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CLEAN AIR AGENCY

**Shell Oil Products US**

Puget Sound Refinery

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November 1, 2018

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



Dear NWCAA:

Subject: Title V Air Operating Permit Renewal Application

Shell, Puget Sound Refinery (PSR) is submitting the attached Air Operating Permit (AOP) Renewal Application. A copy of this form will also be sent to you electronically as requested.

Please contact Mr. Tim Figgie at 293-1525 if you have any questions related to this information.

Based on information and belief formed after reasonable inquiry, I certify that the statements and information in this document are true, accurate and complete.

Sincerely,

Shirely Yap  
General Manager

Attachment

Gail \_\_\_\_\_ Michele \_\_\_\_\_ Scanned   
Christos \_\_\_\_\_ Crystal \_\_\_\_\_ Dan \_\_\_\_\_  
Jason \_\_\_\_\_ Lyn \_\_\_\_\_ Robyn \_\_\_\_\_

Mark B \_\_\_\_\_ Agata \_\_\_\_\_ Toby \_\_\_\_\_  
Other: \_\_\_\_\_  
Rtn to: \_\_\_\_\_



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Mount Vernon, WA 98273-5202  
ph 360.428.1617  
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# Title V Air Operating Permit Renewal Application

Please provide the information requested in this application. Please submit to the Northwest Clean Air Agency three paper copies and one electronic copy of the completed application. The certification at the end of this document applies to the entire submittal. If additional room to reply is required, please attach pages to this request.

In some cases, a prior submittal to the NWCAA (e.g., the annual emissions inventory) may include information requested below. If you would like to refer the NWCAA to that information rather than provide the information here, please note this in your response. Any submittal to which the NWCAA is referred will become part of your renewal application. It is also acceptable to attach relevant portions of your current Air Operating Permit if the information therein provides an adequate response to a question below.

## Part 1: General Information

- 1) Company name and address  
Shell Puget Sound Refinery  
8505 S. Texas Road  
PO Box 622  
Anacortes, WA 98221
- 2) Current Air Operating Permit number and expiration date  
No. 014R1M1  
November 5, 2019
- 3) Owner's name and agent  
Same as above
- 4) Responsible Official name and address  
Ms. Shirley Yap  
Address same as above
- 5) Telephone number and name of plant site manager/contact  
HSSE Manager – Ms. Laura Brown, (360) 299-9283  
Site Contact – Mr. Tim Figgie, (360) 293-1525
- 6) Were there any changes to the facility impacting air emissions since receiving the current Air Operating Permit (AOP)? [if yes, please describe changes] YES, the following changes have occurred since the last update.
  - OAC 1291 was received for construction of new crude tank.
  - OAC 787g was changed to allow the HTU3 to comply with the new Tier III gasoline regulations.
  - OAC 321b was modified in 2012 due to the addition of the Benzene Reduction Unit and during that time the CRU1 heater was shutdown. This heater has not operated since that time and the SOB and AOP can be changed to reflect this.
  - OAC 1215 was issued for the construction of a new laboratory
  - OAC 1253 was issued for the VPS Process Improvement Project

- OAC 1181a was modified to allow for the receipt of lighter feedstocks
- OAC 828b was issued for modifications to the SRU permit calculations
- OAC 476h and 475i were modified for removing fuel oil capability from the Cogens
- The Shell Consent Decree referenced in the current AOP permit has been officially closed

**Part 2: Process and Emissions Information**

- 7) Will there be any changes to the operating scenario(s) identified in the current AOP?  
NO
- 8) Provide a description of process and products by Standard Industrial Classification (SIC) Code. Please list the applicable SIC Code. Please repeat the list of processes and products for each alternative operating scenario.  
The petroleum refinery SIC Code is 2911. Refer to the current AOP and Statement of Basis for a description.
- 9) Please list any and all pollutants that would cause the facility to be classified as a "major source" as defined in WAC 173-401.  
Please refer to the 2017 annual emissions inventory
- 10) Please identify and describe all points of emissions at the facility except those that qualify as insignificant emission units or activities as defined in WAC 173-401-530. Are these emissions units correctly identified and defined in the current AOP? If not, please note the requested changes below.  
All emission points are identified in the current AOP.
- 11) Please list and quantify all emissions of regulated air pollutants from the emission points identified in item 10 above. Please include calculations. If the most recent annual emissions inventory accurately describes these emissions, it is not necessary to repeat the same information here. Please refer the NWAPA to the most recent annual emissions inventory.  
Please refer to the 2017 Annual Emissions Inventory.
- 12) List the fuels used and their respective usage rates at design capacity for the emission points identified in item 10 above.  
Please refer to the 2017 Annual Emissions Inventory.
- 13) List the raw materials used and their respective usage rates at design capacity for the emission points identified in item 10 above.  
Please refer to the 2017 Annual Emissions Inventory.
- 14) List the production rate at design capacity for the emission points identified in item 10 above.  
Please refer to the 2017 Annual Emissions Inventory.
- 15) Identify the facility operating schedule (anticipated operating hours per day, days per week, weeks per year).  
The refinery normally operates 24 hours per day, 7 per week, 52 weeks per year.
- 16) Please identify all air pollution control equipment at the facility. Is this air pollution control equipment correctly identified and defined in the current AOP? If not, please provide information necessary to correct.  
Please refer to the 2017 Annual Emissions Inventory and the current AOP.
- 17) Please identify and describe all compliance monitoring devices or activities at the facility.  
The current AOP describes all compliance monitoring devices except those that are or will be added due to the new Refinery Sector Rule (RSR). Those new monitoring devices for the

SRU and FCCU are described in the updated OMMP that was sent to your office in December 2017. Some new monitoring devices related to the RSR are not required until January 30, 2019 and those devices are listed in the table in question 19 below.

- 18) Identify any limitations on source operation that affect emissions of a regulated pollutant. Similarly, list any work practice standards that affect emissions of a regulated pollutant at this facility.

There have been no changes since the last AOP.

**Part 3: Applicable Requirements**

- 19) Cite and describe all applicable requirements. An updated copy of the applicable requirements in the current AOP for the facility may be sufficient. All applicable requirements are listed in our current AOP except as described below.
- RSR: The Refinery Sector Rule, and corresponding changes made to NSPS and NESHAP, have resulted in new and revised applicable requirements. The SSMP requirement for MACT sources has been removed and replaced with specific requirements as listed in the table below. These new SSM requirements are currently in effect along with the Fenceline Monitoring and Maintenance Vents provisions. Other RSR changes related to the Flare, DCU, PRD's and CPMS's become effective on January 30, 2019 and are also listed below.
  - NWCAA regulation 508 – Spray Coating Operations can apply to our site.
  - WAC 173-400-040 has been changed by removal of the second paragraph. 173-400-108 & 109 have been added and become applicable once the SIP has been changed to remove 107.

The following Table summarizes the changes due to the RSR.

Regulatory Description	Regulatory Citation	MR&R
MACT 1 Storage Tank Provisions	63.641, 63.660 & Subpart WW	No changes to Group 1 status from the current AOP; tanks meet Subpart WW for guide poles and fittings.
Maintenance Vents - must be below 10% LEL before open	63.643(c)(1), (2) & (3)	Measure and record LEL prior to opening vents
FCCU - Maintain liquid to gas ratio operating limit	63.1564(a)(5)(i)	No change from current AOP conditions.
FCCU - During startup and shutdown operate at above 1% O2 from the regenerator	63.1565(a)(5)(ii)	Maintain O2 probe and weekly cal checks and PM's.
SRU - During startup and shutdown operate the incinerator above 1200 deg F and 2% O2.	63.1568(a)(4)(iii)	Maintain O2 probe with quarterly PM's and daily cal checks & temp probes with quarterly and annual checks.
Fenceline Monitoring	63.658	Use M325A & B to monitor benzene concentrations and report as required.
CRU – no changes needed to our current AOP.	Subpart UUU	Measure and record HClppm during coke burn and regen.
LDAR & MPV - no changes to our current AOP required	Subpart CC & UUU.	Maintain our existing LDAR program

PRD's that relieve to atmosphere require control measures. PSR has 17.	63.648(j)	3 preventative measures, method of detection and RCA at certain relief frequency.
Marine Vessel Loading – no changes to our current practices are required.	63.560(d) & 40CFR153.282	Submerged fill is required.
DCU – open coke drums (A&B) to atmosphere after drum pressure is at or below 2 psia on a 5min average basis.	63.657 (a)(1)(i) & (d)	Measure and record drum pressure. View reading daily, visually inspect quarterly and verify annually or per manufacturer.
Flare – Replace PT 5.11.6 - Meet the NHV of 270 btu/cf while regulated material is routed to the flare at a flow rate less than smokeless capacity for greater than 15mins. Measure flare gas heat content, flare & steam flow. PSR will be using the direct measurement method. Natural gas purge gas will use a default value of 920 per (j)(5).	63.670(e), (i), (j)(3)-(4), (l)(2), (l)(5)(ii) & (m)(1). Table 13 for monitor QA/QC.	Operate and maintain a calorimeter to record btu/cf; flare gas flow meters visually inspected quarterly and cal'd annually; and steam flow meters that are temp and pressure compensated and inspected and cal'd annually.
Flare – Meet the velocity of 400 ft/sec while regulated material is routed to the flare at a flow rate less than smokeless capacity.	63.670(d) & (k)	Report velocity above limit
Flare –opacity not to exceed 5mins/2hrs while regulated material is routed to the flare at a flow rate less than smokeless capacity. Record and store a video snap shot every 15 secs.	63.670(c) & (h)(2)	Maintain and operate video cameras and store snap shot data every 15secs for 3 years.
Flare – Flare Management Plan and root cause analysis reports for opacity, flow, velocity and SO2 deviations.	63.670(o), (p), & (q)	Development and maintain a FMP. Submit updates to the agency if baseline flows change. Submit a RCA report as required.
CPMS – required for: FCCU L/G ratio and CO boiler O2 levels; Flare gas and steam flow; SRU O2 and temp; DCU pressure indication.	63.671 & 63.1563(d)(1)	Maintain CPMS and documentation of inspections for agency review.

- 20) Please list any applicable test method(s) for determining compliance with each applicable requirement listed in item 19 above. An updated copy of the current AOP for the facility may be sufficient.  
There have been no changes since the last AOP.
- 21) Does the applicant propose any exemptions from an otherwise applicable requirement? If so, please explain.  
NO
- 22) Does the CAM rule (40 CFR part 64) apply to any of the emissions units?  
NO. CAM does not apply to PSR because CAM exempts standards proposed after November 15, 1990, which includes MACT and MACT II units, and units that have a continuous compliance determination method. For PSR this includes our fuel gas monitoring systems, flares, truck rack combustor and carbon canisters. In addition, low-NOx burners are not considered control devices for the purposes of CAM and, therefore, the regulation does not apply to NOx limits on PSR process heaters. CAM does not apply to Puget Sound Refinery. Refer to Table 2-6 of our current AOP for details. In addition, the new RSR provisions have CPMS requirements for compliance monitoring systems.
- 23) Does the accidental release prevention regulation (40 CFR part 68) apply to the facility?  
YES
- 24) Do the federal Acid Rain rules (40 CFR parts 72-78) apply to any of the emissions units?  
NO
- 25) Are there any requested changes to any condition in the current Air Operating Permit? [if yes, identify the condition, the requested change, and the reason]  
YES. PSR requests the following permit terms be changed.  
- Permit Term 5.14.2 currently references NWCAA 580.32 as an applicable requirement but NWCAA 580.26 specifically exempts this section if a federal NSPS or NESHAP applies (see permit term 5.14.3). Therefore, this permit term should be changed to not include 580.3. -  
- Section 5.5.1 of the AOP refers to the CRU1 unit. The CRU1 heaters were shutdown in 2013 and have not been restarted. Due to this length of time, it may be appropriate to state in PT 5.5.1 that restart of the heaters will require a OAC revision. Portions of the old CRU1 unit are operating as a part of the ISOM unit. Please see the attached description for the CRU1 with recommended changes to the Statement of Basis (SOB).
- 26) If the applicant would like to request that the permit shield be extended to cover certain requirements that the applicant believes are inapplicable, please list those requirements, below. Please include a brief narrative description of each requirement and the basis for the belief that each is inapplicable.  
PSR requests the permit shield for Site Remediation MACT and CAM. Regarding SR MACT, the rule is not applicable until triggered and for CAM please see discussion in item 22.

#### **Part 4: Compliance Status and Certification**

- 27) Describe the compliance status of the facility with regard to all applicable requirements. Compliance status for each applicable requirement shall be described as "continuous" or "intermittent". Please include the method used for determining compliance. If an annual compliance certification has been recently submitted to the NWAPA, the applicant may reference this report. However, if the applicable requirements or compliance status have

changed since that submittal, an updated submittal is required.  
Please see the Annual 2017 Compliance Certification Report for the most recent compliance status for PSR.

28) Provide the following:

- a) For applicable requirements with which the source is in compliance, provide a statement that the source will continue to comply with such requirements;

For applicable requirements with which PSR is in compliance, PSR will continue to comply with such requirements

- b) For applicable requirements that become effective during the permit term, provide a statement that the source will meet such requirements on a timely basis;

For applicable requirements that become effective during the permit term, PSR will meet such requirements on a timely basis.

- c) For applicable requirements with which the source is not in compliance at the time of permit issuance, provide a narrative description and provide a schedule of compliance. Such a schedule shall include a schedule of remedial measures, including an enforceable sequence of actions with milestones, leading to compliance with any applicable requirements for which the source will be in noncompliance at the time of permit issuance. This compliance schedule shall resemble and be at least as stringent as that contained in any judicial consent decree or administrative order to which the source is subject. Any such schedule of compliance shall be supplemental to, and shall not sanction noncompliance with, the applicable requirements on which it is based. There are no applicable requirements for which PSR is not currently in compliance with.

- d) For sources required to have a schedule of compliance to remedy a violation, provide a schedule for submission of certified progress reports every six months or at a more frequent period if specified in an applicable requirement.


**Statement of Certification:** *Based on information and belief formed after reasonable inquiry, the statements and information in this document and any attachments are true, accurate and complete.*

\_\_\_\_\_ Ms. Shirley Yap \_\_\_\_\_

Name of designated responsible official

\_\_\_\_\_ General Manager \_\_\_\_\_

Title of responsible official

  
\_\_\_\_\_  
Signature of responsible official

11-1-2018  
\_\_\_\_\_  
Date

## Attachment 1 – CRU1 Process Description Changes

### CRU SECTION

Catalytic reforming converts low octane naphthas into high octane gasoline blending stocks. In reforming, straight chain hydrocarbons and cyclo-paraffins are converted to aromatics by dehydroisomerization and dehydrogenation. The naphtha feed is mixed with hydrogen (H<sub>2</sub>), vaporized and passed through a series of heaters and fixed bed reactors containing a platinum and rhenium bimetallic catalyst. The Isom reactor effluent is sent to a CRU1 separator where the pressure is reduced and the mixture cooled. H<sub>2</sub> and light hydrocarbons are separated from the higher molecular weight isomere. The mostly-H<sub>2</sub> gas is compressed and recycled back to the Isom unit. The CRU1 section also uses jet fuel to sponge LPG from fuel gas for recovery in the hydrotreaters. reformate which is then fractionated. Hydrocarbon products for the CRUs are recycle H<sub>2</sub>, fuel gas, and sponged jet fuel LPG, and light and heavy platforme. A byproduct of reforming is hydrogen gas. This excess hydrogen is sent to the HTU's for use in hydrotreating.

Major components at the CRU #1 include heaters, reactors, the Isom recycle compressor, product separator, and an absorber tower debutanizer tower, rerun tower and caustic wash drum. Operating temperatures range from ambient to 980 °F. Operating pressures range from 100 to 450 psi.

### REFERENCE IN THE ISOM SECTION

The ISOM unit, located on the HTU/CRU 1 Unit, receives Light naphtha from the HTU1 Debutanizer bottoms, HTU2 Debutanizer bottoms, and the DCH overhead stream. The hydrocarbon feed is mixed with electrolytic H<sub>2</sub> from the hydrogen plant header CRU1 and then sent to the Benzene Saturation Reactor (6D-C29) to remove benzene.

### REFERENCE IN THE POLY SECTION

The Catalytic Polymerization Unit (CPU) consists of a Treater section, a Splitter section, Reactor section, and Product Fractionation section. There are two treating sections – the Unstaturated and Saturated Treater sections. The unstaturated treater section is charged with light feedstock that originates as a byproduct of cracking at the DCU and FCCU. This stream, which contains propane and butane as well as propylene and butylenes, also known as C<sub>3</sub>/C<sub>4</sub> olefins, are first treated to remove reduced sulfur compounds (H<sub>2</sub>S and mercaptans). This stream is then sent to the splitter section to separate C<sub>3</sub>s from C<sub>4</sub>s. The C<sub>4</sub> olefins are sent to the Alkylation (Alky) Unit and the C<sub>3</sub> olefins are primarily routed to the reactor section of the CPU. Part of the C<sub>3</sub> stream may be routed to the Alky 2 Unit if required for alkylate production or CPU reactor switches. The saturated treater section is charged with propane and butane from the CRU1 HTU1 and VPS for sulfur removal and then sent to the Depropanizer in the Product Fractionation section for separation into finished propane and butane. Sulfur-free propane and butane from the ISOM unit can also be sent to the CPU saturated treater section if desired.

REFERENCE IN THE CONSTRUCTION HISTORY and REGULATORY APPLICABILITY SECTION – CRU1 Paragraphs 8 and 9 of this section can be changed to reference that OAC modifications will be required before the unit can be restarted.