DOCKETED	
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Project Title:	Compliance - Application for Certification for SMUD's Campbell Soup Cogeneration Project
TN #:	226122
Document Title:	Petition to Amend Staff Analysis
Description:	Staff Analysis of Petition to Amend filed for Sacramento Power Authority's Campbell Cogeneration Project.
Filer:	Mary Dyas
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CALIFORNIA ENERGY COMMISSION
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DATE: December 14, 2018

TO: Interested Parties

FROM: Mary Dyas, Compliance Project Manager

SUBJECT: **CAMPBELL COGENERATION PROJECT (93-AFC-3C)**
Staff Analysis of Petition to Amend Commission Decision

On November 2, 2018, the Sacramento Power Authority filed a petition with the California Energy Commission requesting to modify the Campbell Cogeneration Project by installing a Siemens wet compression system upgrade to increase electrical production during high ambient temperature conditions, replacing the two existing burners with upgraded Siemens HR3 burners, and increasing the start-up carbon monoxide emission limits to avoid exceeding permitted emission limits.

The Campbell Cogeneration Project is a 158-megawatt cogeneration facility that was certified by the Energy Commission on November 30, 1994, and began commercial operation in 1997. The facility is located at 3215 47th Avenue, about 1/3 mile west of the corner of 47th Avenue and Franklin Boulevard, and 1 mile west of Highway 99, in an unincorporated area of Sacramento County. The facility is on approximately 5.8 acres adjacent to the former Campbell Soup facility.

Energy Commission staff has reviewed the petition pursuant to Title 20, California Code of Regulations, section 1769 (Post Certification Amendments and Changes) and has concluded that the recovered electrical production and its fuel consumption on hot days would not result in a significant impact on the environment, or cause the project to not comply with applicable laws, ordinances, regulations, and standards. Staff intends to recommend approval of the petition at the January 9, 2019 Business Meeting of the Energy Commission.

The Energy Commission's webpage for this facility, https://www.energy.ca.gov/sitingcases/pre1999_page/index.php?xkm=ajdkha2385duhkasd146dsasjd5598fhajkhs, has a link to the petition and the Staff Analysis on the right side of the webpage in the box labeled "Compliance Proceeding." Click on the "Documents for this Proceeding (Docket Log)" option. If approved, the Energy Commission's Order approving this petition will also be available from the same webpage.

This letter has been mailed to the Commission's list of interested parties and property owners adjacent to the facility site. It has also been emailed to the Siting listserv. The listserv is an automated Energy Commission system by which information about this facility is emailed to parties who have subscribed. To subscribe, go to the Commission's

webpage for this facility, cited above, scroll down the right side of the project's webpage to the box labeled "Subscribe," and provide the requested contact information.

Any person may comment on the Staff Analysis. Those who wish to comment on the analysis are asked to submit their comments by January 4, 2019. To use the Energy Commission's electronic commenting feature, go to the Energy Commission's webpage for this facility, cited above, click on either the "Comment on this Proceeding" or "Submit e-Comment" link, and follow the instructions in the on-line form. Be sure to include the facility name in your comments.

Written comments may also be mailed or hand-delivered to:

California Energy Commission
Dockets Unit, MS-4
Docket No. **93-AFC-3C**
1516 Ninth Street
Sacramento, CA 95814-5512

All comments and materials filed with the Dockets Unit will be added to the facility Docket Log and become publically accessible on the Energy Commission's webpage for the facility.

If you have questions about this notice, please contact Mary Dyas, Compliance Project Manager, at (916) 651-8891, or by fax to (916) 654-3882, or via e-mail at mary.dyas@energy.ca.gov.

For information on participating in the Energy Commission's review of the petition, call Alana Mathews, Public Adviser, at (916) 654-4489 or (800) 822-6228 (toll-free in California) or send your e-mail to publicadviser@energy.ca.gov.

News media inquiries should be directed to the Energy Commission Media Office at (916) 654-4989, or by e-mail to mediaoffice@energy.ca.gov.

Mail List: 784
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CAMPBELL COGENERATION PROJECT (93-AFC-3C)

Petition to Amend Commission Decision

EXECUTIVE SUMMARY

Mary Dyas

INTRODUCTION

On November 2, 2018, the Sacramento Power Authority (SPA) filed a petition with the California Energy Commission requesting to modify the SPA Campbell Cogeneration Project (SPAC) by installing a Siemens wet compression system upgrade to increase electrical production during high ambient temperature conditions, replacing the two existing burners with upgraded Siemens HR3 burners, and increasing the start-up carbon monoxide (CO) emission limits to avoid exceeding permitted CO emission limits. Staff has completed its review of all materials received.

The purpose of the Energy Commission's review process is to assess whether the proposed amendment would have a significant impact on the environment or cause the project to not comply with applicable laws, ordinances, regulations, and standards (Cal. Code Regs., tit. 20, § 1769).

The scope of the analysis conducted by staff under Section 1769 is limited to an evaluation of the incremental impacts, if any, of the proposed modifications to the project on the environment, as well as a determination of the consistency of the proposed modifications with the applicable laws, ordinances, regulations, and standards (LORS). The analysis of the proposed changes must be consistent with the requirements of CEQA Guidelines section 15162, which limits additional environmental review to any "substantial changes" that will result in greater environmental impacts than what was analyzed in the Commission Final Decision. Under section 15162, the Energy Commission may rely on the Final Decision for areas that will not have substantial changes. Here, staff has concluded that the proposed modifications to the project do not include any new significant environmental impacts or a substantial increase in the severity of previously identified significant effects that would require additional analysis.

PROJECT LOCATION AND DESCRIPTION

The SPAC is a 158-megawatt (MW) cogeneration facility that was certified by the Energy Commission on November 30, 1994, and began commercial operation in 1997. Cogeneration ceased in 2016 (TN 210677) with the shutdown of the Campbell Soup facility next door.

The facility is located at 3215 47th Avenue, about 1/3 mile west of the corner of 47th Avenue and Franklin Boulevard and 1 mile west of Highway 99, in an unincorporated area of Sacramento County. The facility is on approximately 5.8 acres adjacent to the former Campbell Soup facility.

DESCRIPTION OF PROPOSED MODIFICATIONS

The modifications proposed in this petition to amend include the following:

- Install Siemens wet compression system upgrade to increase electrical production during high ambient temperature conditions.
- Replace the two existing burners with upgraded Siemens HR3 burners.
- Increase the start-up CO emission limits to avoid exceeding permitted CO emission limits.

SPAC modifications will not increase either:

(i) electrical generation in excess of 158 MW currently licensed for the facility, or

(ii) fuel consumption beyond existing licensed limits.

NECESSITY FOR THE PROPOSED MODIFICATIONS

The primary purpose and need for this amendment is to enable SPA to improve SPAC's ability to generate power during peak load periods in Sacramento's hot summers. A wet compression system would inject water into the gas turbine inlet, increasing the power output of the gas turbine (i.e., minimizes power loss experienced at high ambient temperatures) by reducing compressor inlet temperatures, intercooling the air mass flow within the compressor, and hence increasing mass flow throughout the turbine.

STAFF'S ASSESSMENT OF THE PROPOSED MODIFICATIONS

Energy Commission technical staff reviewed the proposed facility modifications for potential environmental effects and consistency with applicable LORS. A summary of staff's conclusions reached in each technical area are included in **Executive Summary Table 1**.

Staff determined that the technical area of **Air Quality** would be affected by the proposed project changes and has proposed new and revised conditions of certification. The requested changes in permit conditions would comply with applicable federal, state, and SMAQMD air quality laws, ordinances, regulations, and standards, and the amended project would not cause significant air quality impacts, provided that the modified Conditions of Certification are included. The details of the proposed changes to conditions of certification can be found in the attached **Air Quality** section in this Staff Analysis.

Staff has determined that the technical or environmental areas of **Biological Resources**, **Public Health**, **Transmission Line Safety and Nuisance**, **Transmission System Engineering**, and **Waste Management** are not affected by the proposed facility modifications.

Executive Summary Table 1
Summary of Impacts to Each Technical Area

Technical Areas Reviewed	Technical Area Not Affected	CEQA			Conforms with applicable LORS	Revised or New Conditions of Certification requested or recommended
		Potentially significant impact	Less than significant impact with mitigation	Less than significant impact		
Air Quality				X	X	X
Biological Resources	X					
Cultural Resources				X	X	
Efficiency and Reliability				X	X	
Facility Design				N/A[a]	X	
Geological and Paleontological Resources				X	X	
Hazardous Materials Management				X	X	
Land Use				X	X	
Noise				X	X	
Public Health	X					
Socioeconomics				X	X	
Soil and Water Resources				X	X	
Traffic and Transportation				X	X	
Transmission Line Safety and Nuisance	X					
Transmission System Engineering	X					
Visual Resources				X	X	
Waste Management	X					
Worker Safety and Fire Protection				X	X	

a N/A = Not Applicable

For **Cultural Resources**, **Efficiency and Reliability**, **Facility Design**, **Geological and Paleontological Resources**, **Hazardous Materials Management**, **Land Use**, **Noise**, **Socioeconomics**, **Soil and Water Resources**, **Traffic and Transportation**, **Visual Resources**, and **Worker Safety and Fire Protection**, staff has concluded that the proposed changes would not result in a significant impact on the environment or cause the project to not comply with applicable LORS. Staff notes the following for these areas:

CULTURAL RESOURCES

There are no known cultural resources on the project site or the laydown area that could be impacted by the proposed modifications. Several archaeological discoveries occurred during the construction of the original project; none of these cultural resources were considered eligible to the historical registers. In the event that cultural resources are encountered during construction of the wet compression system and associated facilities, implementation of existing Cultural Resources Conditions of Certification **CUL-1**, **CUL-2**, and **CUL-3** would ensure impacts remain less than significant.

While state and local LORS have been updated since the Commission Decision in 1994, the project, as modified, would remain in compliance with LORS as they pertain to Cultural Resources. No changes to conditions of certification are required for this project modification.

EFFICIENCY AND RELIABILITY

Staff notes that the burner design enhances the fuel/air mixing while increasing the fuel/air mixture's velocity through the burner. The modifications would not increase the facility's fuel consumption above the licensed levels. These performance advantages would make the unit more efficient and more reliable. The existing conditions of certification in the facility license related to **Efficiency** and **Reliability** require reporting and maintaining logs of equipment failure, plant outages, annual energy production, and efficiency rates achieved by the facility. The modifications proposed in this petition would not affect the project's ability to remain in compliance with these conditions of certification.

FACILITY DESIGN

Installation of the foundation, skid structure, and connections associated with the wet compression equipment must comply with the California Building Code (CBC) and related engineering LORS. Implementation of the existing **Facility Design** conditions of certification in the facility license would ensure continued compliance with the CBC and LORS.

GEOLOGY AND PALEONTOLOGY

To evaluate potential impacts to paleontologic resources from site disturbance, staff reviewed previous investigations and the Commission Decision (CEC 1994, SPA 2015, Fugro 2016). These sources indicated that no significant fossil discoveries were made at the site and that it is highly unlikely that significant paleontological resources would

be encountered at shallow depths beneath the site. Any potential impacts due to excavation in the limited area of disturbance would be adequately managed if the existing Conditions of Certification **PAL- 1** through **PAL-3** are implemented when paleontologic resources are encountered.

The proposed construction would not require any change to the conditions of certification related to paleontological resources adopted by the Energy Commission in its 1994 Decision (CEC 1994). Staff also concludes that compliance with current geology LORS and with Condition of Certification **GEO-3** (CEC 2016a and 2016b) would ensure the effects of geologic hazards at the site would remain less than significant.

HAZARDOUS MATERIALS MANAGEMENT

No extremely hazardous or regulated hazardous materials will be used on site specifically for the replacement of the combustion turbine burner and installation of the wet compression system. Therefore, with petitioner's continued compliance with existing conditions of certification, **HAZ-1** specifically, the proposed modification would not have a significant effect on the environment and the facility would continue to comply with all applicable LORS.

LAND USE

The proposed modification to install a wet compression system upgrade and replace the two existing burners would have a less than significant land use impact. The proposed modifications would comply with the development standards for industrial zoning set forth in the County of Sacramento Zoning Ordinance and, therefore, comply with Condition of Certification **LAND-1** in the Commission's 1994 Decision.

NOISE

Construction work would be limited to installation of the wet compression equipment. Construction work would be temporary and would occur during the daytime hours in accordance with the Sacramento County Code, Chapter 6.68 Noise Control. The replacement of burners would be internal to the turbine unit and would not involve construction. Operational noise levels would not increase at the nearest residences (more than 1,200 feet away). Thus, the project would remain in compliance with the existing conditions of certification in the facility license related to **Noise** and would not result in any significant noise impact.

SOCIOECONOMICS

The proposed modification to install the wet compression system would require approximately eight workers and take one week to complete. From a socioeconomics standpoint, the proposed modifications would have insignificant workforce-related impacts on housing and community services.

SOIL AND WATER RESOURCES

Soil Erosion and Water Quality

All of the proposed modifications are within the boundaries of the originally analyzed and certified project. The potential environmental impacts will not be different than what was originally analyzed for the final decision. Staff therefore concludes that the original Drainage, Erosion, and Sedimentation Control documents, required in accordance with Conditions of Certification **SOILS-1** and the General Industrial Activities Storm Water permit required by Condition of Certification **WATER-3,** are adequate for the proposed modifications. However, the plans should be updated to show the proposed changes and necessary storm water controls.

Water Supply

Installation of the concrete pad needed for the wet compression system would require a small amount of water for concrete mixing and equipment washout. Since the location where the pad would be installed is already paved, no water would be needed for dust suppression. Based on a 15 percent by weight of water fraction in a typical concrete mix, staff estimates the amount of water needed for the concrete mix to be less than 300 gallons. Assuming another 500 gallons for equipment washout and other miscellaneous needs, staff estimates the amount of water needed for the installation of the pad to be less than 1,000 gallons. Use of such a small amount of water would not have a significant impact on water resources.

Operation of the wet compression system would result in an increase in potable water consumption of approximately 20 acre-feet per year (AFY) (SPA 2018). The project is currently licensed to use 1,314 AFY of potable water. However, over the past 7 years since the Campbell Soup facility closed and cogeneration steam delivery was no longer needed, the average project consumption has been about 900 AFY of potable water. An increase of 20 AFY in potable water consumption constitutes a small fraction of the project's historic consumption and would not cause the project to exceed its approved water limit. The limit of 1,314 AFY of potable water would not change and the project would continue to operate within that limit. In addition, in 2016 the project was approved to replace potable water supply for evaporative cooling with recycled water (CEC 2016b). Replacing potable water used for evaporative cooling with recycled water would result in significant saving of freshwater that would be made available for other uses within the service area. Hence, the expected increase of about 20 AFY in potable water consumption would be substantially smaller than the savings in potable water realized by the approved switch to recycled water. There would be no impacts to the water supply from the proposed modifications.

There would be no changes to the volumes or quality of storm water or sanitary wastewater from the proposed modifications. Existing conditions of certification are adequate to ensure there would be no significant adverse impacts.

TRAFFIC AND TRANSPORTATION

Construction equipment and workers associated with the proposed modifications would generate approximately eight total one-way worker vehicle daily trips and six truck deliveries over the course of approximately one week. This amount of construction traffic would not impact existing roadway levels of service or intersection delays.

VISUAL RESOURCES

The proposed modifications would not be visible from any offsite locations. With implementation of the modifications, a change in the existing exhaust stack visible plumes is not anticipated. There would be no impacts to visual resources.

WORKER SAFETY AND FIRE PROTECTION

By continuing to comply with the existing conditions of certification, the petitioner's proposed replacement of the combustion burner and installation of the wet compression system would not have a significant effect on the environment, and would continue to comply with all applicable LORS. Construction activities would comply with worker safety and fire safety requirements already contained in health and safety plans utilized for construction of the main facility per Condition of Certification **SAFETY-1**.

ENVIRONMENTAL JUSTICE

Environmental Justice – Figure 1 shows 2010 census blocks in the six-mile radius of the Campbell Cogeneration Project with a minority population greater than or equal to 50 percent. The population in these census blocks represents an environmental justice (EJ) population based on race and ethnicity as defined in the United States Environmental Protection Agency's *Guidance on Considering Environmental Justice During the Development of Regulatory Actions*. Staff conservatively obtains demographic data within a six-mile radius around a project site based on the parameters for dispersion modeling used in staff's air quality analysis. Air quality impacts are generally the type of project impacts that extend the furthest from a project site. Beyond a six-mile radius, air emissions have either settled out of the air column or mixed with surrounding air to the extent the potential impacts are less than significant. The area of potential impacts would not extend this far from the project site for most other technical areas included in staff's EJ analysis.

Based on California Department of Education data in the **Environmental Justice – Table 1**, staff concluded that the percentage of those living in the Sacramento City Unified School District and Washington Unified School District (in a six-mile radius of the project site) and enrolled in the free or reduced price meal program is larger than those in the reference geographies (Sacramento County and Yolo County, respectively), and thus are considered an EJ population based on low income as defined in *Guidance on Considering Environmental Justice During the Development of Regulatory Actions*. **Environmental Justice – Figure 2** shows where the boundaries of

the school districts are in relation to the six-mile radius around the Campbell Cogeneration Project site.

Environmental Justice – Table 1
Low Income Data within the Project Area

SACRAMENTO COUNTY SCHOOL DISTRICTS IN SIX-MILE RADIUS	Enrollment Used for Meals	Free or Reduced Price Meals	
Elk Grove Unified	63,297	34,107	53.9%
Sacramento City Unified	46,595	32,513	69.8%
Reference Geography			
Sacramento County	245,910	148,221	60.3%
YOLO COUNTY SCHOOL DISTRICTS IN SIX-MILE RADIUS	**Enrollment Used for Meals**	**Free or Reduced Price Meals**	
Washington Unified	8,281	5,422	65.5%
Reference Geography			
Yolo County	30,067	15,754	52.4%

Source: CDE 2018. California Department of Education, DataQuest, Free or Reduced Price Meals, District level data for the year 2017-2018, <http://dq.cde.ca.gov/dataquest/>.

The following technical areas (if affected) consider impacts to EJ populations: Air Quality, Cultural Resources (indigenous people), Hazardous Materials Management, Land Use, Noise, Public Health, Socioeconomics, Soil and Water resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, and Waste Management.

ENVIRONMENTAL JUSTICE CONCLUSIONS

For the technical areas of **Cultural Resources**, **Hazardous Materials Management**, **Land Use**, **Noise**, **Socioeconomics**, **Soil and Water Resources**, **Traffic and Transportation**, and **Visual Resources**, staff concludes that impacts would be less than significant, and thus would be less than significant on the EJ population represented in **Environmental Justice – Figure 1** and **Figure 2**. For **Air Quality**, staff has determined that the modified project would not cause significant air quality impacts for any population in the project's six-mile radius, including the EJ population. Impacts to the EJ population would be less than significant.

STAFF RECOMMENDATIONS AND CONCLUSIONS

Staff concludes that the following required findings mandated by Title 20, section 1769(a)(3) of the California Code of Regulations can be made and will recommend approval of the petition by the Energy Commission:

A. The modified project will not have a significant impact on the environment;

B. The facility will remain in compliance with all applicable laws, ordinances, regulations and standards;

C. The changes will be beneficial to the project owner and the public because they will improve SPAC's ability to generate power during peak load periods in Sacramento's hot summers; and

D. There has been a substantial change in circumstances since the Energy Commission certification justifying the changes. The proposed changes would allow the SPAC to continue to run efficiently, while meeting environmental goals and local electrical demand during warm ambient temperatures.

REFERENCES

CEC 1994, Commission Decision on the Application for Certification of the Sacramento Power Authority at Campbell Cogeneration Project, Docket No. 93-AFC-03, November 30, 1994.

CEC 2016a, California Energy Commission Staff Response to July 5, 2016 Comments on the Staff Analysis of the Campbell Cogeneration Project Petition to Amend Seeking Approval of Option to Use Recycled Water in the Cooling Towers, July 8, 2016. (TN 212202)

CEC 2016b, California Energy Commission Order Approving Petition to Amend to Replace Potable Water with Recycled Water, Docket No. 93-AFC-03C, July 13, 2016. (TN 212335).

CEC 2015. California Energy Commission Staff Analysis on Petition to Amend (Recycled Water Use) Campbell Cogeneration Project (93-AFC-3C). (TN 211785).

Fugro 2016. Geotechnical Study Sacramento Power Authority Cogen III Additions Sacramento, California, December 5, 2016.

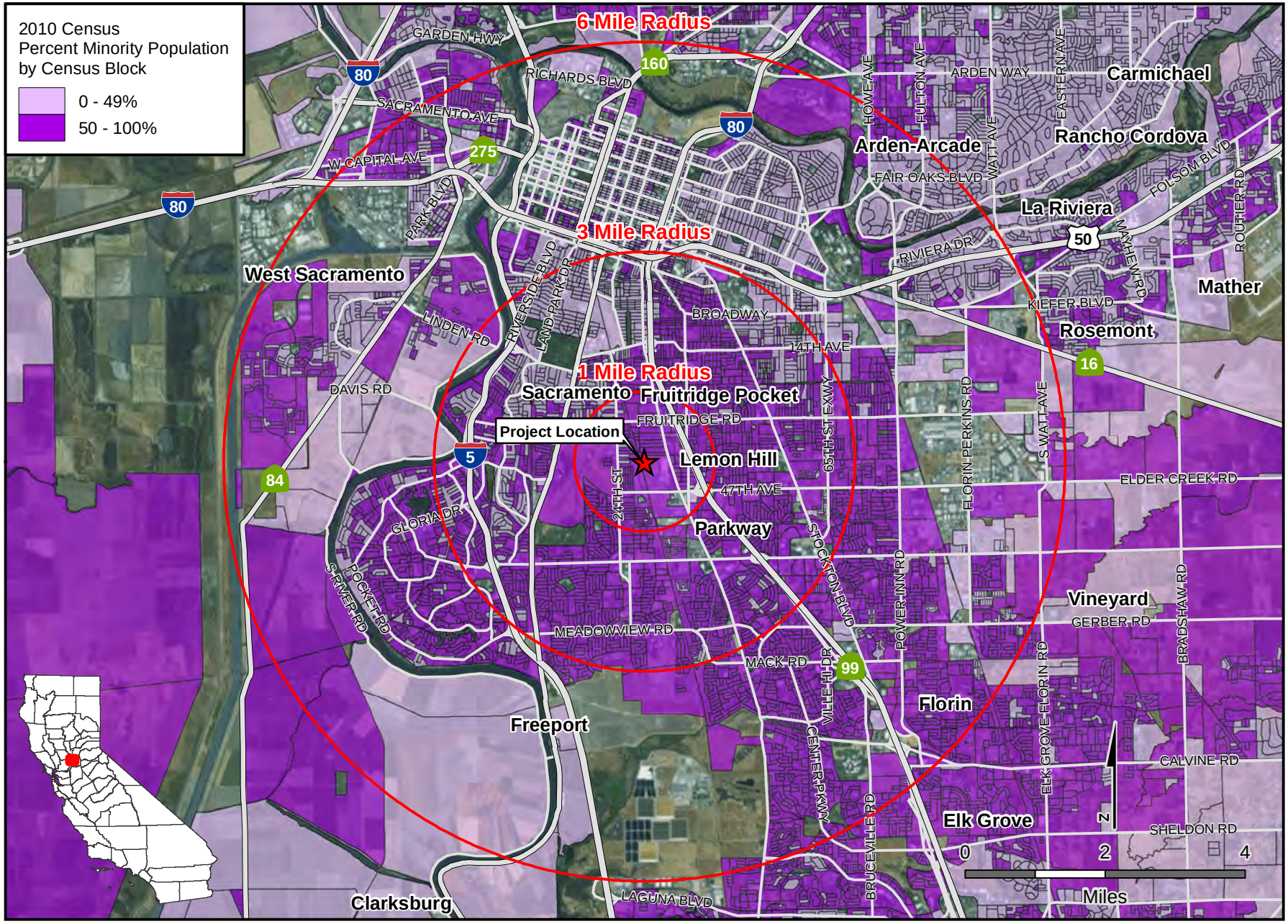
SPA 2015, Sacramento Power Authority, Petition for Modification, Use of Recycled Water and Associated Facilities for the Sacramento Power Authority's Campbell Cogeneration Project, Sacramento, California (93-AFC-03C), November 19, 2015. (TN 206750).

SPA 2016. Sacramento Power Authority. *Use of Recycled Water and Associated* Facilities for the Sacramento Power Authority's Campbell Cogeneration Project. Data Response Set 3. Confidential Filing. 93-AFC-3C. January 6, 2016. (TN 207726).

SPA 2018, Sacramento Power Authority, Petition for post-certification License Amendment for Wet Compression and Burner Replacement Project for the Campbell Cogeneration Project, Sacramento, California (93-AFC-03C), November, 2018. (TN 225779).

ENVIRONMENTAL JUSTICE POPULATION FIGURE

SPA Campbell Cogeneration - Census 2010 Minority Population by Census Block



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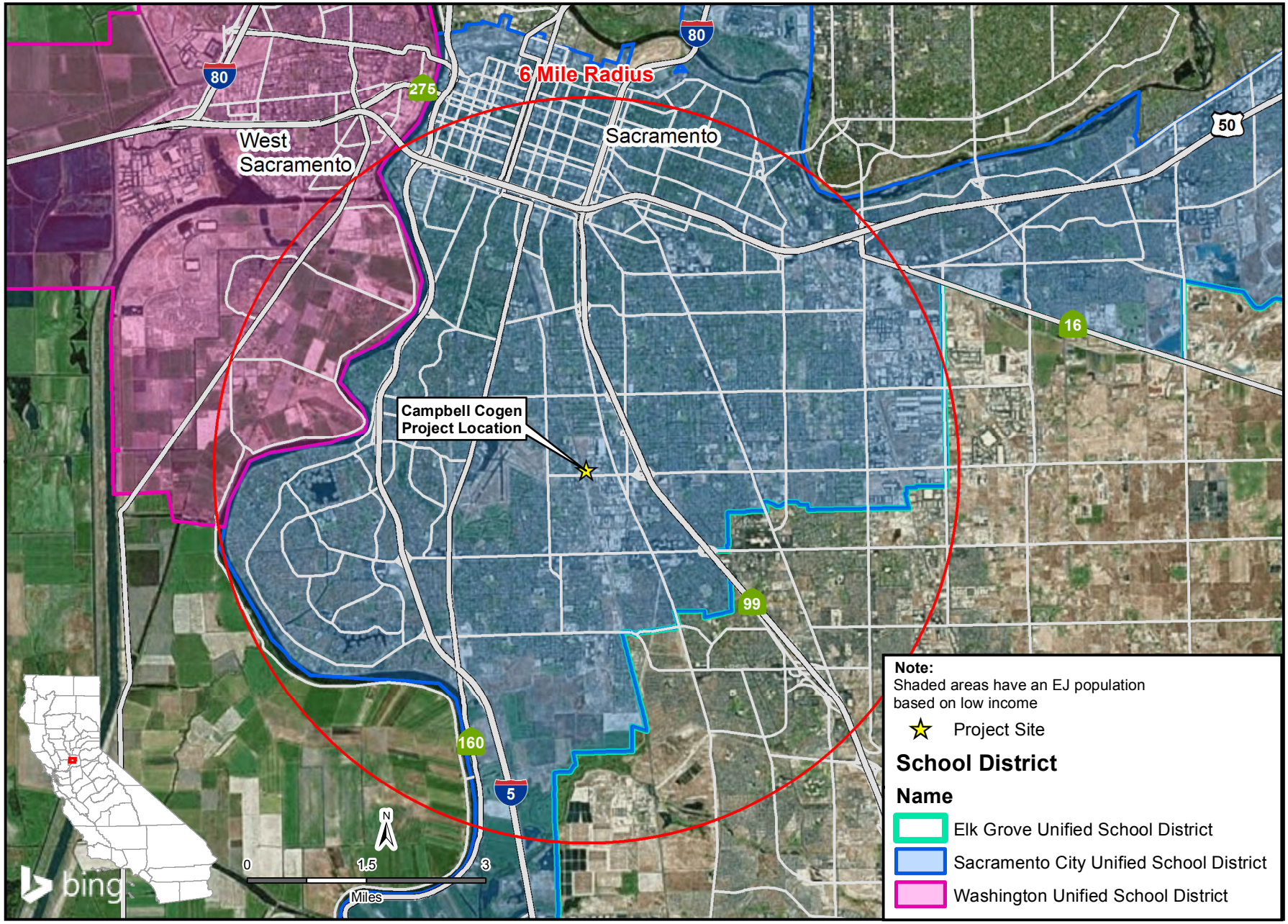
SOURCE: Census 2010 PL 94-171 Data

ENVIRONMENTAL JUSTICE - FIGURE 2

Campbell Cogen - Enironmental Justice Population Based on Low Income



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SOURCE: TIGER Data, California Department of Education Data, DataQuest

CAMPBELL COGENERATION PROJECT (93-AFC-3C)
Petition to Amend Commission Decision
AIR QUALITY
Jacquelyn Record

INTRODUCTION

On November 2, 2018, the Sacramento Power Authority (SPA) submitted a petition to amend (TN 225779) to the California Energy Commission (Energy Commission) to enable wet compression, a modification that would allow for an increase in power output of the gas turbine making the unit more efficient during hot days. The amendment is also requesting to allow for an increase in start-up CO emission rates at the SPA's Campbell Cogeneration Project (SPAC). The currently applicable Air Quality (AQ) conditions of certification evolved from the original November 30, 1994 Energy Commission Decision (Decision) (CEC Pub. No. P800-94-011, CEC 1994), as amended by Order No. 97-1217-05 (CEC 1997), Order No. 98-04-15-03 (CEC 1998 Order No. 99-1215-08 (CEC 1999), Order No. 09-826-4 (CEC 2009) and Order No 16-0713-5 (CEC 2016).

The proposed changes in this amendment request that would **not** necessitate any modifications to the currently applicable Air Quality conditions of certification include the following:

- Install Siemens wet compression system update in order to reclaim electricity production typically lost during high ambient temperature conditions.
- Replace the two existing burners with upgraded Siemens model HR3 burners, and

The proposed change in this amendment request that **would** necessitate a modification to currently applicable Air Quality conditions of certification includes the following:

- Increase the start-up carbon monoxide (CO) emission limit to reflect actual start-up emissions.

On November 15, 2018, Sacramento Metropolitan Air Quality Management District (SMAQMD) issued an Engineering Evaluation of the proposed changes (SMAQMD 2018a) and a preliminary "Authority to Construct" (ATC, SMAQMD 2018b) modifying the existing SMAQMD permit conditions to allow for an increase in start-up CO emission limits. The proposed modification to increase CO emission limits during start-up would modify some current Air Quality conditions of certification. This analysis details needed changes in the conditions of certification to reflect SMAQMD's current ATC conditions and SPA's proposed modifications.

As shown in **Air Quality Tables 4** and **7**, SMAQMD added PM2.5 to their project evaluation by applying a ratio of 0.998 PM2.5 to PM10 emission fraction to establish historical and proposed PM2.5 emissions. PM2.5 is considered a subset of PM10. Consistent with Energy Commission evaluations, staff conservatively assumes PM2.5 emissions are equivalent to PM10 emissions for natural gas emissions. This is

supported by studies evaluating in-stack testing results. Staff assumes as part of this analysis that all PM10 equals PM2.5. There would be no increase in any other pollutant, other than CO emissions, in the facility's potential to emit (PTE). This amendment request does not affect PM10 or PM2.5 emissions. However, the updated permit conditions from SMAQMD now include PM2.5 in addition to PM10 so this analysis incorporates PM2.5 into applicable conditions of certification so that Energy Commission conditions of certification would be consistent with corresponding District permit conditions.

This staff analysis evaluates the consistency of all currently proposed changes with the Final Decision and subsequent amendments and evaluates whether the project, as modified, would remain in compliance with applicable laws, ordinances, regulations, and standards (LORS) (Title 20, California Code of Regulations, section 1769).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS COMPLIANCE

The SMAQMD reviewed the proposed project changes and determined the proposed changes would comply with their regulations. Energy Commission staff reviewed both the permit evaluation and preliminary ATC which evaluate and incorporate the proposed changes. Staff evaluated the proposed changes for consistency with all federal, state, and SMAQMD laws, ordinances, regulations, and standards (LORS).

Air Quality Table 1 includes a summary of the LORS applicable to the PTA. The conditions of certification in the Energy Commission Final Decision, along with those conditions of certification amended thereafter, ensure that the facility would remain in compliance with all applicable LORS.

Air Quality Table 1
Laws, Ordinances, Regulations, and Standards

APPLICABLE LAW	DESCRIPTION
Federal	**U.S. Environmental Protection Agency (EPA)**
Title 40 Code of Federal Regulations (CFR) Part 50 (National Primary and Secondary Ambient Air Quality Standards)	National Ambient Air Quality Standards (NAAQS) are set in this part. NAAQS define levels of air quality necessary to protect public health.
Title 40 CFR Part 51 (Requirements for Preparation Adoption and Submittal of Implementation Plans)	Requires emission reporting and control strategies for the attainment and maintenance of national ambient air quality standards.
Title 40 CFR Part 52	Prevention of Significant Deterioration (PSD) requires review and facility permitting for construction of new or modified major stationary sources of pollutants at locations where ambient concentrations attain the NAAQS. PSD would not be required for the proposed upgrade since CO emissions would not exceed levels of significance.

APPLICABLE LAW	DESCRIPTION
Title 40 CFR Part 60, Subpart A	Outlines general requirements for facilities subject to standards of performance including notification, work practice, monitoring and testing requirements. Continued compliance is expected.
40 CFR 60, Subpart GG	NSPS GG, *Standards of Performance for Stationary Gas Turbines*, applies to stationary gas turbines with a heat input at peak load equal to or greater than 10.7 gigajoules (10 MMBtu) per hour, based on the lower heating value of the fuel fired. Based on the construction date (pre-February 2005) and the heat input at peak loads, the combustion turbine at SPAC is subject to NSPS Subpart GG. The project is not a "modification" under NSPS because it does not result in an increase in hourly emissions of a regulated NSPS pollutant per 40 CFR 60.14. SPAC will continue to comply with all applicable NSPS Subpart GG requirements as outlined in the current Title V permit.
40 CFR 60, Subpart TTTT	Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units. Establishes emission standards for units installed after January 8, 2014. The modification would not result in the turbine being subject to this Subpart.
Title 40 CFR Part 61	Establishes National Emission Standards for Hazardous Air Pollutants (NESHAPS) provisions for specified pollutants. The list of adopted NESHAPS was reviewed. No standards were found that are applicable to the proposed changes.
40 CFR 63, Subpart YYYY	National Emission Standards for Hazardous Air Pollutants for Stationary Gas Turbines. This subpart establishes requirements for facilities that are major sources of hazardous air pollutants (HAPS). The facility is not considered a major source of HAPS since HAP emissions are less than 25 tons/year in combination and 10 tons/year for any single HAP.
40 CFR 70	State Operating Permit Program. Part 70 establishes the Title V permitting program. This facility currently operates under a Title V permit. The project is being evaluated under SMAQMD enhanced NSR. Continued compliance is expected.
40 CFR 72	Permits Regulation. Part 72 establishes the Acid Rain Permit Program. The acid rain program requirements establish controls for sulfur dioxide (SO_2) and NOx emissions from fossil fuel-fired combustion used to generate electricity. Facilities are required to cover SO_2 emissions with allowances or offsets. This facility is subject to the acid rain program. The facility would continue to comply with program requirements.
State	**California Air Resources Board and Energy Commission**
California Health & Safety Code (H&SC) §41700 (Nuisance Regulation)	Prohibits discharge of such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance. Continued compliance is expected.

APPLICABLE LAW	DESCRIPTION
H&SC §40910-40930 (District Plans to Attain State Ambient Air Quality Standards)	State Ambient Air Quality Standards should be achieved and maintained. The permitting of the source needs to be consistent with the approved clean air plan. The SMAQMD NSR program needs to be consistent with regional air quality management plans.
H&SC §42301.6 (AB 3205)	Establishes noticing requirements for projects within 1,000 feet of a school site. The facility is not located within 1,000 feet of a school site and therefore the public noticing requirements do not apply.
California Code of Regulations	Greenhouse Gases Emission Performance Standard (EPS), Article 1 –Provisions Applicable to Power Plants 10 megawatts (MW) and Larger (SB1368) —The facility is considered a deemed-compliant power plant.
Local	**Sacramento Metropolitan Air Quality Management District**
Regulation I – General Provisions and Definitions	Outlines general requirements such as definitions, circumvention, exceptions, alternative compliance, minor violations, etc.
Regulation II - Permits Rule 201	General Permit Requirements — Establishes procedures for the review of new sources of air pollution and the modification of existing sources. Replacing or altering equipment that causes or controls the emissions of air pollutants requires an ATC from the SMAQMD. The facility submitted their application to the SMAQMD for the installation of the upgraded components and an increase in CO during start-up. The ATC for the installation of the components will be issued by SMAQMD.
Regulation II - Permits Rule 202	New Source Review — Provides for the issuance of ATCs and PTOs. Provides mechanisms, including best available control technology (BACT), emission offsets, and impact analysis to issue ATCs without interfering with the attainment or maintenance of the ambient air quality standards (AAQS). The SMAQMD reviewed SPA's proposal applying the principles of NSR. See analysis for more details.
Regulation II - Permits Rule 203	Prevention of Significant Deterioration (PSD) – Establishes requirements for attainment emissions. PSD requirements apply on a pollutant specific basis for major stationary sources. Twenty-eight source categories are subject to PSD requirements for attainment pollutants if a facility's annual emissions exceed established thresholds. SMAQMD has delegation of PSD authority from the United States Environmental Protection Agency (U.S. EPA). In addition, the facility emissions would not exceed PSD thresholds. Since this is not a major stationary source (for PSD purposes), a PSD analysis is not required.

APPLICABLE LAW	DESCRIPTION
Regulation II - Permits Rule 207	Title V Federal Operating Permit Programs – SPAC is an existing Title V facility. SPA requested the application be reviewed through the enhanced NSR process. Enhanced NSR allows the SMAQMD to administratively amend the Title V permit to reflect the proposed project. The permit action is subject to a 30-day public notice and 45-day U.S. EPA review process.
Regulation II - Permits Rule 208	Acid Rain – Incorporates by reference provisions of 40 CFR Parts 72, 75, and 76 for purposes of implementing an acid rain program that meets the requirements of Title IV of the Federal Clean Air Act. Rule 208 requires the facility to hold emission allowances for SOx and to monitor and report SOx, NOx, and carbon dioxide (CO_2) emissions. SPA operates SMAQMD approved Continuous Emission Monitoring System (CEMS) and Continuous Parameter Monitoring System (CPMS) to monitor and record information needed to demonstrate compliance with the Title IV and Title V permits. To date, SPA Cogen has not had an exceedance in emissions, failed to hold sufficient allocations, or failed to surrender allocations in a timely manner. Continued compliance is expected.
Regulation II - Permits Rule 214	Federal New Source Review – Establishes requirements for new major stationary sources or modifications to existing major stationary sources. Requires an analysis for BACT and offsets. SPA requested enhanced NSR.
Regulation II - Permits Rule 217	Public Notice Requirements for Permits – Provides a mechanism for public notification and review of ATCs and PTOs. Public notice is triggered under enhanced NSR.
Regulation IV - Prohibitions Rule 401	Ringelmann Chart — Limits visible emissions opacity to less than 20 percent (or Ringelmann No. 1) with specific exemptions. Properly maintained turbines are expected to meet the requirements. SMAQMD would inspect the equipment prior to issuance of the PTO and on a regular basis afterwards.
Regulation IV - Prohibitions Rule 402	Nuisance — Prohibits the discharge of air contaminants that could cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public. SMAQMD regulates toxic air contaminants (TACs) under this rule. SMAQMD toxics policy requires proposed projects with TAC emission increases to perform a screening-level health risk assessment. SPA was evaluated for health risk when it was originally permitted. However, since this evaluation was performed under the previous risk assessment guidelines, a screening HRA utilizing the newer risk calculation methodologies is performed here. The details of the assessment can be found in the **Public Health Section** of this analysis.
Regulation IV - Prohibitions Rule 406	Specific Contaminants — Established limits for emissions of combustion contaminants. The rule's limits for SO_2 and PM are 0.2% SO_2 by volume and 0.1 grains/cubic foot (cf) at 12% CO_2, respectively. Emissions from the turbine comply with Rule 406.

APPLICABLE LAW	DESCRIPTION
Regulation IV - Prohibitions Rule 413	Stationary Gas Turbines — Prohibits the emission of NOx in excess of 9 parts per million by volume (ppmv) at 15 percent oxygen (15% O_2) based on a 15-minute average with exceptions for specific excursions. Rule 413 is applicable to the SPA turbine, which has a maximum electrical output rating of 103 MW and operates up to 8760 hours/year. At a permitted NOx concentration of 3 ppmvd corrected to 15% O_2 averaged over three hours, the SPAC turbine complies with Rule 413 NOx limit.
Regulation IV - Prohibitions Rule 420	Sulfur Content of Fuels — Limits the sulfur content in any gaseous fuel to 50 gr/100 cf calculated as hydrogen sulfide (H_2S). Pipeline quality natural gas in Sacramento County has a sulfur content of approximately 0.22 grains per 100 cubic foot. Therefore, the turbine will comply with the requirement of this rule.

SETTING

AMBIENT AIR QUALITY STANDARDS

The U.S. EPA and the California Air Resources Board (ARB) have both established allowable maximum ambient concentrations of criteria air pollutants. Ambient air quality standards are designed to protect people who are most susceptible to respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and people engaged in strenuous work or exercise. The ambient air quality standards are also set to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The California Ambient Air Quality Standards, established by ARB, are typically lower (more stringent) than the federally established NAAQS. See **Air Quality Table 2.** The averaging time for the various ambient air quality standards (the duration of time the measurements are taken and averaged) ranges from one hour to one year. The standards are read as a concentration, in parts per million (ppm), parts per billion (ppb), or as a weighted mass of material per unit volume of air, in milligrams (mg) or micrograms (µg) of pollutant in a cubic meter (m^3) of ambient air, drawn over the applicable averaging period.

Air Quality Table 2
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	8 Hour	0.070 ppm (137 µg/m^3)[a]	0.070 ppm (137 µg/m^3)
	1 Hour	—	0.09 ppm (180 µg/m^3)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual	53 ppb (100 µg/m^3)	30 ppb (57 µg/m^3)
	1 Hour	100 ppb (188 µg/m^3)[b]	180 ppb (339 µg/m^3)
Sulfur Dioxide (SO_2)	24 Hour	—	0.04 ppm (105 µg/m^3)
	3 Hour	0.5 ppm (1300 µg/m^3)	—
	1 Hour	75 ppb (196 µg/m^3)[c]	0.25 ppm (655 µg/m^3)
Respirable Particulate Matter (PM10)	Annual	—	20 µg/m^3
	24 Hour	150 µg/m^3	50 µg/m^3
Fine Particulate Matter (PM2.5)	Annual	12 µg/m^3	12 µg/m^3
	24 Hour	35 µg/m^3 [b]	—
Sulfates (SO_4)	24 Hour	—	25 µg/m^3
Lead	30 Day Average	—	1.5 µg/m^3
	Rolling 3-Month Average	1.5 µg/m^3	—
Hydrogen Sulfide (H_2S)	1 Hour	—	0.03 ppm (42 µg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.01 ppm (26 µg/m^3)
Visibility Reducing Particulates	8 Hour	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

Source: ARB 2018b, U.S. EPA 2018b
[a] Fourth- highest maximum 8 – hour concentration, averaged over 3 years.
[b] 98th percentile of daily maximum value, averaged over 3 years.
[c] 99th percentile of daily maximum value, averaged over 3 years.

AMBIENT AIR QUALITY ATTAINMENT STATUS

Federal and state ambient air quality attainment status designations have not been revised since the latest SPAC amendment. For convenience, staff includes **Air Quality Table 3**, which summarizes the area's current attainment status for AAQS for the SMAQMD.

Air Quality Table 3
SMAQMD Attainment Status

Pollutants	Attainment Status	
	Federal Classification	**State Classification**
Ozone (1-hr)	Attainment[a]	**Nonattainment**
Ozone (8-hr)	**Nonattainment[b]**	**Nonattainment**
CO	Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified/Attainment	Attainment
PM10 (24-hour)	Attainment	**Nonattainment**
PM10 (annual)	----------	**Nonattainment**
PM2.5 (24-hour)	**Nonattainment**	----------
PM2.5 (annual)	Attainment	Attainment
Lead	Attainment	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particulates	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	Unclassified

Source: SMAQMD website, ARB 2018a, U.S. EPA 2018a.
Note: Unclassified means the area is treated as if it is in attainment.
[a] 1-hour NAAQ ozone standard was revoked effective June 15, 2005.
[b.] 2008 8-hour standard designation severe, 2015 8-hour NAAQ standard designation moderate.

BACKGROUND AND AMENDMENT DESCRIPTION

The petitioner is requesting approval of two modifications at the facility. The first is to perform a “Wet Compression Upgrade”. This modification is an equipment addition and replacement which will result in increased efficiency. The second is an increase in the hourly start-up and quarterly CO emissions that are associated with the combustion turbine and duct burner. Both the combustion turbine and duct burners are controlled by air pollution control devices. One is a selective catalytic reduction (SCR) system which reduces nitrogen oxides (NOx) emissions and the second is an oxidation catalyst which reduces carbon monoxide (CO) emissions. The second requested change triggers a BACT analysis for CO which was conducted by SMAQMD. The result is that SMAQMD imposes a lower emission rate (lb/hr) at steady state. Neither the Wet Compression Upgrade nor the start-up CO emissions change would result in an increase in the maximum fuel usage. The Wet Compression Upgrade will result in an increase in megawatt (MW) output during the hottest portion of the year with a slight improvement in heat rate. Both modifications are explained more fully in the section below.

ANALYSIS

This analysis includes the evaluation of the emissions related to the modifications. The only associated emissions change relates to the amendment request for CO, which is explained below. The relevant SMAQMD permit conditions have been reviewed by Energy Commission staff (staff). The resulting proposed modifications to the project's conditions of certification are shown in this analysis. Staff concludes that changes requested by SPA would comply with applicable federal, state, and SMAQMD air quality LORS and the amended project would not cause significant air quality impacts, provided that the recommended conditions of certification are included as provided below.

WET COMPRESSION UPGRADE

The petitioner requests to install a "Wet Compression Upgrade" to the combustion turbine. During high ambient temperatures this process would introduce demineralized water into the compressor inlet in a controlled and sequenced manner. As the air and water are mixed and compressed, the water evaporates and effectively intercools the front stages of the compressor making the compression process more efficient. By improving the efficiency of the compressor and increasing the mass flow through the turbine, more power from the turbine is available to drive the electric generator. The result is a greater amount of available power output in conjunction with an additional benefit of improved heat rate. This upgrade requires the installation of a high pressure pump skid and new "HR3 Burners" in the turbine combustor.

The wet compression system, consisting of high pressure pumps, motors, filters, and monitoring systems connected to the wet compression injection system grid, is mounted in the compressor inlet duct. Wet Compression is effective at recovering power loss experienced at high ambient temperatures. According to the application, "Siemens provides a power increase guarantee for the Wet Compression Upgrade Project of 10.5 MW (+/- 500 kW) at an ambient condition of 105º F and 20% relative humidity, and assumes no evaporative cooler or power augmentation (PAG) water contribution" (SPA 2018a). The wet compression equipment would be installed on the northern side of the air inlet on a skid which would be located on the project site.

Siemen's HR3 burners are the turbine vendor's direct replacement for the currently installed burners in the SPAC combustion turbine and are a mandatory retrofit required by the wet compression system. The HR3 burner design enhances the mixing of fuel gas and combustion air during the gas premix mode. The design also reduces turbulence of the combustion airflow while increasing its velocity through the burner. The manufacturer has verified that the burners must be replaced as part of the wet compression installation. The HR3 burner design enhances the fuel/air mixing while increasing the fuel mixture's velocity through the burner. These two enhanced features contribute to a more stable combustion flame. The HR3 burners also include upgraded corrosion-resistant materials to reduce maintenance cycles (SPA 2018a).

The petitioner expects to optimize the system performance to achieve an estimated 20 MW increase while operating in "mixed mode," with both PAG and Wet Compression operating simultaneously at high ambient temperatures. There is no expected increase

in fuel usage or emissions as a result of this upgrade. The installation and operational related impacts associated with this upgrade would not result in any significant Air Quality (AQ) or greenhouse gas (GHG) impacts.

Construction Related Emissions

It is expected that on-site construction required for the installation of the wet compression system would take approximately one week with up to eight construction workers and six delivery trucks (SPA 2018a). Construction would occur within the plant site, in a paved area, which would minimize fugitive dust emissions. The level of construction activity that would be associated with the installation of the wet compression system is consistent with other routine maintenance performed on the project. The construction related impacts associated with this upgrade would not result in any significant construction AQ or GHG impacts.

CO START-UP EMISSION INCREASE

SPA is requesting a CO emission rate increase in their operating permit. The changes to the CO emissions do not represent an increase in capacity nor fuel usage but rather changes in monitoring equipment and changes in how the turbine is being dispatched. The following is a summary of the proposed changes.

CEMS Analyzer Replacement

In the fall of 2017, a new Dual Range CO analyzer was installed with a new range of 0 - 2,000 part per million (ppm) to be in accordance with Environmental Protection Agency (EPA) performance Specification 4A. The previous Dual Range analyzer had a range of 0 - 200 ppm which was in compliance with EPA performance Specification 4 at the time of original permitting.

During a “cold-iron” start-up (i.e., more than 5 days of no fuel firing) on November 16, 2017, the newly upgraded CEMS indicated that the combustion turbine’s CO emissions exceeded the daily emissions limit. SPA discovered this problem as a result of installing a new CO CEMS analyzer during a regularly scheduled outage that preceded the November 2017 start-up. The upgraded CO CEMS analyzer has a higher span and range settings than the previous CO CEMS analyzer, which had a maximum reading of 200 ppm and therefore could not read any value above 200 ppm (it would read as 199.99 ppm). The upgraded CO CEMS analyzer now has two independent CO analyzers that can be used to read both the low range (normal operating range up to 10 ppm) and the high range (operating range of up to 2,000 ppm). This higher range allows the new CO CEMS analyzer to more accurately measure start-up emissions (SPA 2018a). The new CEMS data indicates that during a “cold-iron” start during cold ambient temperatures there can be a brief 15- to 20-minute period of high CO emissions above the previous upper range of the old CO analyzer. However, as typically shown in quarterly CEMS reports, CO emissions during normal operations are less than 2 ppm.

SMAQMD issued a Notice of Violation (NOV) on November 27, 2017 for 28 lbs. CO daily limit exceedance. An interim variance request from SMAQMD was granted on December 19, 2017 through January 16, 2018, and a regular variance was also granted

effective January 16, 2018 through December 18, 2018 (Variance 111418) to enable the project owner to investigate why the CO limit for start-up was exceeded. SPAC determined that the combustion turbine was operating normally but under the coldest site conditions could not meet the emissions rate as expressed by the combustion turbine vendor.

CO emissions during normal (non-start-up) operation have been significantly below the hourly emissions limit of 10.81 lb/hr (**AQ-6**) and also below the daily emissions limit of 326.9 lb/day (**AQ-7**). The turbine unit is equipped with an oxidation catalyst that has been very effective at reducing CO emissions during normal operation.

CO Emission Analysis

The petitioner is proposing higher CO emission limits for all averaging periods to account for more frequent turbine start-ups based on recent operating practices that integrate renewable energy resources into the *Sacramento Municipal Utility District* (SMUD) energy mix. Renewable resources tend to be variable, and more frequent turbine starts are necessary to account for this variability in renewable power supply. These more frequent start-ups would occur mostly as warm and hot start-ups with less than 5 days and 24 hours between fuel firing, respectively.

In order to determine which calculation methodology to use for the BACT and offset trigger analysis, we must first determine if the change is a “major stationary source” and then whether the project is a “major modification.” The source is subject to both Rule 202 as well as 214 so the “major stationary source” determination must be determined for both rules.

The SMAQMD major source determination is summarized in **Air Quality Table 4**.

Air Quality Table 4
SMAQMD Major Source Determination

Pollutant	Major Source Threshold	SPA Permit Limit[a]	Major Source?
VOC	25	20.0	NO
NOx	**25**	**49.9**	**YES**
SO_2	NA	3.7	NO
PM10[b]/PM2.5[c]	100	22.6	NO
CO	NA	43.7	NA

Source: SMAQMD 2018a and staff analysis
Note: The SMAQMD evaluates PM2.5 as 99.8 percent of PM10 emissions. Energy Commission assumes PM2.5 is equivalent to PM10. This assumption does not impact the conclusion of major source determination.
NA = not applicable, SMAQMD Rule 214 does not have a threshold.
a Current SPAC SMAQMD permit limits.
b 100 tons per year of PM10 or 100 tons per year of SOx as a PM10 precursor.
c 100 tons per year of PM2.5 or 100 tons per year of NOx or SOx as a PM2.5 precursors.

The methodology for determining a requested change is a “major modification” is the same for either Rule 202 or 214. For the pollutant (NOx) for which the source is major, it must be determined whether the project is a “major modification” for these pollutants. Emission increases are determined by the calculation method in either Rule 202 or 214 (SMAQMD 2018a). The first condition that applies compares the actual emissions of the project to the potential emissions for the project. If the actual baseline emissions are less than 80 percent of the potential emissions, then the actual baseline emissions are considered the historical actual emissions. The second condition would apply, according to the SMAQMD ATC, states if, “The emissions unit was fully offset for any emissions increase during the five-year period prior to the date that the application is deemed complete”. SMAQMD determined the project did fully offset for NOx during the original permitting of the project, however, it happened more than five years ago. This second condition would not apply for this case, only the first condition applies to this amendment request. The SMAQMD major modification determination is shown in **Air Quality Table 5**.

Air Quality Table 5
SMAQMD Major Modification Determination

Facility Emissions	Major Modification (tons/year)
	NOx
Actual Baseline Emissions	28.7
SPAC Permit Limits [a]	49.9
Percent of Potential	57.5%
Over 80% Determination	No
SPAC Proposed Permit Limits [b]	49.9
Historical Actual Emission	28.7
Emission Difference	21.2
Major Modification Threshold	25
Major Modification	No

Source: SMAQMD 2018a and staff analysis
[a] Current SPAC SMAQMD permit limits.
[b] The annual emissions for the facility are calculated from the quarterly emissions from the gas turbine and duct burner and are limited by condition of certification **AQ-8**. The tons per year has been rounded to one decimal point.

Once a two-year baseline period was established, the historic actual emissions were determined for each pollutant and displayed in **Air Quality Table 5**. Since NOx emissions are less than 80 percent of the SPA facility PTE, the next step is to compare the “emission increase” calculated by subtracting the historic actual emissions from the future potential (permitted) emissions and comparing this difference to the “major modification” emission increase thresholds in **Air Quality Table 5**.

Based on this analysis, the proposed modification is not considered a major modification for any pollutant, calculation methodology used for determining BACT

and/or offset triggers is the difference between the proposed potential emissions minus the historic potential or the current permitted potential emissions.

The BACT analysis was performed according to SMAQMD Rule 202 New Source Review. According to Rule 202, BACT is triggered for any pollutant for which the emission increase calculated as shown in **Air Quality Table 6** exceeds the levels specified below.

As shown in **Air Quality Table 5** this project is not considered a major modification and therefore BACT is only applicable to pollutants with daily emission increases above the threshold. The BACT applicability determination is summarized in **Air Quality Table 6**.

Air Quality Table 6
BACT Applicability

Pollutant	$BACT_{EI}$ (lb/day)	$BACT_{TL}$ (lb/day)	Is BACT Required?
VOC	0	>0	No
NOx	0	>0	No
SOx	0	>0	No
PM10	0	>0	No
PM2.5	0	>0	No
CO	**932**	**>550**	**Yes**
Lead[a]	0	>3.3	No

Source: SMAQMD 2018a and staff analysis

Notes: EI = Emission Increase
TL = Trigger Level

[a] The proposed changes would not change any lead emissions from the facility.

[b] The difference is between the daily potential to emit and the daily historic potential to emit for the proposed CO emission increase as shown in **Air Quality Table 8**.

For the increased CO start-up emissions, this request would trigger BACT only for CO as shown in **Air Quality Table 6**. SMAQMD did a BACT analysis for CO and determined a new steady state concentration for CO would be necessary. As a result, the steady state CO emissions would be reduced from the current permitted limits of 4 ppmvd corrected to 15% O_2 and 10.81 lb/hr to the new proposed BACT limits of 2 ppmvd corrected to 15% O_2 with an hourly mass emission limit of 7.22[1] lb/hr. To comply with emission monitoring standards less than 200 PPMV, 40 CFR 60 Appendix B performance specification 4A will be added to the CEMs condition on the District's ATC. This is found in condition of certification **AQ-17**, and Condition 19C of the ATC.

[1] 2.0 ppm / 10^6 x 8710 dscf/MMBtu x 1610 MMBtu/hr x 28 lb CO/mol x mol/385.3 dscf x 20.9/(20.9-15) = 7.22 lb/hr CO

Air Quality Table 7
SPAC BACT Requirements

Pollutant	BACT Standard	Compliance Demonstration
VOC	1.0 ppmvd corrected to 15% O_2, 3-Hr average, utilizing an Oxidation Catalyst	N/A – BACT was not triggered
NOx	2.0 ppm at 15% O_2, 1-hr average	N/A – BACT was not triggered
SOx	Natural Gas Sulfur content less than 0.7 gr/100 scf	N/A – BACT was not triggered
PM10	Natural gas or equivalent fuel that meets 0.7 gr sulfur/100 scf with an air inlet filter cooler and lube oil vent coalescer.	N/A – BACT was not triggered
PM2.5	Natural gas or equivalent fuel that meets 0.7 gr sulfur/100 scf with an air inlet filter cooler and lube oil vent coalescer.	N/A – BACT was not triggered
CO	2.0 ppmvd corrected to 15% O_2, 1-Hr average utilizing an Oxidation Catalyst	The turbine has an oxidation catalyst and the CO emissions will be limited to 2.0 ppmvd corrected to 15% O_2, 1-Hr average

Source: SMAQMD 2018
gr/100 scf = grains per 100 standard cubic feet

Air Quality Table 8 below presents the existing and proposed permitted hourly, daily, quarterly, CO emission limits.

Air Quality Table 8
Summary of Emission Limit Changes

	lb/hr	Lb/day	Q1 lb/qtr	Q2 lb/qtr	Q3 lb/qtr	Q4 lb/qtr	CO (lb/yr)
Current CO Limit	10.81	326.9	21,265	21,601	22,803	21,708	87,377
Proposed CO Limit	7.22[a] 550[b]	1,258.80	47,600	47,600	47,600	47,600	190,396

[a] Steady state operation is the result of BACT implementation.
[b] Start-up emission hourly limit, proposed by the applicant.

The proposed increase in the CO start-up emissions would result in an increase in the facility's PTE CO emissions. Air Quality conditions of certification which currently limit CO mass emissions and concentrations are AQ-5, 6, 7, and 8. These limitations are average concentrations, hourly, daily, and quarterly limits, respectively. The CO daily emission rate is based on two start-ups with 22 hours of normal steady-state operation, and is reproduced with the same assumptions in the CO modeling analysis shown below. CO quarterly emissions are based on 90 one-hour start-ups averaging 500 lb/hr CO and 360 hours of normal steady-state operation.

According to SMAQMD Rule 214 Section 302, offsets are triggered for any project where the stationary source potential to emit exceeds (for CO in this case) 49,500 pounds per quarter (lb/qtr). According to Air Quality Table 8, the proposed new quarterly limit would be 47,600 lb/qtr. Therefore, no emissions offsets would be required.

IMPACTS ANALYSIS

The petitioner conducted air dispersion modeling analysis using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) to analyze potential ambient air quality impacts associated with the new CO start-up emissions at the facility. AERMOD considers emissions in the context of various ambient meteorological conditions, local terrain, and nearby structures that could affect air flow.

The inputs for the air dispersion models include stack information (exhaust flow rate, temperature, and stack dimensions), specific emission data and meteorological data, such as wind speed and atmospheric conditions, and site elevation. The petitioner used AERMOD version 16216 to perform the modeling and the analysis includes the following:

- AERMAP - The terrain preprocessor;
- AERMET – The meteorological preprocessor; and
- AERMOD – The control module and modeling processor.

Site-specific dispersion models require a sequential hourly record of dispersion meteorology representative of the regions within which the source is located. ARB provided pre-processed meteorological data for a 5-year range from 2009-2013. The surface readings are from the Sacramento Executive Airport in Sacramento, California and the upper air readings are from the Oakland International Airport in Oakland, California (SPA 2018a). The anemometer base elevation for the Sacramento Executive Airport is 4.6 meters as confirmed by the ARB Meteorological Files website.

The proposed worst-case CO emission rates are presented in **Air Quality Table 8** and are based on the operating assumptions listed below (SPA 2018a).

- Maximum hourly CO emissions during start-up are 550 lb/hr (used for modeling hourly CO impacts).
- Maximum hourly CO emissions at steady-state are 7.22 lb/hr based on a new BACT level of 2.0 ppm at 15% O_2.
- Maximum daily CO emissions are based on two one-hour start-ups at 550 lb/hr CO with 22 hours of normal operation.
- Maximum quarterly CO emissions are based on 90 one-hour start-ups averaging 500 lb/hr CO and 360 hours of normal operation per quarter.
- Maximum annual CO emissions are the sum of the four quarterly emissions totals.

Note that this represents the worst-case CO emissions operating scenario; actual operating scenarios could include everything from continuous operation for the entire quarter (with very low CO emissions) up to the worst-case emissions scenario presented in **Air Quality Table 8**, and limited by **AQ-8** (multiple cold, warm, and hot starts resulting in higher CO emissions). This worst-case scenario is very conservative.

Staff reviewed the modeling files used for the facility's impact analysis, and determined the inputs were conservative and appropriate. The modeled concentrations from the worst case scenarios of facility operation were combined with background or baseline concentrations to evaluate the total impact from the proposed changes to the facility operation. Background or baseline concentrations are determined from the measured pollutant values at surrounding representative air monitoring sites. Staff uses the highest background concentrations to determine the total impacts of a project. This is a conservative approach because it assumes the greatest project impacts occur concurrently with the worst case background concentrations.

There are ten air monitoring stations identified in the SMAQMD 2017 Air Monitoring Network Assessment measuring pollutants in the SMAQMD. SMAQMD operates nine air monitoring sites within Sacramento County with ARB operating the tenth at the Sacramento-T Street location. Qualified monitoring data is available on ARB and U.S. EPA websites. Available monitoring data varies by station depending on the station objective. Trend and county summaries are included for some pollutants. The Sacramento Del Paso station is the most comprehensive site located approximately 9 miles north-north-west of the facility site. Measured data at the Del Paso site includes ozone, PM10, PM2.5, NO_2, CO, SO_2, lead, and meteorological data.

Air Quality Table 9 contains air monitoring data from 2013 to 2017. Qualified data is included from the closest monitoring site.

Air Quality Table 9
Criteria Pollutants Concentrations, 2013-2017 (ppm)

Pollutant	Averaging Time	Station	2013	2014	2015	2016	2017
CO (ppm)	1-hour (Max)	Del Paso	**2.4**	1.9	2.2	**2.4**	1.9
	8-hour (Max)	Del Paso	2.1	1.7	2	2.1	1.8

Source: SPA 2018a, ARB 2018a, and U.S. EPA 2018c and staff analysis.
Note: Max = maximum

Staff selected the highest criteria pollutant concentration from the last five years of available data collected from the Del Paso monitoring station to represent background values and are marked in **bold**. The background values selected by staff for CO are included in **Air Quality Table 10**. The representative background values used by staff in the analysis are included in **Air Quality Table 11.**

Air quality Table 10
Staff-Recommended Background Concentrations and Comparison Values (µg/m^3)

Pollutant	Averaging Time	Background Values	Limiting Standard	Percent of Standard
CO	1-hour	2,960	23,000	13%
	8-hour	2,590	10,000	26%

Source: U.S. EPA 2018b, and staff analysis

Staff combined the petitioner's modeled impacts with the appropriate background concentration, and compared the results with the ambient air quality standards for CO to determine whether the project's emission impacts after the modifications would cause a new exceedance of the ambient air quality standards or would contribute to an existing exceedance. Total impacts were compared with the AAQS for CO. **Air Quality Table 11** summarizes the maximum predicted concentrations for the modeled scenario with the corresponding averaging period. **Air Quality Table 11** includes background values and compares the total impact to the limiting AAQS.

Air Quality Table 11
Proposed CO Modeling Impact Results

Pollutant	Averaging Period	Project Impact (µg/m^3)	Background (µg/m^3)[a]	Total Impact (µg/m^3)	Limiting Standard (µg/m^3)	SIL (µg/m^3)	Percent of Standard
CO	1-hour	509	2,960	3,469	23,000	2,000	15%
	8-hour	41	2,590	2,631	10,000	500	26%

Source: SPA 2018a, staff analysis.
[a] Staff's representative background values are presented in **Air Quality Table 10.**

The petitioner, and the District, performed a modeling analysis using AERMOD to determine the impact of the new proposed increase in CO emission limit. **Air Quality Table 11** shows those results as compared to the Significant Impact Levels (SILs) and the Ambient Air Quality standards (AAQS).

Air Quality Table 11 summarizes the 1-hr and 8-hr highest maximum modeled impacts as compared to the CO SILs and the AAQS limiting standards. As shown, the facility would not significantly impact the ambient air surrounding the facility for the 1-hr or 8-hr CO limiting AAQS, as all of the modeled project impacts are far below the corresponding SIL for each standard.

ENVIRONMENTAL JUSTICE

Air Quality staff revised conditions of certification to ensure project impacts remain less than significant. Therefore, with the implementation of these modified conditions, impacts would be less than significant for any population in the project's six-mile radius, including the Environmental Justice population represented in **Environmental Justice Figures** and **Table** in the **Executive Summary**.

PROPOSED CONDITIONS FOR CO START-UP EMISSION INCREASE

The existing Conditions of Certification include mass emission rate limits for the gas turbine and duct burner in the combined emission limits for the gas turbine, duct burner and cooling tower.

RECOMMENDED REVISIONS TO AIR QUALITY CONDITIONS OF CERTIFICATION

Staff recommends that some existing Energy Commission conditions be modified in order to align Energy Commission conditions of certification with the current SMAQMD permit. Staff considers these additional changes to be minor administrative changes except for those that affect CO. The following revisions would not cause any additional air quality impacts or adversely affect the ability of the project to comply with LORS.

- Administrative change to revise existing conditions to read "**must"** instead of "**shall"**. This affects Air Quality Conditions of Certification **AQ-4** through **AQ-21**, **AQ-25**, **AQ-SC1** through **AQ-SC5**, **AQ-S1**, **AQ-CM1** through **AQ-CM12**, and **AQ-CT3**, **AQ-CT5**, and **AQ-CT6**.
- Revise **AQ-5** renumbering to **5a** to now include the new BACT limit for CO to 2.0 ppm. Staff included **AQ-5b** to include the SMAQMD's requirement to meet the BACT standards.
- Revise **AQ-6** to now include the CO emission limits for steady-state and during start-up.
- Change **AQ-7** to allow for an increase in the maximum allowable daily emissions for CO.
- Modify **AQ-8** to allow for an increase in the maximum allowable quarterly emissions for CO.
- Administrative Change **AQ-CT1** regarding the Ringelmann Opacity test to specify the specific equipment (turbine, duct burner, SCR and Oxidation catalyst) onsite rather than a general statement of "equipment".
- Modify **AQ-17** to include the updated CEMS requirement as part of U.S. EPA Performance Specifications in 40 CFR Appendix B Performance Specification 4 or 4A.

CONCLUSIONS

The requested changes in permit conditions would comply with applicable federal, state, and SMAQMD air quality laws, ordinances, regulations, and standards, and the amended project would not cause significant air quality impacts, provided that the modified Conditions of Certification shown below are included. The conditions in the Authority to Construct issued November 15, 2018 have been reviewed by Energy Commission staff and SMAQMD. Staff recommends that the revised conditions of certification be approved as shown below.

PROPOSED CHANGES OR MODIFICATIONS TO CONDITIONS OF CERTIFICATION

Bold underline is used to indicate new language. ~~Strikethrough~~ is used to indicate deleted language.

SPAC AMENDED CONDITIONS OF CERTIFICATION

AQ-S5 The Sacramento Power Authority ~~shall~~ **must** submit to the Air Pollution Control Officer (APCO) an application to modify the Title V permit with an Administrative Title V Permit Amendment prior to commencing operation**/ construction** with modifications authorized by ~~this~~ **SMAQMD's** Authority to Construct.

Verification: Within fifteen (15) working days before the execution of the condition, the facility owner ~~shall~~ **must** notify the SMAQMD APCO and the CPM.

AQ-2 The Sacramento Metropolitan Air Quality Management District Air Pollution Control Officer and/or authorized representatives, ~~upon the presentation of credentials, shall~~ **must** be permitted **to do all the following**:

a. to enter upon the premises where the source is located or in which any records are required to be kept under the terms and conditions of ~~this~~ **SMAQMD's** Authority to Construct;

b. at reasonable times to have access to and copy any records required to be kept under terms and conditions of ~~this~~ **SMAQMD's** Authority to Construct;

c. to inspect any equipment, operation, or method required in ~~this~~ **SMAQMD's** Authority to Construct, and

d. to sample emissions from the source or require samples to be taken.

Verification: The project owner ~~shall~~ must advise appropriate site personnel of this Condition, and provide the Commission CPM with a notification by letter that site personnel have been informed regarding the rights of entry described above.

AQ-5a Except as specified in Condition **AQ-CM9**, concentrations of nitrogen oxides (NOx)**, carbon monoxide (CO)** emissions from the gas turbine and duct burner ~~shall~~ **must** not exceed the following limit:

Pollutant	Maximum Allowable ~~NOx~~ Concentration ~~(A)~~ Gas Turbine and Duct Burner ~~ppmv at 15% O2~~ ~~averaged over any consecutive 3 hour period~~
NOx	3 **ppmvd corrected to 15% O2, averaged over any consecutive 3 hour period (A)**
CO	**2.0 ppmvd corrected to 15% O2, averaged over any consecutive 1 hour period (B)**

(A) Excluding start-ups, shutdowns and short term excursions as defined in Conditions **AQ-13**, **AQ-14** and **AQ-15**.

(B) Excluding start-ups and shutdowns as defined in Condition AQ-13, and AQ-14.

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20** and submit source test reports required under Condition **AQ-25**. A summary of significant operation and maintenance events and monitoring records ~~shall~~ **must** be included in the quarterly operation report (**AQ-20**).

AQ-5b The turbine and duct burner must meet the following BACT standards:

Pollutant	Emission Standard and Work Practice
NOx	5 ppmvd corrected to 15% oxygen, 3 hour average (A)
VOC	The use of an oxidation catalyst (B)
CO	2.0 ppmvd corrected to 15% oxygen, 1 hour average (B)
SOx	Use of natural gas (C)
PM10/PM2.5	Use of natural gas and inlet air filtration (C)

(A) Based on SMAQMD BACT Determination during the original permitting in 1994. The NOx BACT concentration is for reference only, the applicable regulatory NOx concentration can be found in AQ-5a.

(B) Based on SMAQMD BACT Determination

(C) Based on SMAQMD BACT Determination during the original permitting in 1994.

Verification: Same Verification as AQ-5a.

AQ-6 Except as specified in Condition **AQ-CM10**, hourly mass emissions from the gas turbine and duct burner ~~shall~~ **must** not exceed the following limits~~.~~

Pollutant	Maximum Allowable Emissions ~~(A)~~ Gas Turbine and Duct Burner lb/hour ~~averaged over any consecutive 3 hour period~~
~~R~~**V**OC	9.01 (**A**~~B~~)
NO_x	17.76 (**B**~~C~~)
SO2	0.97 (**C**~~D~~)
PM10**/PM2.5**	7.00 (**D**~~E~~)
CO **(Normal Steady-state Operation**	~~10.81~~**7.22** (**E**~~F~~)
CO (Worst Case Start-Up)	**550 (F)**

~~(A) Excluding start-ups, shutdowns and short term excursions as defined in Conditions **AQ-13**, **AQ-14** and **AQ-15**.~~

(**A**~~B~~) **Averaged over a three hour period, not including periods containing start-ups, shut-downs, and short-term excursions as defined in Conditions AQ-13, AQ-14, and AQ-15.** Based on a turbine ~~R~~**V**OC emission factor of 0.00228 lb/MMBTU, duct burner ~~R~~**V**OC emission factor of 0.029 lb/MMBTU and firing at full capacity.

(~~C~~**B) Averaged over a three hour period, not including periods containing start-ups, shut-downs, and short-term excursions as defined in Conditions AQ-13, AQ-14, and AQ-15.** Based on data submitted in the permit application and is monitored by the turbine's NOx CEM system.

(**C**~~D~~) **Averaged over a three hour period, not including periods containing start-ups, shut-downs, and short-term excursions as defined in Conditions AQ-13, AQ-14, and AQ-15.** Based on a turbine and duct burner SO_2 emission factor of 0.0006 lb/MMBTU and firing at full capacity.

(**D**~~E~~) **Averaged over a three hour period, not including periods containing start-ups, shut-downs, and short-term excursions as defined in Conditions AQ-13, AQ-14, and AQ-15.** Based on a turbine PM10**/PM2.5** emission factor of 0.003546 lb/MMBTU, duct burner PM10**/PM2.5** emission factor of 0.01 lb/MMBTU and firing at full capacity.

(**E**~~F~~) **Averaged over a three hour period, not including periods containing start-ups, shut-downs, and short-term excursions as defined in Conditions AQ-13, AQ-14, and AQ-15.** Based on data submitted in the permit application and is monitored by the turbine's CO CEM system.

(F) Including periods containing start-ups as defined in AQ-13. Based on data submitted in the application and is monitored by the turbine's CO CEM system

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20** and submit source test reports required under Condition **AQ-25**. A summary of significant operation and maintenance events and monitoring records ~~shall~~ **must** be included in the quarterly operation report (**AQ-20**).

AQ-7 ~~Emissions at the SPAC cogeneration project, from the combustion turbine, duct burner and cooling tower, on a pounds per calendar day basis, Except as specified in Condition No. **CM11**, daily mass e~~**E**missions from the following equipment at the facility ~~shall~~ **must** not exceed the following limits**, including periods containing start-ups, shutdowns and short-term excursions as defined in AQ-13, AQ-14, and AQ-15.**

Pollutant	Maximum Allowable Emissions ~~(A)~~ lb/day		
	Gas Turbine and Duct Burner	Cooling Tower	Total
VOC~~/ROC~~	146.7	0.5	147.2
NOx	384.5	NA	384.5
SO2	21.8	NA	21.8
PM10**/PM2.5**	142.1	9.7	151.8
CO	~~326.9~~ **1,258.8**	NA	~~326.9~~ **1,258.8**

(A) ~~Including start-ups, shutdowns and short term excursions as defined in Conditions **AQ-13**, **AQ-14** and **AQ-15**~~

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20**. A summary of significant operation and maintenance events and monitoring records ~~shall~~ **must** be included in the quarterly operation report (**AQ-20**).

AQ-8 Combined mass emissions from the following equipment at the facility ~~shall~~ **must** not exceed the following limits**, including periods containing start-ups, shutdowns and short-term excursions as defined in AQ-13, AQ-14, and AQ-15.**

Pollutant	**Maximum Allowable Emissions Combined Emissions from: Gas Turbine and Duct Burner**				
	Quarter 1 lb/quarter	**Quarter 2 lb/quarter**	**Quarter 3 lb/quarter**	**Quarter 4 lb/quarter**	**Total lb/year**
VOC	**8,792**	**8,898**	**13,264**	**8,968**	**39,922**
NOx	**24,209**	**24,545**	**26,321**	**24,725**	**99,800**
SOx	**1,814**	**1,836**	**1,944**	**1,853**	**7,447**
PM10/PM2.5	**10,183**	**9,319**	**11,444**	**10,769**	**41,715**
CO	**47,599**	**47,599**	**47,599**	**47,599**	**190,396**

Pollutant	Maximum Allowable Emissions ~~(A)~~ Combined Emissions from: Gas Turbine and Duct Burner and Cooling Tower				
	Quarter 1 lb/quarter	Quarter 2 lb/quarter	Quarter 3 lb/quarter	Quarter 4 lb/quarter	Total lb/year
VOC~~/ROC~~	8,836	8,943	13,309	9,013	40,101
NOx	24,209	24,545	26,321	24,725	99,800
SOx	1,814	1,836	1,944	1,853	7,447
PM10**/PM2.5**	11,015	10,160	12,294	11,619	45,088
CO	~~21,265~~**47,599**	**47,599**~~21,601~~	**47,599**~~22,803~~	**47,599**~~21,708~~	~~87,377~~**190,396**

(A) ~~Including start-ups, shutdowns and short term excursions as defined in Conditions **AQ-13**, **AQ-14** and **AQ-15**.~~

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20**. A summary of significant operation and maintenance events and monitoring records ~~shall~~ **must** be included in the quarterly operation report (**AQ-20**).

AQ-17 The permittee ~~shall~~ **must** operate a continuous emission monitoring system that has been approved by the SMAQMD Air Pollution Control Officer for the gas turbine and duct burner.

A. The continuous emission monitoring (CEM) system ~~shall~~ **must** monitor and record nitrogen oxides, carbon monoxide and oxygen.

B. For NOx and O_2, the CEM system ~~shall~~ **must** comply with U.S. EPA Performance Specifications in 40 CFR 75 Appendix A.

C. For CO, the CEM system ~~shall~~ **must** comply with U.S. EPA Performance Specifications in 40 CFR 60 Appendix B Performance Specification 4 **or 4A**.

Verification: The project owner ~~shall~~ **must** provide a Continuous Emission Monitoring System (CEM) protocol for approval by the APCO and CPM. The project owner ~~shall~~ **must** make the site available for inspection by representatives of the District, ARB, and the Commission upon request. A summary of significant operation and maintenance events and monitoring records ~~shall~~ **must** be included in the quarterly operation report (**AQ-20**).

AQ-CT1 The ~~equipment~~ **turbine, duct burner, and APC SCR and Oxidation catalyst** must not discharge into the atmosphere any visible air contaminant other than uncombined water vapor for a period or periods aggregating more than three minutes in any one hour if the discharge is as dark or darker than Ringelmann No. 1 or is equal to or greater than 20% opacity.

Verification: As part of the Quarterly Air Quality Report (as required by **AQ-20**), the facility owner ~~shall~~ **must** submit to the Energy Commission CPM a copy of a statement of compliance with the above provisions and regulations.

THE FOLLOWING CHANGED CONDITIONS OF CERTIFICATION ONLY REPLACE THE WORD "SHALL" WITH "MUST"

AQ-S1 The project owner ~~shall~~ **must** notify the Compliance Project Manager (CPM) and the SMAQMD, in writing, of the date that the recommissioning period will begin.

Verification: The project owner ~~shall~~ **must** provide notification of the start of recommissioning to the CPM and SMAQMD at least 30 days before starting the recommissioning activity.

AQ-S2 After completing the equipment installation authorized under ~~this~~ **SMAQMD's** Authority to Construct (ATC), the permit holder must contact the Sacramento Metropolitan Air Quality District (SMAQMD) to arrange a start-up inspection. SMAQMD may be contacted at (916) 874-4800. The CA Energy Commission Compliance Project Manager (CPM) must be notified of the startup inspection.

Verification: Within 30 days prior to the startup inspection, the project owner ~~shall~~ **must** advise appropriate site personnel of this condition, and provide the Energy Commission CPM with a notification by letter that site personnel have been informed regarding the arranged start-up inspection described above.

AQ-1 The equipment must be properly maintained and operated in accordance with the information submitted with the application and the manufacturer's recommendations at all times.

Verification: As part of the Quarterly Emissions Report required by Condition of Certification **AQ-20**, the facility owner ~~shall~~ **must** assert that they comply with this condition and report any instances of noncompliance.

AQ-3b The facility may not discharge air contaminants or other materials that cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons of the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

Verification: As part of the Quarterly Emissions Report required by Condition of Certification **AQ-20**, the facility owner ~~shall~~ **must** assert that they comply with this condition and report any instances of noncompliance.

AQ-4 A legible copy of ~~this~~ **SMAQMD's** Authority to Construct ~~shall~~ **must** be maintained on the premises with the equipment.

Verification: The project owner ~~shall~~ **must** make the site available for inspection by representatives of the District, ARB, and the Commission upon request.

AQ-9 The combined cycle combustion turbine and its associated duct burner HRSG ~~shall~~ **must** not emit more than 10 ppmvd ammonia at 15% O2 measured as NH3, averaged over any consecutive three-hour period, excluding start-ups as defined in Condition 19. Concentrations of ammonia (NH3) emissions from the gas turbine and duct burner ~~shall~~ **must** not exceed the following limit.

Pollutant	Maximum Allowable Ammonia Concentration ppmv at 15% O2 (measured as NH3) averaged over any consecutive 3 hour
Ammonia (NH3)	10

(A) Excluding start-ups, shutdowns and short term excursions as defined in Conditions **AQ-13**, **AQ-14** and **AQ-15**.

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20**. A summary of significant operation and maintenance events and monitoring records ~~shall~~ **must** be included in the quarterly operation report (**AQ-20**).

AQ-10 Hazardous Air Pollutants (HAPs) mass emissions from the facility ~~shall~~ **must** not exceed the following limits:

Equipment	Maximum Allowable HAP Emissions (A) tons/year	
	Single HAP	Combination of HAPs
Total facility	9.4	24.4

(A) The purpose of this limitation is to qualify the gas turbines for the non-applicability of 40 CFR 63 Subpart YYYY - National Emission Standards for Hazardous Air Pollutants for Stationary Gas Turbines.

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20**. A summary of significant operation and maintenance events and monitoring records ~~shall~~ **must** be included in the quarterly operation report (**AQ-20**).

EQUIPMENT CONDITIONS

Combined Cycle Combustion Turbine and Duct Burner

AQ-11 The duct burner ~~shall~~ **must** not be operated unless the gas turbine is operating.

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20**.

AQ-12 Except as specified in Condition **AQ-CM3** for the selective catalytic reduction system, the gas turbine and duct burner ~~shall~~ **must** not be operated without fully functioning selective catalytic reduction and oxidizing catalyst systems, excluding periods of start-ups and shutdowns.

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20**. A summary of significant operation and maintenance events and monitoring records ~~shall~~ **must** be included in the quarterly operation report (**AQ-20**).

AQ-13 The duration of the gas turbine's start-up period ~~shall~~ **must** not exceed 60 minutes.

A. Gas turbine start-ups are defined as the time periods commencing with the introduction of fuel to the gas turbine and ending at the time that 15-minute average NOx concentrations do not exceed 3 ppmvd at 15% O2, but in no case exceeding 60 consecutive minutes.

Short-term excursions are defined as 15-minute periods designated by the project owner, not to exceed four consecutive 15-minute periods, when the 15-minute average NOx concentration exceeds 3 ppmvd corrected to 15% O2. Maximum 3-hour average NOx concentrations for periods that include short-term excursions ~~shall~~ **must** not exceed 30 ppmvd corrected to 15%O2. Short-term excursion periods that total in excess of 10 hours per rolling 12-month period ~~shall~~ **must** not be excluded from evaluations of compliance with limits in Conditions 11 and 15.

Any emissions during start-ups and short-term excursions ~~shall~~ **must** be included in all calculations of daily, quarterly, and annual mass emissions required by this permit.

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20**. A summary of significant operation and maintenance events and monitoring records ~~shall~~ **must** be included in the quarterly operation report (**AQ-20**).

AQ-14 Gas turbine shutdowns are defined as the 30-minute time period immediately preceding the termination of fuel to the gas turbine.

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20**. A summary of significant operation and maintenance events and monitoring records ~~shall~~ **must** be included in the quarterly operation report (**AQ-20**).

AQ-15 Gas turbine short-term excursions are defined as 15-minute periods designated by the applicant that are a direct result of a diffusion mode switchover, not to exceed four consecutive 15-minute periods, when the 15-minute average NOx concentration exceeds 3 ppmvd at 15% O2.

A. Maximum 3-hour average NOx concentration for periods that include short-term excursions ~~shall~~ **must** not exceed 30 ppmvd at 15% O2.

B. Short-term excursion periods that total in excess of 10 hours per rolling 12-month period ~~shall~~ **must** not be excluded from evaluations for compliance with emission limits in Condition **AQ-5** and **AQ-6**.

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20**. A summary of significant operation and maintenance events and monitoring records ~~shall~~ **must** be included in the quarterly operation report (**AQ-20**).

AQ-16 The gas turbine and duct burner ~~shall~~ **must** only combust natural gas fuel.

Verification: The project owner ~~shall~~ **must** make the site available for inspection by representatives of the District, ARB, and the Commission upon request.

AQ-18 The permittee ~~shall~~ **must** operate a continuous parameter monitoring system that has been approved by the SMAQMD Air Pollution Control Officer that either measures or calculates and records the following:

Parameter to be Monitored	Units
A. Fuel consumption of the combined cycle gas turbine	MMBTU/hour of natural gas
B. Fuel consumption of the duct burner MMBTU/hour of natural gas	MMBTU/hour of natural gas
C. Exhaust gas flow rate of the combined cycle gas turbine and the duct burner.	kscfh or lb/hr

Verification: The project owner ~~shall~~ **must** make the site available for inspection by representatives of the District, ARB, and the Commission upon request.

RECORDKEEPING AND REPORTING REQUIREMENTS

AQ-19 The permittee ~~shall~~ **must** continuously maintain onsite the following records for the most recent five-year period and ~~shall~~ **must** make such records available to the SMAQMD Air Pollution Control Officer upon request. Quarterly records as specified in the table below ~~shall~~ **must** be made available for inspection within 30 days of the end of the quarter.

Frequency	Information to be recorded
Upon occurrence	A. Record of the occurrence and duration of any start-up, shutdown or short term excursion. i. The number of consecutive 15-minute periods when the 15-minute average NOx concentration exceeded the limits of Condition **AQ-5** during each short-term excursion. ii. The qualified condition(s) under which each short-term excursion occurred, pursuant to SMAQMD Rule No. 413 Section 114. iii. The maximum 6-hour average NOx concentration during the period that includes each short-term excursion. iv. The cumulative total, per calendar year, of all 15-minute periods when the 15-minute average NOx concentration exceeded the limits of Condition **AQ-5**. B. Malfunction in operation of the gas turbine. C. Measurements from the continuous emission and parameter monitoring systems. D. Monitoring device and performance testing measurements. E. All continuous monitoring system performance evaluations. F. All continuous monitoring system or monitoring device calibration checks G. All continuous monitoring system adjustments and maintenance.
Hourly	H. Gas turbine natural gas fuel consumption (MMBTU/hr). I. Duct burner natural gas fuel consumption (MMBTU/hr). J. Indicate when gas turbine start-up occurred. K. NOx emission concentration from the gas turbine and duct burner (ppmvd at 15% O2). L. ROC, NOx, SOx, PM10 and CO hourly emissions (lb/hour) from the gas turbine and duct burner (combined emissions). i. For those pollutants directly monitored (NOx and CO), the hourly emissions ~~shall~~ **must** be from the CEM system required pursuant to Condition No. 17. ii. For those pollutants that are not directly monitored (ROC, SOx and PM10), the hourly emissions ~~shall~~ **must** be calculated based on SMAQMD approved emission factors contained in the footnotes to Condition No. 6.
Daily	M. ROC, NOx, SOx, PM10 and CO daily mass emissions from all equipment separately and combined at the facility (lb/day):

Frequency	Information to be recorded
	i. gas turbine and duct burner (for separate reporting the gas turbine and duct burner emission are combined). ii. cooling tower.
Quarterly	N. ROC, NOx, SOx, PM10 and CO quarterly mass emissions from all equipment combined at the facility (lb/quarter). i. gas turbine and duct burner. ii. cooling tower.

Verification: The project owner ~~shall~~ **must** submit appropriate records as required by Condition **AQ-20**. The project owner ~~shall~~ **must** make the site available for inspection by representatives of the District, ARB, and the Commission upon request.

AQ-20 Submit to the SMAQMD Air Pollution Control Officer a written report which contains the following information.

Frequency	Information to be Reported
Quarterly Submitted by: Jan 30 Apr 30 Jul 30 Oct 30 for the previous calendar quarter	A. Whenever the continuous emissions monitoring system is inoperative except for zero and span checks: i. Date and time of non-operation of the continuous emission monitoring system. ii. Nature of the continuous emission monitoring system repairs or adjustments. B. Whenever an emission occurs as measured by the required continuous emissions monitoring system that is in excess of any emission limitation: i. Magnitude of the emission which has been determined to be in excess. ii. Date and time of the commencement and completion of each period of excess emissions. iii. Periods of excess emissions due to startup, shutdown and malfunction ~~shall~~ **must** be specifically identified. iv. The nature and cause of any malfunction (if known). v. The corrective action taken or preventive measures adopted. C. If there are no excess emissions or the continuous monitoring system has not been inoperative, repaired or adjusted for a calendar quarter, a report ~~shall~~ **must** be submitted stating such information.

Verification: The project owner ~~shall~~ **must** submit quarterly operation reports to the CPM and Air Pollution Control Officer (APCO) no later than 30 days following the end of each calendar quarter. This information ~~shall~~ **must** be maintained on site for a minimum of five years and ~~shall~~ **must** be provided to the CPM and District personnel

upon request. The project owner ~~shall~~ **must** make the site available for inspection by representatives of the District, ARB, and the Commission upon request.

EMISSION REDUCTION CREDIT (ERC) REQUIREMENTS

AQ-21 The permittee ~~shall~~ **must** surrender (and has surrendered - See Conditions **AQ-22**, **AQ-23** and **AQ-24**) ERCs to the SMAQMD Air Pollution Control Officer to offset the following amount of emissions:

Equipment – Gas Turbine Duct Burner Cooling Tower	Amount of Emission Offsets For which ERCs are to be Surrendered lb/quarter			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
ROC	1,292	1,398	5,764	1,468
NOx	24,209	24,545	26,321	24,725
PM10	11,015	10,160	12,294	11,619

Verification: No verification necessary.

AQ-22 The following ERCs have been surrendered to the SMAQMD Air Pollution Control Officer to comply with the ROC emission offset requirements as stated in Condition **AQ-21**:

ERC C Certificate No.	Face Value of Emission Reduction Credit Certificates lb/quarter				IPTR (A)	Offset Ratio	Value Applied to ROC Emission Liability lb/quarter			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4			Qtr 1	Qtr 2	Qtr 3	Qtr 4
SMAQMD 00-00652 Swansons	1,550	1,678	6,917	1,762	NA	1.2	1,292	1,398	5,764	1,468
Total ROC Emission Offsets							1,292	1,398	5,764	1,468

(A) IPTR = interpollutant trading ratio

Verification: No verification necessary.

AQ-23 The following ERCs have been surrendered to the SMAQMD Air Pollution Control Officer to comply with the NOx emission offset requirements as stated in Condition **AQ-21**:

ERC Certificate No.	Face Value of Emission Reduction credit Certificates lb/quarter				IPTR (A)	Offset Ratio	Value Applied to NOx Emission Liability lb/quarter			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4			Qtr 1	Qtr 2	Qtr 3	Qtr 4
SMAQMD 97-00437 Campbell	23,622	13,491	31,585	20,983	NA	1.2:1	19,685	11,243	26,321	17,486
PCAQMD 98-00002 Formica (ROC)	18,096	53,208	0	28,956	2:1	2:1	4,524	13,302	0	7,239
Total NOx Emission Offsets							24,209	24,545	26,321	24,725

(A) IPTR = interpollutant trading ratio

Verification: No verification necessary.

AQ-24 The following ERCs have been surrendered to the SMAQMD Air Pollution Control Officer to comply with the PM10 emission offset requirements as stated in Condition **AQ-21**:

Offset Source	Face Value of Emission Reduction credit Certificates lb/quarter				IPTR (A)	Offset Ratio	Value Applied to PM10 Emission Liability lb/quarter			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4			Qtr 1	Qtr 2	Qtr 3	Qtr 4
PCAPCD 99-00003 Sierra Pine	16,523	15,240	18,441	17,429	NA	1.5	11,015	10,160	12,294	11,619
Total PM10 Emission Offsets							11,015	10,160	12,294	11,619

(A) IPTR = interpollutant trading ratio

Verification: No verification necessary.

AQ-25 The permittee ~~shall~~ **must** perform an ROC, NOx, PM10, CO and ammonia (NH3) source test and CEM accuracy (RATA) test of the gas turbine and duct burner once each calendar year.

a. Submit a source test plan to the SMAQMD Air Pollution Control Officer for approval at least 30 days before the source test is to be performed. The source test plan ~~shall~~ **must** indicate that U.S. EPA approved test methods are used for NOx and CO.

b. Notify the SMAQMD Air Pollution Control Officer at least 7 days prior to the source testing date if the date has changed from that approved in the source test plan.

c. During the source test(s), the gas turbine and duct burner ~~shall~~ **must** be operated at their maximum total firing capacity, defined as > or = 90% of the heat input capacity achievable at the time of the source test, based on then current ambient conditions.

d. Submit the source test report to the SMAQMD Air Pollution Control Officer within 60 days after the completion of the source test(s).

e. The SMAQMD Air Pollution Control Officer may waive the ROC and PM10 annual source test requirement every other year if the prior annual source test results indicates that the respective hourly emissions are less than or equal to 75% of the respective hourly emission limit.

Verification: The project owner ~~shall~~ **must** submit a test plan to the Air Pollution Control Officer for approval at least 30 days before the source tests are to be performed. The source test results ~~shall~~ **must** be submitted to the Air Pollution Control Officer and the Commission CPM within 60 days from the completion of the source tests.

Cooling Towers and Staff Compliance Requirements

AQ-SC1 The cooling towers ~~shall~~ **must** not use any chromium-containing water treatment chemicals.

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20**.

AQ-SC2 The total dissolved solids content of the circulating cooling water ~~shall~~ **must** not exceed 3000 ppm, averaged over any consecutive three-hour period. The 3-hour average TDS limit is on a clock-hour basis.

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20**.

AQ-SC3 The cooling towers drift rate ~~shall~~ **must** not exceed 0.0006%. The project owner ~~shall~~ **must** provide a written vendor statement, prior to installation, declaring that the cooling towers mist eliminators used meet the drift criteria stated above.

Verification: At least 30 days prior to the installation of drift eliminators on the cooling towers, the project owner ~~shall~~ **must** submit to the SMAQMD a written vendor statement declaring that the mist eliminators to be installed meet the drift rate stated above.

AQ-SC4 The following tests, reports and conditions ~~shall~~ **must** be met:

a. Within 60 days of terminating the recommissioning period-but no later than 180 days after commencing the recommisioning period-the owner or operator will conduct performance test(s) as per Condition **AQ-SC5** and furnish the Air Pollution Control Officer a written report of the results of such performance test(s).

b. The owner or operator ~~shall~~ **must** provide the Air Pollution Control Officer 30 days' prior notice of the performance test(s).

Verification: The project owner ~~shall~~ **must** notify the District and perform the source tests described above and submit to the District and the Commission CPM the results of the source tests within 60 days from the completion of the tests, per the requirements of Condition **AQ-SC5**.

AQ-SC5 The project owner ~~shall~~ **must** perform an oxides of nitrogen (NOx) , reactive organic compounds (ROC), carbon monoxide (CO), particulate matter less than 10 microns (PM10), and ammonia (NH3) source test and CEM accuracy (RATA) test of the combined cycle combustion turbine with duct fired HRSG during the time frame pursuant to Condition **AQ-SC4**.

a. Submit a test plan to the Air Pollution Control Officer for approval at least 30 days before the source test is to be performed.

b. During the test(s), the gas turbine and duct burner ~~shall~~ **must** be operated at their maximum total firing capacity.

c. The source test results ~~shall~~ **must** be submitted to the Air Pollution Control Officer within 60 days from the completion of the source tests).

Verification: The project owner ~~shall~~ **must** submit a test plan to the Air Pollution Control Officer for approval at least 30 days before the source tests are to be performed. The source test results ~~shall~~ **must** be submitted to the Air Pollution Control Officer and the Commission CPM within 60 days from the completion of the source tests.

AQ-CM1 The recommissioning period is defined as follows: "The recommissioning period ~~shall~~ **must** commence when all mechanical, electrical and control systems associated with the Siemens T-3000 control system are installed and the gas turbine is first fired. The recommissioning period ~~shall~~ **must** terminate 30 operating days after commencement, or when the SPA facility has successfully completed performance testing, tuning and shakedown operations and compliance is demonstrated by continuous emissions monitoring equipment, whichever occurs first. For purposes of this condition, "operating day" is defined as any calendar day during which fuel is combusted in the turbine or duct burner."

Verification: No verification necessary.

AQ-CM2 The facility ~~shall~~ **must** record the date that the recommissioning period terminates and submit written notification of this date to the SMAQMD Air Pollution Control Officer within 3 weekdays (Monday through Friday) of such termination.

Verification: The project owner ~~shall~~ **must** provide notification of the end of re-commissioning to the CPM and SMAQMD within 3 weekdays after completing the re-commissioning activity.

AQ-CM3 During the recommissioning period at the earliest feasible opportunity, in accordance with recommendations of the equipment manufacturers and the construction contractor, the gas turbine combustors ~~shall~~ **must** be tuned to minimize emissions of CO and NOx.

Verification: A summary of significant operation and maintenance events ~~shall~~ **must** be included in a report of re-commissioning activities provided to the CPM and SMAQMD within 30 days after completing the re-commissioning activity.

AQ-CM4 During the recommissioning period, at the earliest feasible opportunity, in accordance with recommendations of the equipment manufacturers and the construction contractor, the gas turbine and duct burner ~~shall~~ **must** operate with the Selective Catalytic Reduction (SCR) system. The SCR system ~~shall~~ **must** be adjusted and operated to minimize emissions of NOx.

Verification: A summary of significant operation and maintenance events ~~shall~~ **must** be included in a report of re-commissioning activities provided to the CPM and SMAQMD within 30 days after completing the re-commissioning activity.

AQ-CM5 During the recommissioning period, compliance with NOx and CO emission limits for the gas turbine and duct burner ~~shall~~ **must** be demonstrated through the use of properly operated and maintained continuous emission monitoring systems and continuous parameter monitoring systems for the following:

A. Firing hours of the gas turbine and duct burner

B. Fuel flow rates to the gas turbine and duct burner

C. Stack gas NOx emission concentrations

D. Stack gas CO emission concentrations

E. Stack gas O2 concentrations

Verification: A summary of monitoring records ~~shall~~ **must** be included in a report of re-commissioning activities provided to the CPM and SMAQMD within 30 days after completing the re-commissioning activity.

AQ-CM6 During the recommissioning period the monitored parameters ~~shall~~ **must** be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the gas turbine and duct burner. Previously approved methods ~~shall~~ **must** be used to calculate heat input rates, NOx and CO mass emission rates, and NOx and CO emission concentrations, summarized for each clock hour and each calendar day. All records ~~shall~~ **must** be retained on site for at least 5 years from the date of entry and made available to SMAQMD personnel upon request.

Verification: A summary of monitoring records ~~shall~~ **must** be included in a report of re-commissioning activities provided to the CPM and SMAQMD within 30 days after completing the re-commissioning activity.

AQ-CM7 During the recommissioning period the continuous emission and parameter monitors ~~shall~~ **must** be installed, calibrated and operational prior to firing of the gas turbine and duct burner with the new master control system. After initial firing of the gas turbine and duct burner, the detection range of these continuous emission monitors ~~shall~~ **must** be adjusted as necessary to accurately measure the resulting range of NOx and CO emission concentrations.

Verification: A summary of monitoring records ~~shall~~ **must** be included in a report of re-commissioning activities provided to the CPM and SMAQMD within 30 days after completing the re-commissioning activity.

AQ-CM8 During the recommissioning period the total number of firing hours of the gas turbine and duct burner without control of NOx emissions by the SCR system ~~shall~~ **must** not exceed 100 hours. Such operation of the gas turbine and duct burner ~~shall~~ **must** be limited to discrete recommissioning activities that can only be properly executed without the SCR system fully operational.

A. The number of firing hours of the gas turbine and duct burner without control of NOx emissions by the SCR system shall must be recorded on an hourly basis during the recommissioning period.

Verification: A summary of monitoring records ~~shall~~ **must** be included in a report of re-commissioning activities provided to the CPM and SMAQMD within 30 days after completing the re-commissioning activity.

AQ-CM9 During the recommissioning period the total mass emissions of ROC, NOx, SOx, PMI0 and CO that are emitted by the gas turbine and duct burner ~~shall~~ **must** accrue towards the quarterly mass emission limits in Condition **AQ-8**.

Verification: A summary of monitoring records ~~shall~~ **must** be included in a report of re-commissioning activities provided to the CPM and SMAQMD within 30 days after completing the re-commissioning activity.

AQ-CM10 During the recommissioning period the concentration of nitrogen oxides (NOx) emissions from the gas turbine and duct burner ~~shall~~ **must** not exceed the following limit:

Pollutant	Maximum Allowable NOx Concentration Gas Turbine and Duct Burner ppmv at 15% O2, averaged over any consecutive 3 hour period	
	Current Permit Limit	Permit Limit Applicable During the Recommissioning Period
NOx	3	No limit

Verification: A summary of significant operation and maintenance events ~~shall~~ **must** be included in a report of re-commissioning activities provided to the CPM and SMAQMD within 30 days after completing the re-commissioning activity.

AQ-CM11 During the recommissioning period hourly mass emissions from the gas turbine and duct burner ~~shall~~ **must** not exceed the following limits:

Pollutant	Maximum Allowable Hourly Emissions Gas Turbine and Duct Burner lb/hour, averaged over any consecutive 3 hour period	
	Current Permit Limits	Permit Limits During the Recommissioning Period
ROC	9.01	9.01 (no change)
NOx	17.76	360
SO2	0.97	0.97 (no change)
PM10	7.00	7.00 (no change)
CO	10.81	500

Verification: A summary of significant operation and maintenance events ~~shall~~ **must** be included in a report of re-commissioning activities provided to the CPM and SMAQMD within 30 days after completing the re-commissioning activity.

AQ-CM12 During the recommissioning period daily mass emissions from the gas turbine and duct burner ~~shall~~ **must** not exceed the following limits:

Pollutant	Maximum Allowable Daily Emissions Gas Turbine and Duct Burner lb/day	
	Current Permit Limits	Permit Limits During the Recommissioning Period
ROC	146.7	146.7 (no change)
NOx	384.5	1500
SO2	21.8	21.8 (no change)
PM10	142.1	142.1 (no change)
CO	326.9	1875

Verification: A summary of significant operation and maintenance events ~~shall~~ **must** be included in a report of re-commissioning activities provided to the CPM and SMAQMD within 30 days after completing the re-commissioning activity.

AQ-CT2 The mass emissions from the cooling tower must not exceed the following:

Pollutant	Maximum Allowable Emissions Cooling Tower	
	lb/hour	lb/day
VOC/ROC[a]	N/A	0.5
NOx	N/A	NA
SO2	N/A	NA
PM10[b]	0.41	9.7
PM2.5[b]	0.41	9.7
CO	N/A	NA

[a] VOC emissions are estimated by tests conducted at the source of thereclaimed/recycled water. Further testing at the final use point, may show a lower VOC value that will be adjusted during the final permitting process, see AQ-CT8.

[b] Based on a water circulation rate of 45,000 gal/min, cooling tower drift rate of .0006%, and a TDS level of 3,000 ppmw, based on a 3-hour average.

Pollutant	Maximum Allowable Emissions Cooling Tower (lb/quarter)			
	Q1	Q2	Q3	Q4
VOC/ROC[a]	44	45	45	45
NOx	N/A	N/A	N/A	N/A
SO2	N/A	N/A	N/A	N/A
PM10[b]	875	885	895	895
PM2.5[b]	875	885	895	895
CO	N/A	N/A	N/A	N/A

[a] VOC emissions are estimated by tests conducted at the source of thereclaimed/recycled water. Further testing at the final use point, may show a lower VOC value that will be adjusted during the final permitting process, see **AQ-CT8**.

[b] Based on a water circulation rate of 45,000 gal/min, cooling tower drift rate of .0006%, and a TDS level of 3,000 ppmw.

Verification: The project owner ~~shall~~ **must** maintain appropriate emission data records as required by Conditions **AQ-19** and **AQ-20**. A summary of significant operation and maintenance events and monitoring records ~~shall~~ **must** be included in the quarterly operation report (**AQ-20**).

MONITORING SYSTEM CONDITIONS

AQ-CT3 The Sacramento Power Authority ~~shall~~ **must** operate a continuous monitoring system that has been approved by the Air Pollution Control Officer that either measures or calculates and records the following.

Parameter to be Monitored	Units
Total dissolved solids content of the circulating water in the cooling towers	PPMV

Verification: The facility owner ~~shall~~ **must** make the site available for inspection by representatives of the SMAQMD, the ARB, and the CPM to verify the continuous monitoring and recordkeeping system is properly installed and operational.

EMISSIONS TESTING CONDITIONS

AQ-CT4 Testing for VOC/ROC and Hexavalent Chrome (measured as compounds of chrome) of the reclaimed/recycled water inlet to the cooling tower must be performed within 60 days of startup (or if revising the VOC emission limits testing must occur before startup with reclaimed/recycled water) and once every second calendar year thereafter to verify compliance with Condition **AQ-CT2 and AQ-SC1**.

A. Submit a source test plan to the Air Pollution Control Officer for approval at least 30 days before the test is to be performed.

B. Notify the Air Pollution Control Officer at least 7 days prior to the source test date of the exact date and time of test if the date has changed from that approved in the source test plan.

C. Submit the source test report to the Air Pollution Control Officer within 60 days from the completion of the test(s).

Verification: At least thirty (30) days before conducting a source test, the facility owner ~~shall~~ **must** submit to the SMAQMD and the CPM for their review and approval, a source test plan. The facility owner ~~shall~~ **must** notify the SMAQMD and the CPM within seven (7) working days before the project begins initial operation and/or plans to conduct a source test. All source test results ~~shall~~ **must** be submitted to the CPM and the SMAQMD within sixty (60) days of the date of the tests.

RECORD KEEPING & REPORTING CONDITIONS

AQ-CT5 The following records must be continuously maintained onsite for the most recent five-year period and must be made available to the Air Pollution Control Officer upon request. Monthly, quarterly, and annual records must be made available within 30 days of the end of the reporting period.

Frequency	Information to be Recorded
Hourly	A. Total dissolved solids content of the circulating water in the cooling towers in ppmw. B. Cooling Tower hourly PM10 mass emission rate. The hourly emissions ~~shall~~ **must** be calculated based on the cooling water circulation rate multiplied by the cooling tower drift rate, density of water, and the measured TDS level.
Daily	C. Cooling Tower PM10 daily emissions. D. Total daily PM10 emissions from all equipment at the Sacramento Power Authority Facility.
Quarterly	E. Total facility PM10 quarterly mass emissions.

Verification: The facility owner ~~shall~~ **must** make the site available for inspection by representatives of the SMAQMD, the ARB, and the CPM to verify the continuous monitoring and recordkeeping system is properly installed and operational.

AQ-CT6 The project owner ~~shall~~ **must**, upon determination of applicability and written notification by the SMAQMD, comply with all applicable requirements of the Air Toxics "Hot Spots" Information and Assessment Act (California Health and Safety Code Section 44300 et seq.)

Verification: The facility owner ~~shall~~ **must** notify the SMAQMD and the CPM within fifteen (15) working days before the execution of this condition.

EMISSION OFFSETS CONDITIONS

AQ-CT7 Prior to commencing operation, the permittee must surrender sufficient ERCs to the SMAQMD Air Pollution Control Officer to offset the following amount of emissions:

Pollutant	Qtr1 lb/qtr	Qtr2 lb/qtr	Qtr3 lb/qtr	Qtr4 lb/qtr
VOC	44 lbs	45 lbs	45 lbs	45 lbs

The applicant has identified three possible credits that individually are sufficient to offset the project VOC emissions. One of the credit certificates originated from the reduction in rice straw burning from the Feather River Air Quality Management District (FRAQMD). The locations of the reduction in rice straw burning are located greater than 15 miles from SCA but less than 50 miles. Two other credits that could potentially be submitted were generated from a shutdown of the compound application process at Campbell Soup Company which is located adjacent to the SPA facility. Therefore, the table below depicts the total quantity of offsets that would be needed to be surrendered for the project.

Emission Reduction Credit Certificate No. (A)	Pollutant	Amount of ERC's Surrendered lb/quarter				Offset Ratio	Value Applied to The Project Emission Liability lb/quarter			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4		Qtr 1	Qtr 2	Qtr 3	Qtr 4
FRAQMD #99001-T2, or	VOC	88	90	90	90	2.0	44	45	45	45
SMAQMD #04-00916, or	VOC	52.8	54	54	54	1.2				
SMAQMD #04-00920	VOC	52.8	54	54	54					

A The applicant has requested that 3 certificates be listed as options to be used for this project.

Verification: At least thirty (30) days prior to the start of construction, the facility owner must provide to the CPM a copy of one of the three certificates listed as follows: SMAQMD #04-00916, or SMAQMD #04-00920 or the signed recertification from Feather River Air Quality Management District and Sacramento Metropolitan Air Quality Management District demonstration the banking certificate (Certificate FRAQMD #99001-T2) which must have been validated.

AQ-CT8 The applicant must provide the District, prior to commencing operation under this permit, emission reduction credit certificates in sufficient quantity to offset the emissions increase specified in Condition **AQ-CT7**. If further source testing of the cooling tower reclaimed/recycled water shows a lower VOC concentration in the reclaimed/recycled water, then the amount of VOC credits submitted may be adjusted downward provided the VOC emission limitations in Conditions **AQ-CT2**, **AQ-7**, and **AQ-8** are correspondingly adjusted to reflect the revised lower reclaimed/recycled water VOC concentration. Any adjustment of the VOC emission limits and corresponding reduction of VOC credits must occur prior to startup of the cooling tower with reclaimed/recycled water. Source testing must include sampling of the reclaimed/recycled water prior to entering the cooling tower basin.

Verification: Prior to commencing operating of the above activities, the facility owner must provide written notice to the District and the CPM. Any adjustment of the VOC emission limits and corresponding reduction of VOC credits, ~~shall~~ **must** also be in a written notification to the CPM regarding any changes to ERCs.

REFERENCES

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SMAQMD 2018b. Authority to Construct, Issued to: Sacramento Power Authority (SPA), A/C 24808. November 15, 2018.

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U.S. EPA 2018c – United States Environmental Protection Agency. Air Data Monitor Values Report website. https://www.epa.gov/outdoor-air-quality-data/monitor-values-report. Accessed November 2018.