



November 6, 2009

Dockets Unit California Energy Commission 1516 Ninth Street, MS 4 Sacramento, CA 95814

> RE: Hydrogen Energy California Project Application for Certification 08-AFC-8

On behalf of Hydrogen Energy International LLC, the applicant for the abovereferenced Hydrogen Energy California AFC, we are pleased to submit the enclosed document:

• Responses to Association of Irritated Residents Data Requests (#1-14)

The enclosed document is being docketed electronically and one print copy submitted to the CEC Dockets Unit.

URS Corporation

A. G. kas

Dale Shileikis Vice President, Environmental Services

Enclosures

CC: Rod Jones (w/o enclosure)

URS Corporation 221 Main Street, Suite 600 San Francisco, CA 94105 Tel: 415.896.5858 Fax: 415.882.9261 www.urscorp.com Responses to Association of Irritated Residents Data Requests (#1–14)

Revised Application for Certification (08-AFC-8) for HYDROGEN ENERGY CALIFORNIA Kern County, California Prepared for: Hydrogen Energy International LLC



Submitted to: Association of Irritated Residents

Prepared by:



November 2009

RESPONSES TO DATA REQUESTS 1 THROUGH 14 FROM THE ASSOCIATION OF IRRITATED RESIDENTS (AIR)

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LIST OF ACRONYMS AND ABBREVIATIONS USED IN RESPONSES

AFC	Application for Certification
AIR	Association of Irritated Residents
BVWSD	Buena Vista Water Storage District
CARB	California Air Resources Board
CO ₂	carbon dioxide
DOE	Department of Energy
DOE-NETL	Department of Energy – National Energy Technology Laboratory
EOR	enhanced oil recovery
ERC	emissions reduction credit
HECA	Hydrogen Energy California
PM _{2.5}	particulate matter less than 2.5 microns
VOC	volatile organic compound

1. Was the concept that there would be less local opposition to the project because of a clear majority of the local population consists of people of color who are lowincome and under-educated, a reason for the current site selection in the San Joaquin Valley instead of elsewhere in the state? Was that concept ever discussed at any level by the applicant?

RESPONSE

Please refer to Applicant's objections to Data Request No. 1 and the background thereto filed on October 27, 2009. Without waiving its objections, Applicant provides the following response to Data Request No. 1.

The Applicant selected the site for the Hydrogen Energy California project (HECA or Project) based on a variety of factors, including proximity to an available and appropriate carbon sequestration reservoir and needed infrastructure. The Elk Hills Field was selected for its well-known and understood geology, its safe and available carbon storage capacity and containment, and the ability to use carbon dioxide (CO₂) in enhanced oil recovery (EOR) operations, thus creating an economic value for the CO₂ captured by the Project to offset operational costs. The site was selected also for its proximity to pre-existing infrastructure necessary to service the operations of the Project. This included an interconnection to the electric transmission system; available land suited for an interconnection transmission corridor; existing natural gas transmission service lines; and appropriate water sources that could be used without resulting in negative environmental impacts.

Once proximity was established to both an available carbon sink and needed infrastructure, additional critical factors in the site selection process included the availability of land parcels and the existing uses of those land parcels. To preserve arable farmland, the Applicant initially selected a site that consisted of undeveloped, non-agricultural land. However, as is the case with some undeveloped land in the area, this site was habitat for a number of important and endangered species that could potentially be adversely affected by the Project. Because of this, the Applicant decided to relocate onto land that had already been in agricultural production, thus avoiding biological resource issues.

The proposed site was determined to be optimal based on the operational and environmental factors described above. For a more detailed discussion of the site selection process, including an analysis of alternative Project sites that were considered by the Applicant, please refer to Section 6, Alternatives of the Revised Application for Certification (AFC).

With respect to the racial and socioeconomic character of the area surrounding the Project, the Applicant notes that, contrary to the assertions of the Intervenor, the community nearest the Project Site consists of a predominantly non-minority population. The Tupman area, according to 2000 census data, is 93 percent Anglo. Nevertheless, awareness of and sensitivity to the Project's potential impact upon minority and low-income populations, while not driving site selection decisions as suggested by the Intervenor, were given careful consideration. Applicable laws and regulations require consideration of "environmental justice" factors related to any project. The Applicant and the reviewing and permitting agencies will ensure that there are no disproportionate adverse impacts upon minority and low-income populations. For a more detailed discussion of the environmental justice analysis undertaken by the Applicant in connection with the Project, please refer to Section 5, Socioeconomics of the Revised AFC.

Additionally, significant economic benefits will accrue to the community in terms of capital investment, construction and operational employment opportunities, and ancillary economic stimulus related to improved income and local spending. A proposed community benefits program will ensure that net social and community benefits accrue to surrounding communities as well. For a more detailed discussion of the Project's positive economic impacts on surrounding communities, please refer to Section 5, Socioeconomics of the Revised AFC.

2. Is there any reason not to do the air analysis using the measurements of the nearby monitoring stations (in Kern County) showing the highest numbers for the relevant criteria air emissions?

RESPONSE

Please refer to Applicant's objections to Data Request No. 2 and the background thereto filed on October 27, 2009. Without waiving its objections, Applicant provides the following response to Data Request No. 2.

As a preliminary matter, the background air quality data provided by the Intervenor is inaccurate. Specifically, the data showing the number of days that the National 8-hour ozone standards are exceeded in Kern County is wrong and biased high. Furthermore, the worsening trend line presented by the Intervenor for particulate matter less than 2.5 microns ($PM_{2.5}$) is incorrect.

Based on data obtained from the California Air Resources Board (CARB), the historical trend of number of days exceeding the national 8-hour ozone standard for Arvin-Bear Mountain Boulevard Station, Bakersfield-5558 California Avenue Station, and Shafter-Walker Street Station are presented in Figure AIR 2-1, *Number of Days Above 2008 8-Hour Ozone National Standard*. The data presented by Intervenor, which is implied to refer to the national 8-hour ozone standard of 0.075 ppm (which the Intervenor misstated as ".75 ppm") (see Figure AIR 2-2, *Copy of Graph from AIR Data Request*), is not consistent with the data provided by CARB. (For ozone data from the interactive CARB site called iADAM, see complete reference under Figure AIR 2-1). The CARB data show better air quality than the information provided by the Intervenor.











Comparison of Number of Violations of 8 hr Ozone Standard

The Applicant is also unable to verify the data for PM_{2.5} presented in the submittal by the Intervenor. Based on data generated by CARB, Figure AIR 2-3, *PM_{2.5} Historical Trend (23 November to 17 January) and Trend Line* presents the average readings for 24-hour PM_{2.5} during the 8-week period from November 23 to January 17 of each year from 2000 to 2009 for the Bakersfield-5558 California Avenue Station (see complete reference under Figure AIR 2-3). Compared to the trend graph presented in Figure AIR 2-4, *Copy of Graph from AIR Data Request*, the trend of the data provided by CARB indicates a gradual decrease of PM_{2.5} concentrations during winter. These data indicate the opposite of the erroneous trend presented by the Intervenor in the data request.

With respect to the monitoring data used in the air quality analysis presented in the Revised AFC, the Applicant used the highest reading from the monitoring station most representative of ambient air quality at the location of the Project. Criteria used to assess whether data from a monitoring site represent conditions at a project site include the distance between the project site and the monitoring station, source types and source locations potentially influencing both locations, terrain, and meteorological conditions. Monitoring sites influenced by nearby emission sources are not representative of a project site unless the project site is also influenced by similar nearby emission sources. Data from urban areas potentially influenced by traffic, commercial, and residential emission sources are generally not representative of conditions at a rural site such as the Project site.

For some projects, it is possible to obtain data from a monitoring station in close proximity to the project site. When no nearby station exists, as in the case of the Project, the best approach is to find an existing monitoring station with data that represent the location of the proposed project.

Figure AIR 2-3. PM_{2.5} Historical Trend (23 November to 17 January) and Trend Line



PM 2.5 24-hour Winter Average California St, Bakersfield

Source: CARB- ADAM (http://www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4b.d2w/Branch, Last access: October 15, 2009)





Figure AIR 2-5 shows all of the CARB air monitoring stations in western Kern County. As stated in the Revised AFC, not all stations monitor all pollutants. The Shafter-Walker Street Station is closest to the Project site, is much more rural than any of the stations in the greater Bakersfield area, and has topography and meteorology very similar to the Project site. Therefore, the Shafter-Walker Street Station was selected as having the most representative ozone data.

The Arvin-Bear Mountain Boulevard Station is the station farthest from the Project site in western Kern County and is much closer to elevated terrain that is widely known to obstruct air flow movement out of the valley. Therefore, the ozone data from the Arvin-Bear Mountain Station are not representative of the ozone levels at the Project site, and were therefore not selected.



Figure AIR 2-5 ARB Monitoring Stations

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3. Will any SOx erc's be used to mitigate PM10/2.5 emissions from the project and, if so, how can this interpollutant trading be justified?

RESPONSE

Please refer to Applicant's objections to Data Request No. 3 and the background thereto filed on October 27, 2009. Without waiving its objections, Applicant provides the following response to Data Request No. 3.

Depending on the availability of PM emissions reduction credits (ERCs), it may be necessary to procure ERCs for sulfur oxides (or other qualifying pollutants) to offset some or all PM emissions. If ERCs other than PM are used to offset PM emissions, then Applicant will apply interpollutant ratios accepted by San Joaquin Valley Air Pollution Control District based on publicly available modeling analyses. Such ratios will also be reviewed by the U.S. Environmental Protection Agency and the California Energy Commission during the permit review process.

4. Without quantifying this significant nearby source of VOCs how can an accurate ambient air quality analysis be done?

RESPONSE

Please refer to Applicant's objections to Data Request No. 4 and the background thereto filed on October 27, 2009. Without waiving its objections, Applicant provides the following response to Data Request No. 4.

Volatile organic compound (VOC) concentrations are not required in the Revised AFC or included in the air quality impact analysis because there are no ambient air quality standards for VOCs established for comparison.

5. In order to compare the HECA project to other fossil fuel plant alternatives such as the Avenal project we request an analysis to be done from the respective AFC's of the total projected emissions of both plants for NOx, SOx (or SO2), VOC, and PM 10/PM2.5. The figures should be put into a joint table and then calculations per unit of power to the grid should be done for each plant and each pollutant. Projected gross mobile emissions (in the San Joaquin Valley) should also be included in the comparison.

RESPONSE

Please refer to Applicant's objections to Data Request No. 5 and the background thereto filed on October 27, 2009.

6. Please provide the best estimate for the project of the total annual emissions from mobile sources for delivery of pet coke, coal, ammonia, other materials, waste disposal, and any other related transportation. These emissions should be calculated according to what quantities will be released in the San Joaquin Valley Air Pollution Control District. Construction phase emissions need not be included.

RESPONSE

Please refer to Applicant's objections to Data Request No. 6 and the background thereto filed on October 27, 2009. Without waiving its objections, Applicant provides the following response to Data Request No. 6.

Please see Table 5.1-26, San Joaquin Valley Air Basin Net Emission Difference, in the Revised AFC; specifically, the lower half of this table entitled *Project Site Scenario*.

- 7. a. Please compare total green house gas emission estimates for Avenal and HECA and be sure to include all mobile emissions from all transportation related to each project.
 - b. On a separate line please show all GHG emissions that Occidental will emit as they receive, inject, recover, clean, separate, repressurize, and reinject all CO2 produced by HECA and sent to them for Enhanced Oil Recovery operations.

RESPONSE

Please refer to Applicant's objections to Data Request No. 7 and the background thereto filed on October 27, 2009. Without waiving its objections, Applicant provides the following response to Data Request No. 7.

Specific information related to CO_2 recovery and reinjection processes associated with oil recovery will be detailed in the Occidental of Elk Hills EOR and Sequestration Project's CO_2 Injection Permit, which will be issued by the Division of Oil, Gas and Geothermal Resources Region 4 office in Bakersfield. The entire EOR process occurs within a specially-designed, closed system. During normal operations, there is no venting or emission of CO_2 to the atmosphere. CO_2 is a valuable commodity, and there is significant financial incentive for EOR operators to closely monitor and contain all of the injected CO_2 , as described in the section of AFC Appendix F titled *Overview of CO_2 EOR and Sequestration*.

The Department of Energy's (DOE's) National Energy Technology Laboratory recently released a paper titled *Carbon Dioxide Enhanced Oil Recovery* (DOE-NETL, 2009), which specifically addressed the question "Won't the CO₂ be released when the oil is produced?" DOE's answer is found on page 23: "No. Any CO₂ that is produced along with oil and natural gas is captured and re-injected. The company operating the EOR project bought the CO₂ and expects to re-inject it if any is produced, to maximize its value. It only has value when it is used to remove oil from the rock formation underground, so there is a strong economic motivation to collect it for re-injection, either in the current project or another. When a CO₂ EOR flood is finished, the CO₂ that is true."

Reference

DOE-NETL (Department of Energy – National Energy Technology Laboratory), 2009. Carbon Dioxide Enhanced Oil Recovery – Untapped Domestic Energy Supply and Long Term Carbon Storage Solution. DOE/NETL Oil & Natural Gas Technologies, Exploration & Production Report – CO_2 EOR Primer. 32 pp. www.netl.doe.gov. September.

8. Please estimate the amount of oil to be recovered using the CO2 from HECA and then calculate how much additional CO2 the consumption of this oil will produce.

RESPONSE

Please refer to Applicant's objections to Data Request No. 8 and the background thereto filed on October 27, 2009.

9. Please estimate the total cost to this project of each ton of projected CO2 captured and compare that to the current cost of photovoltaic energy on an equivalent energy produced scale. If this data request is not understood, the point is to see if producing energy from photovoltaic is comparable to the cost of capturing CO2 including all subsidies, when the amount of energy produced is the key comparison factor.

RESPONSE

Please refer to Applicant's objections to Data Request No. 9 and the background thereto filed on October 27, 2009.

10. What is the total amount of farmland that will be preserved to mitigate the farmland loss from this project? Where is it located?

RESPONSE

Please refer to Applicant's objections to Data Request No. 10 and the background thereto filed on October 27, 2009. Without waiving its objections, Applicant provides the following response to Data Request No. 10.

Notwithstanding the fact that the Project will have less-than-significant impacts to agricultural lands, the Applicant has discussed the Project with the Department of Conservation and Kern County Planning Department, and is prepared to compensate for the loss of agricultural land at a ratio of 1:1 through implementation of appropriate mechanisms, such as agricultural conservation easements or credit purchases from an established agricultural farmland bank. The Project currently plans to remove 473 acres from the Williamson Act and is proposing to provide 473 acres in replacement lands.

Given the early stage of the Project, the actual location of the replacement farmland has not been established at this time.

11. What are the impediments to the project using produced water from the nearby oil fields instead of the relatively fresh groundwater?

RESPONSE

Please refer to Applicant's objections to Data Request No. 11 and the background thereto filed on October 27, 2009. Without waiving its objections, Applicant provides the following response to Data Request No. 11.

As detailed in the Revised AFC, use of produced water from oil fields presents both technological and practical challenges. The water treatment plant that would be needed to treat produced water from oil fields is prohibitively expensive, requires a great deal of energy to operate, and involves a complex series of treatment steps. All of these treatment steps must operate properly for the treated water to be useable, to maintain a reliable water source for the power plant, and to avoid shutdowns. In addition, oil field water producers are unwilling to guarantee water supply volumes to the Project. The volume of water produced from oil fields varies depending on field operations, and the oil field operators are unwilling to have field operations impacted by providing a guaranteed water supply contract to a power plant developer. Based on the technological problems, high cost, and lack of supply guarantee, this option was not chosen as water supply for HECA.

12. Where does the water migrate from currently to keep this underground aquifer brackish while farmers have been pumping in the area for decades already?

RESPONSE

Please refer to Applicant's objections to Data Request No. 12 and the background thereto filed on October 27, 2009. Without waiving its objections, Applicant provides the following response to Data Request No. 12.

The Buena Vista Water Storage District (BVWSD) salinity contour maps provided in the Revised AFC include detailed salinity information for the entire district. This information shows a brackish water plume in the center of the BVWSD, with salinity concentrations increasing as the plume travels west, and reaching a maximum concentration at the location of the proposed wellfield. Extensive subsurface modeling, which describes the movement of water in and around the BVWSD, was included in the Revised AFC. It is clear from this analysis that saline water is infiltrating from the sedimentary rock west of BVWSD (not to the east as stated in the Data Request) and that water with low salt content is flowing from the volcanic rock east of the BVWSD (not west as stated in the Data Request). The proposed HECA wellfield will intercept and pump out this saline intrusion, which, over time, will lower the salt content of wells in the affected area.

13. What, if anything, is being done to mitigate the direct air pollution impacts of this project on the Tule Elk Reserve?

RESPONSE

Please refer to Applicant's objections to Data Request No. 13 and the background thereto filed on October 27, 2009. Without waiving its objections, Applicant provides the following response to Data Request No. 13.

The ambient air quality standards established by the regulatory agencies have been set at levels that are protective both of human health and of plants and animals. HECA will comply with these standards which are protective of the Tule Elk Reserve. The Project proposes to mitigate all emissions of non-attainment pollutants and precursors to non-attainment pollutants through the purchase and surrender of emission reduction credits; therefore, no additional mitigation is necessary to protect the Tule Elk Reserve.

14. Given all the environmental problems already in the immediate neighborhood of this project, and given that this project will add significantly to these problems, what can morally justify locating this project in this area at this time?

RESPONSE

Please refer to Applicant's objections to Data Request No. 14 and the background thereto filed on October 27, 2009. Applicant disagrees with the Intervenor's unsubstantiated assertions regarding existing environmental problems in the vicinity of the Project, as well as the Intervenor's unsupported assertion that the Project will add significantly to any such problems. Nevertheless, without waiving its objections, Applicant provides the following response to Data Request No. 14.

For a detailed discussion of the benefits and objectives of the Project that justify its location at the proposed site, please refer to Section 2, Project Description and Section 5, Socioeconomics of the Revised AFC. In addition, for each area of environmental concern, the Revised AFC includes: (1) an analysis of the existing background conditions, including any known environmental issues in the vicinity of the Project; (2) an analysis of the Project's potential to result in significant adverse impacts itself; and (3) a cumulative impact analysis that takes into consideration the potential for the Project, when combined with other existing and proposed projects in the area, to result in significant adverse impacts. Review of the Revised AFC, which is available on line at www.energy.ca.gov, demonstrates that the Project will not result in significant adverse impacts to the environment.



BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA 1516 NINTH STREET, SACRAMENTO, CA 95814 1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE HYDROGEN ENERGY CALIFORNIA PROJECT

Docket No. 08-AFC-8

PROOF OF SERVICE LIST (Rev. 9/3/09)

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DECLARATION OF SERVICE

I, <u>Dale Shileikis</u>, declare that on <u>November 6</u>, 2009, I served and filed copies of the attached <u>**Responses to Association of Irritated Residents Data Requests (#1-14)**, dated <u>November</u> 2009. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [www.energy.ca.gov/sitingcases/hydrogen_energy].</u>

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(Check all that Apply)

FOR SERVICE TO ALL OTHER PARTIES:

X sent electronically to all email addresses on the Proof of Service list

by personal delivery or by depositing in the United States mail at ______ with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

X sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (*preferred method*);

OR

depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION

Attn: Docket No. <u>08-AFC-8</u> 1516 Ninth Street, MS-4 Sacramento, CA 95814-5512

docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

1)a Aktikas