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Notice of Construction Worksheet (7/28/16)

NOC No. 1289	Source: BP West Coast Products, LLC Cherry Point Refinery
Permit Engineer: Robyn Jones	4519 Grandview Blaine, WA 98230
NOC Received: August 14, 2017	NOC Contact: Ryan O'Larey NWCAA No. 011-V-W

A. Project Description

BP West Coast Products, LLC is proposing to physically modify the existing Delayed Coker (Coker) unit and Flare Gas Recovery Unit (FGRU) to capture gases normally released directly to atmosphere or flared during coke drum venting and maintenance events. Physical modifications within the Coker unit include installation of a new skid-mounted liquid ring booster compressor, an additional rupture pin relief device, and ancillary equipment. Physical modifications within the FGRU include addition of a tie-in to the existing Coker unit compressor suction knockout drum and ancillary equipment.

The existing Coker unit converts vacuum tower bottoms to petroleum coke for off-site electrode manufacturing. Currently, gases from the venting of the coke drums during normal operation are routed to the existing Coker wet gas compressor until the inlet pressure drops below approximately 11 pounds per square inch gauge (psig). The gases captured by the existing wet gas compressor are treated to remove H₂S within the Coker blow down vapor recovery (CBVR) system before being introduced into a fuel gas system. When wet gas compressor inlet pressure drops below 11 psig, gases from the coke drums are routed to the low pressure flare header until coke drum pressure is less than 5 psig. Once coke drum pressure drops below 5 psig, the drums are opened to atmosphere. The new booster compressor will recover gases normally routed to the flare header or released to atmosphere until coke drum pressure drops below 2 psig. This project will enable BP to satisfy the requirement found in 40 CFR 63.657(a), promulgated as part of the Refinery Sector Rule, that existing affected sources "depressure each coke drum to a closed blowdown system until the coke drum vessel pressure... meets the applicable limits... prior to venting to the atmosphere, draining or deheading the coke drum at the end of the cooling cycle". BP has elected to comply with 40 CFR 63.657(a)(1)(i): "an average vessel pressure of 2 psig determined on a rolling 60-event average". This requirement must be met by the compliance date of January 31, 2019.

In addition to the new booster compressor within the Coker unit, BP also proposes to install a redundant rupture pin relief device and bypass piping around two existing valves to allow gases normally flared during maintenance and relief device integrity testing to be captured and treated for H₂S removal.

The existing FGRU recovers gases routed to the flare header during routine operation, unit maintenance activities, and unit upsets. These gases are treated for H₂S removal and routed to the refinery's main fuel gas system. Currently, a single existing amine absorption column within the FGRU treats the gases recovered by both the high and low pressure flare gas recovery compressors. This column must be taken out of service for inspection every six

years, resulting in the planned shutdown of the entire FGRU. To decrease the volume of gases flared during FGRU maintenance events, BP proposes to install a tie-in between the FGRU and the existing amine absorption column located in the Coker unit. During maintenance events requiring the shutdown of the FGRU, this tie-in will allow BP to route previously unrecovered gases from the flare header to the Coker unit for recovery and treatment.

This project will not increase the maximum processing capacity of the existing Coker unit or the existing FGRU. It will not increase the refinery's capacity to process crude or change the crude slate processed.

As such, pursuant to NWCAA 300.3, the only equipment involved in the project with potential emissions subject to minor new source review are the components in VOC and Toxic Air Pollutant (TAP) service including valves, pumps, connectors, instrumentation, and one new booster compressor.

B. New Source Review (NSR) Fees

NWCAA NSR fees have been assessed in accordance with the fee schedule effective January 1, 2017. The NSR fees assessed and amount paid are listed in the NSR Fee Worksheet posted on the OAC Whiteboard for this project.

C. Public Notice

In accordance with NWCAA Section 305.1, an internet notice that the NWCAA received this NOC application was posted on the NWCAA website for a minimum of 15 consecutive days ending on August 30, 2017. A request for a public comment period was received on August 30, 2017. Two requests for a public hearing were received on August 30, 2017 and September 13, 2017.

Formal public involvement and notification (i.e., comment period) are required for this project. The project meets the criteria set forth in NWCAA 305.2, specifically, a public comment period has been requested by an individual during the period that the NOC was posted on the NWCAA website.

The NWCAA has also elected to hold a public hearing in accordance with NWCAA 305.5.

D. SEPA Review (NWCAA Section 155)

Whatcom County Planning & Development Services is the SEPA lead agency for this project. The applicant submitted a SEPA checklist that was signed on October 13, 2017.

GHG Disclosure and Mitigation

Under "Guidance for Ecology, Including Greenhouse Gas Emissions in SEPA Reviews", projects with GHG emissions over 10,000 metric tons per year as CO₂e are expected to disclose their emissions, and those projects with GHG emissions over 25,000 metric tons per year are expected to mitigate 11% of their GHG emissions, if those emissions are not otherwise regulated (e. g., PSD BACT, WAC 173-407, EFSEC Rules). Because this project has emissions less than 10,000 metric tons, it is not necessary to disclose these emissions under SEPA.

E. Permit History

The Coker unit was constructed in 1970 as part of the refinery. Equipment in VOC service at the Coker unit is currently subject to 40 CFR 60 Subpart GGa and Subpart Ja (pursuant to OAC 1200).

Equipment in VOC service within the FGRU is not currently subject to Subpart GGG or GGa requirements. After this permitting action, the unit will be subject to Subpart GGa.

F. Basis for New Source Review Applicability

Minor NSR program applicability for criteria pollutants is on an individual emission unit basis under NWCAA Section 300. For TAP, applicability is determined using net emissions associated with the project. For new emission units, the potential to emit (PTE) is based on operating at 100% capacity and uncontrolled (or utilizing whatever controls, if any, would apply regardless of any permitting action) for 8,760 hour per year. For modified emission units the analysis is based on the change in actual emissions.

In some cases, minor NSR is triggered regardless of emission rates through the applicability of a federal New Source Performance Standard (NSPS: 40 CFR Part 60) or a National Emission Standard for Hazardous Air Pollutants (NESHAP: 40 CFR Parts 61 & 63).

This NSR applicability analysis includes the installation of new components and one compressor.

NSR via NWCAA 300.5

Table 1 below compares potential VOC emissions associated with the new equipment with the emissions thresholds under NWCAA Section 300.5. VOC emissions were estimated based on actual 2016 leak rates for the Coker unit and FGRU, and new component counts.

Table 1: Potential VOC Emissions for New Components and Compressor

Equipment	Potential VOC Emissions (tpy)	NWCAA 300.5 Threshold (tpy)	NSR Triggered Under NWCAA 300.5?
Components & Compressor	0.07	2	No

Potential VOC emissions from the new equipment are less than the NSR exemption thresholds, and therefore are not subject to NSR via NWCAA 300.5.

Net TAP emissions associated with the new equipment are compared against de minimis values in Table 2 below. Emissions increases were calculated using actual refinery leak rate data and chemical speciation from 2016 fuel gas emissions. Fugitive hydrogen sulfide (H₂S) emissions rates were calculated assuming a 30,000 ppm and 80,000 ppm H₂S concentration in fugitive leaks in the Coker unit and FGRU, respectively. Short-term emission rates assume continuous operation (8,760 hours/year and 365 days/year). Information on emissions of 1,3-Butadiene and propylene from coke drum venting were not available, and therefore were conservatively excluded from TAP emission decrease estimates. Note that an actual net decrease in all TAP emissions is expected after project implementation. Decrease

in emissions of H₂S were estimated by subtracting BP's projected delayed coking emissions¹ of H₂S from coke drum venting at 2 psig after project implementation from BP's estimated emissions of H₂S from coke drum venting at 5 psig².

Table 2: Net TAP Emissions for Project

TAP	Averaging Period	Emission Increase (lb/avg period)	Emission Decrease (lb/avg period)	Net Emissions for Project (lb/avg period)	De Minimis (lb/avg period)	NSR Triggered Under NWCAA 300.5?
1,3-Butadiene	Lb/yr	0.03	--	0.03	0.0564	No
Hydrogen Sulfide	Lb/24-hr	0.015	12.16	-12.15	0.0131	No
Propylene	Lb/24-hr	0.012	--	0.012	19.7	No

Net TAP emissions are below de minimis thresholds, and therefore, are not subject to NSR through NWCAA 300.5.

NSR via NWCAA 300.2

NWCAA Section 300.2 requires a NOC application for any project that qualifies as:

- a) Construction, reconstruction, or modification of an affected facility within the meaning of 40 CFR Part 60, New Source Performance Standards (NSPS),
- b) a new or modified source within the meaning of 40 CFR 61.02, National Emission Standards for Hazardous Air Pollutants, or
- c) A new source within the meaning of 40 CFR 63.2, National Emission Standards for Hazardous Air Pollutants for Source Categories.

NSPS applicability as it pertains to triggering NSR is discussed below.

40 CFR 60 Subpart GGGa

The group of all equipment (valve, pump, pressure relief device, sampling connection system, open-ended valve or line, and flange or other connector) in VOC service within a process unit is defined as an "affected facility" by Subpart GGGa. The definition of "process unit" includes only those components assembled to produce intermediate or final products from petroleum, petroleum derivatives, or other intermediates.

The subpart also identifies each individual compressor containing a process fluid that is at least 10 percent VOC by weight as an affected facility. As such, the addition of a compressor in VOC service within the existing Coker unit qualifies as construction of a new affected facility, thereby triggering NSPS and NSR for VOC under NWCAA 300.2.

¹ Projected BP H₂S emissions were calculated by multiplying BP's estimated H₂S emissions at 5 psig by the ratio of projected national H₂S delayed coker emissions at 2 psig (using H₂S emissions decreases from Table 2 of Petroleum Refinery Sector Risk and Technology Review and NSPS; Final Rule, 80 Fed. Reg. 75178, [December 1, 2015]) to estimated national H₂S delayed coker emissions at approximately 5 psig.

$$3.7 \text{ tpy } H_2S @ 5 \text{ psig} * \frac{1,373 \text{ tpy } H_2S @ 2 \text{ psig}}{3,433 \text{ tpy } H_2S @ \sim 5 \text{ psig}} = 1.48 \text{ tpy } H_2S$$

² Per January 13, 2014 email from Adam Egert to Scott Inloes (BP).

The new components to be installed within the existing FGRU, which is not currently subject to Subpart GGG or GGGa, will trigger a modification under Subpart GGGa, which also triggers NSR for VOC under NWCAA 300.2

VOC emissions for the equipment subject to NSR are addressed in Section G, Air Pollutant Emissions and Impacts.

G. Air Pollutant Emissions and Impacts

Proposed VOC emission increases are listed in Table 1. BP estimated fugitive VOC emissions from the new components and compressor at 0.07 tpy, less than the NWCAA de minimis threshold. There is no ambient VOC standard. As such, no criteria pollutant ambient demonstration is required.

H. Prevention of Significant Deterioration (PSD) Program

BP calculated emission increases associated with this project to determine Prevention of Significant Deterioration (PSD) program applicability. The application states that PSD does not apply. In addition, there is no synthetic minor limit to avoid PSD in the permit.

PSD is not triggered for any of the emissions increases associated with the project. The project is a minor modification at a major source.

I. Air Operating Permit (AOP) Program

The facility is a Title V air operating permit source and conditions of this OAC will be incorporated into the AOP during the ongoing renewal.

J. NWCAA Compliance Database (Stratus)

The NWCAA Stratus database has not been updated to include the emission units approved by this OAC because they are associated only with fugitive emissions.

K. Confidential Business Information (CBI)

The NOC application does not contain any information deemed by the applicant to be CBI.

L. Applicable/Inapplicable Regulations

Relevant sections of NWCAA, state and federal regulations as they relate to the approved emission units listed in the OAC.

1. Northwest Clean Air Agency

Section 580 contains generally applicable requirements for refineries.

2. State

Chapter 173-400 WAC contains requirements similar to those listed above.

3. Federal

40 CFR Part 60 – New Source Performance Standards (NSPS)

- ✓ 40 CFR 60 Subpart A – General Provisions:

Because the project is subject to an equipment-specific NSPS subpart, the general provisions of NSPS also apply to the project.

- ✓ 40 CFR 60 Subpart GGGa—Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After November 7, 2006.

The project is a modification to the existing FGRU under Subpart GGGa, therefore Subpart GGGa now applies. The new compressor is a new affected facility under GGGa. Modifications at the Coke Unit do not qualify as a modification to that process unit under GGGa.

- ✓ 40 CFR 60 Subpart QQQ – Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems:

40 CFR 60 Subpart QQQ generally applies to individual drain systems, oil-water separators, and aggregate facilities in refinery wastewater systems that were constructed, modified, or reconstructed after May 4, 1987. No new individual drain systems will be installed by BP as part of this project. New equipment will tie into existing drain systems.

40 CFR Part 63 – National Emissions Standards for Hazardous Air Pollutants (NESHAP)

- ✓ 40 CFR 63 Subpart A – General Provisions:

Because the approved emission unit is subject to an equipment-specific NESHAP subpart, the general provisions of NESHAP Part 63 also apply.

- ✓ 40 CFR 63 Subpart CC – National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries:

40 CFR 63 Subpart CC (MACT Subpart CC) generally applies to fugitive HAP emission sources at the refinery. The BP refinery is an existing source subject to MACT Subpart CC. The affected source under MACT Subpart CC is the entire petroleum refinery. Unless the entire petroleum refinery undergoes reconstruction or unless a new process unit is constructed at an existing source that, in and of itself, is a major source of HAPs (at least 10 tpy of one HAP or 25 tpy of total HAPs), then new-source standards are not triggered.

The proposed project does not trigger reconstruction of the petroleum refinery or process unit (the project cost does not exceed 50% of the cost of a comparable new petroleum refinery or process unit); therefore, new-source standards under MACT Subpart CC are not triggered.

40 CFR 63 Subpart CC will apply to components in hazardous air pollutants (HAP) service upon startup. The refinery currently complies with 40 CFR 63 Subpart CC for equipment leaks by implementing a LDAR program in accordance with 40 CFR 60 Subpart VVa, or 40 CFR 60 Subparts GGGa and VVa.

M. Best Available Control Technology (BACT) Technology Review

NWCAA is responsible for determining BACT for this project under NSR. The emission units and pollutants reviewable are limited to the fugitive VOC emissions from the new equipment components.

Previous BACT analyses at BP for fugitive components (OAC 814c, 1200, 1142, 1141) have dictated compliance with NSPS Subpart GGGa and its referenced requirements under 40 CFR 60 Subpart VVa.

Recent NWCAA BACT determinations for fugitive components have established leak definitions of 2,000 ppm for pumps and 500 ppm for all other components (i.e., a program meeting the requirements of NSPS Subpart GGGa).

Therefore, BACT for the new components to be installed is determined to be a program that is consistent with the requirements of 40 CFR 60 Subpart GGGa. Consistent with NWCAA's policy, since the FGRU is modified under NSPS Subpart GGGa, BACT for the fugitive components in the entire unit is GGGa. Because the new compressor to be installed in the Coker unit is a new affected facility under Subpart GGGa, the compressor is also subject to Subpart GGGa.

N. Basis for OAC conditions

Condition (1): Startup notification of compressor within Coker unit as an affected facility under Subpart GGGa.

O. Condition (1): Timeline and Review

Timeline	Date
NOC Received	8/14/17
NOC Incompleteness Determined (due 30 days from receipt)	9/14/17
NOC Completeness Determined	10/13/17
Final Decision Due (due 60 days from complete)	12/13/17
Final OAC issued	

Review	Date
NWCAA Engineering	Dan Mahar 10/20/17
NWCAA Management	Agata McIntyre
Source	Ryan O'Larey

P. Correspondence

8/14/17 – Received application via USPS

9/14/17 – Application deemed incomplete due to outstanding environmental checklist and SEPA determination.

9/20/17 – Phone conversation with Ryan O’Larey of BP for more information, relayed that the environmental checklist should be received by County and complete before proceeding to public comment.

10/13/17 – Ryan O’Larey notified NWCAA that the environmental checklist had been delivered to the County.