



**Olympic Region  
Clean Air Agency**  
2940 Limited Lane NW  
Olympia, WA 98502

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

[www.ORCAA.org](http://www.ORCAA.org)

**Executive Director**  
*Francea L. McNair*

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

---

# Technical Support Document

For Air Operating  
Permit # 18RFC1287

---

Aquatic Company

---

AOP - Reopening for Cause  
18RFC1287  
June 26, 2020

---

# Table of Contents

1.0	DISCLAIMER.....	1
2.0	PERMIT IMPLEMENTATION.....	1
2.1	General.....	1
	Table 1: Administrative Information and Contact Information.....	1
2.2	Permittee .....	2
2.3	Responsible Official.....	2
2.4	AOP Enforcement.....	3
3.0	Basis for Title V Applicability.....	3
4.0	FACILITY DESCRIPTION .....	4
	Table 2- Emissions Units (EU) & Insignificant Emissions Units (IEU) .....	7
5.0	REGULATORY BACKGROUND .....	9
5.1	Pre-1996.....	9
5.2	Post-1996 .....	9
6.0	EMISSIONS .....	11
	Table 3: Potential to Emit .....	11
	Table 4: Actual Emissions 2019.....	11
7.0	REGULATORY DETERMINATIONS.....	12
7.1	Effective Versions of Applicable Requirements.....	12
7.2	National Emissions Standards for Hazardous Air Pollutants .....	12
7.3	Compliance Assurance Monitoring (CAM) Rule.....	13
7.4	Federal Mandatory Greenhouse Gas Reporting Rule.....	13
7.5	Risk Management Program Requirements under 40 CFR Part 68.....	13
7.6	Major Source Permitting Programs under 40 CFR Part 52 .....	14
7.7	State Carbon Dioxide Mitigation Program .....	14
7.8	State Greenhouse Gas (GHG) Reporting Rule.....	14
8.0	MONITORING .....	14
8.1	Emissions Monitoring .....	14
	Table 5 - Daily Emissions Equation .....	15
	Table 6 - Resin Monitoring.....	16
8.2	CRTO Monitoring .....	17
8.3	Spray Booth Monitoring.....	18
9.0	BASIS for AOP TERMS and CONDITIONS.....	18
9.1	Origin and Authority of AOP Conditions.....	18

Table 7: Required Permit Content, Washington AOP Program .....	18
9.2 Permit Administration (P1 – P20) .....	19
9.3 General Terms and Conditions (G1 – G13) .....	19
9.4 Applicable Requirements .....	20
9.5 Monitoring Terms and Conditions .....	20
9.6 General Recordkeeping Requirements .....	20
9.7 Reporting.....	20
10.0 OPERATION OF CRTO .....	20
Table 8. Control Equipment Design Specifications .....	22
Figure 2: CRTO Simplified Diagram .....	23
Attachment 1: Data Summary .....	1

# 1.0 DISCLAIMER

Information contained in this Technical Support Document is for purposes of background information only and is not enforceable. Applicable requirements including emission limits and monitoring, recordkeeping and reporting requirements are contained in the associated Air Operating Permit (AOP) for the Facility located at 801 Northern Pacific Road SE in Yelm, permit 18RFC1287, which was issued by Olympic Region Clean Air Agency (ORCAA) on <enter Date>.

# 2.0 PERMIT IMPLEMENTATION

## 2.1 General

The Aquatic Company located in Yelm (Aquatic), owns and operates a manufacturing facility (Facility) that produces bathroom fixtures including bathtubs, shower stalls and whirlpools in a variety of sizes and styles. The Facility is located at 801 Northern Pacific Road SE, Yelm, Washington, and has operated at this location since 1981. Major structures at Aquatic include two large warehouse buildings, an office building, a small resin mixing/storage building, four large above-ground tanks, a rail spur and outside storage areas for finished product. The two large warehouse buildings contain all of Aquatic's production operations except for bulk mixing of resin, which takes place in a separate mixing building. The Facility has operated under an Air Operating Permit (AOP) since 1997.

**Table 1: Administrative Information and Contact Information**

Company Name	Aquatic Co
Facility/Source Name	Aquatic, Yelm
AOP Permit No.	<####>
Mailing Address	801 Northern Pacific Road SE Yelm, WA 98589
Site Address	same
Facility/Plant/Environmental Manager	OSCAR MOLINA: Administrative Manager David Clouser: Safety, Health & Environmental Manager
Responsible Official	Ryan Prince Plant Manager
Unified Business Identification #	<342011264>
Standard Industrial Classification (SIC) Code	3088: SIC Code 3088 - Plastics Plumbing Fixtures is a final level code of the "Manufacturing" Division. There are 104 companies classified in this industry in the USA.
Attainment Area Status	Attainment or unclassified for all criteria air pollutants.
Permitting Authority	Olympic Region Clean Air Agency
Permit Engineer	Mark V. Goodin – ORCAA Engineer Manager (360) 539-7610 ext. 108
Compliance Supervisor	Mike Shults – Compliance Supervisor (360) 539-7610

## **2.2 Permittee**

The owner and operator of the facility is the entity responsible for complying with the AOP. The current owner and operator is identified in the permit, but permit conditions refer to the owner and operator as the "Permittee." Currently, Aquatic is the owner and operator of the facility and, therefore, responsible for complying with the AOP. The AOP and its requirements apply to operations at the facility regardless of ownership changes. Therefore, a change in ownership transfers responsibility for complying with the AOP immediately to the new owner and operator even though Aquatic is identified in the permit as the owner and operator.

## **2.3 Responsible Official**

AOP regulations under Chapter 173-401 WAC require a "Responsible Official" certify any submittals regarding compliance with the AOP as being true, accurate and complete based on their belief formed after reasonable inquiry. To form a reasonable belief of the truth, accuracy, and completeness of a compliance certification or other AOP-related submittal, the Responsible Official needs to understand the significance of the submittal with respect to assuring compliance with the AOP. The Responsible Official must have a basic understanding of the Title V permitting program, an understanding of the deviations being reported, how permit deviations are determined and the role of credible evidence in certifying compliance.

AOP compliance-related submittals covers practically every report and submittal associated with an AOP, such as deviation reports, malfunction reports, periodic monitoring reports, test reports, quarterly reports and annual compliance certifications. The AOP as written for the Aquatic facility does allow "batch-wise" certification of routine compliance reports. This is facilitated by condition R1, which states:

"Provided, however, where a report is sent more frequently than once every six months, the responsible official's certification needs only be submitted once every six months, covering all required reporting since the date of the last certification."

This allows the Responsible Official to batch-wise certify retroactively all reports submitted since the last certification.

According to WAC 173-401-200(29), the responsible official means one of the following:

- a) For a corporation: A president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

- i. The facilities employ more than two hundred fifty persons or have gross annual sales or expenditures exceeding forty-three million in 1992 dollars; or
  - ii. The delegation of authority to such representative is approved in advance by the permitting authority;
- b) For a partnership or sole proprietorship: A general partner or the proprietor, respectively;
- c) For a municipality, state, federal, or other public agency: Either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a regional administrator of EPA); or
- d) For affected sources:
  - i. The designated representative in so far as actions, standards, requirements, or prohibitions under Title IV of the FCAA or the regulations promulgated thereunder and in effect on April 7, 1993 are concerned; and
  - ii. The designated representative for any other purposes under 40 C.F.R. Part 70.

Because the Aquatic facility is subject to Subpart WWWW of 40 CFR Part 73, it is considered an "Affected Source." Therefore, Aquatic's "Designated Representative" and "Responsible Official" should be the same person.

## **2.4 AOP Enforcement**

Terms and conditions in the AOP apply continuously and are enforceable by ORCAA, Washington State, and, except for state or local only requirements, the U.S. EPA. Each condition in the AOP cites both the regulatory origin and authority for each permit condition. Any disputes regarding the exact language of an applicable requirement listed in the AOP should be settled by consulting the regulation cited in the regulatory origin of the condition.

## **3.0 Basis for Title V Applicability**

Facilities with a potential to emit (PTE) at or above the "major source" thresholds defined in WAC 173-401-200(19) are required to operate under an Air Operating Permit (AOP) issued through an approved Washington State AOP program, according to Title V of the federal Clean Air Act. Aquatic is a major source the compound styrene, which is both a Hazardous Air Pollutant (HAP) under federal air regulations and a Toxic Air Pollutant (TAP) under Washington's regulations. Other air pollutants emitted in minor amounts by Aquatic include the compounds Methyl Methacrylate (MMA) and Diphenylmethane diisocyanate (MDI), which are both a HAP and TAP, and particulate dust. Aquatic also emits criteria air pollutants in minor

amounts from the combustion of natural gas used for space heating and in their regenerative thermal oxidizer (RTO).

## 4.0 FACILITY DESCRIPTION

Styrene and MMA are components of the resin used in the production process. While the production process relies on the polymerization of styrene monomer in the presence of MMA to make the final product a rigid solid, a certain amount of the styrene and MMA are emitted as a volatile gases. These emissions occur primarily when the resin is spray applied and during the initial stages of curing.

MDI is emitted during application of a two-part polyuria material that forms a protective, flexible plastic coating on surfaces of finished products. The material is applied to certain finished products just prior to shipment in a dedicated spray booth. The material cures into a flexible plastic skin that protects product surfaces and can be peeled off by the customer.

Combustion emissions result from the combustion of natural gas in Aquatic's RTO and in space heating equipment throughout the Facility. The RTO is part of the overall air pollution control system serving the production lines.

Products, including shower stalls, bathtubs and whirlpools, are produced in assembly lines by applying layers of resin on molds. The resin is sprayed in successive layers. Each primary layer is allowed to partially cure before the next layer is applied. After curing of the final layer, the product is separated from the mold. The mold is then cleaned and prepared for the next cycle.

Aquatic operates two independent production lines, Line 1 (EU1) and Line 2 (EU2), which are regulated by ORCAA as separate emissions units. Although Line 1 and Line 2 operate independently, the production process is the same for each. For both lines, resin is applied within semi-enclosed spray booth tunnels. Volatile emissions are captured in the spray booths by a single exhaust system that serves spray booths in both lines. All exhaust from Line 1 and Line 2 is routed first through a rotary pre-concentrator and then through the RTO. The combined control system is referred to as the CRTO. Exhaust is routed first through the rotary concentrator located outside the production buildings. The Rotary Concentrator cleans the exhaust using an adsorption process where styrene from the exhaust is adsorbed onto a catalyst substrate. The cleaned exhaust from the Rotary Concentrator is then emitted to the atmosphere through the RTO stack. The adsorption process in the Rotary Concentrator is a continual process accomplished using three large, rotating zeolite catalyst wheels. At any given time, Styrene is both being adsorbed and desorbed from a portion of each wheel as it rotates through the housing. Styrene adsorbed onto the catalyst is desorbed to a smaller exhaust air stream that is sent to a Regenerative Thermal Oxidizer, which destroys the majority of the styrene through thermal oxidation. The figure on page 23 provides a diagram of the major components and functions of the CRTO.

For both production lines (lines), the entire production line from mold preparation through final product storage is considered as part of the emissions unit. ORCAA believes that defining the entire production line as an emissions unit is consistent with current permitting practices at ORCAA and with the definition of "emissions unit" contained in WAC 173-400-030. Under WAC 173-400-030(23), emissions unit is defined as, "any part of a stationary source which emits or would have the potential to emit any air pollutant subject to regulation..."

Both Lines contain resin spray areas made up of modular spray booth segments. ORCAA considers individual spray booth segments as capture and control devices associated with these emissions units. Emissions captured from the Lines are ducted to the CRTO to control Styrene, MMA and other VOCs emissions by incineration.

Insignificant emissions units (IEUs) at the facility include gas fired make-up air space heaters, gas fired radiant space heaters, four 6,000 gallon bulk resin storage tanks, minor uses of materials containing VOCs such as PVC glue, cans of spray paint, and minor amounts of cleaning solvents, an above ground propane storage tank, and use of propane powered fork lifts.

The four, 6,000 gallon bulk resin storage tanks are insignificant on the basis of size according to WAC 173-401-533(c), which defines storage tanks less than 10,000 gallons in capacity and storing volatile organic liquids with a vapor pressure of less than 80mm Hg at 21oC as insignificant emissions units. According to Safety Data Sheets (SDS) provided in Aquatic's original AOP application, the vapor pressure of resin is less than 4mm Hg. Natural gas fired space heaters for heating the work areas are insignificant on the basis of size according to WAC 173-401-533(e), which defines combustion sources less than five million Btu/hr exclusively using natural gas, butane, or propane as insignificant. The remainder of IEUs at Aquatic qualify as categorically exempt IEUs according to WAC 173-401-532.





**Table 2- Emissions Units (EU) & Insignificant Emissions Units (IEU)**

ID	Description:	Specifications	Control Equipment
Line 1 (EU1)	<p><b>Production Line 1:</b> Referred to as the "Line 1" of EU1. For purposes of the AOP, EU1 is an independent production line that may use gelcoat or a vacuum-formed acrylic sheet as the 1st laminate followed by polyester resin for subsequent laminates. The entirety of Line 1 is located in Building #1 except for the product trim and drill booth and parts repair. Emissions include Styrene, MMA, VOC and particulates from spray coating operations.</p>	<p>Spray Booth Modules (9 total):                      2 gelcoat booths                      1 Specialty gelcoat booth                      2 barrier coat booths                      4 lamination booths                      Filters: 4" dry filters                      Mixing Room: 1 small exhaust fan</p>	<p>Rotary pre-concentrator (Concentrator) followed by regenerative thermal oxidizer (RTO). Referred to as "CRTO."                      Stack:                      Height = 30 ft (from ground)                      Diameter = 88 in</p>
Line 2 (EU2)	<p><b>Production Line 2:</b> Referred to as "Line 2" or EU2. For purposes of the AOP, EU2 is an independent production line that may use gelcoat or a vacuum-formed acrylic sheet as the 1st laminate followed by polyester resin for subsequent laminates. The entirety of Line 2 is located in Building #2 except for the product trim and drill booth and parts repair. Emissions include Styrene, MMA, VOC and particulates from spray coating operations.</p>	<p>Spray Booth Modules (3 total):                      1 gelcoat                      1<sup>st</sup> lamination                      2<sup>nd</sup> lamination                      Filters: 4" dry filters</p>	
Bulk Mixing (EU3)	<p>Bulk Mixing Operations: VOC and particulate emissions from resin mixing operations which support both production lines. Conducted in separate mixing building.</p>	<p>2 batch mixers:                      700 cubic feet</p>	<p>Covered except when adding/removing material</p>
Tooling (EU4)	<p>Parts Finishing: EU4 includes all mechanical operations on finished parts which generate particulate air emissions.</p>	<p>6 dust collectors</p>	<p>Dust Collectors that exhaust back into buildings 1 and 2.</p>
Armor Coat (EU5)	<p>Protective Coating Application: EU5 encompasses operations used to apply a flexible plastic coating on finished parts to protect them during shipping. The flexible plastic coating (referred to as Armor Shield) is a two-part polyuria material that is spray applied within a dedicated spray booth.</p>	<p>Armor Shield Spray Booth</p>	<p>Armor Shield Spray Booth stack:                      Height = 25ft from ground level                      Diameter = 34"                      Butterfly rain damper</p>
Day Tanks and Gelcoat Drums (EU6)	<p>Process tanks and drums used for day to day dispensing of material.</p>	<p>Varies</p>	<p>Covered except when adding/removing material</p>
IEU1	<p>Bulk Resin Storage Tanks</p>	<p>Four, 6,000 gallon above ground resin storage tanks used to store bulk resin.</p>	<p>None</p>

ID	Description:	Specifications	Control Equipment
IEU2	Process Dust Emissions	Particulate dust from trimming, drilling, and abrasive forming of finished product.	Dust collection systems
IEU3	Heating Units	Natural gas fired, forced air, convection and infrared heaters used for space heating, make-up air heating and to provide heat for product curing. All less than 5 MMBtu/hr heat input.	None
IEU4	PVC Glue Use:	Use of PVC glue in finish plumbing of the whirlpool products.	None

## 5.0 REGULATORY BACKGROUND

### 5.1 Pre-1996

Aquatic's Yelm facility was established by the original owner, HYTEC, in 1981 under NOC #310. NOC #310 was reviewed and approved unconditionally by ORCAA on February 26, 1981. After this date, records indicate one plant expansion occurred in the mid-1980s. However, records of correspondences regarding this expansion indicate ORCAA was aware of the expansion and did not consider it as a modification triggering a NOC. There have been several minor modifications and addition of new emission units and control devices at the facility since 1981 that have triggered new source review. The outcome of ORCAA's approval of these cases follows.

NOC #310 provided unconditional approval to HYTEC to establish a Fiberglass Reinforced Plastics (FRP) plant at the Yelm site. Documentation of the NOC application and ORCAA's review and approval of NOC #310 is sparse. The application consisted of a request letter which generally describes the facility and the company's intent to establish in Yelm. Record of ORCAA's approval of NOC #310 includes NOC Form 1 signed by ORCAA's Control Officer at that time and stamped "APPROVED". ORCAA recognizes these records as proof of compliance with new source review requirements for the facility when it was established in Yelm. However, although records associated with NOC #310 indicate that review and approval of the Yelm facility was consistent with the "standard of care" for new source review that existed at that time, both ORCAA's approval and the associated NOC application are deficient by today's standards in that they did not limit the Facility's potential to emit. ORCAA's approval of NOC #310 did not include any associated Approval Order containing emission limitations and other conditions necessary for assuring compliance. Neither ORCAA's approval nor the NOC application describe emission units or document the facility's maximum potential to emit. Also, there was a no documented determinations with respect to other air permitting programs, specifically, the State's Prevention of Significant Deterioration (PSD) program.

### 5.2 Post-1996

Prior to issuing the Facility's initial AOP in July of 1997 the New Source Review (NSR) deficiencies described above were rectified through a Regulatory Order issued by ORCAA on June 20, 1996 pursuant to WAC 173-400-091, Voluntary Limits on Emissions. This Regulatory Order established an enforceable limit on plant-wide VOC emissions, as well as monitoring, recordkeeping and reporting requirements.

Between 1996 and 2006, the Facility completed several significant modifications to the facility that required ORCAA's prior approval through a NOC application:

1. In 1998, the Facility increased the height of all exhaust stacks serving the spray booths. Twelve separate stacks were increased to a height of 75' above grade. This action was approved through the special flexibility condition in Aquatic's original Air Operating Permit (AOP).

2. In 2000 under NOC # 00NOC011, the Facility received approval to install a Regenerative Thermal Oxidizer (RTO) to serve the gelcoat booth. In 2020, the Approval Order for NOC # 00NOC011 was superseded by the Approval Order for 20NOR1432, which combines and consolidates permit conditions applying to the CRTO.
3. In 2001 under NOC # 01NOC119, the Facility received approval to route emissions from the Lamination #1 spray booth in the “gelcoat” line to the RTO.
4. In 2002, the Facility received approval to install a polyurethane production line. However, this project has since been abandoned.

In 2006, the Facility significantly improved air pollution control at the facility by installing a Rotary Concentrator. The Rotary Concentrator receives all exhaust from Line 1 and Line 2 and enables incineration of 90% of the styrene and MMA emissions. This is because the Rotary Concentrator concentrates the pollutants into a smaller volume of air flow that can be processed entirely by the RTO. The Rotary Concentrator in tandem with the RTO is referred to as the “CRTO.” The CRTO was approved by ORCAA on October 6, 2006, through 06NOC494. In 2020, the Approval Order for NOC # 06NOC494 was superseded by the Approval Order for 20NOR1432, which combines and consolidates permit conditions applying to the CRTO.

In 2018 under 17NOC1256 Aquatic was approved to modify Line 2 (formerly referred to as the “Acrylic Line”) to enable using either gelcoat or acrylic as the first material in a product. Line 2 was extended by 170 feet and a new spray booth was added to enable this production flexibility. When in “gelcoat mode,” gelcoat is applied in the gelcoat booth followed by two successive laminations in the subsequent lamination booths. In the “acrylic mode,” acrylic parts pass through the gelcoat booth without any operations performed and then through the lamination booths for a 1st and 2nd lamination.

In 2019 under 19NOC1358 Aquatic was approved to install a new spray booth for spray applying a two-part polyurea material that forms a flexible plastic coating referred to as Armor Shield. The flexible plastic coating is applied to certain products requiring protection prior to shipping. The Armor Shield spray booth is located in Building 2 and exhausts directly to the atmosphere after passing through the new spray booth filters and exhaust stack. The protective coating material applied, IsoShield 3001 or Armor Shield, is a two-part polyurea material with a 50/50 mix ratio. It cures into a flexible plastic material that protects product surfaces and can be peeled off by the customer. The material contains Diphenylmethane diisocyanate (MDI) which is both a HAP and TAP. Most of the MDI polymerizes when the two-parts of the mixture are mixed. However, a certain percentage of the MDI does not react and is emitted as a gaseous air pollutant. In addition, a small percentage of MDI is emitted as airborne particulate.

In 2020 under 20NOR1432 Aquatic received approval to combine Approval Orders (Orders) from two past Notice of Construction (NOC) approvals that approved air pollution control equipment installed at the facility. In addition to combining the two Orders, Aquatic requested superseded and outdated conditions be eliminated. The resulting Approval Order for NOC # 20NOR1432, supersedes the Order issued in 2001 approving the regenerative thermal oxidizer (# 00NOC011) and the Order issued in 2006 approving the rotary pre-concentrator (#

06NOC494). Combining these Orders and eliminating superseded and outdated conditions simplified the regulation of air emissions from Aquatic.

## 6.0 EMISSIONS

Title V Air Operating Permits apply to “Major Sources” based on their Potential to Emit (PTE) regulated air pollutants. PTE is defined as the maximum possible emissions given physical and regulatory limitations. Table 3 below shows PTE estimates for the facility based on current emissions limits and equipment design parameters. Table 4 below shows actual, reported emissions from the facility for 2019.

**Table 3: Potential to Emit**

Pollutant	Hourly Rate (lbs/hr)	Daily Rate (lbs/day)	Annual (tons/year)
PM (Total Particulate)	0.08	1.82	0.3
PM-10 (Total Particulate) (<= 10)	0.08	1.82	0.3
PM 2.5 (Fine Particulate (<=2.5))	0.08	1.82	0.3
VOC as Volatile Organic Compounds	27.68	443.4	80.9
SO2 (Sulfur Dioxide)	5.99	1.4	2.6
NOX (Nitrogen Oxides)	1.00	24.0	4.4
CO (Carbon Monoxide)	0.84	20.1	3.7
Styrene	24.34	389.5	71.1
MMA	3.28	52.5	9.6
MDI	5.00E-3	8.00E-2	8.40E-3
Total HAP	27.63	442.1	80.7

\*PTE emissions rates for calculated by ORCAA according to permit limits and cumulative plant-wide heat rate for natural gas and propane combustion.

**Table 4: Actual Emissions 2019**

Pollutant	Annual Emissions	Units
PM (Total Particulate)	0.01	Tons
PM-10 (Total Particulate) (<= 10)	0.01	Tons
PM 2.5 (Fine Particulate (<=2.5))	0.01	Tons
VOC as Volatile Organic Compounds	13.1	Tons
SO2 (Sulfur Dioxide)	0.01	Tons
NOX (Nitrogen Oxides)	1.7	Tons
CO (Carbon Monoxide)	1.4	Tons
Styrene	12.3	Tons
MMA	0.7	Tons
MDI	0	Tons
Total HAP	13.0	Tons

For Styrene and MMA, PTE is limited by daily and annual regulatory limits on facility-wide VOC emissions. These limits were established through the Regulatory Order issued by ORCAA June 20, 1996 under WAC 173-400-091, which provides authority to air regulatory agencies to make voluntary reductions in emissions enforceable via regulatory orders.

The annual VOC limit corrects deficiencies in the initial permitting of the Facility of not establishing emissions limits. The annual VOC limit establishes an annual limit on facility-wide emissions of VOC to no more than 249 tons per consecutive 12-month period. The annual limit keeps the Facility a “minor source” under Washington’s Prevention of Significant Deterioration (PSD) program (WAC 173-400-720). The annual VOC limit is included in condition AR3.1 of the AOP.

The daily VOC limit was established as a “plant-wide applicability limit” for purposes of making New Source Review (NSR) applicability determinations. Originally, the daily, plant-wide VOC limit was set at 3,419 pounds per day of VOC. This daily limit has since been superseded by separate limits on Styrene and MMA specifically. These two new daily limits are also in condition AR3.1:

- Styrene limited to 389.5 lbs/day (17NOC1256)
- Methyl Methacrylate limited to 52.5 lbs/day (17NOC1256)

Aquatic’s PTE for combustion-related air pollutants is limited by the combined design heat rates of all combustion equipment at the Facility, including the RTO. The design heat rate of the RTO is 7 MMBtu/hr. The combined heat rates of all combustion equipment at the Facility is 5 MMBtu/hr. The plant-wide combined heat rate and emissions factors for combustion of natural gas were used to estimate PTE for combustion-related emissions.

PTE for particulate from cutting, drilling, grinding and sanding finished products is considered negligible. This conclusion is based:

1. Dust collectors emitting back into either building 1 or 2; and,
2. Spray booth filters in Lines 1 and 2 are properly maintained.

## **7.0 REGULATORY DETERMINATIONS**

### ***7.1 Effective Versions of Applicable Requirements***

Effective versions of each applicable requirement in the AOP for Aquatic are the versions that were effective on the date the AOP was issued.

### ***7.2 National Emissions Standards for Hazardous Air Pollutants***

EPA established National Emission Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR Part 63 to regulate HAP emissions from major sources of HAP. This regulatory program

defines a major source as any facility that has the potential to emit more than 10 tons per year of a single HAP or more than 25 tons per year of all HAPs combined.

On August 16, 2005, EPA signed the NESHAP for Reinforced Plastic Composite Production facilities that are “Major Sources” of hazardous air pollutants. This NESHAP is codified under 40 CFR Part 63, Subpart WWWW, and is referred to as Subpart WWWW in both the AOP and this TSD for convenience. Aquatic has the potential to emit the pollutant Styrene (a HAP) in major quantities and is, therefore, regulated as a “Major Source” and subject to Subpart WWWW. In addition, Subpart WWWW references certain requirements from Subparts A and SS of 40 CFR Part 63.

### ***7.3 Compliance Assurance Monitoring (CAM) Rule***

40 CFR Part 64 contains the Compliance Assurance Monitoring (CAM) Rule, which establishes the minimum requirements for compliance assurance monitoring at major sources. The CAM rule applies on a pollutant-by-pollutant and rule by rule basis to emissions units at major sources when:

1. The pollutant is subject to an emissions limit;
2. The emissions unit uses a control device to comply with the emissions limit; and,
3. The uncontrolled emissions rate of the pollutant is equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.

The pre-control PTE for Styrene of Line 1 and Line 2 are above the major source threshold for Styrene. Pre-control PTE for all other pollutants and emissions units are less than 100 percent of any major source threshold. Therefore, the CAM Rule only needs to be considered for Styrene emissions from Line 1 and Line 2 and can be ruled out as inapplicable for all emissions units.

The CAM Rule specifically exempts emission limitations or standards proposed after November 15, 1990. Subpart WWWW was proposed in 1997, which is later than this CAM landmark date. Therefore, the CAM rule does not apply to Aquatic.

### ***7.4 Federal Mandatory Greenhouse Gas Reporting Rule***

The Federal Mandatory Greenhouse Gas Reporting Rules under 40 CFR Part 98 establishes requirements for reporting emissions of GHGs. However, these requirements are not pursuant to either the state or federal Clean Air Acts and, therefore, are not “Applicable Requirements” for purposes of Title V AOPs.

### ***7.5 Risk Management Program Requirements under 40 CFR Part 68***



40 CFR Part 68 is pursuant to Section 112(r) of the Federal Clean Air Act, which requires implementation of risk management plans at facilities that use hazardous substances. The requirements under 40 CFR Part 68 apply to facilities that use or store materials in quantities that might pose an immediate danger to human health or safety if there is an accidental release. However, based on their inventory of materials entering or being produced at the facility, Aquatic does not maintain significant quantities or use any of the regulated substances listed in Section 112(r) of the Federal Clean Air Act. Therefore, Aquatic is not subject to 40 CFR Part 68.

## ***7.6 Major Source Permitting Programs under 40 CFR Part 52***

Washington's programs implementing federal Major Source Permitting Programs pursuant to 40 CFR part 52, including the Prevention of Significant Deterioration (PSD) program and permitting rules for major sources in non-attainment areas, are contained in Chapters 173-400-700 and 800 of the Washington Administrative code. The term "Major Source" is defined differently under 40 CFR Part 52 as compared to Title V and generally includes stationary sources with a potential to emit greater than 250 tons per year of a "regulated air pollutant." Aquatic's physical and regulatory limits on PTE maintain the Facility as a "Minor source" with respect to Major Source Permitting Programs under 40 CFR Part 52.

## ***7.7 State Carbon Dioxide Mitigation Program***

Carbon dioxide mitigation per Chapters 463-80 and 173-485 WAC are requirements for thermal electric generating facilities and, therefore, does not apply to Aquatic.

## ***7.8 State Greenhouse Gas (GHG) Reporting Rule***

According to WAC 173-441-030(1), the State GHG Reporting Rule applies to industrial facilities that emit at least 10,000 metric tons per year of GHG in terms of carbon dioxide equivalents, including carbon dioxide from biofuels. Because Aquatic does not have the potential to emit GHGs of this magnitude, the State GHG Reporting Rule does not apply.

# **8.0 MONITORING**

## ***8.1 Emissions Monitoring***

Monitoring compliance with daily and annual emissions limits is accomplished indirectly by monitoring material inputs and outputs, material composition, and production rate. Material flows monitored include resin, gelcoat, and resin and gelcoat additives. Production is monitored in terms of the number of marketable units produced.

In general, daily emissions are computed by multiplying the amount of styrene monomer used per day times the appropriate plant specific emission factor. The plant specific emission factors

are required to be based on the most recent source testing and must be approved by ORCAA. The amount of styrene monomer used is computed by multiplying the amount of resin and gelcoat used, times the percent composition of styrene monomer in those materials respectively. The amount of styrene monomer in the resin and gelcoat used by Aquatic is verified in the Safety Data Sheets (SDS) and "Certificates of Analysis," which accompany shipments of these materials. The amount of resin and gelcoat used is monitored by Aquatic and is used as the basis for computing daily emissions.

**Table 5 - Daily Emissions Equation**

$$\text{Emissions}_{\text{lbs/day}} = \sum_i (\text{Usage}_i, \text{ lbs/day}) * (\% \text{ Styrene}_i) * (\text{EF}_i)$$

Where:

1. Subscript "i" denotes the specific process and material: gelcoat, barrier coat, lamination coats.
2.  $\text{EF}_i$  denotes the plant specific emission factor for process "i".

On a daily basis, monitoring is conducted, and the data is input into Aquatic's emissions data tracking system. Aquatic's emissions data tracking system stores the data in a database, and, on a monthly basis, computes:

1. Production parameters which are used to evaluate the plant's production and material use efficiency;
2. Styrene and MMA emissions factors in terms of pounds per ton of material used (lbs/ton);
3. Styrene and MMA daily and 12-month cumulative emissions in pounds and tons; and,
4. Whether compliance with Subpart WWWW and daily and annual emissions standards were achieved.

Resin comes to the Yelm plant by either rail cars or tanker trucks and is off-loaded directly into one of the four bulk tanks located outside and to the east of buildings 1 and 2. These tanks are referred to as the "bulk tanks". The amount of resin received during a shipment is determined by measuring tank levels before and after off-loading and converting the difference into gallons using a conversion chart which relates the tank's level with the volume in gallons of material stored. The amount of resin off-loaded in gallons is converted to pounds using a resin density provided in the "Certificate of Analysis" or SDS which accompanies the shipment. Bulk tank levels are measured each day to determine resin used since the last reading. The displacement in tank level is converted to volume in gallons and then pounds. This monitoring accounts for the material outflow from the bulk tanks.

Resin is pumped from the bulk tanks to the mixing building located east of the production buildings, where fillers are added to the resin and mixed in a batch mixers. Fillers are added according to the required material specifications for the particular batch. For example, a barrier coat batch is different compared to a laminate coat batch. The amount of each particular filler

is weighed, and the composition of the batch is verified by comparing the material's measured density to the computed density based on the formula for the mixture.

After a batch is mixed, the resin is pumped to one of three "day tanks" which are located in the mixing room of building 2. The day tanks keep the mixture agitated and at the proper temperature for application. The resin is circulated from each day tank in a continuous loop to a specific spray booth for use. Catalyst is added to the gelcoat and resin just prior to applying the material at each individual spray gun.

The level of material remaining in each day tank at the end of the last shift is measured daily either by measuring the tank level or by taking a reading from the load cell if the tank is equipped with a load cell. If the day tank is equipped with a load cell, the amount of resin in pounds is directly recorded. If tank level is measured, the day tank level in inches is converted to gallons using a tank conversion chart which relates tank level to volume, and then to pounds using the density of the mixture. In either case, the amount of raw resin remaining in the day tank is computed by "backing-out" the amount of fillers added.

The amount of resin usage in pounds on a daily basis can then be computed by the following formula:

**Table 6 - Resin Monitoring**

<p>Bulk Tanks<sub>daily output</sub> – Day Tanks<sub>pounds remaining</sub> = Daily Usage</p> <p>where:</p> <ol style="list-style-type: none"><li>1. Bulk Tanks<sub>daily output</sub> is the total daily amount of raw resin output from the bulk resin storage tanks, in units of pounds.</li><li>2. Bulk Tanks<sub>daily output</sub> = <math>\sum_{i=1 \text{ to } 4} \text{Bulk Tank}_{i, \text{beginning}} - \text{Bulk Tank}_{i, \text{end}} + \text{Bulk Tank}_{i, \text{inputs}}</math></li><li>3. Day Tanks<sub>pounds remaining</sub> is the total remaining amount of raw resin left in the day tanks at the end of the day, in units of pounds.</li><li>4. Pounds computed from volume in gallons using known density of the raw resin and known amount of fillers added.</li><li>5. Volume in gallons computed using the tank's unique level to volume conversion chart.</li><li>6. Tank level measured directly.</li></ol>
---

Gelcoat is stored in portable drums, primarily 55 gallon drums. The amount of gelcoat used is monitored daily by taking a daily inventory of drums storing gelcoat. Partially used drums are accounted for by measuring the remaining level in the drum and computing the amount of gelcoat used.

Aquatic monitors unit production for purposes of evaluating plant performance. Monitoring unit production provides useful information for purposes of evaluating pollution prevention

status and improvements. The number per day of marketable units produced is monitored and input into Aquatic's computer database along with daily material use data. On a monthly basis, this information is used to compute efficiency indicators such as the amount of material used per unit, the amount of waste per marketable unit, and the amount of material per unit. These parameters are then compared to Aquatic's standard rates, which reflect optimal efficiency and performance.

The pounds of available styrene used per volume of material applied is computed to track the Aquatic's progress towards reducing styrene in the process. The volume of waste per volume of useful product produced is computed to track Aquatic's progress towards improving spray application efficiency. The pounds of styrene emitted per pound of available styrene in the process is computed periodically after source testing to evaluate improvements in the styrene emission factor.

## ***8.2 CRTO Monitoring***

Several CRTO operating parameters are required to be monitored continuously:

- Concentrator Inlet pressure;
- Inlet gas stream temperature to the desorption/reactivation zone of wheel # 3 in the pre-Concentrator;
- RTO Combustion Chamber Temperature;
- Exhaust air flow in the main exhaust duct serving both Line 1 and Line 2;
- Pressure drops across filter stages 1 and 2 of the CRTO;
- CRTO bypass damper position; and,
- Concentrator wheel speed.

Appropriate operating ranges for these parameters are established or reconfirmed based on monitored performance during the most recent stack testing per condition M4 in the AOP which confirms a control efficiency of at least 90% by the CRTO. In addition to continuous monitoring, performance of the CRTO catalyst is checked using a portable flame ionization detector (FDI), photo ionization detector (PID), or another appropriate instrument at least annually. In addition, EPA Reference Method 18 is conducted at least once every five years to confirm compliance with the minimum control efficiency standard of 90% and to reconfirm acceptable CRTO operating parameters.

### 8.3 Spray Booth Monitoring

Conditions of filters in all spray booths and pressure drops across the filter banks in all spray groups are required to be monitored and logged each shift. In addition to this, EPA method 204 testing to confirm Line 1 and Line 2 meet standards for “Permanent Total Enclosures” is required at least once every five years.

## 9.0 BASIS for AOP TERMS and CONDITIONS

### 9.1 Origin and Authority of AOP Conditions

Per the Washington Air Operating Permit Program under WAC 173-401-600, the regulatory origin and authority for each condition must be stated in an AOP. For Aquatic’s AOP, origin and authority are stated at the end of each permit condition. The “Origin” cites the local, state or federal regulation or NSR permit where the applicable requirement came from. The “Authority” cites the specific section in Chapter 173-401 WAC providing authority to include the requirement in the AOP.

**Table 7: Required Permit Content, Washington AOP Program**

WAC 173-401 Section:	Provides authority to include in AOP:
WAC 173-401-600(1)(a)	Federal emissions limits and standards.
WAC 173-401-600(1)(b)	State emissions limits and standards.
WAC 173-401-600(1)(c)	Requirements from permits issued by a local air pollution control authority (NOC and PSD permits).
WAC 173-401-615(1)(a)	Monitoring required by an applicable requirement.
WAC 173-401-615(1)(b)	Periodic monitoring where the applicable requirement does not require specific monitoring (commonly referred to as “gap-filling monitoring”).
WAC 173-401-615(1)(c)	As necessary, requirements concerning the use, maintenance, and, where appropriate, installation of monitoring equipment or methods.
WAC 173-401-615(2)	<p>All applicable recordkeeping requirements and require, where applicable:</p> <ul style="list-style-type: none"> <li>• Records of required monitoring;</li> <li>• Records of changes made at the facility that result in emissions of a regulated air pollutant, but not otherwise regulated under the permit;</li> <li>• Retention of records of all required monitoring data and support information for a period of five years from the date the record originated;</li> <li>• Monitoring support information including all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation; and,</li> <li>• Copies of all reports required by the permit.</li> </ul>

WAC 173-401-615(3)	All applicable reporting requirements and require: <ul style="list-style-type: none"> <li>• Submittal of reports of any required monitoring at least once every six months; and,</li> <li>• Prompt reporting of deviations from permit requirements, including those attributable to upset conditions.</li> </ul>
WAC 173-401-620(2)	Standard Title V provisions from WAC 173-401-620(2).
WAC 173-401-605(1)	Emission limitations and standards, including those operational requirements and limitations that assure compliance with all applicable requirements at the time of permit issuance.
WAC 173-401-640(1)	Upon request, the permitting authority shall include in the permit or in a separate written finding issued with the permit a determination identifying specific requirements that do not apply to the source.

### **9.2 Permit Administration (P1 – P20)**

Permit administrative conditions (conditions P1 – P20) include conditions specifying how the AOP is managed according to the State AOP program under Chapter 173-401 WAC and conditions having implications on assuring compliance with all other conditions in the AOP. Many of the permit administrative conditions are “standard terms and conditions” and required to be in the AOP per either Chapter 173-401 WAC or per federal requirements for AOPs.

The origin of each permit administrative condition is stated at the end of each condition. Authority to include permit administrative conditions comes from primarily from WAC 173-401-600(1)(b), which specifies AOPs contain requirements from the Washington Clean Air Act (Chapter 70.94 RCW) and rules implementing that chapter (Washington’s AOP program is pursuant to RCW 70.94.162, which is under the Washington Clean Air Act.).

Permit administrative conditions specify terms of the AOP such as the permit duration, expiration, renewal and revision requirements. They also explain the “Permit Shield,” extent of AOP enforceability and how the AOP can be revoked or re-opened for cause. They are essential to the proper functioning of the AOP under the State of Washington Program. Because permit administrative conditions do not include any applicable emissions limitations or operational standards, monitoring is not applicable. However, general recordkeeping and reporting requirements apply. Also, compliance with permit administrative conditions must be certified annually. Several key conditions are discussed in detail below.

### **9.3 General Terms and Conditions (G1 – G13)**

General terms and conditions (G1 – G13) cover general compliance and permitting requirements. These conditions are categorized as General Terms and Conditions in the permit because they either have broad implications on multiple conditions in the AOP, or are entire programs that are applicable if triggered, such as the Stratospheric Ozone Protection program. Authority for each condition varies depending on whether the applicable requirement

originated from a state or federal regulation. Several general terms or conditions are discussed in detail below.

#### **9.4 *Applicable Requirements***

Applicable requirements (AR1 – AR4) cover applicable emissions limits and operating standards from applicable state and federal regulations and NOC permits issued by ORCAA. Origin and authority are stated at the end of each condition. All applicable requirements are in their original form except for minor reorganization for ease of implementation. All monitoring details are included in the Monitoring section of the permit. The following applicable regulations are included in the Applicable Requirements section of the permit:

- General facility-wide standards and prohibitions primarily from Chapter 173-400 WAC and ORCAA’s rules; and,
- CFR Part 63, Subpart WWWW, National Emissions Standards for Hazardous Air Pollutants: Reinforced Plastic Composites Production.

#### **9.5 *Monitoring Terms and Conditions***

Applicable monitoring terms and conditions (M1 – M8) include all required monitoring from applicable federal subparts and NSR permits. Origin and authority are stated at the end of each condition. Although applicable monitoring requirements are included in their original form, additions were required to clarify requirements. This is allowed in Title V AOPs under “gap filling monitoring” provisions in WAC 173-401-615(1)(b) and (1)(c). Regulatory origins are stated at the end of each condition.

#### **9.6 *General Recordkeeping Requirements***

Applicable recordkeeping terms and conditions (RK1 – RK9) include all required recordkeeping requirements for Title V AOPs as required under WAC 173-401-615(2). Origin and authority are stated at the end of each condition.

#### **9.7 *Reporting***

Applicable reporting terms and conditions (R1 – R13) include all required reporting requirements for Title V AOPs as required under WAC 173-401-615(32). Origin and authority are stated at the end of each condition.

## **10.0 OPERATION OF CRTO**

Rotary concentrators take large volumes of air containing low concentrations of VOCs and concentrate the VOCs into a smaller air stream that can be more practically treated in an air pollution control device such as a thermal oxidizer. Aquatic’s Rotary Concentrator is

manufactured by Dürr Environmental Energy Systems. The adsorbent material in the Dürr Rotary Concentrator is mounted in three identical, continuously rotating “wheels.” The adsorbent material is porous, allowing gases to pass through and providing a large amount of surface area for pollutants to be adsorbed. VOC laden air from the plant is cleaned as it passes through the adsorbent material. The cleaned air is then discharged to the atmosphere through the RTO stack. The pollutants are then stripped from the adsorbent material into a smaller air stream that can be treated using a thermal oxidizer or similar air pollution control device.

The type of adsorbent material used in the Dürr rotary concentrator is zeolite. Zeolites are micro porous, crystalline solids that contain aluminum, silicon, and oxygen in their regular framework. Although some zeolites are natural minerals that are mined in many parts of the world, most zeolites used commercially are produced synthetically. Zeolites have cavities or channels that can hold other molecules. Because of their regular and reproducible structure, they behave in a predictable fashion and can be used to adsorb a variety of materials. They can remove volatile organic chemicals from air streams, separate isomers and mixtures of gases. The capacity of zeolite to adsorb pollutants can be regenerated by stripping the pollutants using a heated air stream.

The three separate wheel units in the Dürr concentrator operate in parallel, allowing Aquatic flexibility to treat varying volumes of exhaust air streams from the plant. As a wheel rotates, the zeolite accumulates VOCs. To avoid saturating the zeolite, the rate of the wheel is set such that any segment of the wheel rotates out of the cleaning section before there is a possibility of saturation. Directly after each cleaning section is a desorbing section. The desorbing section is a segregated section of the wheel unit that allows a heated air stream to clean the zeolite material. The heated air stream strips VOCs from the zeolite into a smaller air stream from which it was removed, thus concentrating the VOCs. This process is referred to as “Regeneration.” After regeneration, the adsorbent material is cooled to a temperature less than 100° F, and then is ready to rotate back into the active air-cleaning section of the wheel unit again.

The air stream used to remove pollutants from the zeolite is referred to as “desorb air.” In a typical concentrator, the desorb air is a tenth or less than the original incoming air stream being cleaned. In the Dürr concentrator, the desorb air is obtained by diverting a small side stream of plant exhaust from just prior to the concentrator. The desorb air is first preheated by using it to cool the zeolite after the zeolite has been regenerated. The preheated desorb air is then heated in the “Desorb Heater” using residual heat extracted from the RTO exhaust gases.

The desorb air containing high concentrations of pollutants is typically routed to an air pollution control device such as an incinerator or an RTO to destroy by oxidation the organic pollutants. Aquatic uses their existing RTO for this purpose. A smaller air stream with a higher concentration of pollutants going to the RTO results in more efficient and cost-effective destruction of air pollutants compared to oxidizing the exhaust air stream directly. This enables Aquatic to treat all exhaust air from the plant including exhaust air with low concentrations of VOCs, which was not possible to treat previously.



Proper operation and maintenance of the CRTO system requires special attention to several key system components and performance monitoring. Aquatic developed an operations and maintenance plan for the CRTO. Critical elements of the plan are incorporated into Aquatic's AOP.

The prefilters are critical to system operation by keeping the adsorbent free of particulate contamination. The Dürr concentrator is equipped with a modular, three-stage filter house. Each stage of filtration provides progressively higher levels of filtration. The first stage is a pad filter capable of 45% removal of 5 micron sized particles. The second stage is 95% effective at removing 2 micron particles. And the third stage is capable of 98% control of 1 micron and 95% removal of ½ micron particles.

Temperatures, pressure drops and other operating parameters within the various sections of the concentrator are monitored to ensure continued control effectiveness. Acceptable operating ranges and set points for all critical parameters are based on performance testing. The concentrator is equipped with devices for measuring the following operating conditions:

1. RTO Combustion chamber temperature
2. Temperature of the desorb air at the inlet of the desorption section;
3. Inlet static pressure;
4. Pressure drop across the adsorb section;
5. Temperature of the cooling air just after passing through the adsorb cooling section;
6. Duct pressure just after the desorb sections but prior to the outlet balance dampers;
7. Pressure drop across stage 1 and 2 combined, and stage 3 of the filtration unit;
8. System bypass damper position; and,
9. Fan speed in hertz.

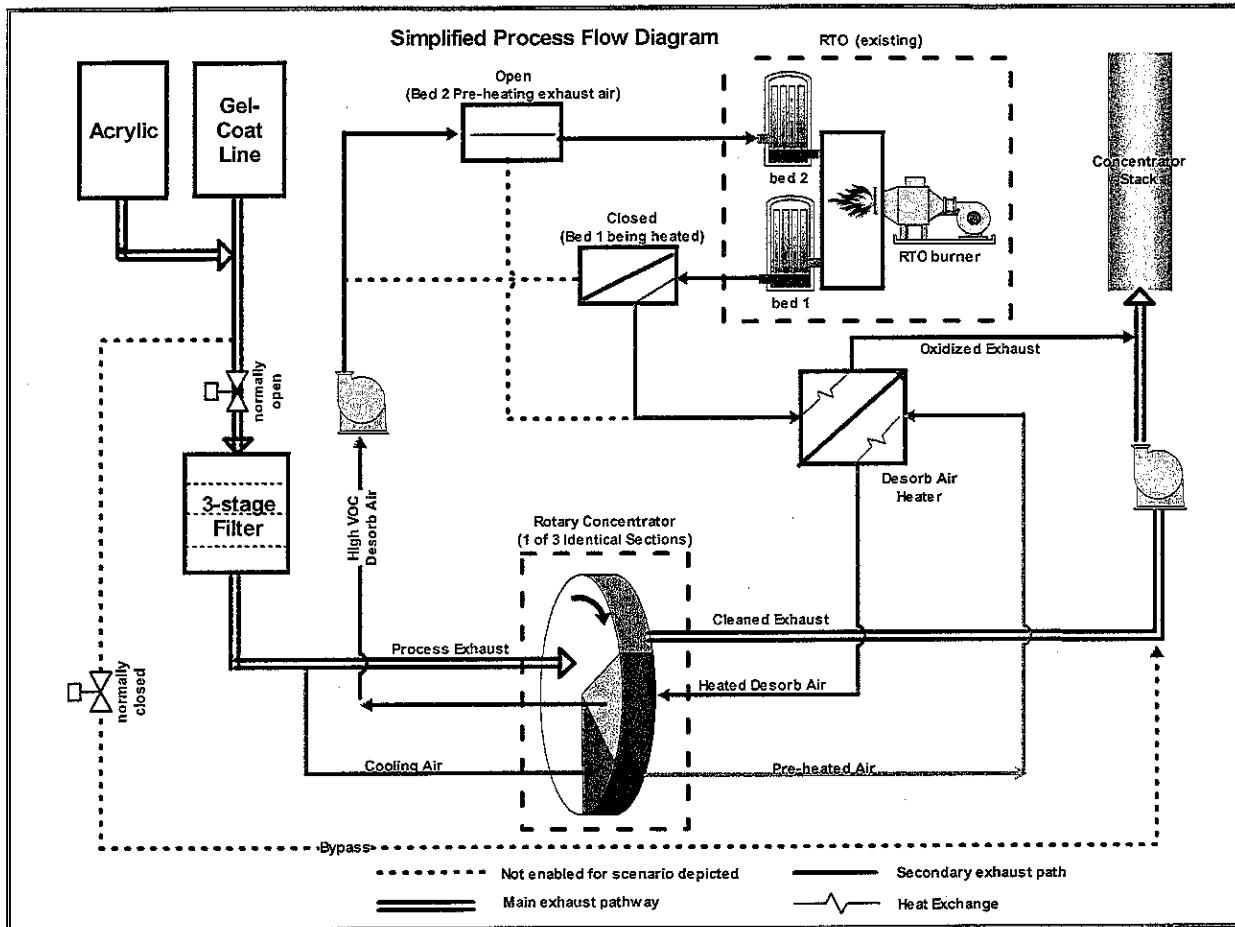
The following table provides design specifications for the CRTO. A simplified process flow diagram of the system is provided in the following figure on page 32.

**Table 8. Control Equipment Design Specifications**

Parameter	Design Basis
VOC removal efficiency	90%
Process exhaust rate	125,000 scfm @ 90 F°
Maximum relative humidity	60%
Inlet particulate concentrations (prior to the pre-filters)	Less than 0.1 grains per standard cubic foot (gr/scf) of air
Inlet VOC load to concentrator	260 pounds per hour
Design pressure @ inlet to the dry cassette filtration system	-3 inch water column
Maximum turndown	4:1

Concentration ratio	10 times
Concentrator Stack	30 feet tall, 88-inch diameter Equipped with test/monitoring ports
Desorb air to the RTO	12,500 scfm
VOC concentration to the RTO	3,000 ppm <sub>v</sub> as propane
Temperature of desorb air to the RTO	180 F°
The zeolite must be periodically regenerated with a high temperature purge in order to prevent progression of deterioration	

Figure 2: CRTO Simplified Diagram





# ATTACHMENTS



# Attachment 1: Data Summary

Name: Aquatic Co

Physical address: 801 Northern Pacific, Yelm, WA 98589

County: Thurston

Primary Contact: Oscar Molina

Contact phone number: 800-444-5126

Air Operation Permit #: 18RFC1287

EIS #: 6210911

FRS #: 110000490754

ICIS-AIR #: WAORC0005306700010

Type of ownership: private

Operating status: operating

NAICS code: 326191

SIC code(s): 3088

Air program(s): MACT Part 63, SIP, Title V

Subparts:

- 40 CFR Part 63, Subpart WWWW

- 40 CFR Part 63, Subpart A

- 40 CFR Part 63, Subpart SS

Major for which pollutant(s)? Styrene & VOC

Class: major

