

**PROPOSED**  
06-25-2009

**AUTHORITY TO CONSTRUCT  
ENGINEERING EVALUATION**

**Application No.:** A/C 22021, 22022,  
22066  
**Date:** June 25, 2009  
**Engineer:** Bruce Nixon

**A. FACILITY NAME:**

Central Valley Financing Authority - Carson Cogeneration Project

**B. LOCATION OF EQUIPMENT:**

8521 Laguna Station Road, Elk Grove

**C. PROPOSAL:**

CVFA Carson is proposing to:

1. Modify the existing LM6000PA combined cycle gas turbine to a newer model LM6000PC Sprint/EFS gas turbine. Reduce the NOx concentration emission limit from the modified combined cycle gas turbine from 5 ppmvd at 15% O2 to 2.5 ppmvd at 15% O2.
2. Install an oxidation catalyst air pollution control system to control future CO emissions from the combined cycle gas turbine to the current level of the combined cycle gas turbine.
3. Reduce the NOx concentration emission limit from the existing duct burner from 5 ppmvd at 15% O2 to 2.5 ppmvd at 15% O2.

**D. INTRODUCTION:**

CVFA Carson is proposing to upgrade their current combined cycle LM6000PA gas turbine [existing P/O 12829(rev3)] to a newer more efficient design that is designated Model LM6000PC Sprint/EFS. The upgrade consists of changing vanes, adding additional ports for water injection and upgrading control components and sensors.

The existing combined cycle gas turbine is nominally rated at 42 MW. The upgrade will result in an increase in the capacity of the baseload gas turbine to a nominal rating of 50 MW. Along with the increased MW rating, the upgrade will result in an increase in fuel flow from 450 MMBTU/hr to 500 MMBTU/hr.

The upgrade will result in lower NOx emissions. The PC Sprint combustors reduce NOx emissions from the combined cycle gas turbine to about 25 ppmvd at 15% O2 in contrast to the current PA combustors which emit around 42 ppmvd at 15% O2. This will allow the CVFA Carson to accept a

post SCR NOx concentration limit of 2.5 ppmvd at 15% O2 as compared to the current combined cycle gas turbine's NOx concentration limit of 5 ppmvd at 15% O2.

The duct burner (existing P/O 11014) NOx concentration limit will also be reduced to 2.5 ppmvd at 15% O2.

CVFA Carson is proposing that the new upgraded combined cycle gas turbine will remain in compliance with the existing ROC and PM10 emission limitations for the existing combined cycle gas turbine.

CVFA Carson is proposing to install an oxidation catalyst in order to keep the CO emissions from the upgraded combined cycle gas turbine at or below the CO emission limits of the current combined cycle gas turbine.

CVFA Carson is proposing an increase in SO2 emissions from the combined cycle gas turbine due to the proposed increase in fuel flow from 450 MMBTU/hour to 500 MMBTU/hour.

The combined cycle gas turbine upgrade project will require a short time period for commissioning activities. CVFA Carson estimates that the commissioning period will last approximately one week but may take longer if they experience startup problems. Commissioning will involve testing, adjustment, tuning and calibration of the various systems associated with the operation of the combined cycle gas turbine. During the commissioning period the SCR and oxidation catalyst air pollution control systems will be installed and operating, but possibly not at their full effectiveness. CVFA Carson has requested that the emission limit for NOx during the commissioning period be changed to the startup emission limits. Conditions will be placed on the Authority to Construct to reflect the need for different emission limits during the commissioning period.

#### **E. EQUIPMENT DESCRIPTION:**

The following equipment is associated with this permit evaluation -

##### Combined Cycle Gas Turbine (modified equipment):

Application No.: A/C 22021  
Previous P/O No.: 12829(rev3)  
Manufacturer: General Electric  
Model No.: LM6000PC Sprint/EFS  
Heat Input: 500 MMBTU/hour  
Electrical Output: nominal 50 MW  
Primary Fuel: Natural gas  
Secondary Fuel: Digester gas and natural gas mixture

##### Oxidation catalyst (new equipment):

Application No.: A/C 22022  
Manufacturer: Not known at this time  
Model No.: Not known at this time

Duct Burner (modified permit conditions only):

Application No.: A/C 22066  
Previous P/O No.: 11014  
Heat Input Rating: 99.9 MMBTU/hour  
Primary Fuel: Natural gas  
Secondary Fuel: Digester gas and natural gas mixture

**F. PROCESS RATE/FUEL USAGE:**

The modified combined cycle gas turbine can consume 500 MMBTU/hr of natural gas and is nominally rated at 50 MW electrical output.

The existing duct burner can consume 99.9 MMBTU/hour of natural gas.

**G. OPERATING SCHEDULE:**

The combined cycle gas turbine's emissions are based on operating at 100% load and 8,322 hours per year. Actual load and annual hours of operation are not limited by permit conditions.

The duct burner's emissions are based on operating at 100% load and 4,380 hours per year. Actual load and annual hours of operation are not limited by permit conditions.

**H. CONTROL EQUIPMENT EVALUATION:**

1. The modified combined cycle gas turbine will continue to use:
  - a. water injection and selective catalytic reduction (SCR) to control NOx emissions.
  - b. pipeline quality natural gas, digester gas and combustion air filtration to control PM10 emissions.
2. The modified combined cycle gas turbine will use a new oxidation catalyst to control CO emissions.
3. The duct burner will continue to use:
  - a. selective catalytic reduction (SCR) to control NOx emissions.
  - b. pipeline quality natural gas, digester gas and combustion air filtration to control PM10 emissions.

**I. EMISSIONS CALCULATIONS:**

**1. HISTORIC POTENTIAL EMISSIONS:**

This proposed modification is a non-major modification based on SMAQMD Rule 202 Section 221. A non-major modification increases emissions less than the following amounts:

- 25 tons of reactive organic compounds;
- 25 tons of nitrogen oxides;
- 40 tons of sulfur oxides;
- 15 tons of PM10; or
- 100 tons of carbon monoxide

This permit action will not increase emissions more than the above amounts.

Therefore, Historic Potential to Emit is equal to the Potential to Emit.

See P/O 11012 - 11019 and P/O 12453 Engineering Evaluations for the basis of the following emission limits on Potential to Emit. The historic emission limits for the combined cycle gas turbine, in some cases, are combined with the duct burner, other equipment at the facility and other equipment at the SRWTP because of the complex interactions of the various emission sources.

There is no discussion of historic emissions associated with the oxidation catalyst air pollution control system because it is proposed new equipment.

**Existing Emission Limits**

**A/C 22021 Modified Gas Turbine**

Pollutant	Maximum Allowable Emissions Combined Cycle Gas Turbine (A)					
	lb/hour	lb/day	Quarter 1 lb/quarter	Quarter 2 lb/quarter	Quarter 3 lb/quarter	Quarter 4 lb/quarter
ROC	2.46	59.0	5,034	5,090	5,146	5,146
NOx	7.33	175.9	15,145	15,312	15,479	15,479
SO2	1.42	34.1	2,914	2,946	2,979	2,979
PM10	2.50	60.0	5,130	5,187	5,244	5,244
CO	12.00	288.0	24,743	25,017	25,291	25,291

(A) The mass emission limits for the combined cycle gas turbine alone are not a condition of the current Permit to Operate No. 12829(rev3), but are taken from the Engineering Evaluations associated with prior Permits to Operate. The lb/hour and lb/quarter mass emission limits

for the combined cycle gas turbine alone are necessary for determining the applicability of BACT.

(B) Startups and shutdowns are not included in the lb/hour and lb/day limits but are included in the lb/quarter limits.

**A/C 22066 Duct Burner Modification**

Pollutant	Maximum Allowable Emissions Duct Burner (A)					
	lb/hour	lb/day	Quarter 1 lb/quarter	Quarter 2 lb/quarter	Quarter 3 lb/quarter	Quarter 4 lb/quarter
ROC	1.29	31.0	1,393	1,409	1,424	1,424
NOx	1.95	46.7	2,106	2,129	2,153	2,153
SO2	1.36	32.6	1,469	1,485	1,501	1,501
PM10	1.00	24.0	1,080	1,092	1,104	1,104
CO (B)	40	547.0	48,822	49,364	49,907	49,907

(A) The mass emission limits for the duct burner alone are not a condition of the current Permit to Operate No. 11014, but are taken from the Engineering Evaluations associated with prior Permits to Operate. The lb/hour and lb/quarter mass emission limits for the duct burner alone are necessary for determining the applicability of BACT.

(B) The CO limit of 547 lb/day applies to all of the equipment at the facility.

**2. PROPOSED POTENTIAL TO EMIT**

Maximum daily emissions from the combined cycle gas turbine and duct burner are calculated based on the increased combined cycle gas turbine firing rate of 500 MMBTU/hour. The maximum amount of digester gas fired in the combined cycle gas turbine remains unchanged at 90 MMBTU/hour of the total 500 MMBTU/hour.

ROC, PM10 and CO emission limits are proposed to remain the same as those emission limits in place prior to the combined cycle gas turbine modification.

NOx emissions from the combined cycle gas turbine and duct burner will be reduced from 5 ppmvd at 15% O2 to 2.5 ppmvd at 15% O2.

SO2 emissions will increase due to the increased firing rate of natural gas in the combined cycle gas turbine from 450 MMBTU/hour to 500 MMBTU/hour.

There is no discussion of emissions associated with the proposed oxidation catalyst air pollution control system because it is a passive air pollution control device that generates no emissions due to its operation.

**Proposed Emission Limits**

**A/C 22021 Combined Cycle Gas Turbine Modification**

Pollutant	Maximum Allowable Emissions Combined Cycle Gas Turbine (A)					
	lb/hour	lb/day	Quarter 1 lb/quarter	Quarter 2 lb/quarter	Quarter 3 lb/quarter	Quarter 4 lb/quarter
ROC	2.46	59.0	5,034	5,090	5,146	5,146
NOx	4.64	111.3	9,650	9,755	9,861	9,861
SO2	1.45	34.8	2,975	3,008	3,041	3,041
PM10	2.50	60.0	5,130	5,187	5,244	5,244
CO	12.00	288.0	24,743	25,017	25,291	25,291

(A) The mass emission limits for the combined cycle gas turbine alone will not be a condition of the new Permit to Operate, but will be integrated with the other equipment at the facility as has been done with the current Permit to Operate No. 12829(rev3). The lb/hour and lb/quarter mass emission limits for the combined cycle gas turbine alone are necessary for determining the applicability of BACT.

(B) Startups and shutdowns are not included in the lb/hour and lb/day limits but are included in the lb/quarter limits.

**A/C 22066 Duct Burner Modification**

Pollutant	Maximum Allowable Emissions Duct Burner (A)					
	lb/hour	lb/day	Quarter 1 lb/quarter	Quarter 2 lb/quarter	Quarter 3 lb/quarter	Quarter 4 lb/quarter
ROC	1.29	31.0	1,393	1,409	1,424	1,424
NOx	0.98	23.5	1,055	1,067	1,079	1,079
SO2	1.6	32.6	1,469	1,485	1,501	1,501
PM10	1.00	24.0	1,080	1,092	1,104	1,104
CO (B)	40	547.0	48,822	49,364	49,907	49,907

(A) The mass emission limits for the duct burner alone will not be a condition of the new Permit to Operate, but will be integrated with the other equipment at the facility as has been done with the current Permit to Operate No. 11014. The lb/hour and lb/quarter mass emission limits for the combined duct burner alone are necessary for determining the applicability of

BACT.

(B) The CO limit of 547 lb/day applies to all of the equipment at the facility.

**3. CALCULATION OF BACT TRIGGER**

NEI (BACT) = Net Emissions Increase for BACT trigger purposes  
 = Proposed Potential to Emit - Potential to Emit prior to modification  
 (calculation uses values from the quarter that results in the largest NEI)

MPE = Maximum Potential Emissions for a 24-hour day operation

**A/C 22021 Combined Cycle Gas Turbine Modification**

Pollutant	NEI (BACT) lb/quarter	Is NEI (BACT) >0 ?	MPE lb/day	BACT Trigger lb/day	Is BACT Required?
ROC	0	No	59.1	≥ 10	No
NOx	-5,618	No	111.3	≥ 10	No
SO2	62	Yes	34.8	≥ 10	Yes
PM10	0	No	60.0	≥ 10	No
CO	0	No	547	≥ 550	No

**A/C 22066 Duct Burner Modification**

Pollutant	NEI (BACT) lb/quarter	Is NEI (BACT) >0 ?	MPE lb/day	BACT Trigger lb/day	Is BACT Required?
ROC	0	No	31.0	≥ 10	No
NOx	-1,074	No	23.5	≥ 10	No
SO2	0	Yes	32.6	≥ 10	No
PM10	0	No	24.0	≥ 10	No
CO (A)	0	No	547.0	≥ 550	No

(A) The CO limit of 547 lb/day applies to all of the equipment at the facility.

**4. CALCULATION OF OFFSET TRIGGER FOR ROC AND NOx:**

 Indicates active permit

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter

		ROC	NOx
P/O 11012	Combined Cycle Gas turbine	Modified to P/O 12453	
P/O 11013	Peaking Gas Turbine	Modified to P/O 12830	
P/O 11014	Duct Burner	Modified to A/C 22066	
P/O 11015	APC SCR - Combined Cycle Gas Turbine	0	0
App. 11016	APC Oxidation Catalyst - Combined Cycle Gas Turbine	Application Cancelled	
P/O 11017	APC SCR - Peaking Gas Turbine	0	0
P/O 11018	APC Oxidation Catalyst - Peaking Gas Turbine	0	0
P/O 11019	Cooling Tower	0	0
P/O 11020	IC Engine, Emergency Use	176	3,844
P/O 12453	Combined Cycle Gas Turbine	Modified to P/O 12829	
P/O 12829	Combined Cycle Gas Turbine	Modified to A/C 22021	
P/O 12830	Peaking Gas Turbine	Modified to P/O 15535	
P/O 15535	Peaking Gas Turbine	See A/C 22021	
A/C 22021	Combined Cycle Gas Turbine <i>Potential to Emit includes emissions from -</i> Combined Cycle Gas Turbine Duct Burner Peaking Gas Turbine Cooling Tower	9,172	23,522
A/C 22022	APC Oxidation Catalyst - Combined Cycle Gas Turbine	0	0
A/C 22066	Duct Burner	See A/C 22021	
Total		9,348	30,214
Offset Trigger Level		≥ 5,000	≥ 5,000

**5. CALCULATION OF OFFSET TRIGGER FOR SO<sub>2</sub>, PM<sub>10</sub> AND CO:**

 Indicates active permit

Permit No.	Emissions Unit	Stationary Source Cumulative Emission Increase Since 01-01-77 lb/quarter		
		SO2	PM10	CO
P/O 11012	Combined Cycle Gas turbine	Modified to P/O 12453		
P/O 11013	Peaking Gas Turbine	Modified to P/O 12830		
P/O 11014	Duct Burner	Modified to A/C 22066		
P/O 11015	APC SCR - Combined Cycle Gas Turbine	0	0	0
App. 11016	APC Oxidation Catalyst - Combined Cycle Gas Turbine	Application Cancelled		
P/O 11017	APC SCR - Peaking Gas Turbine	0	0	0
P/O 11018	APC Oxidation Catalyst - Peaking Gas Turbine	0	0	0
P/O 11019	Cooling Tower	0	See A/C 22021	0
P/O 11020	IC Engine, Emergency Use	56	116	1,950
P/O 12453	Combined Cycle Gas Turbine	Modified to P/O 12829		
P/O 12829	Combined Cycle Gas Turbine	Modified to A/C 22021		
P/O 12830	Peaking Gas Turbine	Modified to P/O 15535		
P/O 15535	Peaking Gas Turbine	See A/C 22021		
A/C 22021	Combined Cycle Gas Turbine <i>Potential to Emit includes emissions from -</i> Combined Cycle Gas Turbine Duct Burner Peaking Gas Turbine Cooling Tower	5,849	9,545	49,907

Permit No.	Emissions Unit	Stationary Source Cumulative Emission Increase Since 01-01-77 lb/quarter		
		SO2	PM10	CO
A/C 22022	APC Oxidation Catalyst - Combined Cycle Gas Turbine	0	0	0
A/c 22066	Duct Burner	See A/C 22021		
Total		5,905	9,661	51,857
Trigger Level		≥13,650	≥7,500	≥49,500

**6. CALCULATION OF EMISSION OFFSETS FOR ROC AND NOX:**

ROC: Emission offsets are triggered for ROC. However, the quarterly net ROC emissions increase for the combined cycle gas turbine and duct burner modification is zero.

The amount of ROC emissions that must be offset is 0 lb/quarter.

NOx: Emission offsets are triggered for NOx. However, the quarterly net NOx emissions increase for the combined cycle gas turbine and duct burner modification is less than zero (an actual NOx emissions decrease).

	NOx emissions change lb/quarter
Combined cycle gas turbine modification	-5,618
Duct burner modification	-1,074
Oxidation catalyst new	<u>0</u>
Total	-6,692

The amount of NOx emissions that must be offset is 0 lb/quarter.

**7. CALCULATION OF EMISSION OFFSETS FOR SO2, PM10 AND CO:**

SO2: Emission offsets are not triggered for SO2.

The amount of SO2 emissions that must be offset is 0 lb/quarter.

PM10: Emission offsets are triggered for PM10. However, the quarterly net PM10 emissions

increase for the combined cycle gas turbine and duct burner modification is zero.

The amount of PM10 emissions that must be offset is 0 lb/quarter.

CO: Emission offsets are triggered for CO. However, the quarterly net CO emissions increase for the combined cycle gas turbine and duct burner modification is zero.

**NOTE** - See the prior Engineering Evaluation for the initial Permit to Operate No. 11012 for the combined cycle gas turbine. The CO emissions were shown to not cause a 500 ug/m3 CO concentration increase in the 8-hour average CO concentration and therefore CO emission offsets were not required.

The amount of CO emissions that must be offset is 0 lb/quarter

## **J. COMPLIANCE WITH RULES AND REGULATIONS:**

### **1. HEALTH AND SAFETY CODE SECTION 42301.6:**

The proposed equipment is not located within 1000 feet of a K–12 school, therefore, California Health and Safety Code Section 42301.6 requirements for public noticing do not apply.

### **2. NEW SOURCE REVIEW COMPLIANCE:**

#### **Rule 202 - New Source Review**

##### **Section 101 - Purpose**

This permit action will be processed using SMAQMD Rule 202 Section 404 *Enhanced New Source Review*. The procedural requirements in SMAQMD Rule 207 Sections 401 through 408 will be used. There will be public noticing and a U.S. EPA comment period for the proposed Authority to Construct.

The use of the Enhanced New Source Review process will allow this permit action to be incorporated into the facility's Title V permit through a Title V administrative permit amendment (see SMAQMD Rule 207 Section 202.5).

##### **Section 112 - Exemption - Notification Requirements**

The increase in Potential to Emit due to this permit action **does not exceed** the maximum quarterly mass emission level that exempts the permit action from U.S. EPA, CARB and public noticing for BACT and emission offsets. Therefore, there is no requirement for U.S. EPA, CARB and public noticing for BACT and emission offsets.

Pollutant	Potential to Emit Increase Requiring Public Noticing lb/quarter
ROC	≥ 5,000

Pollutant	Potential to Emit Increase Requiring Public Noticing lb/quarter
NOx	≥ 5,000
SO2	≥ 13,650
PM10	≥ 7,500
CO	≥ 49,500

**Section 301 - BACT**

ROC: The combined cycle gas turbine and duct burner modifications result, for each, in no quarterly ROC emissions increase. Therefore BACT is not triggered for ROC for the modification.

NOx: The combined cycle gas turbine and duct burner modifications result, for each, in a quarterly NOx emissions decrease. Therefore BACT is not triggered for NOx for the modification.

PM10: The combined cycle gas turbine and duct burner modifications result, for each, in no quarterly PM10 emissions increase. Therefore BACT is not triggered for PM10 for the modification.

SO2: The combined cycle gas turbine modification does result in a quarterly SO2 emissions increase and a daily potential to emit greater than the 10 lb/day trigger level. Therefore BACT is triggered for SO2 for the modification of the combined cycle gas turbine.

After reviewing BACT determinations made by the SMAQMD, SCAQMD, BAAQMD and SJVUAQMD, BACT is determined to be the use of pipeline quality natural gas for the combined cycle gas turbine. This is the same BACT determination that was made when the combined cycle gas turbine was initially permitted. The combined cycle gas turbine is proposed to continue to use pipeline quality natural gas as fuel.

The combined cycle gas turbine modification does not affect the quantity of digester gas that is allowed to be combusted (90 MMBTU/hour). The modification only affects the amount of natural gas that can be combusted (an increase from 450 MMBTU/hour to 500 MMBTU/hour). The quarterly SO2 emission increase associated with the modification is based on the increased combustion of natural gas from 450 MMBTU/hour to 500 MMBTU/hour only. The combustion of digester gas is not subject to a new BACT determination. The digester gas will continue to be limited to 90 MMBTU/hour and a maximum H2S content of 50 ppmv.

The duct burner modification results in no quarterly SO2 emissions increase. Therefore BACT is not triggered for SO2 for the duct burner modification.

CO: The combined cycle gas turbine and duct burner modifications result, for each, in no quarterly CO emissions increase. Therefore BACT is not triggered for CO for the modification.

**Section 302 – Offsets:**

ROC: The amount of ROC offsets required for the modifications is 0 lb/quarter.

NOx: The amount of NOx offsets required for the modifications is 0 lb/quarter.

SO2: The amount of SO2 offsets required for the modifications is 0 lb/quarter.

PM10: The amount of PM10 offsets required the modifications is 0 lb/quarter.

CO: The amount of CO offsets required the modifications is 0 lb/quarter.

**Section 305 – Ambient Air Quality Standards**

Emissions from a new or modified stationary source shall not prevent or interfere with the attainment or maintenance of any ambient air quality standard.

The proposed modifications will result in short term increases in NOx due to the commissioning period for the modified combined cycle gas turbine. The proposed modifications will result in long term increases of SO2 emissions due to the increased hourly natural gas fuel consumption.

CVFA Carson conducted an air quality impact analysis using the air quality modeling conducted when the facility was initially permitted. Air quality impacts were analyzed relative to the 1-hour NO2, annual NO2, 1-hour SO2, 24 hour SO2 and annual SO2 ambient air quality standards. The results from the air quality impact analysis, in the following table, demonstrate that the combined cycle gas turbine and duct burner modifications and commissioning period will not prevent or interfere with the attainment or maintenance of ambient air quality standards.

Modeled Maximum Ambient Air Impacts (ug/m3)							
Pollutant	Averaging Time	Initial CVFA Project Impact (ug/m3)	Combined Cycle Gas Turbine Upgrade Impact (ug/m3)	Background Concentration (ug/m3)	Total Impact (ug/m3)	State AAQS (A) (ug/m3)	Federal AAQS (A) (ug/m3)
NO2	1-hour during commissioning	94.1	217 (B)	98	315 (B)	338	--
NO2	1-hour after commissioning	94.1	73.3	98	171	338	-

Modeled Maximum Ambient Air Impacts (ug/m3)							
Pollutant	Averaging Time	Initial CVFA Project Impact (ug/m3)	Combined Cycle Gas Turbine Upgrade Impact (ug/m3)	Background Concentration (ug/m3)	Total Impact (ug/m3)	State AAQS (A) (ug/m3)	Federal AAQS (A) (ug/m3)
NO2	Annual	0.61	0.61 (C)	17	18	56	100
SO2	1-hour	10.4	11.6	86	98	655	--
SO2	24-hour	2.96	3.3	11.4	14.7	105	365
SO2	Annual	0.4	0.44	3.1	3.5	--	80

(A) AAQS is ambient air quality standard.

(B) Impact due to the one time startup emissions from commissioning activities.

(C) No change is expected in annual impact for NOx emissions.

### Section 307 - Denial, Failure to Meet CEQA

The SMAQMD utilizes the *Guide to Air Quality Assessment in Sacramento County, SMAQMD, July 2004* as a guide during the initial study phase of a proposed project to determine the level of review necessary under CEQA.

- a. ROG and NOx: The average daily increase in emissions from this permitting action is 0 lb/day of ROG and 0 lb/day of NOx. These emission levels are below the CEQA review trigger levels of 65 lb/day.

There will be no increase in the quarterly mass emissions of ROG and NOx. Therefore, the daily average increase for the quarter will be 0 lb/day.

- b. Other pollutants: This permitting action does not result in emission increases that could lead to violations of any applicable California Ambient Air Quality Standards.
- c. Toxic Air Contaminants (TACs): This permitting action is not subject to T-BACT because there are no increases in TACs and therefore the cancer health risk from this permitting action does not exceed 1 in 1 million.
- d. Cumulative TACs: The emission of TACs from this permitting action, when combined with TACs from any nearby sources identified in the CARB Toxics Hot Spot Program (AB2588), does not result in a cumulative health risk greater than 10 in one million.

This permitting action does not exceed any of the criteria above, therefore the project does not require further CEQA review.

### Section 404 - Enhanced New Source Review

This permit action will be processed using SMAQMD Rule 202 Section 404 Enhanced New Source Review. The procedural requirements in SMAQMD Rule 207 Sections 401 through 408 will be used. A public notice will be published in the Sacramento Bee requesting comments within a 30 day review period. The U.S. EPA Region 9 will have a 45 day review period.

The use of the Enhanced New Source Review process will allow this permit action to be incorporated into the facility's Title V permit through a Title V administrative permit amendment (see SMAQMD Rule 207 Section 202.5). CVFA Carson will still be required to submit a Title V permit application to modify their current Title V permit.

### **3. TITLE V COMPLIANCE:**

#### **Rule 207 Title V Federal Operating Permits Program**

The combined cycle gas turbine modification is considered a Significant Title V Modification, as specified in SMAQMD Rule 207 Section 233.1. The applicant will be required to submit an application for a modification to their Title V permit and the Title V permit modification will need to be issued prior to operation of the turbine under this Authority to Construct.

### **4. FEDERAL TITLE IV ACID RAIN COMPLIANCE:**

#### **Rule 208 - Acid Rain**

The 40 CFR Parts 72, 75 and 76 Acid Rain requirements are applicable to the CVFA Carson facility. The Acid Rain requirements are listed as part of their Title V permit. This modification will not result in any changes to these requirements or compliance with them. CVFA Carson will be required to update its monitoring plan to reflect the changes to the turbines output.

### **5. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) COMPLIANCE:**

A PSD analysis is not required because there are no emissions of an attainment pollutant that exceed the following levels.

Attainment Pollutants within the SMAQMD	Primary PSD Applicability Level (A) (i.e. federal PSD "major" source level)  tons/year	Secondary PSD Applicability Level (B) (i.e. federal PSD "significance" level)  tons/year
NO2	≥ 250	≥ 40
SO2	≥ 250	≥ 40
CO	≥ 250	≥ 100

(A) Except that the "major" source level is ≥ 100 tons/year for stationary sources listed in 40

CFR 51.166(b)(1)(i)(a).

- (B) If emissions of one of the "attainment" pollutants qualifies the stationary source as a federal PSD "major" source, then PSD is also applicable to any other "attainment" pollutant that exceeds the federal PSD "significance" level for both (1) the project emissions increase **and** (2) the facility net emissions increase.

## **6. PROHIBITORY RULE COMPLIANCE**

### **SMAQMD Rule 401 Ringelmann Chart**

The combined cycle gas turbine and duct burner will be fired exclusively with natural gas and digester gas. Visible emissions will comply with the 20% opacity requirement of this rule.

### **SMAQMD Rule 402 Public Nuisance**

A Health Risk Assessment was performed for the facility when hours of operation were increased for the peaking turbine in December 2000 (see Authority to Construct No. 15535). The December 2000 HRA used the modeling results from the initial HRA (performed in 1993 for initial permitting of the facility). The December 2000 Excess Cancer Risk was determined to be 0.35 in a million. The Chronic and Acute Risk were determined to have a Hazard Index of 0.059 and 0.086 respectively.

The risk values are updated for this permit action by:

- a. Applying the ratio of 500/450 to reflect the new maximum fuel input of 500 MMBTU/hour versus the prior 450 MMBTU/hour. This is a conservation estimate because it applies the ratio to all emissions at the facility, not just emissions from the combined cycle gas turbine.
- b. Applying the OEHHA Breathing Rate Factor of 1.25 that was put into use after the initial HRA was performed in 1993.

The results of applying the above factors is:

- a. Excess Cancer Risk = 0.49 in 1 million
- b. Acute Hazard Index = 0.119
- c. Chronic Hazard Index = 0.082

The requirement to apply TBACT is not applicable since the excess cancer risk is less than 1 in 1 million and the Acute and Chronic Hazard Index are both less than 1.

Therefore, the CVFA Carson facility will comply with this rule.

### **SMAQMD Rule 406 Specific Contaminants**

The sulfur compounds expected to be emitted by the combined cycle gas turbine and duct burner (worst case when combusting 100% digester gas) will be less than 2.5 ppmvd which is

0.00025% by volume. The rule requirement is to not exceed 0.2% by volume for the sulfur emissions as SO<sub>2</sub>.

The particulate matter concentration expected to be emitted by the combined cycle gas turbine and duct burner will be less than 0.005 grains/dscf at 12% CO<sub>2</sub>. The rule requirement for particulate matter is 0.1 grains/dscf at 12% CO<sub>2</sub>.

Therefore, the combined cycle gas turbine and duct burner operation will comply with this rule.

### **SMAQMD Rule 413 Stationary Gas Turbines**

The rule limits the NO<sub>x</sub> concentration to 9 ppmvd at 15% O<sub>2</sub>. In addition, the rule requires that turbines greater than 10 MW have a NO<sub>x</sub> CEM system. The combined cycle gas turbine will be required to meet a NO<sub>x</sub> concentration of 2.5 ppmvd at 15% O<sub>2</sub>. A NO<sub>x</sub> and CO CEM system is currently installed and will continue to be used. The combined cycle gas turbine complies with the current SIP approved version of SMAQMD Rule 413 (adopted 05-01-1997) as well as the most recent amendments to SMAQMD Rule 413 (03-24-2005).

### **SMAQMD Rule 420 Sulfur Content of Fuels**

The rule limits the sulfur compounds content of all gaseous fuels to less than 50 grains of sulfur compounds (calculated as H<sub>2</sub>S) per 100 cubic feet. The natural gas proposed for the gas turbine is estimated to have a maximum sulfur compounds content (calculated as H<sub>2</sub>S) of 1 grain per 100 cubic feet. The digester gas proposed for the gas turbine is estimated to have a maximum sulfur compounds content (calculated as H<sub>2</sub>S) of 5.9 grains per 100 cubic feet. Therefore, the gas turbine operation will comply with this rule.

## **8. NSPS COMPLIANCE**

### **40 CFR 60 Subpart A General Provisions**

[begin at 40 CFR 60.1]

This regulation has three major provisions.

1. Notification - The applicant must provide written notification to the Air Pollution Control Officer of the following:
  - a. The date when construction begins.
  - b. The actual date of initial startup.
  - c. Any modifications which may increase an emission rate to which a standard applies.
  - d. The date when demonstration of the continuous monitoring system performance commences.All of these notifications have specific time periods that are defined in the regulation.
2. Records - The applicant must maintain records of any startup, shutdown or malfunction of the equipment, all CEM data including performance tests, evaluations and calibrations. In addition, the applicant must submit a written report of excess emissions.

3. Emission Tests - The applicant must conduct performance tests of the gas turbine within 60 days of achieving the maximum production rate, but no later than 180 days after initial startup.

The applicant will be required to comply with the provisions of this regulation through permit conditions.

**40 CFR 60 Subpart KKKK - Standards of Performance for Stationary Combustion Turbines**  
[begin at 40 CFR 60.4300]

The NSPS is applicable to any gas turbine that will commence modification after February 18, 2005. The term "modification" is defined as any physical or operational change that results in an increase in the emission rate (lb/hour) of any pollutant to which the NSPS applies. The SO<sub>2</sub> emissions from the combined cycle gas turbine are a regulated pollutant by Subpart KKKK and will increase as a result of this permitting action. The combined cycle gas turbine is therefore subject to Subpart KKKK.

40 CFR 60.4320 and Table 1

Emissions from the combined cycle gas turbine shall not exceed 42 ppmvd NO<sub>x</sub> at 15% O<sub>2</sub>:

- a. The combined cycle gas turbine NO<sub>x</sub> emission concentration is limited to 2.5 ppmvd NO<sub>x</sub> at 15% O<sub>2</sub>.

40 CFR 60.4330(a)(2)

Emissions from the combined cycle gas turbine shall not exceed 0.060 lb SO<sub>2</sub>/MMBTU heat input:

- a. The combined cycle gas turbine SO<sub>2</sub> mass emissions are limited to:

$$\frac{1.42 \text{ lb SO}_2/\text{hour}}{500 \text{ MMBTU/hour}} = \frac{0.003 \text{ lb SO}_2}{\text{MMBTU}}$$

Therefore, the combined cycle gas turbine operation will comply with this NSPS.

40 CFR 60.4320 and Table 1

Emissions from the duct burner shall not exceed 54 ppmvd NO<sub>x</sub> at 15% O<sub>2</sub>:

- a. The duct burner NO<sub>x</sub> emission concentration is limited to 2.5 ppmvd NO<sub>x</sub> at 15% O<sub>2</sub>.

Therefore, the duct burner operation will comply with this NSPS.

**9. NESHAP COMPLIANCE**

**40 CFR 63 Subpart YYYY Stationary Combustion Turbines**  
[begin at 40 CFR 63.6080]

The CVFA Carson facility is not a major source of HAP emissions and therefore is not subject to Subpart YYYYY.

**RECOMMENDATION:**

1. **PRELIMINARY DECISION** - An Authority to Construct to modify the combined cycle gas turbine and duct burner and install an oxidation catalyst air pollution control system should be issued to CVFA Carson with the following conditions.
2. **ENHANCED NEW SOURCE REVIEW PROCESSING** - Following the procedures in SMAQMD Rule 207 Sections 401 through 408:
  - a. Publish a public notice in the Sacramento Bee newspaper regarding the preliminary decision to issue the Authority to Construct allowing a 30 day comment period.
  - b. Send to U.S. EPA Region 9 the proposed Engineering Evaluation and proposed Authority to Construct allowing a 45 day comment period.
3. **FINAL DECISION** - Prior to making a final decision on the proposed Authority to Construct, take into consideration all comments received from the public and U.S. EPA.

**PERMIT CONDITIONS:**

*Refer to permit conditions in Authority to Construct Nos. 22021, 22022 and 22066*

REVIEWED BY: \_\_\_\_\_ DATE: \_\_\_\_\_