

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT*COMPLIANCE and ENGINEERING*

APPLICATION EVALUATION AND CALCULATIONS

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PERMIT TO CONSTRUCT

COMPANY NAME: BP WEST COAST PRODUCTS LLC

MAILING ADDRESS: P.O. BOX 6210
 CARSON, CA 90749

EQUIPMENT ADDRESS: 1801 E. SEPULVEDA BLVD.
 CARSON, CA 90745

PROCESS 6: CATALYTIC REFORMER UNIT				
SYSTEM 3: : NO. 3 CATALYTIC REFORMER UNIT				S4.3, S4.4, S13.2, S31.4 , S56.1
DESCRIPTION	DEVICE ID NO.	CONNECTED TO	Emissions And Requirements	CONDITIONS
KNOCK OUT POT, RPV-2366, HYDROGEN RECYCLE, HEIGHT: 10 FT; DIAMETER: 7 FT A/N 395834 535604	D487			
DRUM, RPV 2781, STABILIZER REBOILER CONDENSATE, HEIGHT: 2 FT 4 IN; DIAMETER: 1 FT 8 IN A/N 395834 535604	D488			
ACCUMULATOR, RPV 2849, STABILIZER OVERHEAD, HEIGHT: 8 FT; DIAMETER: 4 FT A/N 395834 535604	D489			
TOWER, REFORMATE STABILIZER, RPV-2850, HEIGHT: 77 FT; DIAMETER: 6 FT A/N 395834 535604	D490			
COLUMN, WASH, RPV-2800, RAFFINATE WATER, HEIGHT: 24 FT; DIAMETER: 3 FT A/N 395834 535604	D491			
COLUMN, WASH, RPV-2801, RAFFINATE WATER, HEIGHT: 24 FT; DIAMETER: 3 FT A/N 395834 535604	D492			
VESSEL, EXTRACTOR, RPV 2806, HEIGHT: 77 FT; DIAMETER: 8 FT A/N 395834 535604	D493			
COLUMN, STRIPPER, RPV-2807A, HEIGHT: 118 FT; DIAMETER: 7 FT A/N 395834 535604	D494			

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TANK, STRIPPER FLASH, RPV-2807B, HEIGHT: 9 FT 7 IN; DIAMETER: 7 FT A/N 395834 535604	D495			
VESSEL, RECEIVER, EXTRACTOR, RPV 2810, LENGTH: 16 FT; DIAMETER: 4 FT A/N 395834 535604	D496			
VESSEL, RECEIVER, RPV 2816, STRIPPER OVERHEAD, LENGTH: 16 FT; DIAMETER: 5 FT 6 IN A/N 395834 535604	D497			
VESSEL, RECEIVER, RPV 2819, WATER, LENGTH: 16 FT; DIAMETER: 3 FT A/N 395834 535604	D498			
REGENERATOR RPV-2822, SOLVENT, HEIGHT: 27 FT 6 IN; DIAMETER: 6 FT A/N 395834 535604	D499			
COLUMN, RPV-2823, WATER, HEIGHT: 32 FT; DIAMETER: 3 FT 6 IN A/N 395834 535604	D500			
DRUM, TRAP, RPV 2872, SULFUR, HEIGHT: 6 FT 9 IN; DIAMETER: 9 FT 10 IN A/N 395834 535604	D501			
KNOCK OUT POT, RPV-2896, FUEL GAS A/N 395834 535604	D503			
FLTER, RPV-2948, SOLVENT, W, HEIGHT: 2 FT 8 IN; DIAMETER: 10 FT A/N 395834 535604	D504			
FLTER, RPV-2949, SOLVENT, E, HEIGHT: 2 FT 8 IN; DIAMETER: 10 FT A/N 395834 535604	D505			
DRUM, CHLORIDE TRAP, RPV 4015, HEIGHT: 7 FT 10 IN; DIAMETER: 5 FT 10 IN A/N 395834 535604	D506			
TANK, SURGE, RPV 2836, FEED, LENGTH: 32 FT; DIAMETER: 9 FT A/N 395834 535604	D507			
ACCUMULATOR, RPV 2843, OVERHEAD, LENGTH: 20 FT; DIAMETER: 8 FT A/N 395834 535604	D508	D1313 D1314 D1656 D2807		
COLUMN, NO. 3 REFORMER FRACTIONATOR DEISOPENTANIZER./DEHEXANIZER, RPV 2845, HEIGHT: 93 FT 6 IN; DIAMETER: 8 FT A/N 395834 535604	D509			

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POT, INJECTION, RPV 4045, CHLORIDE, HEIGHT: 5 FT 8 IN; DIAMETER: 2 FT A/N 395834 535604	D510			
VESSEL, RECEIVER, RPV 5109, WATER COLUMN, HEIGHT: 12 FT; DIAMETER: 2 FT A/N 395834 535604	D511			
TANK, FLASH, RPV 2863, REFORMATE, HEIGHT: 15 FT; DIAMETER: 6 FT 6 IN A/N 395834 535604	D512			
KNOCK OUT POT, RPV 2864, HYDROGEN GAS, HEIGHT: 6 FT; DIAMETER: 2 FT 6 IN A/N 395834 535604	D513			
REACTOR, RPV 2871, NO. 1, HEIGHT: 11 FT 6 IN; DIAMETER: 6 FT 6 IN A/N 395834 535604	D514		HAP: (10) [40CFR 63 Subpart UUU, #1, 4-20-2006]	
REACTOR, RPV 5115, NO. 4, HEIGHT: 12 FT 7 IN; DIAMETER: 15 FT 6 IN A/N 395834 535604	D515		HAP: (10) [40CFR 63 Subpart UUU, #1, 4-20-2006]	
REACTOR, RPV 2873, NO. 2, HEIGHT: 11 FT 6 IN; DIAMETER: 5 FT 6 IN A/N 395834 535604	D516		HAP: (10) [40CFR 63 Subpart UUU, #1, 4-20-2006]	
REACTOR, RPV 2874, NO. 3, HEIGHT: 11 FT 1 IN; DIAMETER: 7 FT A/N 395834 535604	D517		HAP: (10) [40CFR 63 Subpart UUU, #1, 4-20-2006]	
KNOCK OUT POT, RPV 2876, HEIGHT: 8 FT; DIAMETER: 2 FT A/N 395834 535604	D518			
POT, STRIPPER REBOILER CONDENSATE, RPV 5110, HEIGHT: 3 FT; DIAMETER: 1 FT 8 IN A/N 395834 535604	D519			
FLTER, RPV 5754, FUEL GAS, HEIGHT: 10 FT; DIAMETER: 1 FT 5 IN A/N 395834 535604	D520			
KNOCK OUT POT, VAPOR RECOVERY, RPV 2891, HEIGHT: 12 FT; DIAMETER: 6 FT A/N 395834 535604	D521			
DRUM, RPV 5108, FRACTIONATOR REBOILER CONDENSATE, HEIGHT: 2 FT 2 IN; DIAMETER: 1 FT 10 IN A/N 395834 535604	D522			
COMPRESSOR, RW 0005 087.06, RECYCLE GAS, CENTRIFUGAL A/N 395834 535604	D523			

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TANK, HOLDING, NO. 930, SODA ASH, 300 BBL, DIAMETER: 13 FT 6 IN; HEIGHT: 12 FT A/N 395834 535604	D525	D1313 D1314 D1656 D2807		
TANK, HOLDING, NO. 931, UDEX FEED, 1570 BBL, DIAMETER: 25 FT; HEIGHT: 18 FT A/N 395834 535604	D526	D1313 D1314 D1656 D2807		
TANK, HOLDING, NO. 932, PLANT SOLVENT, 1000 BBL, DIAMETER: 20 FT; HEIGHT: 18 FT A/N 395834 535604	D527	D1313 D1314 D1656 D2807		
TANK, HOLDING, NO. 934, WET SOLVENT, 300 BBL, DIAMETER: 12 FT 3 IN; HEIGHT: 12 FT A/N 395834 535604	D528	D1313 D1314 D1656 D2807		
SUMP, CONCRETE, SOLVENT, WITH METAL COVER, WIDTH: 6 FT; DEPTH: 8 FT; LENGTH: 6 FT A/N 395834 535604	D529			
ADSORBER, DRIER, SECONDARY EAST, RPV 2981, HEIGHT: 10 FT 6 IN; DIAMETER: 3 FT 6 IN A/N 395834 535604	D530			
ADSORBER, DRIER, SECONDARY WEST, RPV 2982, HEIGHT: 10 FT 6 IN; DIAMETER: 3 FT 6 IN A/N 395834 535604	D531			
FUGITIVE EMISSIONS, MISCELLANEOUS A/N 395834 535604	D2491		HAP: (10) [40CFR 63 Subpart CC, #5A-5-25-2001]	H23.3

BACKGROUND:

BP West Coast Products LLC submitted application no. 535604 for a modification to the No. 3 Catalytic Reformer Unit (CRU#3) as described above. The fractionator tower, device D509, in CRU#3 will be modified to allow two-mode operation as both dehexanizer column and deisopentanizer column. The proposed modification will not require any actual physical modification to the CRU#3.

Prior to 2002, the fractionator tower was already operated as a dehexanizer column. In 2000, application no. 376189 was submitted by BP to modify this column so that it could be operated as a deisopentanizer column. Arco (the previous owner) did not describe nor request to permit the fractionator tower for dual operation. As a result, the P/C granted in 2002 for the modification restricted the fractionation tower's operation to deisopentanizer mode only. This application is required to allow the fractionation tower to function as a dehexanizer column.

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Permit history

The permit history for the above process unit is shown in the following table:

A/N	Previous Permit	Date	Permitting History
535604	395834 C/O		To allow the fractionator tower to operate as a dehexanizer in addition to its current operation as a deisopentanizer
	376189 P/C	4/23/02	To modify the fractionation tower for deisopentanizer operation
	30594 P/C	10/23/95	To modify CRU#3 for Clean Fuel Project
	276930 P/C	8/18/93	To modify CRU#3 by additions of coolers under Clean Fuel Project
	140023 P/O	M58838	To modify CRU#3

COMPLIANCE RECORD REVIEW

A check of the AQMD compliance database for the compliance activity of this facility from 04/01/10 until the present determined that there were no specific violations reported for the No. 3 Catalytic Reformer Unit.

PROCESS DESCRIPTION

No. 3 Catalytic Reformer Unit processes various low sulfur naphtha feeds to produce high octane reformat and hydrogen. In the reformer fractionator column, hydrocarbons are separated to lighter molecular weight hydrocarbons and heavier molecular weight hydrocarbons. These products are sent to storage or further processed in other units in the refinery. The current configuration and piping of the No. 3 Reformer Fractionator D509 allow to the tower operate in two modes without any actual physical modification.

- Current Mode – Deisopentanizer

In this mode, C5 and lighter molecular weight hydrocarbons are separated from the light reformat overhead product streams of the reformat strippers. The overhead stream of the fractionation tower is sent to the Superfractionation Unit (SFIA) and other downstream units to produce butane and pentane products. The bottoms are sent to the Naphtha Isomerization Unit to be isomerized and ultimately blended into gasoline.

- New Mode - Dehexanizer

In this mode, C6 and lighter molecular weight hydrocarbons are separated from the reformat bottoms product streams of the reformat stabilizers. The overhead stream of the fractionation tower, instead of being sent to the SFIA unit in

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deisopentanizer mode, it is sent to the Isomerization Unit (Process 9, System 8). The bottoms are sent to storage tanks 62 and 63, where they can be used directly in gasoline blending.

EMISSIONS

Fugitive emissions are the main concerned air contaminant from this equipment. Since the proposed addition of dehexanizing operation mode to the No. 3 Reformer Fractionator column will not require any physical modification, the fugitive emissions from the CRU#3 remain unchanged. The fugitive emissions calculated for the previous application A/N 376189 can be found in Appendix A.

RULE REVIEW

Rule 212 - Standards for Approving Permits

The equipment affected by this project is expected to continue to operate without emitting air contaminants in violation of the State Health and Safety Code of in violation of SCAQMD's rules and regulations. This equipment is not located within 1000 feet of a school. The proposed project will not cause any increased cancer risk greater than, or equal to, one in a million (1×10^{-6}) during a lifetime of 70 years or pose a risk of nuisance. Public notice under Rule 212(g) is not required for this proposed project.

Rule 401 & 402 - Visible Emissions & Nuisance

With proper operation and maintenance, the subject equipment is not expected to produce visible and public nuisance. Compliance with this rule is expected.

Rule 1173 - Fugitive Emissions of Volatile Organic Compounds

This rule specifies leak control, identification, operator inspection, maintenance, and record keeping requirements for valves, pumps, compressors, pressure relief valves, and other components from which fugitive VOC emissions may emit. BP has an existing fugitive emissions component inspection and monitoring program for compliance with the requirements of this rule. Compliance with the requirements of this rule is expected.

Reg. XIII - New Source Review:

This regulation applies to any new, modified or relocated source which results in an emission increase of any non-attainment air contaminant, any ozone depleting compound, or ammonia. The proposed modification will not create any emission increase; therefore, it will not trigger the BACT requirements. However, the existing BACT conditions S4.3 and S4.4 for this equipment are out of date and will be replaced with the new standard condition S31.4, which has the same requirements as the old conditions.

Reg. XIV - Toxics and Other Non-Criteria Pollutants

Rule 1401 – New Source Review of Carcinogenic Air Contaminants

This proposed project will not cause any emission increase that can affect the toxic air contaminants from this equipment. Compliance with this rule is expected.

Reg. XVII - Prevention of Significant Deterioration (PSD)

This regulation applies to pollutants which have attained the ambient air standards in South Coast Air Basin. These include NO₂, SO₂ and lead. This project does not result in an increase in emissions of these pollutants and therefore it is not subject to the requirements of this regulation.

Reg. XXX - Title V Operating Permits

Rule 3002 requires that no person shall construct, modify, or operate equipment located at a Title V facility without first obtaining a Title V permit or permit revision that allows the construction, or modification. This facility is subject to and complies with Title V requirements. On September 1, 2009, BP's initial Title V permit became effective, and has been issued revisions.

This project is considered to be a "Minor Permit Revision" as it does not cause any emission increase, requires any significant change in monitoring terms or conditions in the permit, nor does it requires the relaxation of any recordkeeping, reporting requirement, term, or condition in the permit. The proposed Title V permit revision will be submitted to EPA for a 45-day review.

CONCLUSION AND RECOMMENDATION:

Based on the above analysis, the above equipment will operate in compliance with all applicable rules and regulations of the District. Permit to Construct is recommended to be issued to BP Carson Refinery subject to the following conditions:

~~S4.3 — The following condition(s) shall apply to affected devices listed under Section H of this system for fugitive emissions of volatile organic compounds (VOC):~~

~~All open ended valves shall be equipped with cap, blind flange, plug, or a secondary valve.~~

~~All pressure relief valves shall be connected to closed vent system or equipped with rupture disc.~~

~~All sampling connections shall be closed-purge, closed-loop, or closed-vent system.~~

~~All process drains shall be equipped with water seal, or a closed vent system and control device complying with the requirements of 40CFR60 Subpart QQQ, section 60.692-5.~~

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~~[RULE 1173, 5-13-1994; RULE 1173, 2-6-2009; 40 CFR 60 Subpart QQ, 10-17-2000]~~

S13.2 All devices under this system are subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1123

~~[RULE 1123, 12-7-1990]~~

~~S4.4 The following condition(s) shall apply to all affected devices listed under Section H of this system for fugitive emissions of volatile organic compounds (VOC):~~

~~All components are subject to District Rule 1173 and 40CFR60, Subpart GGG.~~

~~All new components in VOC service as defined in Rule 1173, except valves and flanges shall be inspected quarterly using EPA reference method 21. All new valves and flanges in VOC service except those specifically exempted by Rule 1173 shall be inspected monthly using EPA Method 21.~~

~~All new valves in VOC service shall be of leakless type, except those specifically exempted by Rule 1173 or approved by the District in writing in the following applications: heavy liquid service, control valves, instrument piping/tubing, applications requiring torsional valve stem motion, applications where failures could pose safety hazards (e.g. drain valves with valve stem in horizontal position), retrofits with space limitations, and valves not commercially available.~~

~~For the purpose of this condition, leakless valve shall be defined as any valve equipped with sealed bellow or equivalent as approved in writing by the District prior to installation.~~

~~If 98.0 percent or greater of the new valve and the new flange population inspected is found to leak gaseous or liquid volatile organic compounds at a rate less than 500 ppm for two consecutive months, then the operator may revert to a quarterly inspection program with the approval of the executive officer. This condition shall not apply to leakless valves.~~

~~All new components in VOC service, a leak greater than 500 ppm but less than 1,000 ppm measured as methane above background as measured using EPA Method 21, shall be repaired within 14 day of detection. Components shall be defined as any valve, fitting, pump, compressor, pressure relief device, diaphragm, hatch, sight glass, and meter, which are not exempted by Rule 1173.~~

~~The operator shall keep records of monthly inspection (and quarterly where applicable), subsequent repair, and reinspection, in a manner approved by the District.~~

~~The operator shall provide to the District, no later than 90 days after initial startup, a recalculation of the fugitive emissions based on actual components installed and~~

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~~removed from service. The operator shall also submit a complete, as built, piping and instrumentation diagram(s) and copies of requisition data sheet for all non-leakless type valves with a listing of tag numbers and reasons why leakless valves were not used.~~

~~[RULE 1173, 5-13-1994; RULE 1173, 2-6-2009; RULE 1303(a)(1) BACT, 5-10-1996; 40 CFR 60 Subpart GGC, 6-2-2008]~~

S31.4 THE FOLLOWING BACT REQUIREMENTS SHALL APPLY TO VOC SERVICE FUGITIVE COMPONENTS ASSOCIATED WITH THE DEVICES THAT ARE COVERED BY APPLICATION NUMBER(S) 427414, 376189:

For the purpose of this condition, leakless valve shall be defined as any valve equipped with sealed bellow or equivalent as approved in writing by the District prior to installation. Components shall be defined as any valve, flange, fitting, pump, compressor, pressure relief device, diaphragm, hatch, sight-glass, and meter, which are not exempted by Rule 1173.

The operator shall keep records of the monthly inspection (and quarterly where applicable), subsequent repair, and reinspection, in a manner approved by the District.

All process drains shall be equipped with water seal, or a closed vent system and control device complying with the requirements of 40CFR60 Subpart QQQ Section 60.692-5.

All components in VOC service, except valves and flanges shall be inspected quarterly using EPA reference method 21. All valves and flanges in VOC service except those specifically exempted by Rule 1173 shall be inspected monthly using EPA Method 21.

If 98.0 percent or greater of the new valve and the new flange population inspected is found to leak gaseous or liquid volatile organic compounds at a rate less than 500 ppm for two consecutive months, then the operator may revert to a quarterly inspection program with the approval of the executive officer. This condition does not apply to leakless valves.

All valves in VOC service shall be of leakless type, except those specifically exempted by Rule 1173 or approved by the District in the following applications: heavy liquid service, control valves, instrument piping/tubing, applications requiring torsional valve stem motion, applications where failures could pose safety hazards (e.g. drain valves with valve stems in horizontal position), retrofits with space limitations, and valves not commercially available.

The operator shall provide to the District, no later than 90 days after initial startup, a recalculation of the fugitive emissions based on actual components installed and removed from service. The operator shall also submit a complete, as built, piping and instrumentation diagram(s) and copies of requisition data sheets for all non-leakless type valves with a listing of tag numbers and reasons why leakless valves were not used.

All open-ended valves shall be equipped with cap, blind flange, plug, or a second valve.

All pressure relief valves shall be connected to closed vent system or equipped with rupture disc.

All sampling connections shall be closed-purge, closed-loop, or closed-vent system.

All components in VOC service, a leak greater than 500 ppm but less than 1,000 ppm measured as methane above background as measured using EPA Method 21, shall be repaired within 14 days of detection. A leak greater than 1,000 ppm shall be repaired according to Rule 1173.

All components are subject to 40CFR60, Subpart GGG

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996]

S56.1 Vent gases from all affected devices of this process/system shall be directed to a gas recovery system, except for venting from those equipment specifically indicated in a permit condition, and for the following vent gases which may be directed to a flare:

- 1) Vent gases during an emergency as defined in Rule 1118(b)(2) ;
- 2) Vent gases resulting from planned Shutdowns, Startups and/or Turnarounds as defined in Rule 1118(b)(21) and (b)(19), respectively, provided that the owner/operator follows the applicable options and any associated limitations to reduce flaring that were identified, evaluated and most recently submitted by the owner/operator to the Executive Officer pursuant to Rule 1118(c)(3); and
- 3) Vent gases due to and resulting from an Essential Operating Need, as defined in Rule 1118(b)(4)(A).

The evaluation of options to reduce flaring during Planned Shutdowns, Startups and/or Turnarounds shall be updated annually to reflect any revisions, and submitted to the Executive Officer in the first quarter of each year, but no later than March 31st of that year.

This process/system shall not be operated unless its designated flare(s) are in full use and have valid permits to receive vent gases from this process/system.

Vent gases shall not be released to the atmosphere except from the existing safety devices or relief valves on the following equipment:

- Process 1, System 2: 10, 12, 14
- Process 1, System 3: 19, 20, 24 to 26
- Process 1, System 5: 35, 39, 41, 42, 2726
- Process 1, System 6: 43, 49, 57, 58
- Process 1, System 7: 59, 60, 61, 62
- Process 2, System 1: 74, 77, 2388
- Process 2, System 2: 82, 89, 90, 92, 2389

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[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996]

H23.3 This equipment is subject to the applicable requirements of the following rules and regulations:

CONTAMINANT	RULE	RULE/SUBPART
VOC	DISTRICT RULE	1173
VOC	40CFR60, SUBPART	GGG

[RULE 1173, 5-13-1994, RULE 1173, 2-6-2009, 40CFR 60 Subpart GGG, 6-2-2008]