

APPENDIX 5.1H

Cumulative Impact Support Data

Cumulative Impacts Analysis Protocol

Potential cumulative air quality impacts that might be expected to occur resulting from CCGS Project and other reasonably foreseeable projects are both regional and localized in nature. These cumulative impacts will be evaluated as follows.

Regional Impacts

Regional air quality impacts are possible for pollutants such as ozone, which involve photochemical processes that can take hours to occur. CCGS is proposing to supply emissions mitigation per Appendix 5.1G. Additional mitigation for other pollutants may be required by the CEC.

Although the relative importance of VOC and NO_x emissions in ozone formation differs from region to region, and from day to day, most air pollution control plans in California require roughly equivalent controls (on a ton per year basis) for these two pollutants. The change in emissions of the sum of these pollutants, equally weighted, will be used to provide a reasonable estimate of the impact of CCGS on ozone levels. The net change in emissions of ozone precursors from CCGS will be compared with emissions from all sources within the Bay Area Air Basin (Table 5.1H-1).

Table 5.1H-1 Estimated Bay Area Air Basin Emissions Inventory for 2008 (tons/day)

| Source Category | TOG | ROG | CO | NO _x | SO _x | PM10 | PM2.5 |
|--------------------------|-------------|------------|-------------|-----------------|-----------------|------------|-----------|
| Total Stationary Sources | 614.6 | 106.6 | 44.3 | 50.6 | 45.9 | 16.3 | 12.1 |
| Total Area Sources | 173.5 | 87.9 | 161.9 | 16.9 | 0.6 | 175.5 | 52.9 |
| Total Mobile Sources | 200.7 | 183.1 | 1541.5 | 380.5 | 14.9 | 20.3 | 16.3 |
| Total Natural Sources | 116.1 | 106.5 | 49.4 | 1.6 | 0.5 | 5.1 | 4.3 |
| <i>Air Basin Totals</i> | <i>1105</i> | <i>484</i> | <i>1797</i> | <i>450</i> | <i>62</i> | <i>217</i> | <i>86</i> |

Source: CARB, June 2009

Air quality impacts of fine particulate, PM10 and/or PM2.5, have the potential to be either regional or localized in nature. On a regional basis, an analysis similar to that proposed above for ozone will be performed, looking at the three pollutants that can form PM₁₀ in the atmosphere, i.e., VOC, SO_x, and NO_x as well as at directly emitted particulate matter. BAAQMD regulations require offsets to be provided for NO_x and VOC emissions from the project, i.e., the net increase in emissions must be mitigated.

As in the case of ozone precursors, emissions of PM10/2.5 precursors are expected to have approximately equivalent ambient impacts in forming PM10/2.5, per ton of emissions on a regional basis. Table 5.1H-2 provides the comparison of emissions of the criteria pollutants from CCGS with emissions from all sources within Bay Area Air Basin as a whole.

Table 5.1H-2 Comparison of CCGS Project Emissions to Estimated Inventory for 2008

| Category | TOG | ROG ¹ | CO | NO _x | SO _x | PM10 | PM2.5 |
|---|------|------------------|--------------|-----------------|-----------------|--------------|--------------|
| CCGS Emissions (tons/yr) | - | 30 | 96 | 99 | 13 | 42 | 42 |
| CCGS Emissions (tons/day) | - | 0.082 | 0.263 | 0.271 | 0.036 | 0.115 | 0.115 |
| BA Air Basin Total (tons/day) | 1105 | 484 | 1797 | 450 | 62 | 217 | 86 |
| CCGS % of Air Basin Total Tons/day basis | - | 0.017 | 0.015 | 0.06 | 0.058 | 0.053 | 0.134 |

¹ CCGS VOC emissions compared to inventory ROG emissions.

Localized Impacts

Localized impacts from CCGS could result from emissions of carbon monoxide, oxides of nitrogen, sulfur oxides, and directly emitted PM10/2.5. A dispersion modeling analysis of potential cumulative air quality impacts will be performed for all four of these pollutants.

In evaluating the potential cumulative localized impacts of CCGS in conjunction with the impacts of existing power generation facilities immediately adjacent to the project site and facilities not yet in operation but that are reasonably foreseeable, a potential impact area in which cumulative localized impacts could occur was identified as an area with a radius of 8 miles around the plant site. Based on the results of the proposed air quality modeling analyses described above, "significant" air quality impacts, as that term is defined in federal air quality modeling guidelines, will be determined. If the project's impacts do not exceed the significance levels, no cumulative impacts will be expected to occur, and no further analysis will be required. Otherwise, in order to ensure that other projects that might have significant cumulative impacts in conjunction with CCGS are identified, a search area with a radius of 8 miles beyond the project's impact area will be used for the cumulative impacts analysis. Within this search area, three categories of projects with emissions sources will be used as criteria for identification:

- Projects that have been in operation for a sufficient time period, and whose emissions are included in the overall background air quality data.
- Projects which recently began operations whose emissions may not be reflected in the ambient monitoring background data.
- Projects for which air pollution permits to construct have not been issued, but that are reasonably foreseeable.

The applicable inclusion dates for each of the above source categories will be discussed and approved by the BAAQMD staff. The requested source listings will incorporate these dates. Projects that are existing, and that have been in operation such that their emissions are reflected in the ambient air quality data that has been used to represent background concentrations require no further analysis. The cumulative impacts analysis adds the modeled impacts of selected facilities to the maximum measured background air quality levels, thus ensuring that these existing projects are taken into account.

Projects for which air pollution permits to construct have been issued but that were not operational will be identified through a request of permit records from the BAAQMD. The search will be requested to extend outwards to 8 miles from the project site.

Given the potentially wide geographic area over which the dispersion modeling analysis is to be performed, the AERMOD model will be used to evaluate cumulative localized air quality impacts. The detailed modeling procedures, AERMOD options, and meteorological data used in the cumulative impacts dispersion analysis were the same as those described in Section 5.1. The receptor grid will be the same one that was used to assess this project.

Cumulative Impacts Dispersion Modeling

The dispersion modeling analysis of cumulative localized air quality impacts for the proposed project will be evaluated in combination with other reasonably foreseeable projects and air quality levels attributable to existing emission sources, and the impacts were compared to state or federal air quality standards for significant impact. As discussed above, the highest second-highest modeled concentrations will be used to demonstrate compliance with standards based on short-term averaging periods (24 hours or less).

Supporting information to be used in the analysis includes the following:

- 2008 estimated emissions inventory for Bay Area Air Basin (Table 5.1H-1);
- List of projects resulting from the screening analysis of permit files by the BAAQMD;
- Table delineating location data of sources included in the cumulative air quality impacts dispersion modeling analysis;
- Stack parameters for sources included in the cumulative air quality impacts dispersion modeling analysis; and
- Output files for the dispersion modeling analysis.