ENGINEERING EVALUATION
PPF Paramount One Market Plaza, LP
Plant No. 19432
Application No. 24565

BACKGROUND

PPF Paramount One Market Plaza, LP (PPF Paramount) or Plant No. 19432 has submitted an application for modifications to the following existing equipment:

S-2 Steam Boiler #2, 12.5 MMBtu/hr rated heat input

S-3 Steam Boiler #3 with Ultra Low NOx burner, 25 MMBtu/hr rated heat input

S-2 and S-3 are located at One Market Street, San Francisco, CA 94105. The boilers are used for space heating. The operation of the two sources is limited by Permit Condition No. 13348.

For S-2, to meet the nitrogen oxides (NOx) and carbon monoxide (CO) standards of Regulation 9-7, PPF Paramount is replacing the existing natural gas/diesel oil burner with the following new burner:

Power Flame NOVA Plus Ultra-Low NOx Burner (Model: NVC9-G-30), 15.5 MMBtu/hr, natural gas only

Permit Condition No. 13348 currently does not state any limitations on NOx and CO emissions from S-2. This means the boiler is presently limited to the current standards of Regulation 9-7-300, which are 30 ppmv of NOx and 400 ppmv of CO, both dry at 3% O_2, pursuant to Regulation 9-7-301. The new ultra low NOx burner will ensure NOx emissions below 15 ppm, dry at 3% O_2. The new burner will also assure complete combustion with minimal levels of CO and unburned hydrocarbons.

Because the burner retrofit at S-2 will result in increased heat input (from 12.5 MMBtu/hr to 15.5 MMBtu/hr), the retrofit is expected to increase criteria pollutant emissions and is thus considered a modification, not an alteration. The criteria pollutants are NOx, CO, precursor organic compounds (POC), sulfur dioxide (SO_2), and particulate matter (PM_{10}). All of these pollutants are briefly discussed on the District's web site at www.baaqmd.gov.

For S-3, PPF Paramount is requesting deletion of the 90,000-therm natural gas usage limitation in Part 7 of Permit Condition No. 13348. The deletion is expected to increase criteria pollutant emissions and is thus considered a modification. Although S-3 has a permitted heat input of 25 MMBtu/hr, the currently existing burner at this source is identical to the new ultra low NOx burner proposed for S-2, with a max rated heat input of 15.5 MMBtu/hr. The burner retrofit of S-3 was approved under Application No. 23671 in 2012, but the permitted heat input of the source was never updated to 15.5 MMBtu/hr because the burner retrofit project was considered an alteration. For purposes of emission calculations in this evaluation report, 15.5 MMBtu/hr will be used as the rated heat input of S-3, and Permit Condition No. 13348 will be amended to include a max rated heat input of 15.5 MMBtu/hr for the burner at the source.

This evaluation report will estimate increase in criteria pollutant emissions associated with the modifications to S-2 and S-3 at Plant No. 19432 and will discuss the compliance of the project with applicable rules and regulations.

EMISSION CALCULATIONS

So as not to double count the emission increase of the proposed modifications to S-2 and S-3, the cumulative increase of this application is the difference between the current and proposed permit limits.

Tables 1 and 2 calculate the annual emission increase from the operation of modified S-2 and S-3, respectively, using the following emission factors:

NOx : 15 ppm, dry at 3% O_2, or 0.018 lb/MMBtu (emission limit in 9-7-307.3)
CO : 50 ppm, dry at 3% O_2, or 0.037 lb/MMBtu (BACT emission limit – see 'BACT' section below)
POC : 5.5 lb/MM cu. ft., or 0.0054 lb/MMBtu (from AP-42, 5th Edition, Table 1.4-2)
PM_{10} : 7.6 lb/MM cu. ft., or 0.0075 lb/MMBtu (from AP-42, 5th Edition, Table 1.4-2)
SO_2 : 0.6 lb/MM cu. ft., or 0.0006 lb/MMBtu (from AP-42, 5th Edition, Table 1.4-2)

PPF Paramount plans to operate S-2 and S-3 24 hours/day, 7 days/week, and 52 weeks/year.

Table 1. Annual emissions from operation of modified S-2

Pollutant	New EF	New Limit*	Existing EF**	Existing Limit***	New Emissions	Permitted Emissions	Increase/Decrease with This Application	
	lb/MMBtu	MMBtu/yr	lb/MMBtu	MMBtu/yr	lb/yr	lb/yr	lb/yr	TPY
NOx	0.018	135,408	0.036	109,200	2,465	3,976	-1,511	-0.755
CO	0.037	135,408	0.296	109,200	5,002	32,269	-27,267	-13.633
POC	0.0054	135,408	0.0054	109,200	730	589	141	0.071
PM_{10}	0.0075	135,408	0.0075	109,200	1,009	814	195	0.098
SO_2	0.0006	135,408	0.0006	109,200	80	64	15	0.008

**Note: 15.5 MMBtu/hr * 24 hr/d * 7 d/wk * 52 wk/yr = 135,408 MMBtu/yr*

***Note: 30 ppmv of NOx and 400 ppmv of CO, per Reg. 9-7-301. POC, PM_{10}, and SO_2 EFs from AP-42, 5th Ed., Table 1.4-2.*

****Note: 12.5 MMBtu/hr * 24 hr/d * 7 d/wk * 52 wk/yr = 109,200 MMBtu/yr*

Table 2. Annual emissions from operation of modified S-3

Pollutant	EF	New Limit*	Existing Limit**	New Emissions	Permitted Emissions	Increase with This Application	
	lb/MMBtu	MMBtu/yr	MMBtu/yr	lb/yr	lb/yr	lb/yr	TPY
NOx	0.018	135,408	9,000	2,465	164	2,301	1.151
CO	0.037	135,408	9,000	5,002	332	4,669	2.335
POC	0.0054	135,408	9,000	730	49	682	0.341
PM_{10}	0.0075	135,408	9,000	1,009	67	942	0.471
SO_2	0.0006	135,408	9,000	80	5	74	0.037

**Note: 15.5 MMBtu/hr * 24 hr/d * 7 d/wk * 52 wk/yr = 135,408 MMBtu/yr*

*** Note: 90,000 therms/yr * 0.1 MMBtu/therm = 9,000 MMBtu/yr*

The total emission increase for this application is shown in Table 3.

Table 3. Total annual emissions increase/decrease with this application

Criteria Pollutant	Emission Increase/Decrease (lb/yr)	Emission Increase/Decrease (TPY)
NOx	790	0.395
CO	-22,598	-11.299
POC	823	0.411
PM_{10}	1,137	0.569
SO_2	90	0.045

PLANT CUMMULATIVE INCREASE

PPF Paramount (Plant No. 19432) is an existing facility. PPF Paramount was previously PPF OFF One Market Plaza LLC (Plant No. 18447), which was previously OSEP LLC (Plant No. 10672). Table 4 displays cumulative increases (post 4/5/91) in tons/year for all three plants.

Table 4. Post 4/5/91 plant cumulative emissions increase

Pollutant	Post 4/5/91 Permitted Increase			New Increase (from this application)	Total Increase
	Plant 10672	Plant 18447	Plant 19432		
	TPY	TPY	TPY	TPY	TPY
NOx	3.260	0.000	0.000	0.395	3.655
POC	4.340	0.000	0.000	0.411	4.751
SO_2	0.050	0.000	0.000	0.045	0.095
PM_{10}	0.430	0.000	0.000	0.569	0.999
CO	13.020	0.000	0.000	-11.299	1.721

TOXIC RISK SCREENING

This application emits one or more toxic air contaminants (TACs) in quantities that exceed the limits listed in Table 2-5-1 of Regulation 2-5, as shown in Table 5. Hence, a risk screening (HRSA) was required. Regulation 2-5 requires that the cumulative impacts from all related projects permitted within the last two years be included in the risk screening analysis. Per Regulation 2-5-216, a project is defined as "all new or modified sources of TACs included in a single permit application." There were no new or modified sources permitted within the two-year period immediately preceding the date this application is deemed complete to be included in the risk screening analysis.

Table 5. Cumulative toxic emission calculations

TACs from Natural Gas Combustion*	AP-42 EF (lb/MMBtu)	Equipment Quantity	Annual Emiss.** (lb/yr)	TAC Trigger Level (lb/yr)	Hourly Emiss.*** (lb/hr)	TAC Trigger Level (lb/hr)	HRSA Triggered?
Benzene	2.1E-06	2	5.6E-01	3.8E+00	6.4E-05	2.9E+00	No
Formaldehyde	7.4E-05	2	2.0E+01	1.8E+01	2.3E-03	1.2E-01	Yes
Toluene	3.3E-06	2	9.0E-01	1.2E+04	1.0E-04	8.2E+01	No

**Note: Based on September 7, 2005 Memorandum from Brian Bateman (Subject: Emission Factors for Toxic Air Contaminants from Miscellaneous Natural Gas Combustion Sources)*

***Note: Annual Emiss. = 135,408 MMBtu/yr (max) * AP-42 EF (lb/MMBtu) * Equipment Quantity*

****Note: Hourly Emiss. = 15.5 MMBtu/hr (max) * AP-42 EF (lb/MMBtu) * Equipment Quantity*

Estimates of residential risk assume exposure to annual average toxic air contaminant concentrations occurs 24 hours per day, 350 days per year, for a 70-year lifetime. Risk estimates for offsite workers assume exposure occurs 8 hours per day, 245 days per year, for 40 years. Risk estimates for students assume a higher breathing rate, and exposure is assumed to occur 10 hours per day, 36 weeks per year, for 9 years.

S-2 and S-3 passed the HRSA conducted on September 5, 2013 by the District's Project Processing Section. The source poses no significant toxic risk, since the maximum cancer risk is estimated at 0.059 in a million, and the maximum project chronic hazard index is estimated at 0.0005, and the acute hazard index is estimated at 0.001. Thus, in accordance with Regulation 2-5, this risk level is considered acceptable.

BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

S-2 and S-3 are subject to BACT requirements for CO because the highest daily emissions of this pollutant exceed 10 pounds (see Table 6) in accordance with Regulation 2-2-301.

Table 6. Highest daily emissions from operation of modified S-2 and S-3

Pollutant	Emissions from Each Boiler	
	lb/yr	lb/day
NOx	2,465	6.8
CO	5,002	13.7
POC	730	2.0
PM_{10}	1,009	2.8
SO_2	80	0.2

BACT for these sources is presented in the current BAAQMD BACT/TBACT Workbook for Boiler: 5 MMBtu/hr to < 33.5 MMBtu/hr Heat Input, Document # 17.1.1, Revision 4 dated 8/4/10. For CO, BACT(1) is 50 ppmv @ 3% O_2 dry.

Because the CO emission rates from each of S-2 and S-3 will be limited by Permit Condition No. 13348 to 50 ppmv at 3% O_2 dry, the boilers satisfy the current BACT(1) standard for CO.

OFFSETS

Offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NOx per Regulation 2-2-302. PPF Paramount (Plant No. 19432) is an existing facility. PPF Paramount was previously PPF OFF One Market Plaza LLC (Plant No. 18447), which was previously OSEP LLC (Plant No. 10672). Table 7 displays cumulative increases (both pre and post 4/5/91) in tons/year for all three plants.

Table 7. Plant cumulative emissions increase

Pollutant	Pre 4/5/91 Permitted Increase			Post 4/5/91 Permitted Increase			New Increase	Total Increase
	Plant 10672	Plant 18447	Plant 19432	Plant 10672	Plant 18447	Plant 19432	(from this application)	
	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
NOx	0.000	0.000	0.000	3.260	0.000	0.000	0.395	3.655
POC	0.000	0.000	0.000	4.340	0.000	0.000	0.411	4.751
SO_2	0.000	0.000	0.000	0.050	0.000	0.000	0.045	0.095
PM_{10}	0.000	0.000	0.000	0.430	0.000	0.000	0.569	0.999
CO	0.000	0.000	0.000	13.020	0.000	0.000	-11.299	1.721

Based on above calculations, PPF Paramount is permitted to emit less than 10 tpy of NOx or POC and thus does not owe any NOx or POC offsets. PPF Paramount is not a Major Facility and thus does not owe any PM_{10} or SO_2 offsets.

STATEMENT OF COMPLIANCE

The owner/operator of S-2 and S-3 will continue to comply with Regulation 6-1 (*Particulate Matter: General Requirements*) and Regulation 9-1-301 (*Inorganic Gaseous Pollutants: Sulfur Dioxide for Limitations on Ground Level Concentrations*). The installation of new Power Flame NOVA Plus Ultra-Low NOx Burner will ensure compliance of S-2 with the emission limits set forth in Regulation 9-7 (*Inorganic Gaseous Pollutants: Nitrogen*

Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters).

The owner/operator of S-2 and S-3 is subject to and expected to comply with the following requirements of Regulation 9-7:

- The limits of 15 ppmv of NOx and 400 ppmv of CO, both at 3% O_2, of Regulation 9-7-307.3. The NOx and CO emissions from modified sources S-2 and S-3 at 3% O_2 will be limited to 15 ppmv and 50 ppmv, respectively, by Permit Condition No. 13348. Since S-2 and S-3 will comply with Regulation 9-7-307, S-2 and S-3 will not be subject to Regulation 9-7-301.
- Compliance schedule requirement of Regulation 9-7-308. With this application, S-1, S-2, and S-3 will all be in compliance with Regulation 9-7-307. This means 100% of devices at the facility, which has three boilers total, will comply with Regulation 9-7-307. Thus, this application complies with Regulation 9-7-308.
- Insulation requirement of Regulation 9-7-311, which limits the temperature of exposed, external surface of a boiler or steam generator, including all pipes and ducts heated by the device, to no higher than 120ºF. This requirement does not apply to Subsections 9-7-311.1 through 9-7-311.5. The applicant has confirmed that S-2 and S-3 will comply with Regulation 9-7-311.
- Stack gas temperature requirement of Regulation 9-7-312, which limits a boiler or steam generator's stack gas temperature (downstream of any economizer) to no higher than the limits set forth in the table in the regulation unless the device is certified by the Air-Conditioning, Heating and Refrigeration Institute (AHRI) as having a thermal efficiency of 80% or more. The applicant has confirmed that S-2 and S-3 will comply with Regulation 9-7-312.
- Initial demonstration of compliance requirement of Regulation 9-7-403, which states no person shall operate a boiler, steam generator or process heater that is subject to the requirements of Sections 9-7-307.1 through 307.6 unless compliance with these requirements is verified in accordance with Sections 9-7-601 or 602 within one year of the date on which these requirements become effective. This requirement is applicable to only S-2 whose burner will be retrofitted. S-3 is not subject to the requirement of Regulation 9-7-403; PPF Paramount already demonstrated initial demonstration of compliance for S-3 under Application No. 23671 after S-3 was retrofitted with a new burner.

Permit Condition No. 13348 will be amended to ensure compliance with the above applicable requirements.

The project is considered to be ministerial under the District's CEQA Regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors and therefore is not discretionary as defined by CEQA (BAAQMD Permit Handbook, Chapter 2.1).

Because Youth Chance High School is located within 1,000 feet from this facility, the project is subject to the public notification requirements of Regulation 2-1-412 due to the increase in the emissions from the project. A public notice will be sent to all parents of students of the above-mentioned school and all residents within 1,000 feet of the facility. There will be a 30-day public comment period.

Pursuant to Regulation 2-2-304, this project is not subject to PSD review because the facility is not a major facility emitting more than 100 TPY.

NSPS and NESHAPS are not triggered.

PERMIT CONDITION

Condition # 13348 ----------

For Sources 1, 2, and 3 (space heat boilers) at Plant #10672, San Francisco

A/N 25863 (Jan 1996), amended by A/N 23671 (Aug 2012) and by A/N 24565 (Sep 2013)

1. The owner/operator of sources 1, 2, and 3, space heat boilers, shall fire the boilers on only natural gas. ~~The owner/operator of source 2, space heat boiler, shall fire the boiler on only natural gas, except that diesel oil shall be permitted only during short test periods (100 hours/year maximum) and/or during periods of natural gas curtailment by Pacific Gas & Electric Company.~~ (basis: Cumulative Increase)

2. The owner/operator of sources 1, 2, and 3 shall not operate either source unless the boiler is fired by Power Flame NOVA Plus Ultra-Low NOx Burner~~s~~ (Model: NVC9-G-30), with a maximum rated heat input of 15.5 MMBtu/hr. (basis: Cumulative Increase~~Regulation 2-1-403~~)

3. The owner/operator shall not emit nitrogen oxides (NOx) and carbon monoxide (CO) from each of sources 2 and 3 exceeding the following emission concentrations:
   15 ppmv, dry at 3% O_2 of NOx; and
   50 ppmv, dry at 3% O_2 of CO.
   (basis: Cumulative Increase, Regulation 9-7-307.3, BACT)

~~3.~~4. ~~(A/C startup source test condition deleted.)~~In order to demonstrate compliance with the emission standards in Part 3, the owner/operator shall perform a District-approved source test for source 2 within 60 days of the installation of the ultra-low NOx burner, in accordance with Regulation 9-7-601 or 602. The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section prior to conducting any tests. The owner/operator shall notify the District's Source Test Section, in writing, of the source test protocols and projected test dates at least 7 days prior to testing. Within 45 days of test completion, a comprehensive report of the test results shall be submitted to the Manager of the Source Test Section for review and disposition. (basis: Regulation 9-7-403, Regulation 2-1-403, BACT)

~~4. The owner/operator of source 2 shall not fire the boiler on diesel oil having a sulfur content greater than 0.5% by weight. (basis: Cumulative Increase, Regulation 9-1-304)~~

~~5. The owner/operator of source 2 shall record the usage of diesel oil in a District approved data log and retain all records for at least two years from date of entry. The diesel oil usage entries shall specify the actual days of oil burning. This log shall be kept on site and made available to the District staff upon request. (basis: Cumulative Increase, Regulation 1-441)~~

~~6.~~5. The owner/operator of sources 1, 2, and 3 shall not emit visible particulate emissions from these sources exceeding Ringelmann 1.0. (basis: Regulation 6-1-301)

~~7. For Source 3, the owner/operator shall have a non-resettable totalizing meter or a utility service meter to demonstrate that each boiler operated at or below 90,000 therms during each consecutive 12 month period. (basis: Regulation 9-7-111, Regulation 9-7-504)~~

~~8. For Source 3, the owner/operator shall have available for inspection by the APCO annual fuel use data for the preceding consecutive 12 month period. These records shall also indicate when each boiler is operated. Records shall be maintained and made accessible to the APCO for a period of 24 months from the date the record is made. (basis: Regulation 9-7-504)~~

End of Conditions

RECOMMENDATION

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for

the equipment listed below. However, the proposed sources will be located within 1,000 feet of at least one school, which triggers the public notification requirements of Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct for the following sources:

S-2 **Steam Boiler #2 with Ultra Low NOx burner, ~~12.5~~15.5 MMBtu/hr rated heat input – Modification to install ultra-low NOx burner with increased rated heat input**

S-3 **Steam Boiler #3 with Ultra Low NOx burner, ~~25~~ 15.5 MMBtu/hr rated heat input – Modification to increase allowable fuel throughput**

By:_____
Kevin Oei
Air Quality Engineer

Date:_____