UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

April 11, 2013

David Warner, Director of Permit Services
San Joaquin Valley Air Pollution Control District
34946 Flyover Court
Bakersfield, California 93308

RE: Hydrogen Energy California, LLC Preliminary Determination of Compliance

Dear Mr. Warner:

This letter is in regard to the Preliminary Determination of Compliance (PDOC) issued by the San Joaquin Valley Air Pollution Control District (District) to Hydrogen Energy California, LLC for the construction of a proposed 300 megawatt integrated gasification combined cycle (IGCC) power generation facility and integrated fertilizer manufacturing complex in western Kern County.

EPA appreciates the opportunity to comment on the PDOC. Based on our review of the PDOC, we have several comments regarding the Best Available Control Technology (BACT) requirements and air quality analysis performed for the project. We provide these comments to help ensure that the project meets federal Clean Air Act requirements, that the permit will provide necessary information so that the basis for the permit decision is transparent and readily accessible to the public, and that the record provides adequate support for the decision. Our comments are attached to this document.

We look forward to working with you and your staff to address these comments. If you have any questions, please contact Shaheerah Kelly, of my staff, at (415) 947-4156 or kelly.shaheerah@epa.gov.

Sincerely,

Gerardo C. Rios
Chief, Permits Office
Air Division

Enclosure: EPA Comments on the Hydrogen Energy California, LLC Preliminary Determination of Compliance

cc: Michael J. Tollstrup, California Air Resources Board
Marisa Mascaro, Hydrogen Energy California, LLC
Julie Mitchell, URS Corporation
Leonard Scandura, San Joaquin Valley Air Pollution Control District
Homero Ramirez, San Joaquin Valley Air Pollution Control District

EPA Comments on the Hydrogen Energy California, LLC Preliminary Determination of Compliance

Greenhouse Gas (GHG) Requirements

1. The PDOC contains two limits that apply to the turbine: a 90% capture efficiency of carbon from syngas when burning hydrogen rich fuel and a 400 lb/MW-hr performance standard. The 400 lb/MW-hr standard is not included in the top-down Best Available Control Technology (BACT) analysis but is included in the pre-analysis discussion as "one of the various requirements to demonstrate with the GHG BACT." The BACT analysis must explain more clearly whether this limit is used to demonstrate BACT for the turbine generator.

2. The PDOC requires that the facility demonstrate compliance with a 400 lb/MW-hr standard which has no averaging period associated with it. Because the standard appears to have been developed by dividing annual CO_2 potential-to-emit (PTE) by annual potential energy output (see Table 2 of appendix I), it is not clear whether the applicant could comply with it on a monthly basis. Also, since there is no averaging period, it is not clear how the applicant would actually demonstrate compliance. The prmit must specify how the permittee will demonstrate compliance with the 400 lb/MW-hr limit and the engineering evaluation must demonstrate whether compliance with this limit will demonstrate compliance with the 90% capture efficiency requirement.

3. The permit must specify whether the 400 lb/MW-hr standard in permit condition 86 for the power generation system (S-7616-26-0) is in terms of CO_2 or CO_2e.

4. The GHG BACT analysis does not contain a discussion regarding what kind of output-based limit in lb/MW-hr would be equivalent to 90% carbon removal from the syngas stream and the limits on CO_2 venting and natural gas combustion. EPA policy is to establish output-based emission limits whenever possible. The permit must establish and the engineering evaluation must justify an output based limit equivalent to the 90% carbon removal requirement and limitations on venting.

5. There are several deficiencies related to monitoring the capture efficiency requirement:

    - The 90% capture efficiency of carbon from syngas has no averaging period.
    - Although the permit requires the permittee to demonstrate compliance with this standard by monthly laboratory tests of CO_2, carbon monoxide (CO), and methane (CH_4) before and after the acid gas removal system, there is no test method, time period, or sample volume associated with the tests.
    - There is no parametric monitoring required for the acid gas removal system (e.g. flow rate, temperature, pH) or even a requirement to monitor whether the acid gas removal system is actually operating.

    The permit must define an averaging period for the 90% carbon capture efficiency establish adequate monitoring requirements for the acid gas removal system. EPA believes that a continuous emission monitoring method for carbon dioxide (CO_2) and a continuous parametric

monitoring system for the acid gas removal system are warranted for this project given the magnitude of GHG emissions.

6. Permit condition 87 for the power generation system (S-7616-26-0) sets a facility-wide limit of 595,917 tons CO_2e per calendar year. Although emissions of CO_2e are calculated monthly, the limit is defined on a calendar year basis, contradicting EPA guidance recommending shorter term limits or at least limits in terms of tons per rolling continuous 12-month period. The permit does not explain how facility-wide CO_2e should be calculated. The permit must include a demonstration methodology for the facility-wide limit and either redefine the limit as a rolling 12-month total or explain in the engineering evaluation why a rolling continuous 12-month total is not necessary.

7. EPA is currently proposing to change 100-year global warming potentials (GWPs). To avoid difficulty complying with CO_2e limits in the future, when emission limits are expressed in terms of CO_2e, the GWPs used should be specified in either the permit or engineering evaluation for the permit.

Criteria Pollutant Requirements

1. The gasification system (S-7616-21-0) includes a general description of the syngas cleanup system which consists of a syngas scrubbing system, sour shift/low temperature gas cooling system, sour water treatment system, and rectisol acid gas removal unit. The permit must contain a condition(s) that specifically requires operation of the syngas cleanup system to minimize emissions of volatile organic compounds, sulfur compounds, and mercury.

2. Permit conditions 41 through 45 for the auxiliary boiler (S-7616-25-0) authorize the use of "equivalent equipment" or "alternate equipment" upon approval by the District. The terms "equivalent equipment" and "alternate equipment" are used interchangeably and are not defined in the permit. The permit must define these terms and require that the facility keep a log of each time the equipment is replaced.

3. Although the Preliminary Determination of Compliance (PDOC) contains permit conditions for the combustion of hydrogen-rich fuel (primary fuel) and natural gas (back-up fuel) in the turbine, it does not address what which limits apply when these fuels are combusted together in the turbine (S-7616-26-0). The permit and/or engineering evaluation should address what limits apply when these fuels are combusted together.

4. 40 CFR 52.21, which is incorporated by reference in the District's Rule 2410, requires that BACT not exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61. The BACT analysis did not address or include a comparison of these standards to the proposed BACT determinations. In the future, we recommend that, where applicable, that a comparison of the applicable standard under 40 CFR parts 60 and 61 to the proposed BACT determination(s) be included in the District's BACT analyses for PSD projects.

Air Quality Analysis

1. It is our understanding, based on the Executive Summary in the PDOC, that certain areas immediately surrounding the source will be inaccessible to members of the public due to a

physical fence, and that therefore those areas were not included in the air quality modeling analysis. This approach is generally consistent with EPA regulations and guidance concerning "ambient air" in the context of required air quality impact analyses under PSD. EPA requests that an enforceable permit condition be added to assure construction and maintenance of the fence for the duration of the facility operations.

2. The nitrogen dioxide/nitrogen oxide (NO_2/NOx) in-stack ratios (ISRs) used in the Tier 3 NO_2 modeling for the nearby sources and proposed project units are presented in Appendix K, Tables 6-6 and 6-7, respectively. We understand that the San Joaquin Valley Air Pollution Control District has a draft guidance document that was relied upon for several of the ISRs, as well as consideration of other sources' ratios. Please ensure that supporting information is available to justify the selected ISRs. Additionally, we recommend forwarding the collected ISR information to Chris Owen of the EPA (owen.chris@epa.gov) for inclusion in the EPA database – http://www.epa.gov/ttn/scram/no2_isr_database.htm.

3. In Section 6.5.2 of Appendix K, the District describes the following, with regards to the significant impact area (SIA):

   For analyzing the representativeness of the meteorological dataset, the area of interest includes:
   - the SIA where screening modeling predicts the project's pollutant impact to be greater than the SILs, and
   - the sources and receptors used in the modeling.

   We note that the SIA is not specifically referenced in the PDOC. Please include a reference in Appendix K that the significant impact area is 13 (thirteen) kilometers.

4. Please include, in the engineering evaluation for the permit, a table that presents and summarizes the specific stack parameters (e.g., stack height, temperature, exit velocity, stack diameter) for those equipment and processes in the air quality modeling analyses as described in Appendix K. For example, the table may be similar to Table 3 of Appendix I in the May 2012 PSD permit application update. Additionally, the permit should contain a condition that requires project construction and operation in accordance with the permit application and plans submitted with the permit application, the District's PSD regulations, and other terms and conditions set forth in the permit.

5. We would like to clarify for the record what we considered in approving HECA's approach for combining monitored and modeled concentrations. In June 2010, EPA issued a guidance document: *Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program* (USEPA, 2010c). In preparation for performing the 1-hour NO_2 modeling analysis described in the guidance document, HECA submitted a modeling protocol titled *"Modeling Protocol for Parameter Selection Specific to the 1-Hour NO2 NAAQS Regional Modeling for the Hydrogen Energy California (HECA) Project"* on January 20, 2011. In order to estimate total NO_2 concentrations for comparison with the new 1-hour NO_2 standard, HECA proposed in the protocol to use the temporal pairing of modeled concentrations with monitored concentrations.

For this project, HECA proposed that the air dispersion model, AERMOD, would add the hourly modeled NO_2 concentrations based on 2006-2010 meteorological data to the concurrent (2006-2010) hourly NO_2 background data from the most representative monitor and determine the design value, the 98th percentile (eighth-highest) daily maximum 1-hour NO_2 concentration at each receptor averaged across the five modeled year for comparison with the 1-hour standard. Before and after the protocol was submitted, there had been ongoing discussions between HECA, Region 9, and OAQPS for several months during which HECA presented justification for using the temporal pairing method they proposed. Based on the rationale provided by HECA, EPA Region 9 approved the modeling protocol on March 11, 2011.

The following discussion provides a summary of the grounds for approving the protocol. HECA proposed to use the Shafter-Walker NO_2 data as the most representative monitoring data available in the area of the project. However, the hourly monitoring concentration was greater than or equal to the new NO_2 standard of 188 ug/m3 twice during the 5-year data set. Because the standard is based on the 98th percentile (eighth-highest) daily maximum 1-hour concentration, more than one hourly average concentration above the standard on the same day will only result in one concentration greater than the standard for that day. This allows a monitor or model receptor to have up to 7 days with one or more hours greater than the standard within each day on an annual basis and still be considered in compliance with the NAAQS. For these monitoring data, the applicant showed that the "first tier" assumption (a term defined in the June 2010 USEPA guidance document) of adding the overall highest hourly background NO_2 concentration to the model results was overly conservative and would result in numerous predicted violations that were not valid. The June, 2010 guidance provided that additional refinements to this "first tier approach" based on some level of temporal pairing of modeled and monitored values may be considered on a case-by-case basis, with adequate justification and documentation.

In addition, during the evaluation period after the submittal of the protocol, EPA issued the March 1, 2011, guidance document: *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard* (USEPA, 2011). This guidance document, provided further clarification on uncertainties raised since the earlier June 2010 modeling guidance document. The new guidance, while not generally recommending the use of hour-by-hour temporal pairing, did provide that it could be justified if there was a demonstration of the overall conservatism of the cumulative assessment based on the combination of modeled and monitored impacts (p. 21). An exploration of the modeled inventory used by the applicant shows that it clearly represents the majority of the emissions that could potentially contribute to the cumulative impact assessment. There are 371 sources in the nearby source inventory that were included in the modeling. The applicant also made a good case that the conservativeness of the monitor more than made up for any other shortcomings.