10/2003; Compliance date- 5/10/2008; Notification due date-: 3/9/2004). The notification was received at the NWCAA on 6/16/2008.

NOV 3737 issued 10/15/2008

Failure to submit a Notice of Construction application prior to commencing construction for the wood hardening process. Construction commenced during 2005. NWCAA inspectors discovered the new process on 2/26/2007. The facility submitted an initial application for the process on 3/19/2007.

NOV 3736 issued 10/15/2008

Failure submit timely and complete emissions information as well as Title 5 air operating permit application information to the Northwest Clean Air Agency since at least 1993.

3. BASIS OF REGUALTION APPLICABILITY

3.1 New Source Performance Standards (NSPS), 40 CFR 60.

3.1.1 **40 CFR 60 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institute Steam Generating Units**

40 CFR Part 60 Subpart Dc is an air quality standard that limits air emissions from new, modified, or reconstructed boilers starting operation after June 9, 1989 and having a maximum design heat input capacity of 100 MMBtu/hr or less, but great than or equal to 10 MMBtu/hr.

Chemco operates one 12.248 MMBtu/hr natural gas-fired boiler equipped with a flue gas recirculation unit and low-NOx burner. The unit was permitted for operation May 16, 2017. As such, the boiler is considered an affected facility under 40 CFR 60.40c. However, the regulation does not impose any SO2 or PM emission limitations, installation and operation of monitors, or performance tests for boilers that operate on only natural gas. Therefore, only the associated recordkeeping and reporting requirements in 40 CFR 60.48c apply. These requirements have been incorporated into AOP Section 5-2.

3.1.2 **40 CFR 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984, and On or Before October 4, 2023**

The various storage tanks on site are not subject to NSPS Subpart Kb because they do not meet the applicability criteria, specifically the vapor pressure of liquids stored in each tank are less than 3.5 kP (~ 0.51 psi) or the capacity of the tanks do not exceed 75 m3 (~ 19,813 gal).

Tank	Vapor Pressure (psi)	Capacity (gal)	Service
T-101	0.77	12,000	Formaldehyde/Methanol
T-102	0.08	12,000	Product Aqueous Solution
T-105	0.003	5,000	Fire Retardant Solution

3.2 National Emission Standards for Hazardous Air Pollutants (NESHAP) For Source Categories, 40 CFR Part 63.

The Chemco facility is a major source because it has the potential to emit more than 10 tons per year (tpy) of methanol, a pollutant designated as a hazardous air pollutant (HAP) in Section 112(b) of the FCAA. Methanol is emitted primarily from the kiln drying of treated wood products.

3.2.1 **40 CFR 63 Subpart UU—Equipment Leaks—Control Level 2 Standards**

The chemical batch plant at Chemco complies with Subpart UU to meet the requirements specified in Table 6 of 40 CFR 63 Subpart FFFF (Miscellaneous Organic Chemical Manufacturing) for equipment leaks.

3.2.2 **40 CFR 63 Subpart DDDD—Plywood and Composite Wood Products (PCWP)**

The facility is an affected source under 40 CFR 63 Subpart DDDD—National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products. According to §63.2231, an affected facility also includes lumber kilns located at any facility. Therefore, drying kilns are the only subject equipment under Subpart DDDD.

The only requirement that applies to the facility, applies to the existing wood drying kilns in § 63.2252 August 13, 2020. The requirement is submission of an initial notification in accordance with 40 CFR 63.9(b). This requirement has been met when Chemco submitted the initial notification with their Title V application in June 2008. No requirements of Subpart DDDD are included in the AOP.

3.2.3 40 CFR 63 Subpart EEEE—Organic Liquids Distribution (Non-Gasoline)

The Organic Liquids Distribution MACT (40 CFR Part 63 Subpart EEEE) applies to emissions from storage tanks, transfer racks, transport vehicles, and equipment leaks at major HAP sources that are not regulated by another NESHAP [§ 63.2338(c)(1)]¹. The chemical batch plant is covered by Subpart FFFF (see below). Therefore, Subpart EEEE does not apply.

3.2.4 40 CFR 63 Subpart FFFF—Miscellaneous Organic Chemical Manufacturing

The Miscellaneous Organic Chemical Manufacturing (“Miscellaneous Organic NESHAP”, or “MON” - 40 CFR Part 63 Subpart FFFF) applies to miscellaneous organic chemical processing units (“MCPUs”) at major HAP sources. Subpart FFFF applicability extends to the formaldehyde storage tank, the equipment components in organic HAP service within the batch reactor area, the concentrate storage tanks and the transfer rack that is used with the trailer-mounted liquid cargo tank to transfer the treatment chemical concentrate from the reactor to the concentrate storage tanks.

A summary of applicability of equipment in Chemco’s batch chemical plant includes:

- General Requirements:
 - Combined Emission Streams: Chemco has one combined emission stream, the combined reactor and formaldehyde & methanol storage tank (T101) vent. Requirements for this stream are covered under Batch Process Vents and Storage Tanks.
 - Control Devices: While Subpart FFFF contains general requirements for control devices, the condenser and scrubber associated with the batch reactor and storage tank vent were installed but are not required by this subpart. For group 2 vents, there are no control device requirements for Group 2 batch reactor vents (Table 2 to Subpart FFFF) and storage tank vents (Table 4 to Subpart FFFF).
- Batch Process Vents (Reactor & Tank Combined Vent): No requirements because the vent meets the definition of a Group 2 vent (organic HAP emissions < 10,000 lb/yr); potential vent emissions are approximately 1,400 lb HAP/yr. No ongoing records are required for Group 2 batch process vents controlled using a control device and properly evaluated for initial compliance determination [40 CFR §63.2525(e)(1)(iii)].
- Storage Tanks: No applicable requirements under FFFF because they are classified as Group 2 (materials with at maximum TVP of <6.9 kPa (1 psi) or <10,000 gal).
- Transfer Rack (transport vehicle loading): No applicable requirements because the transfer rack is classified as Group 2 (loading is less than 171,712 gallons per year of liquids that contain organic HAP with a partial pressure ≥ 1.5 psia).
- Equipment Leaks (Fugitive Leak Components): Leak detection and repair (LDAR) monitoring is conducted on a monthly basis as per 40 CFR Part 63 Subpart UU (40 CFR 63.2480).

¹ § 63.2338 (c) The equipment listed in paragraphs (c)(1) through (4) of this section and used in the identified operations is excluded from the affected source.

(1) Storage tanks, transfer racks, transport vehicles, containers, and equipment leak components that are part of an affected source under another 40 CFR part 63 national emission standards for hazardous air pollutants (NESHAP).

- Equipment subject to the monitoring requirements in Subpart UU at Chemco include valves, connectors, pumps, and one agitator. Chemco does not operate any subject compressors or sampling connection systems. The equipment is not designed to be pressure-tested as an alternative leak test. The applicable requirements for Subpart FFFF/UU are included in Section 5-1 of the AOP.
- Chemco is not subject to the pressure relief device requirements under §63.2480. Tk 101 has a pressure and vacuum relief valve that vents to the condenser and scrubber. This device is actuated at 3 "WC (< 1 psi) and does not meet the definition of pressure relief device because it is actuated by a pressure less than or equal to 2.5 pounds per square inch.
- Wastewater and Open Liquid Streams: Chemco's chemical batch plant does not contain any applicable open liquid or open wastewater streams. The wastewater from the batch reactor cleaning is pumped via a closed system into the storage tank.
- Heat Exchange Systems: The condenser located on the batch reactor and storage tank vent as well as the batch reactors heat transfer (steam and chilled water) jacket do not meet the definition of a "heat exchange system" as defined in §63.101. Chemco's associated closed loop cooling system does not contain a cooling tower or a once-through cooling system such as a river or pond. Chemco's cooling water is supplied from a chiller that uses refrigerant to cool the water. As such, process leaks into the water system would not be cooled in a cooling system open to atmosphere like a cooling tower, river, or pond. Additionally, the pressure of the chilled water supply is operated 20 psig greater than the HAP containing process (reactor and vent). This meets the criteria in §63.104(a)(1) such that the cooling water side is at least 35 kilopascals (5.1 psi) greater than the process side.

40 CFR 63 Subpart FFFF, §63.2515(b) (11/10/03) requires initial notification as specified in § 63.9(b)(2). Chemco provided initial notification to the NWCAA on June 16, 2008. Since this one-time requirement is complete, it's not included in the Air Operating Permit.

40 CFR 63 Subpart FFFF, §63.2520(d) (7/14/06) requires a submittal of a notification of compliance status report no later than 150 days after the applicable compliance date specified in §63.2445. Chemco provided a notice of compliance status as part of the application for the air operating permit. Chemco stated that the facility was in compliance with applicable provisions of the rule, including the LDAR provisions. Since this one-time requirement is complete, it's not included in the Air Operating Permit.

3.2.5 40 CFR Part 63 Subpart DDDDD—Industrial, Commercial, and Institutional Boilers and Process Heaters

40 CFR Part 63 Subpart DDDDD ("Boiler MACT") is a technology-based air toxics standard that limits air toxic emissions from new, reconstructed and existing industrial, commercial, or institutional boilers or process heaters that are located at a major source of hazardous air pollutants.

Chemco operates one 12.248 MMBtu/hr gas-fired boiler designed to burn natural gas. In accordance with 40 CFR 62.7490(b), the unit is a new unit (constructed after June 4, 2010) designed to burn natural gas at a major source of HAPs. As such, the boiler is subject to the work practice standards, annual tune-ups, and associated recordkeeping and reporting required for units greater than 10 MMBtu/hr. As per 40 CFR 63.7545(c), the initial notification of startup was received on August 22, 2018. Because this boiler is designed to burn natural gas, the regulation does not impose any numerical operating limitations, fuel

requirements, installation and operation of monitors, or performance tests for this unit according to 63.7500(e). The applicable requirements O&M and tune-up requirements have been incorporated into AOP Section 5-2.

3.3 40 CFR 64 – Compliance Assurance Monitoring (CAM)

Chemco is not subject to Compliance Assurance Monitoring (CAM). The CAM rule under 40 CFR 64 requires owners or operators of subject sources to conduct monitoring that satisfies specific criteria established in the rule to provide a reasonable assurance of compliance with applicable requirements. Monitoring focuses on pollutant specific emission units (PSEU) that rely on pollution control equipment to achieve compliance with emission standards or limits. CAM applies to units that meet the following criteria:

- (1) located at a major source;
- (2) is subject to an emission limit or standard for applicable pollutant;
- (3) uses a control device to achieve compliance;
- (4) has potential pre-control emissions that are at least 100% of major source amount;
- (5) is not otherwise exempt

Table 3.3-1 provides a summary of CAM applicability to the emission units at Chemco.

Table 3.3-1: CAM Applicability

Pollutant Specific Emission Unit, PSEU		Subject to emission limit or standard for applicable pollutant?	Control device to achieve compliance?	Potential pre-control emissions greater than 100% of major source?		Otherwise exempt?	Is CAM Required?
EU-1 Chemical Batch Plant	Reactor	VOC: Scrubber liquor at least 15% below saturation	Condenser Scrubber	No	1366 lb/yr	No	No
	T-101						
EU-2 Natural Gas-fired Boiler (12.25 MMBtu/hr)		NOx: 9 ppmvd	Flue Gas Recirculation	No		No	No
		CO: 50 ppmvd	No	No		No	No
		SO2: 1000 ppm	No	No		No	No
		PM: 0.10 gr/dscfh 0% Opacity	No	No		No	No
EU-3	Kiln 1	Methanol:	No	Yes	Kiln1	No	No

Pollutant Specific Emission Unit, PSEU		Subject to emission limit or standard for applicable pollutant?	Control device to achieve compliance?	Potential pre-control emissions greater than 100% of major source?		Otherwise exempt?	Is CAM Required?
Kilns	Kiln 2 Kiln 3 Kiln 4	Emissions < ASIL (WAC 173-460-150, -160)		220 tpy	82.5 tpy		
					Kiln 2 82.5 tpy		
					Kiln 3 27.5 tpy		
					Kiln 4 27.5 tpy		
		PM: No VE	No	No	No	No	
	Arsenic: (Ambient) 0.00022 µg/m ³	No	No	No	No		
	Chromium: (Ambient) 0.000083 µg/m ³	No	No	No	No		
EU-4 Storage Tanks	T-102	N/A (No Controls)	No	N/A (No Controls)	No	No	
	T105	N/A (No Controls)	No	N/A (No Controls)	No	No	

The only PSEUs at Chemco that have pre-control emissions greater than the major source threshold are the kilns (see section 14-Attachments for a summary of kiln emissions). However, these kilns do not use a control device to achieve compliance and therefore are not subject to the CAM rule. For the chemical batch plant, the uncontrolled PTE for the batch reactor and storage tank vent is 1366 lb/yr VOC which is less than the major source threshold. Emission estimates for this vent stream were submitted by Chemco in the original AOP application per the emission calculation requirements in 40 CFR 63 Subpart FFFF, §63.2460(b).

3.4 40 CFR 68 Chemical Accident Prevention Provisions (RMP)

Chemco is exempt from the provisions of this program at the time of permit renewal. The goal of 40 CFR 68 and the Risk Management Plan (RMP) it requires is to prevent accidental release of substances that can cause serious harm to the public and the environment, and to mitigate the severity of releases if they do occur. If a tank, drum, container, pipe, or other process at a facility contains any of the regulated toxic and flammable substances listed in 40 CFR 68.130 in an amount above the “threshold quantity” specified for that substance, the facility operator is required to develop and implement a risk management program. Chemco triggers this program for storage of formaldehyde solution; however,

they have demonstrated that the vapor pressure of this solution meets the exemption from the planning requirements associated with this provision [§68.115(b)(1)].

3.5 40 CFR 72 - Acid Rain Program

Chemco is not subject to the acid rain program. Title IV of the federal Clean Air Act regulates SO₂ and NO_x emissions from fossil fuel-fired electrical generation facilities. 40 CFR 72.6 identifies criteria used to determine whether a facility is subject to the Acid Rain Program. Chemco is not an electrical generation facility and is therefore not subject to the provisions of the acid rain program.

3.6 New Source Review

3.6.1 Basic Information

New Source Review (NSR) requires stationary sources of air pollution to acquire permits before they begin construction. NSR is also referred to as construction permitting or preconstruction permitting.

There are three types of NSR permits. A source may have to acquire one or more of these permits:

- Prevention of Significant Deterioration (PSD) permits, which are required for new major sources or a major source making a major modification in an attainment area;
- Nonattainment NSR permits, which are required for new major sources or major sources making a major modification in a nonattainment area; and
- Minor source permits, which are required for sources that emit pollutants below the major source threshold but above the minor source threshold. It is generally the case that a major new or modified source will also require minor NSR permitting that covers a different subset of pollutants.

3.6.2 What are Permits?

Permits are legal documents that the source must follow. Permits specify what emission limits must not be exceeded and how the source is to demonstrate compliance with the set limits. Permits may contain conditions to ensure that the source is built according to the permit application upon which the permitting agency relies for air impact analysis. For example, the permit may specify a stack height that was used by the permitting agency to determine compliance with air pollutant limits. Some limits in the permit may be specified at the request of the source to keep them from being subject to other requirements. For example, the source may take limits in a minor NSR permit to keep the source out of PSD permitting. To assure that sources follow permit requirements, permits also contain monitoring, recordkeeping, and reporting (MR&R) requirements.

3.6.3 Who Issues Permits? Permitting Authorities

In Washington State NSR permits are issued by local air pollution control agencies or the Washington State Department of Ecology (Ecology). The EPA issues permits in special cases. Ecology and local air pollution control agencies have their own permit programs that are approved by EPA in the State Implementation Plan (SIP). In general, in the NWCAA jurisdiction, which encompasses Island, San Juan, Skagit, and Whatcom Counties, Ecology issues major NSR permits (PSD permits) and the NWCAA issues minor NSR permits (Orders of Approval to Construct, or OACs).

3.6.4 Prevention of Significant Deterioration (PSD)

EPA established the Prevention of Significant Deterioration program to ensure that new or expanded sources do not cause a significant deterioration in the air quality of areas that currently meet applicable air quality standards. Before a major source can be constructed or modified in an area that meets all the health-based ambient air requirements (i.e. in an attainment area), the owner or operator must demonstrate that the project will not cause or contribute to violations of any ambient air quality standard or air quality increment through the PSD permitting program. Also, the owner or operator must demonstrate that the project will not cause significant deterioration in nearby Class I Areas (parks and wilderness areas).

Up to the issuance date of this AOP renewal, Chemco has not qualified as a major source under the PSD program (40 CFR 52.21) for any new projects undertaken since the establishment of the PSD program.

3.6.5 Minor New Source Review (OAC)

New or modified sources of air pollution are required to obtain a permit from the NWCAA before beginning construction. Permits are referred to as Orders of Approval to Construct (OACs) and contain requirements to minimize air pollution impacts on the environment. The type of activity, the size of the operation, and the kinds of pollutants emitted determine permit conditions.

Table 3.6.4-1 lists the minor NSR permits issued to the Chemco facility and the current status of each.

Table 3.6.4-1: Chemco Minor NSR Permits

Permit ID.	Date Issued	Equipment/Sources	Status
Identified by date	9/15/81	Installation of Wood Pressure Treating Facility	Currently Applicable
Identified by date	9/19/88	Construct Wood Treatment Process for Fireproofing and Against Decay and Insects	Currently Applicable
758	4/9/01	Manufacture Chemical Fire Retardant Solution	Currently Applicable
1000	01/20/09	Installation of Wood Hardening Process	Permanently Shutdown
1271	5/16/2017	Installation of 12.25 MMBtu/hr boiler	Superseded by 1271a
1271a	6/17/2020	Correction of boiler heat input	Currently Applicable
1295	7/25/2018	Pressure treat pre-dried lumber with waterborne resin	Never operated, project cancelled

3.6.6 Nonattainment New Source Review

Chemco is located in an area designated as in attainment for all criteria pollutants. For this reason no other federal new source review programs for new or modified sources of air pollution are applicable.

3.7 Greenhouse Gas (GHG) Regulation

Greenhouse gases are chemicals that contribute to climate change by trapping heat in the atmosphere. The greenhouse gases (GHG) recognized by EPA and Ecology are: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF₆). “Hydrofluorocarbons” or “HFCs” means a class of GHGs primarily used as refrigerants, consisting of hydrogen, fluorine, and carbon.

This regulation does not apply to Chemco at the time of this permit renewal because GHG emissions from stationary sources at the site do not exceed 25,000 metric tons CO₂ equivalents (CO₂e). Should the emissions of GHG from the facility exceed 25,000 metric tons CO₂e, Chemco will be subject to the reporting provisions of this regulation.

3.7.1 40 CFR 98 – Federal Mandatory Greenhouse Gas Emission Inventory Regulation

The requirements for the mandatory greenhouse gas reporting are contained in 40 CFR 98. This regulation is implemented by the EPA. This regulation is excluded from appearing in a Title V air operating permit because it does not contain applicable requirements under the Title V program (WAC 173-401-200(4)).

3.7.2 Chapter 173-441 WAC – Reporting of Emissions of Greenhouse Gases

This regulation requires GHG reporting for owners or operators of a source that emits at least 10,000 metric tons per year CO₂e. This regulation is implemented in its entirety by Ecology and is considered an applicable requirement under the Title V program. As such it is included in Term 2.4.5 of the AOP for the facility.

3.7.3 Chapter 173-442 WAC and 173-446 –Greenhouse Gas Mitigation

WAC 173-442, the Clean Air Rule, established greenhouse gas emission (GHG) reduction pathways for covered parties in Washington. WAC 173-442 was repealed and the functions it served were preempted and replaced by the 2021 [Climate Commitment Act](#) (WAC 173-446), and removed from the AOP.

WAC 173-446, the Climate Commitment Act, is not a Title V applicable requirement because it implements provisions created under 70A.65 (GHG Emissions, - Cap and Invest Program) and not the WA Clean Air Act, 70A.15. Therefore, it is not included in the AOP.

4. GENERAL PERMIT ADMINISTRATION AND ASSUMPTIONS

4.1 Permit content

The permit contains standard terms, generally applicable conditions for the type of facility permitted, and specifically applicable conditions originating from approvals to construct and any regulatory orders referencing the facility. Applicable requirements that were satisfied by a single past action on the part of the source are not included in the permit but are discussed in this Statement of Basis. An example would include performance testing to demonstrate compliance with applicable emission limitations as a requirement of initial startup. Regulations that require action by a regulatory agency, but not of the regulated source, are not included as applicable permit conditions.

Terms of the permit applicable to the wood treating process remain applicable regardless of the operator under the current leasing situation at the facility. The owner, Chemco, retains responsibility for compliance at all times. The applicability of the AOP to the owner in a lease situation is consistent with EPA guidance².

4.2 Federal Enforceability

Federally enforceable requirements are terms and conditions required under the Federal Clean Air Act (FCAA) or under any implementing regulation. Local and state regulations may become federally enforceable by formal approval and incorporation into the State Implementation Plan (SIP) or through other delegation mechanisms. Federally enforceable requirements are enforceable by the EPA and citizens. All applicable requirements in the permit including standard terms and conditions, generally applicable requirements, and specifically applicable requirements are federally enforceable unless identified in the permit as enforceable only by the state (i.e., labeled as "State only").

Most rules and requirements are followed by a date in parentheses. Two different versions (identified by the date) of the same regulatory citation may apply to the source if federal approval/delegation lags behind changes made to the Washington Administrative Code (WAC) or the NWCAA Regulation. For WAC regulations, the date listed in parentheses in the AOP represents the State Effective date. For SIP-approved WAC regulations, the date represents the "State Effective Date" of the regulation version that was SIP-approved. For the NWCAA regulations, the date represents the most recent Board of Directors adoption date, which is identified as the "Passed" or "Amended" date in the NWCAA Regulation. For SIP-approved the NWCAA regulations, the parenthetical date represents the "Passed" or "Amended" date of the regulation version that was SIP-approved. The date associated with an OAC or PSD permit represents the latest revision date of that order. For a federal rule, the date is the rule's most recent promulgation date prior to the issuance of the AOP.

Note that WAC 173-401 is a state regulation, but it is unique from other state and local regulations listed in the AOP in that it does not require EPA approval through the SIP process. As noted in gap-filling, below, 173-401 stems from 40 CFR Part 70. All of the requirements listed as coming from WAC 173-401 are federally enforceable for the source. Hence, the reader will not see two different versions of WAC 173-401 requirements listed in the AOP.

4.3 Gap Filling & Sufficiency Monitoring

Title V of the Federal Clean Air Act is the basis for the EPA's 40 CFR 70, which is the basis for the State of Washington air operating permit regulation, Chapter 173-401 WAC. Title V requires that all air pollution regulations applicable to the source be called out in the AOP for

² EPA Memo Number 98-1002. *Common Control Determinations for Title V Permit Applicability*; March 5, 1998 (amended January 25, 2010)

that source. Title V also requires that each applicable regulation be accompanied by a federally enforceable means of “reasonably assuring continuous compliance.”

40 CFR Part 70 and WAC 173-401-615 each contain a “gap-filling” provision to address situations where no monitoring is present. 40 CFR Part 70.6(c)(1) and WAC 173-401-630(1) contain authority to address situations where monitoring exists, but is deemed to be insufficient. NWCAA relied upon these authorities to add legally enforceable monitoring requirements where needed to the AOP.

The majority of cases where monitoring did not exist and needed to be added are older regulations, permits, and NWCAA tank requirements. For example, NWCAA used its gap-filling authority to add monitoring for the 20% visible emission standard, NWCAA 451.1. The phrase “Directly enforceable” is included in each AOP term where NWCAA added gap-filling.

There were also some limited cases where monitoring did exist but was found to be insufficient. NWCAA used its sufficiency monitoring authority (WAC 173-401-630(1)) to add monitoring in those cases. “Directly enforceable” is also included in the AOP term when NWCAA used its authority to supplement insufficient monitoring.

The type and frequency of monitoring added under the authorities in WAC 173-401-615 and WAC 173-401-630(1) were set based on the following factors:

1. Historical Compliance of Similar Emission Units – This information helped inform the decision about monitoring frequency and stringency.
2. Margin of Compliance – The margin of compliance is a measure of whether the facility can easily achieve compliance with a requirement, or whether they operate close to an exceedance. NWCAA considered the facility’s margin of compliance for each underlying requirements in setting monitoring for that requirement.
3. Variability of Process and Emissions – Processes that vary their production rates and/or emissions over time (e.g., batch loading of grain silos, VOC emissions from lumber drying kilns) require different monitoring from steady-state processes. NWCAA considered process and emission variability in setting monitoring.
4. Environmental Impact of a Problem – Exceedances of some permit requirements have greater environmental consequences than others. For example, a problem that causes an exceedance of a refinery sulfur plant limit could have a greater environmental impact than failing to use ultra-low sulfur diesel at an emergency generator. NWCAA considered the environmental impact of a problem in setting monitoring.
5. Clarity and Complexity – The requirements that apply to AOP facilities are numerous, varied, and can be complex. The greater number, variety, and complexity of requirements, the harder it is for a facility to understand and comply. NWCAA’s goal is to write clear, concise permits the facilities can understand. To help achieve this goal, when possible, NWCAA aligned additional monitoring with monitoring that the facility is already performing. This approach required careful thought. NWCAA reviewed the monitoring the facility is already performing to see if it was adequate to stand-in as monitoring for the permit term, and only used it if deemed adequate. For example, an older storage tank may have a NWCAA construction permit that didn’t list monitoring. The same tank may also be subject to 40 CFR 60 Subpart Kb. 60 Subpart Kb monitoring would only be used as the gap-filled (or sufficiency monitoring) if we found it was adequate to show compliance with the construction permit.

SOB Table 4.4-1 lists where in the AOP NWCAA used its gap-filling monitoring authority; SOB Table 4.4-2 lists where NWCAA used its sufficiency monitoring authority.

Table 4.3-1: Gap-filled Monitoring (WAC 173-401-615(1)(b) & (c))

AOP Terms	Description	Monitoring, Recordkeeping, & Reporting
4.2	Operation & maintenance	Monitor, keep records, & report
4.3 - 4.8	Nuisance & Odors	Written air contaminant response plan
4.9-4.13	Particulate Matter, Fugitive dust	Fugitive dust monitoring and records
4.14 - 4.19	Visible Emissions, Particulate Matter	Visible emission observation monitoring and recordkeeping
4.20	Weight/heat rate standard – sulfur compounds	Retain fuel consumption/purchase records (burn only natural gas)
4.21 - 4.25	Emission of sulfur compounds	Retain fuel consumption/purchase records (burn only natural gas)
5.1.1	Emissions routed through functioning condenser-wet scrubber control device	Maintain scrubber water use rate records
5.3.2 – 5.3.3	Kiln toxics emission limits	Report changes in throughput and materials

Table 4.3-2: Sufficiency Monitoring (WAC 173-401-630(1))

AOP Terms	Description	Monitoring, Recordkeeping, & Reporting
4.1	Required monitoring reports	Reporting periods identified
5.1.2	Scrubber liquor kept at least 15% below saturation	Maintain water use rate records
5.2.6	Boiler Visible Emissions	Visible emission observation monitoring and recordkeeping

4.4 Future Requirements

Applicable requirements promulgated with future effective compliance dates may be included as applicable requirements in the permit. Some requirements that are not applicable until triggered by an action, such as the requirement to file an application prior to constructing a new source, are addressed within the standard terms and conditions section of the permit.

There are presently no pending applications to construct or modify Chemco in such a way as to trigger New Source Review. Chemco has certified in the permit application that the facility will meet any future applicable requirements on a timely basis.

4.5 Compliance Options

Chemco did not request emissions trading provisions or specify more than one operating scenario in the air operating permit application; therefore, the permit does not address these options as allowed under WAC 173-401-650. This permit does not condense overlapping applicable requirements (streamlining) nor does it provide any alternative emission limitations.

5. COMPLETED REQUIREMENTS

The following actions were noted as having been completed as required by NWCAA Notice of Construction Approvals or Federal Regulations:

5.1 NWCAA OAC

- Approval Letter (issued September 19, 1988):
 - Condition 5: “All tanks with capacity of 6,000 gallons or greater containing liquids with a true vapor pressure of 1.5 psig or greater shall be constructed with either a floating roof, a vapor recovery system or other equipment of equal efficiency provided prior approval is obtained from the control officer.” Chemco does not store any liquids with vapor pressures > 1.5 psig.
- OAC 758 (issued April 9, 2001):
 - Condition 5 required Chemco to analyze and report the free formaldehyde concentration in the fire retardant product (Chemco 1000R) and propose a plan to measure formaldehyde and methanol emissions from the entire facility. Chemco submitted scrubber operation testing and operating plans to the NWCAA in February 2002 demonstrating treatment for formaldehyde and methanol emissions from the fire retardant manufacturing system. Emissions of methanol and formaldehyde from the kilns were determined from mass balances. A corrected mass balance showing methanol emissions was re-submitted to the NWCAA in 2007.
- OAC 1000 (issued January 20, 2009):
 - This OAC was issued to Chemco for a wood hardening process. This process ceased prior to the issuance of the initial AOP in 2011. Therefore all conditions in the AOP specific to this OAC have been removed.
- OAC 1271 (issued May 16, 2017):
 - Chemco complied with the one-time requirement to submit initial notification of applicability (Part 1 & 2) of 40 CFR 63 Subpart DDDDD for the 10.043 MMBtu/hr natural gas-fired boiler, required pursuant to 40 CFR 63 Subpart B, 63.53(a) & (b); and, the one-time requirement notification for date of construction and actual startup pursuant to 40 CFR 60 Subpart Dc, 60.48(c) on August 18, 2017.
- OAC 1271 (issued May 16, 2017):
 - Chemco complied with the initial tune-up, required per 40 CFR 63.7510(e), Table 3, row 4 to Subpart DDDDD of Part 63, and 40 CFR 63.7510(e) and 63.7540(1)(10), November 11, 2017.

5.2 Federal Requirements

5.2.1 40 CFR 63 NESHAPS

- 40 CFR 63 Subpart DDDD: Chemco complied with the one-time requirement to submit initial notification of applicability of 40 CFR 63 Subpart DDDD to the drying kilns, as required in §63.2252 on July 18, 2008.
- 40 CFR 63 Subpart FFFF: Chemco complied with the one-time requirement to submit an initial notification of applicability of 40 CFR 63 Subpart FFFF to the chemical batch plant as required in §63.2515(b) on July 18, 2008.
- 40 CFR 63 Subpart DDDDD:

- Chemco compiled with one-time requirement to submit initial notification of applicability (Part 1 & 2) of 40 CFR 63 Subpart DDDDD to the 25.1 MMBtu/hr natural gas-fired boiler, required pursuant to 40 CFR 63 Subpart B, 63.53(a) & (b), January 29, 2009. The boiler has since been removed so it is not listed in the AOP.
- Chemco complied with the Boiler MACT one-time energy assessment and initial tune-up, required per 40 CFR 63.7510(e), Table 3, row 4 to Subpart DDDDD of Part 63, and 40 CFR 63.7510(e) and 63.7540(1)(10), November, 20, 2015, respectively. The initial 25.1 MMBtu/hr boiler tune up was performed by Cascade Boiler on January 12, 2016. The one-time energy assessment (up to 8 technical hours) was completed January 29, 2016. The boiler has since been removed so it is not listed in the AOP.

6. PERMIT ELEMENTS AND BASIS FOR TERMS AND CONDITIONS

6.1 Permit Organization

The permit is organized in the following sequence:

Permit Information

Attest

Table of Contents

Section 1 Emission Unit Identification

Section 2 Standard Terms and Conditions

Section 3 Standard Terms and Conditions for NESHAP

Section 4 Generally Applicable Requirements

Section 5 Specifically Applicable Requirements for Emission Units

Section 6 Inapplicable Requirements

6.2 Permit Information

The Permit Information section identifies the source and provides general information relevant to the permit such as the facility address, the responsible corporate official, the permit issuance date and expiration date, and the NWCAA personnel responsible for permit preparation, review, and issuance.

6.3 Attest

The Attest section provides authorization by the NWCAA for the source to operate under the terms and conditions contained in the permit.

6.4 Section 1 - Emissions Unit Identification

The Emissions Unit Identification section lists the significant emissions units, associated control equipment, fuel type, and installation dates. This section is a general overview of the facility. Detailed information about the plant can be found in the permit application and supporting files.

6.5 Section 2 – Standard Terms and Conditions

The Standard Terms and Conditions section of the permit contains administrative requirements or prohibitions that do not have ongoing compliance monitoring requirements. Regulations that give legal authority to the Standard Terms and Conditions are cited for each topic. At times, requirements are paraphrased; the language of the cited regulation takes precedence over the paraphrased summary. For understanding and readability, the terms and conditions have been grouped by function. Similar requirements from the State and the NWCAA are grouped together where possible. Requirements that are not applicable until triggered are also included. An example of these would be the requirement to file a “Notice of Construction and Application for Approval.”

Several permit conditions in Section 2 are labeled “Directly enforceable under WAC 173-401-615(1)(b) & (c), 10/17/02”. These conditions are a clarification of the regulatory requirements, as the NWCAA interprets those requirements. “Directly enforceable” conditions are legal requirements with which the permittee must comply and are directly enforceable through the permit per the NWCAA’s gap-filling authority. See Section 4.3 of this SOB for more details on gap filling and sufficiency monitoring.

6.6 Section 3 – Standard Terms and Conditions for NSPS and NESHAPs

This section contains the generally applicable requirements from 40 CFR 60 Subpart A and Subpart A of 40 CFR 63. These requirements, which consist mainly of recordkeeping, reporting, and general testing and operation and maintenance standards, apply generally to emission units that are subject to the federal requirements under NSPS and NESHAP.

The standard terms and conditions in this section are administrative and/or other requirements that typically have no ongoing compliance monitoring requirements. The permittee must comply with the requirements for specific “affected sources” defined in the National Emission Standards for Hazardous Air Pollutants (NESHAP) in 40 CFR 63.2.

Chemco has limited affected sources for the requirements in Section 3. The applicability of Subpart A requirements is found in each applicable NSPS and NESHAP regulation on a line-by-line basis, generally as part of a table at the end of each Subpart. Chemco has regulations that provide the basis for the terms included in Section 3 of the permit; 40 CFR 60 Subpart Dc and CFR 63 Subparts FFFF and DDDDD.

- Chemco does not have any continuous emissions monitoring systems (CEMS) or continuous monitoring systems (CMS) that are required at the facility. Therefore, all requirements from Subpart A regarding these systems have been excluded.
- Chemco has only group 2 emission points and fugitive emissions sources under Subpart FFFF.

6.7 Section 4 – Generally Applicable Requirements

The Generally Applicable Requirements section of the permit identifies requirements that limit emissions or operations and apply broadly to the facility. With some exceptions, each of these requirements applies non-specifically to sources. For example, the NWCAA Regulation Section 455.1 broadly prohibits particulate emissions that exceed 0.1 gr/dscf from any emissions unit, with certain exceptions. Other requirements apply to only certain types of emissions units. For example, WAC 173-400-060 applies only to general process units to limit particulate emissions. Despite these differences in applicability, these requirements have been listed together in the Generally Applicable Requirement section of the permit.

The “Permit Term” column of Table 4–1 provides permit term numbers used to identify listed elements. The requirements specified in the “Citation” column apply to all emission units at the source, including insignificant emission units. The “Description” column is a brief description of the applicable requirements for informational purposes only, and is not enforceable. Periodic or continuous monitoring requirements (including testing) are specified in the “Monitoring/Recordkeeping/Reporting” column, which identifies monitoring, recordkeeping and reporting (MR&R) obligations the source must perform as required by WAC 173-401-605(1) and 615(1) and (2), or the underlying requirement. The NWCAA has determined that the MR&R requirements in Section 4 are not necessary for insignificant emissions units.

Many of the applicable requirements in Section 4 do not have underlying requirements for periodic testing or monitoring that yield sufficiently reliable data for the time increment in which the standard is set. Such monitoring (which may consist of recordkeeping designed to serve as monitoring) is required to be in the permit by Washington Administrative Code (WAC) 173-401-615. In these cases, site-specific MR&R was developed based on the characteristics of the permitted facility, the nature of the underlying requirement, the requirements of WAC 173-401-615, and EPA guidance. The process of developing these MR&R requirements and adding them to the permit is called “gap-filling”. The MR&R requirements that contain gap-filling language are identified with the words “*Directly*

enforceable” in the MR&R column of the table. The regulatory citation (WAC 173-401-615(1)(b) & (c)) is provided for each term with applicable gap filling.

Monitoring Recordkeeping and Reporting for generally-applicable Operation and Maintenance (O&M) requirements in Section 4 consists of operating and maintaining equipment in accordance with all of the other terms of the permit. If there are O&M requirements that are specific to an emission unit, they are addressed in Section 5 of the permit.

6.7.1 Operation and Maintenance (AOP Term 4.2)

These terms require the source to maintain equipment in good condition in order to minimize air emissions.

6.7.2 General Nuisance & Odor (AOP Terms 4.3 - 4.7)

NWCAA Regulations and the WAC contain requirements regarding emissions deemed to be a “general nuisance”. Emissions of air contaminants that damage human health, plant or animal life, or otherwise interfere with the “enjoyment of life and property” are prohibited. Chemco may not generate odors that “unreasonably interfere with property use” and must use good practices to reduce odors to a reasonable minimum. These rules, however, do not include specific monitoring, recordkeeping, or reporting requirements. Therefore, per the requirements of WAC 173-401-615, the MR&R was “gap-filled” with MR&R requirements. The gap-filled MR&R requirements require Chemco to inspect potential sources of nuisance emissions upon receipt of a complaint, repair problems found, document the inspection and subsequent work, and notify NWCAA if repairs cannot be made in a timely fashion. If nuisance emissions cannot be corrected within four hours, PWC must notify the NWCAA within twelve hours with a description of the complaint and action being taken to resolve the problem. Chemco will provide assurance of compliance with these requirements in the annual compliance certification and by maintaining a log of nuisance complaints and associated repairs and mitigation actions.

6.7.3 Fugitive Emissions (AOP Terms 4.9 – 4.13)

Chemco must also take reasonable precautions to prevent fugitive emissions, which are defined as particulate emissions made airborne by forces of wind, human activity, or both. Further, AOP terms regarding fugitive emissions prohibit the offsite deposition of particulate matter. These rules do not include specific monitoring, recordkeeping, or reporting requirements. Therefore, per the requirements of WAC 173-401-615, the MR&R was “gap-filled” with MR&R requirements. The gap filling includes monitoring requirements where Chemco must conduct quarterly facility wide inspections. Where fugitive emissions are observed, Chemco must initiate corrective actions no later than 24 hours or shut down the activity until the problem can be corrected. The recordkeeping requirements include recording the quarterly inspections and actions taken where appropriate.

6.7.4 Visible Emissions (AOP Terms 4.14 – 4.19)

Opacity is defined as “the degree to which an object seen through a plume is obscured, stated as a percentage” and is assumed to be a reasonable approximation of particulate matter emissions. As such, generally applicable AOP terms establishing opacity and particulate matter standards have a common MR&R requirement. The generally applicable opacity requirement limits any source at the facility to 20% opacity according to Ecology Method 9A; however, these limits are not accompanied by specific MR&R. Consequently, the MR&R for this term is gap-filled. Emission units throughout the facility generally operate without any visible emissions, so seeing any visible emissions is indicative of a problem. In order to standardize the facility-wide response to visible emissions, the MR&R for the

opacity standard is written such that any visible emissions require immediate action with increasing stages of monitoring, depending on the situation. Any observed visible emissions (VE) require that one of three steps be taken within 24 hours: correct the problem, shut the unit down, or a certified reader shall determine the opacity according to EPA Method 9, which is a six-minute standard. If any three minutes during the six-minute observation or if the EPA Method 9 test itself shows emissions in excess of any standard, an Ecology Method 9A reading must be taken, if applicable. If a certified VE reader is unavailable to read the emissions, the NWCAA will assume that all opacity standards have been exceeded. Observations and actions taken must be recorded and made available at the facility for inspection. The MR&R requirement for opacity and particulate matter standards is written to allow reduced opacity observation length when the opacity levels are clearly below the standard.

If opacity is greater than an applicable emission standard, immediate corrective action is required and an upset condition must be reported to the NWCAA. All Method 9 or 9A opacity readings must be taken by an individual holding a valid Certification of Completion for Plume Evaluation Training from Ecology or other authorized training facility.

This MR&R is meant to capture all possible exceedances of any applicable opacity standard while providing a consistent set of steps to be taken when any opacity is observed at the facility.

For permit terms that list particulate matter limits in grains/dscf, visible emission monitoring has been chosen as a surrogate to performing Method 5 tests. The facility is required to take corrective action if visible emissions are noted. Based on historical inspections and permitting actions, the NWCAA has determined that Chemco is unlikely to exceed the particulate matter limits if there are no visible emissions. Chemco does not operate any equipment that requires grate cleaning or soot blowing.

For emission units with specific opacity standards, such as the boiler, these conditions are included under the specifically applicable requirements for the equipment in Section 5 of the AOP.

6.7.5 Sulfur Dioxide and Fuel bound Sulfur (AOP Terms 4.20 – 4.25)

Below is a discussion of the generally applicable terms related to sulfur dioxide (SO₂).

6.7.5.1 Fuel Sulfur Content:

NWCAA 520 limits sulfur content of gaseous fuels to a maximum of 412 ppm sulfur, which is about 26 grains of sulfur per 100 standard cubic feet. Natural gas is supplied via pipeline by Cascade Natural Gas and contains an average of 1.5 grain of sulfur per 100 standard cubic feet, which is equivalent to about 25.4 ppm sulfur:

Note:

$$\frac{1.5 \text{ gr. Sulfur}}{100 \text{ ft}^3 \text{ gas}} \times \frac{1 \text{ lb}}{7000 \text{ gr}} \times \frac{1 \text{ lb-mole}}{32 \text{ lb}} \times \frac{379.5 \text{ ft}^3 \text{ Sulfur}}{1 \text{ lb-mole}} = 2.54 \times 10^{-5} \frac{\text{ft}^3 \text{ Sulfur}}{\text{ft}^3 \text{ gas}} = 25.4 \text{ ppm}$$

A lb-mole of a pure gas weighs the molecular weight of that gas in pounds and occupies 379.5 ft³ at 60° F and 1 atmosphere pressure (14.696 pounds per square inch absolute [psia]). A lb-mole of sulfur (S) weighs 32 lb and reacts with a lb-mole of oxygen (O₂) which also weighs 32 lb to form a lb-mole of sulfur dioxide, which weighs 64 lb. Therefore, 2 lb of SO₂ are emitted for every lb of sulfur in the fuel. Because one lb-mole of sulfur reacts to form one lb-mole of sulfur dioxide, each cubic foot of sulfur in the fuel results in one cubic foot of sulfur dioxide out the stack.

Chemco demonstrates compliance with this requirement by burning only natural gas as required in term 4.20.

When natural gas is burned, the boiler will emit about 0.0041 lb/MMBtu SO₂ as shown in the following calculation:

$$\frac{1.5 \text{ gr. Sulfur}}{100 \text{ ft}^3} \times \frac{1 \text{ lb Sulfur}}{7000 \text{ gr Sulfur}} \times \frac{1000 \text{ ft}^3}{1.05 \text{ MMBtu}} \times \frac{2 \text{ lb SO}_2}{1 \text{ lb Sulfur}} = 0.0041 \frac{\text{lb SO}_2}{\text{MMBtu}}$$

6.7.5.2 Sulfur Dioxide, Stack Emissions (Section 4):

NWCAA Regulations 462 and WAC 173-400-040(6) have been grouped together under Permit Terms 4.7 and 4.8 since they are equivalent requirements (SO₂ emissions not to exceed 1,000 parts per million on a dry, volumetric basis (ppmdv)³) and have the same monitoring requirements.

The second paragraph of WAC 173-400-040(6), which is not in the Northwest Clean Air Agency regulations and is not adopted into the SIP, allows for exceptions to this requirement if the source can demonstrate that there is no feasible method of reducing the SO₂ concentrations to 1,000 ppmdv. This requirement is not federally enforceable and is not an applicable requirement for sources regulated by the Northwest Clean Air Agency.

Fuel consuming sources at Chemco burn only natural gas or diesel fuel and are incapable of violating the SO₂ limit while complying with the other requirements in the permit. The following calculations show that it is mathematically impossible for a unit to emit 1,000 ppm sulfur dioxide while burning natural gas.

Natural gas means a mixture of gaseous hydrocarbons, with at least 80 percent methane by volume, such as the gas sold or distributed by any utility company regulated by the Washington Utilities and Transportation Commission. Chemco receives the same natural gas as all of the other natural gas consumers, private and industrial, in the Northwest, and this natural gas contains approximately 1.5 grains of sulfur per 100 standard cubic feet.

According to *Perry's Chemical Engineer's Handbook*, each cubic foot of natural gas requires approximately 10 cubic feet of air for combustion, yielding approximately 11 cubic feet of combustion exhaust gases, consisting mostly of nitrogen, water vapor, and carbon dioxide. The sulfur in the natural gas will almost all be converted to sulfur dioxide, with each cubic foot of sulfur producing the same volume of sulfur dioxide. Since each cubic foot of natural gas contains 2.54×10^{-5} cubic foot of sulfur (from above), each cubic foot of stack exhaust will contain approximately:

$$2.54 \times 10^{-5} \frac{\text{ft}^3 \text{ S}}{\text{ft}^3 \text{ nat. gas}} \times \frac{1 \text{ ft}^3 \text{ SO}_2}{1 \text{ ft}^3 \text{ S}} \times \frac{1 \text{ ft}^3 \text{ nat. gas}}{11 \text{ ft}^3 \text{ stack exhaust}} = 2.3 \times 10^{-6} \frac{\text{ft}^3 \text{ SO}_2}{\text{ft}^3 \text{ stack exhaust}}$$

This is equivalent to 2.3 ppmdv SO₂. Note that this estimated value is about two-tenths of one percent of the 1,000 ppm SO₂ standard. Therefore, it is reasonable to assume that

³ "ppmdv" means "parts per million on a dry, volumetric basis." Stack gas is usually sampled through a probe placed somewhere in the middle of the stack cross-section. The moisture is removed from the gas stream as part of the sampling process. The stack gas sample is analyzed for the pollutant in question, with the lab results being calculated as cubic feet (or meters) of pollutant per million cubic feet (or meters) of dry stack gas. If you had a stack with 50% moisture that was running right at the 1,000 ppmdv SO₂ standard, you would have 1,000 cubic feet of SO₂ for every million cubic feet of dry stack gas. You would also have 1,000 cubic foot of SO₂ for every two million cubic feet of "wet" (as is) stack gas, which is 500 ppmv. This is why it's important to know how stack sampling is done and why stack sampling and continuous emission monitoring methods are so specific.

combustion units that are fired on natural gas cannot exceed the 1,000 ppm SO₂ limits in Northwest Clean Air Agency Regulations 462 and WAC 173-400-040(6).

6.8 Section 5 – Specific Requirements for Emissions Units

This section contains tables that list applicable requirements that specifically apply to the main emission units. AOP Section 5 is separated into four sections: Section 5-1 covers the chemical batch plant (EU-1); section 5-2 covers the boiler (EU-2); section 5-3 covers the drying kilns (EU-3). These requirements specifically apply to significant emission units in addition to the Sections 2, 3, and 4 requirements.

The format of this section is the same as the table for the generally applicable requirements. Section 5 is organized to reflect operations at the facility and existing permits.

6.8.1 Section 5-1 Chemical Batch Plant (EU-1)

This section contains the requirements specific to the Chemical Batch Plant and Formaldehyde/Methanol storage tank from OAC 758 issued April 9, 2001, and the applicable requirements from 40 CFR 63 Subpart FFFF specific to leak detection and repair. Equipment subject to the monitoring requirements at Chemco includes valves, connectors, pumps, and one agitator. Chemco does not operate any subject compressors, sampling connection systems, or pressure relief devices – the process operates at atmospheric pressure.

6.8.2 Section 5-2 Boiler (EU-2)

This section contains the applicable requirements specific to the 10.043 MMBtu/hr natural gas-fired boiler from OAC 1271a and the applicable NESHAP and NSPS regulations. The boiler is subject to the work practice standards, annual tune-ups, and associated recordkeeping and reporting required for new units designed to burn natural gas greater than 10 MMBtu/hr at a major source (40 CFR 63 Subpart DDDDD). The regulation does not impose any numerical operating limitations, fuel requirements, installation and operation of monitors, or performance tests for this unit. The boiler is also subject to 40 CFR 60 Subpart Dc which requires records of the amount of natural gas burned each month.

6.8.3 Section 5-3 Drying Kilns (EU-3)

This section contains the requirements specific to the wood treatment process from OAC 758 issued April 9, 2001 and approval letter dated September 19, 1988.

The gap-filled MR&R for conditions 5.1.2 and 5.1.3 defines what threshold shall be used to identify when throughput or material formulations change significantly. “Significant change” shall be when:

1. Formulation of fire retardant chemical changes,
2. Shingles or shakes are treated with fire retardant chemical, or
3. New products are treated with fire retardant chemical.

7. INSIGNIFICANT EMISSIONS UNITS

WAC 173-401-530 contains criteria for identifying insignificant emission units or activities for purposes of the operating permit program. Designation of an emission unit or activity as insignificant for purposes of this chapter does not exempt the unit or activity from any applicable requirement. A list of insignificant emission units is included in Table 6-1.

Monitoring requirements for insignificant emission units are detailed in Section 2.4.1.4 of the AOP. Chemco is required to use good industrial practices to maintain insignificant emission units, and to promptly repair defective equipment or shut down the unit until defective equipment can be repaired.

Table 6-1: Insignificant Emission units

Unit	WAC Citation	Comment
Tank T103 (12,000 gal)	WAC 173-401-533(2s)	Aqueous phosphoric acid storage (clear)
Tand T104 (12,000 gal)	WAC 173-401-533(2s)	Aqueous phosphoric acid storage (green), no longer in use
Tank T107	WAC 173-401-532(94)	Water storage tank
Dilution Tank 1 (21,240 gal)	WAC 173-401-532(4)	Aqueous fire retardant dilution (HAP<5%)
Dilution Tank 2 (21,240 gal)	WAC 173-401-532(4)	Aqueous fire retardant dilution (HAP<5%)
Dilution Tank 3 (21,240 gal)	WAC 173-401-532(4)	Aqueous fire retardant dilution (HAP<5%)
Dilution Tank 4 (21,240 gal)	WAC 173-401-532(4)	Aqueous fire retardant dilution (HAP<5%)
Wood treating building vents	WAC 173-401-532(9)	Room air vents
Resin manufacturing building vents	WAC 173-401-532(9)	Room air vents
Diesel transfer operation	WAC 173-401-533(2t) & WAC 173-401-532(2)	Transfer from truck to rail
Diesel transfer operation building vents	WAC 173-401-532(9)	Room air vents
Chemical storage totes – non HAP	WAC 173-401-533(2b)	
Enclosed spray device	WAC 173-401-533(y)	Application of water based dye for identification
Administration HVAC	WAC 173-401-532(46)	Comfort air conditioning/heating
Lawns and Landscaping	WAC 173-401-532(43)	

8. INNAPPLICABLE REQUIREMENTS

WAC 173-401-640 requires the permitting authority to issue a determination regarding the applicability of requirements with which the source must comply. The source must specify in the AOP application the requirements for which a determination is requested. Inapplicable requirements must be listed in the AOP in order for the permit shield to apply. Chemco did not request a permit shield against any specific requirements at the time of the application.

9. DEFINITIONS AND ACRONYMS

Definitions are assumed to be those found in the underlying regulation. A short list of definitions has been included to cover those not previously defined.

An "applicable requirement" is a provision, standard, condition or requirement in any of the listed regulations or statutes as it applies to an emission unit or facility at a stationary source.

"Ecology" means the Washington State Department of Ecology.

An "emission unit" is any part or activity of a stationary source that emits or has the potential to emit any regulated air pollutant.

"Chemco" means Chemco, Inc.

"Oil" means low-sulfur No. 2 diesel fuel, containing no more than 0.05 percent sulfur by weight.

A "permit" means for the purposes of the air operating permit program an air operating permit issued pursuant to Title V of the 1990 Federal Clean Air Act Amendments.

"State" means, for the purposes of the air operating permit program, the NWCAA or the Washington State Department of Ecology.

The following is a list of Acronyms used in the Air Operating Permit and/or Statement of Basis:

AFS	AIRS Facility System
AIRS	Aerometric Information Retrieval System
AOP	Air Operating Permit
ASIL	Acceptable Source Impact Level
ASTM	American Society for Testing and Materials
bf	board feet
Btu	British thermal unit
CEM	Continuous Emissions Monitor
CEMS	Continuous Emissions Monitoring System
CFR	Code of Federal Regulations
EPA	The United States Environmental Protection Agency
FCAA	Federal Clean Air Act
MMBtu/hr	million BTU per hour
MR&R	Monitoring, Recordkeeping and Reporting Requirements
NAICS	National Industrial Classification System
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOC	Notice of Construction
NO _x	Oxides of Nitrogen
NSPS	New Source Performance Standard
NSR	New Source Review
NWCAA	Northwest Clean Air Agency

O ₂	Oxygen
OAC	Order of Approval to Construct
PM	Particulate Matter
PM ₁₀	Particulate Matter less than 10 microns in diameter
ppmvd	parts of pollutant per million parts of dry stack gas on a volumetric basis (same as ppmvdv)
PSD	Prevention of Significant Deterioration (federally required program for pre- construction review of major sources)
QA/QC	Quality assurance/quality control
RCW	Revised Code of Washington
scf	standard cubic foot (cubic foot of gas at Standard Conditions – usually 1 atmosphere of pressure and 60°F)
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO ₂	sulfur dioxide
tpy	tons per year
VOC	Volatile Organic Compounds
WAC	Washington Administration Code

10. PUBLIC DOCKET

During the public comment period, copies of Chemco’s air operating permit, the supporting statement of basis, permit application, and any technical support documents are available for download on NWCAA’s website at: <https://nwcleanairwa.gov/>

Copies may also be obtained by contacting NWCAA:

Northwest Clean Air Agency
1600 South Second Street
Mount Vernon, WA 98273-5202

Phone: 360-428-1617

Following the conclusion of the public comment period, a copy of Chemco’s air operating permit and the supporting statement of basis will remain posted on the NWCAA website and can be obtained by contacting NWCAA directly.

11. PUBLIC COMMENTS & EPA REVIEW

Renewal 1:

A 30-day public comment period ran from February 10, 2021 to March 12, 2021. Notice was posted in the Washington Department of Ecology's Permit Register as well as on the NWCAA's website. Copies of the draft permit and statement of basis were available on the NWCAA's website and mailed or emailed to the public upon request (NWCAA's office was closed to the public due to Covid) throughout the public comment period.

During this comment period the agency received one email containing a comment on the draft AOP and no other correspondence regarding comments.

Comment #1:

"The annual emissions inventory demonstrates a lot of methanol and formaldehyde emissions. In the SOB Section 3.2, the kilns have an applicable MACT rule, but no monitoring or record keeping that pertains to it. Also the AOP Condition 5.3.2, refers to the Air Toxics WAC but no reference to the MACT.

My concern is that formaldehyde and methanol emissions have increased, yet there are no monitoring or emissions recordkeeping requirements other than throughput for annual emissions inventory reporting. Is there any gap filling that can be done on this MACT or WAC 173-460 for the kilns. Should 5.3.3 include the ASIL for formaldehyde and methanol (even if they are not in the original OAC)? (The CalEPA lists methanol chronic inflammation reference exposure concentration at 10 mg/m³.) Should 5.3.2 also reference the MACT?"

Response:

This comment specifically addresses toxics emissions from the drying kilns subject to the MACT standard 40 CFR 63 DDDD – National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products and the Washington Administration Code (WAC) 173-400-460: Controls for New Sources of Toxic Air Pollutants.

MACT:

40 CFR 63 Subpart DDDD establishes compliance options, operating requirements and work practice standards for hazardous air pollutants from drying kilns at plywood and composite wood product manufacturing facilities; therefore, applicable to Chemco. The compliance options, described in Tables 1A and 1B of the MACT, are applicable to a subset of drying kilns as defined in § 63.2292. The type of drying kilns at Chemco are not listed in Tables 1A and 1B; and therefore, not subject to these compliance options, operating requirements and work practice standards. The section of the MACT applicable to Chemco is the initial notification requirement in § 63.2252. Chemco submitted the initial notification with their Title V application in June 2008. No additional permit conditions associated with the MACT are included in the AOP as Chemco has complied with all applicable requirements.

NWCAA has authority under WAC 173-401 to add monitoring (known as sufficiency monitoring or gap filling) to assure compliance with the limits in the MACT if NWCAA determines existing monitoring is insufficient. However, as noted above, there are no MACT limits that apply to the Chemco kilns. NWCAA has no basis to add sufficiency monitoring or gap filling as there are no applicable MACT limits.

WAC 173-460:

A review under WAC 173-460, the WA air toxics rule, is triggered at the time equipment or processes undergo New Source Review (NSR), also known as construction permit review. This review is project specific, not facility-wide, and only authorized when NSR review is required. The rule does not allow a re-review for a process that was previously approved unless a facility proposes an action that is a modification of the process or emissions unit.

Chemco's kilns were approved under NSR at the time of installation, which included a review of the TAP emissions. While Chemco's formaldehyde and methanol emissions may fluctuate year to year, they remain within the bounds of the NSR review. Chemco has not proposed any changes that require NSR review, and the renewal of an Air Operating Permit does not trigger NSR review. Therefore, a review under WAC 173-460 is not applicable.

Formaldehyde and methanol emissions are calculated at Chemco based on the concentration of those pollutants in the fire retardant and these emissions are reported annually. A review of annual emissions inventories indicates the formulation has not changed since the original OAC issuance. Annual inspections have confirmed that operational changes have not impacted the concentrate formulation or operation of the kilns since 1981. During the AOP renewal process the source confirmed fire retardant concentration has not changed from the formulation used in the original NOC application.

The MACT standard does not have emission limits and does not require additional monitoring for the type of drying kilns at Chemco. To satisfy the NSR air toxics permit limit, the AOP includes gap filling in Condition 5.3.2, identified as directly enforceable monitoring. This gap filled monitoring requires tracking of the fire retardant formulation, including formaldehyde and methanol content, and notification if the formulation changes. This notifies NWCAA of changes that would trigger an NSR review including a review of toxics increases under WAC 173-460. The AOP also requires Chemco to calculate and report annual emissions. Taken together, NWCAA continues to view the monitoring in the AOP as adequate.

Based upon a review of the regulations and permit term 5.3.2, no change was made to the permit in response to Comment #1.

12. CHANGES INCORPERATED IN PREVIOUS AOP REVISIONS

AOP Renewal: AOP# 020R2 (May 25,2021)

The following changes were made to the AOP during this renewal.

- Regulatory citations in the permit were revised to reflect new or modified regulations and revision/promulgation dates were updated.
- Formatting throughout the permit was updated to current NWCAA standards.
- Contact names and information for the NWCAA were updated where appropriate and the permit information page reflects the updated permit number and dates for the permit renewal. Note the renewal application is due a year in advance of the permit expiration date.
- Table 1-1 in the AOP was modified to include the 12.248 MMBtu/hr boiler reviewed in OAC 1271 and OAC 1271a and reorganized to better reflect the grouping and organization of emission points at the facility.
- The emission unit identification numbers were updated to correspond to permit terms in Table 5 of the AOP and reflected in Section 2.2 below.
- AOP Section 2 (Standard Terms and Conditions) and Section 3 (Standard Terms and Conditions for NSPS and NESHAP) have been replaced with current NWCAA standard versions, containing any new or modified regulations and updated reference dates.
- The conditions of OAC 1271, issued July 13, 2020, were added in Section 5 of the AOP.
- The Statement of Basis content and layout were revised to standardize the documents issued for Chemco. Factual information was revised to correct for current operation and some text has been revised to add clarification.

13. ATTACHMENTS

13.1.1 Kiln PTE Emissions: Methanol & Formaldehyde

The majority of VOC emissions are from Methanol and Formaldehyde emissions from kiln drying of both the fire retardant treated wood and untreated wood. Several iterations of PTE estimates have been determined since the submittal in 1999. A historical summary of each iteration of the PTE calculations and a basis for the data and assumptions used provided below.

2020 AOP Renewal PTE Re-Evaluation

In the 2020 AOP renewal, a re-evaluation of the facility PTE was completed. Chemco's kiln PTE is based on kiln capacity and kiln drying cycle. For fire retardant treated wood, the PTE assumption for methanol is that all of the methanol applied to treat the wood is emitted in kiln drying. For untreated wood, EPA Region 10 emission factors are applied to the maximum throughput for kiln drying.

The following process data, emission factors, and assumptions were used to determine the PTE from kiln drying:

Treated Wood

- 243 maximum kiln cycles per year based on kiln capacity and 7-day kiln cycle. This changed from the kiln cycle estimates in 2008 (5 days) as Chemco had to increase dry time to prevent wood staining.
- 7,624,743 lb maximum fire retardant concentrate per year. This was determined from the amount of fire retardant concentrate that would be needed to treat the maximum board footage amount of wood. Maximum board footage is based on the maximum amount of wood that could fit in the kilns given the maximum of 243 kiln cycles per year.
- 3 lb formaldehyde per kiln cycle. This is based on Chemco's 1998 kiln stack emission testing.
- 5.77 wt% methanol in fire retardant concentrate. This is based on the average water dilution of the fire retardant solution applied to the wood.

Untreated Wood

- 3,744,000 bf/yr maximum throughput for kiln drying
- 0.00068 lb/Mbf formaldehyde emission factor (*EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, November 2019, Douglas Fir*)
- 0.0215 lb/Mbf methanol emission factor (*EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, November 2019, Douglas Fir*)

Formaldehyde Emissions (Kilns)

- Treated Wood Total= 729 lb/yr
 - 243 kiln cycles/yr * 3 lb / kiln cycle
- Untreated Wood Total = 3 lb/yr
 - 3,744,000 bf/yr * 0.00068 lb/Mbf * Mbf/1000 bf

Methanol Emissions (Kilns)

- Treated Wood Total= 439,948 lb/yr
 - 7,624,743 lbs/yr concentrate * 5.77 wt% methanol

- Untreated Wood Total = 80 lb/yr
 - $3,744,000 \text{ bf/yr} * 0.0215 \text{ lb/Mbf} * \text{Mbf}/1000 \text{ bf}$

2008 PTE Estimates

On April 14, 2008 NWCAA received Potential to Emit (PTE) estimates from Chemco of methanol and formaldehyde from the kiln drying process of treated wood. This estimate included the following assumptions and calculations:

- Maximum annual kiln cycles: 73 cycles/yr
 - Each kiln cycle takes 5 days to complete: $365 \text{ days/yr} \div 5 \text{ days/kiln cycle} = 73 \text{ cycles/yr per kiln}$
- Maximum kiln capacity:
 - Kiln 3 & 4 hold 144 pallets per kiln cycle
 - Kiln 1 & 2 hold 48 pallets per kiln cycle (or 1/3 capacity of Kiln 3 & 4)
- 3 lbs formaldehyde / kiln cycle
 - Based on measurements of kiln 1 & 2 stack exhaust samples (Chemco 1998 stack emissions testing)
- 2160 lbs methanol / kiln cycle
 - 248 lbs concentrate per pallet
 - 700 lbs fire retardant treating solution gained per pallet
 - 23% solids in max concentration of treating solution
 - 0.65 Unknown factor, not explained in 2008 documentation
 - $248 \text{ lbs concentrate/pallet} = 100 * 0.23 / 0.65$
 - 2160 lbs methanol / kiln cycle (for Kiln 1 & 2, 144 pallets)
 - Concentrate contains 6% methanol
 - $15 \text{ lbs methanol/pallet} = 248 \text{ lbs concentrate/pallet} * 6\% \text{ methanol}$
 - $2160 \text{ lbs methanol / kiln cycle} = 15 \text{ lbs methanol/pallet} * 144 \text{ pallets/kiln cycle}$

Formaldehyde Emissions:

Kiln 1: $73 \text{ kiln cycles/year} * 3 \text{ lbs formaldehyde/ kiln cycle} = 219 \text{ lbs}$

Kiln 2: $73 \text{ kiln cycles/year} * 3 \text{ lbs formaldehyde/ kiln cycle} = 219 \text{ lbs}$

Kiln 3: $73 \text{ kiln cycles/year} * 3 \text{ lbs formaldehyde/ kiln cycle} * 1/3 \text{ capacity} = 73 \text{ lbs}$

Kiln 4: $73 \text{ kiln cycles/year} * 3 \text{ lbs formaldehyde/ kiln cycle} * 1/3 \text{ capacity} = 73 \text{ lbs}$

Total Formaldehyde (kiln 1-4) = 584 lbs = 0.3 tons/year

Methanol Emissions:

Kiln 1: $73 \text{ kiln cycles/year} * 2160 \text{ lbs methanol/ kiln cycle} = 157,680 \text{ lbs/year}$

Kiln 2: $73 \text{ kiln cycles/year} * 2160 \text{ lbs methanol / kiln cycle} = 157,680 \text{ lbs/year}$

Kiln 3: $73 \text{ kiln cycles/year} * 2160 \text{ lbs methanol / kiln cycle} * 1/3 \text{ capacity} = 52,560 \text{ lbs/yr}$

Kiln 4: $73 \text{ kiln cycles/year} * 2160 \text{ lbs methanol / kiln cycle} * 1/3 \text{ capacity} = 52,560 \text{ lbs/yr}$

Total Methanol (kiln 1-4) = 420,480 lbs/year = 210 tons/year

1999 PTE Estimates

On April 15, 1999 NWCAA received an estimate of formaldehyde emissions from Chemco that included the basis for the emission factor of 3 lbs formaldehyde per kiln cycle. Chemco performed a mass balance around the wood treatment process such that:

- There is 6,962 lbs liquid solution added per pallet:

- Each pallet gained 9,160 lbs of concentrate per pallet based on measurements before/after concentrate addition
- The concentrate has 24 wt% solids
- $6,962 \text{ lbs liquid} = 9,160 \text{ lbs concentrate} * (1-0.24)$
- Each kiln has 1,002,528 lbs liquid concentrate in a cycle:
 - 6,962 lbs liquid concentrate per pallet
 - 144 pallets per kiln cycle
 - $1,002,528 \text{ lbs liquid concentrate/kiln cycle} = 6962 \text{ lbs/pallet} * 144 \text{ pallets/kiln cycle}$

To determine the formaldehyde mass emissions per kiln cycle, Chemco used a measurement from 1998 where the highest concentration of free formaldehyde in the evaporated water collected from kiln 1 & 2 exhaust gas was measured:

- Exhaust formaldehyde concentration: 3 ppm
- 3 lbs formaldehyde / kiln cycle
 - $3 \text{ lbs formaldehyde} = 1,002,528 \text{ lbs liquid concentrate/kiln cycle} * 3 \text{ ppm formaldehyde}$