

## ENGINEERING EVALUATION REPORT

<b>Plant Name:</b>	<b>California Pacific Medical Center – Pacific Campus</b>
<b>Application Number:</b>	<b>23539</b>
<b>Plant Number:</b>	<b>1700</b>

### **BACKGROUND**

The applicant, California Pacific Medical Center – Pacific Campus, is applying for an Authority to Construct for a new natural gas fired boiler at its hospital campus in San Francisco. The boiler is fueled solely by natural gas.

The applicant is requesting an Authority to Construct for the following equipment:

**S-12 SPACE HEAT BOILER, HURST MODEL 500-300, 12.6 MM BTU/HR**

### **CRITERIA POLLUTANT EMISSION CALCULATIONS**

NO<sub>x</sub> and CO emission factors for the new boiler are from the manufacturer's guaranteed emissions specifications. PM, POC, and NPOC emission factors are from AP 42, Tables 1-4.2 and 1-4.3. The SO<sub>2</sub> emission factor is based on the maximum total reduced sulfur content acceptable to PG&E for gas delivered into the PG&E pipeline system, currently 1 grain total sulfur per 100 standard cubic feet of natural gas (17 ppmv). The emission factors used are as follows:

PM	7.45 E-3	lb/MM BTU	
POC	5.39 E-3	lb/MM BTU	
NPOC	3.04 E-3	lb/MM BTU	
NO <sub>x</sub>	1.82 E-2	lb/MM BTU	(based on 15 ppmv limitation) <sup>1</sup>
SO <sub>2</sub>	2.82 E-3	lb/MM BTU	
CO	3.69 E-2	lb/MM BTU	(based on 50 ppmv limitation)

Total criteria pollutant emissions for the new source are as follows:

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<sup>1</sup> For the purposes of cumulative emissions calculations, NO<sub>x</sub> emissions for this boiler are based on the regulatory limit of 15 ppmv NO<sub>x</sub>, even though the manufacturer guarantees that the boilers can meet 9 ppmv NO<sub>x</sub>.

**TABLE 1 - CRITERIA POLLUTANT EMISSIONS**

SOURCE	MM BTU/HR	PM LB/MMBTU	POC LB/MMBTU	NPOC LB/MMBTU	NO <sub>x</sub> LB/MMBTU	SO <sub>2</sub> LB/MMBTU	CO LB/MMBTU
S-12	12.6	7.45E-03	5.39E-03	3.04E-03	1.82E-02	2.82E-03	3.69E-02
<b>TOTAL LB/HR</b>		<b>0.09</b>	<b>0.07</b>	<b>0.04</b>	<b>0.23</b>	<b>0.04</b>	<b>0.47</b>
<b>TOTAL LB/DAY</b>		<b>2.25</b>	<b>1.63</b>	<b>0.92</b>	<b>5.50</b>	<b>0.85</b>	<b>11.17</b>
<b>TOTAL LB/YEAR</b>		<b>822.4</b>	<b>595.2</b>	<b>335.5</b>	<b>2009.1</b>	<b>311.4</b>	<b>4077.5</b>
<b>TOTAL TPY</b>		<b>0.411</b>	<b>0.298</b>	<b>0.168</b>	<b>1.005</b>	<b>0.156</b>	<b>2.039</b>

\*BACT is triggered for CO emissions for this boiler.

**OLD SOURCES: EMISSION REDUCTIONS**

The applicant is not proposing to permanently shut down any existing sources on start-up of the new boiler, therefore no emission reduction credits were calculated for this application.

**OFFSETS**

A summary of the facility's total criteria pollutant Potential to Emit is provided in Attachment 1.

Since the facility will not have the potential to emit more than 100 tons per year of any criteria pollutant, the facility is not a "Major Facility" as defined in Regulation 2-1-203, and is not subject to PM or SO<sub>2</sub> offsets under Regulation 2-2-303.

Since the facility will not have the potential to emit more than 10 tons per year of nitrogen oxides or precursor organic compounds on a pollutant-specific basis, the facility is not subject to NO<sub>x</sub> or POC offsets under Regulation 2-2-302.

**CUMULATIVE EMISSIONS INCREASE**

Changes to the cumulative emissions inventory are as follows:

**TABLE 2 - CUMULATIVE EMISSION INCREASE INVENTORY**

Pollutant	Current Emissions (TPY)	Applications Emissions Increase (TPY)	Onsite Emissions Reductions Credits (TPY)	Offsets From DSFB (TPY)	Final Emissions (TPY)
PM	0.000	0.411	0.000	0.000	0.411
POC	0.000	0.298	0.000	0.000	0.298
NPOC	0.000	0.168	0.000	0.000	0.168
NO <sub>x</sub>	0.000	1.005	0.000	0.000	1.005
SO <sub>2</sub>	0.000	0.156	0.000	0.000	0.156
CO	0.000	2.039	0.000	0.000	2.039

## TOXIC RISK CALCULATIONS

Total chronic and acute toxic emissions for this project are as follows:

**TABLE 3 – CHRONIC TOXIC EMISSIONS**

<b>POLL</b>	<b>POLL NAME</b>	<b>S-12 Space Heat Boiler (lb/yr)</b>	<b>Facility Wide Emissions (lb/yr)</b>	<b>Chronic Trigger Level (lb/yr)</b>	<b>Total EMS &gt; Trigger Level?</b>
41	Benzene	0.227	0.227	3.80	NO
124	Formaldehyde	8.113	8.113	18.00	NO
293	Toluene	0.368	0.368	12,000	NO

**TABLE 4 – ACUTE TOXIC EMISSIONS**

<b>POLL</b>	<b>POLL NAME</b>	<b>S-12 Space Heat Boiler (lb/hr)</b>	<b>Facility Wide Emissions (lb/hr)</b>	<b>Acute Trigger Level (lb/hr)</b>	<b>Total EMS &gt; Trigger (lb/hr)</b>
41	Benzene	2.60E-05	2.60E-05	2.90	NO
124	Formaldehyde	9.26E-04	9.26E-04	0.12	NO
293	Toluene	4.20E-05	4.20E-05	82.00	NO

Since none of the chronic or acute emissions exceed the toxic trigger levels for toxic air contaminants, a health risk screening assessment was not performed for this project.

### BACT REVIEW

Under Regulation 2, Rule 2, any new source which results in an increase of 10 lbs/day or more of any criteria pollutant must be evaluated for adherence to BACT control technologies. Based on Table 1 above, the boiler covered by this application triggers BACT for CO emissions.

To meet BACT, the boiler must be fired on natural gas with a hydrogen sulfide content of no more than 50 ppmv, and a total reduced sulfur content of no more than 100 ppmv. PG&E requires that natural gas delivered into the PG&E pipeline system have a maximum hydrogen sulfide content of 4 ppmv, and maximum total reduced sulfur content of 17 ppmv; therefore natural gas provided by PG&E for commercial combustion purposes meets these emissions limitations.

Additionally, BACT requires that the CO emissions from the boiler not exceed 50 ppmv at 3% O<sub>2</sub>, dry. The boiler proposed in this application meets this CO emissions limitation.

**PUBLIC NOTIFICATION REQUIREMENTS**

The proposed boiler is located within 1,000 feet of one or more schools providing educational services to students enrolled in kindergarten or grades 1 through 12. Under Section 42301.6 of the California Health and Safety Code, notification of the proposed new sources must be mailed to the parents or guardians of all children enrolled in any school within one-quarter mile of the sources, and to each address within a radius of 1,000 feet of the sources, in order to give these parties an opportunity to provide public comment on the proposed actions. All comments received within 30 days of the publication of this notice will be reviewed and considered in the final evaluation and approval or denial of the application.

**COMPLIANCE DETERMINATION**

The boiler in this application is covered under ministerial exemption, Chapter 2.1 of the BAAQMD Permit Handbook. CEQA is not triggered for small boilers (less than 100 MM BTU/hour maximum firing rate).

The boiler is governed by and complies with Regulation 9, Rule 7, "Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters." During natural gas firing, the boiler will meet the following emission limits: 15 ppmv of NOx and 50 ppmv of CO in exhaust gases corrected to 3% O<sub>2</sub>, dry basis. These boiler emission limits comply with the current Regulation 9-7-307.1 for boilers firing on natural gas.

The boiler is not required to meet NSPS requirements as set out in 40 CFR Part 60, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, since the rated heat input is less than 10 MM BTU/hour. The boiler will be required to meet reporting and recordkeeping requirements which are identical to the District Requirements.

**CONDITIONS**

Condition #25043, setting out the operating conditions and recordkeeping requirements for operations at Source S-12 shall be made part of the source's Authority to Construct/Permit to Operate.

**RECOMMENDATION**

As discussed above, the proposed 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 source will be located within 1000 feet of a school, which triggers the public notification requirements of Regulation 2-1-412. The District will conduct this public notice and consider any comments received before taking final action on this project.

**S-12 SPACE HEAT BOILER, HURST MODEL 500-300, 12.6 MM BTU/HR**

Subject to Condition #25043.

By \_\_\_\_\_ Date \_\_\_\_\_  
*Catherine Fortney*

COND# 25043 .....

1. Source S-12 shall burn only natural gas. Basis: Cumulative Increase)
2. The total fuel used at Source S-12 shall not exceed 1,103,760 therms in any successive 12-month period. [Basis: Cumulative Increase]
3. Maximum firing rate of Source S-12 shall not exceed 12.6 MM BTU/hour (based on HHV of the fuel) when firing natural gas. [Basis: NSPS]
4. NOx emissions from the boiler shall not exceed 15 ppmv at 3% oxygen, dry at any firing rate when firing natural gas. (Basis: Reg 9-7-307.2)
5. CO emissions from the boiler shall not exceed 50 ppmv at 3% oxygen, dry at any firing rate when firing natural gas. (Basis: Reg 9-7-307.2; BACT)
6. Within 90 days of start-up, the applicant shall conduct an initial demonstration of compliance with the above emissions limitations. All source testing shall be done in compliance with the District's Manual of Procedures. The applicant shall obtain approval from the Manager of the District's Source Test Section for the installation of test ports and source test procedures. The source test results shall be submitted to the District's Director of Compliance and Enforcement no later than 60 days from the date of the source test. [Basis: Regulation 9-7-403]
7. On or before the later of January 1, 2013, or ten years after the boiler's original date of manufacture if such date was prior to January 1, 2013, the permit holder must initiate periodic emissions testing of each boiler at least once every year. Such testing may be conducted either by source testing performed in accordance with the District's Manual of Procedures, or by use of a portable analyzer that meets the specifications and testing protocols set out in Regulation 9, Rule 7-606. [Basis: Regulation 9-7-506]
8. To demonstrate compliance with the above, the permit holder shall install and maintain a non-resettable totalizing fuel meter, unless the permit holder applies for and receives written approval from the District to use an alternative method for measuring the cumulative annual fuel usage. [Basis: Cumulative Increase]
9. The permit holder shall submit all notifications and reports required by 40 CFR Part 60, Subparts A and Dc to both the US EPA, Region IX and the District by the deadlines specified in these Subparts. [Basis: 40 CFR

Part 60.7 and Part 60.48c(a)]

10. The permit holder shall maintain records of the following:
  - a. Records of the Original Manufacture Date and Initial Startup Date for the source;
  - b. Copies of all notifications and reports submitted pursuant to paragraph 9 above;
  - c. Total monthly natural gas usage, and dates and times of such usage for each boiler; and The results of any testing required under paragraphs 6 and 7 above.Such records shall be retained for at least two years from date of entry and shall be made available to District staff upon request. [Basis: Regulation 9-7-503; Regulation 1-1-441, Cumulative Increase]