



# RTP ENVIRONMENTAL ASSOCIATES INC.®

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## VIA FEDEX EXPRESS

August 20, 2007

Mr. Michael S. Alushin  
Director, Compliance Assessment and Media Programs Division  
U.S. EPA  
Ariel Rios Building, Mail Code: 2223A  
1200 Pennsylvania Avenue, N. W.  
Washington, DC 20004

RECEIVED

AUG 23 2007

AIR QUALITY  
PROGRAM

**Re: Request for NSPS Applicability Determination  
Hyperion Energy Center**

Dear Mr. Alushin:

Hyperion Resources, Inc., ("Hyperion") has proposed to construct the Hyperion Energy Center, a state-of-the-art center for excellence in the production of clean transportation fuels. The Hyperion Energy Center (the "HEC") will comprise a greenfield petroleum refinery and an integrated gasification combined-cycle ("IGCC") power plant. Hyperion is currently considering multiple sites in the midwestern United States for the HEC.

RTP Environmental Associates, Inc. ("RTP") is preparing the preconstruction air quality permit application for the HEC. In the process of preparing this application, questions have arisen regarding applicability of certain New Source Performance Standards ("NSPS"). Accordingly, this letter constitutes a request for NSPS applicability determination pursuant to 40 C.F.R. § 60.5. This request pertains specifically to the IGCC power plant at HEC and its applicability under subparts Da, Db, Ja, and KKKK of 40 C.F.R. part 60.

### **Background**

The proposed HEC refinery and power plant will rank among the cleanest, most environmentally-friendly in the world. The planned refinery is a 400,000 barrel per day, highly-complex, full-conversion refinery that will produce clean, green, transportation fuels such as ultra-low sulfur gasoline and ultra-low sulfur diesel.

The planned IGCC power plant will include a gasification block and a power/steam block. Under one configuration being considered by Hyperion, petroleum coke produced by the refinery will be the primary feedstock to the gasification block. Additional feedstocks to the gasification block will include coal and purchased petroleum coke. Products of the gasification block will include hydrogen for consumption in the refinery and both synthetic gas ("syngas") and pressure swing adsorption ("PSA") offgas to be used as

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fuel in the steam/power block. Both the syngas and the PSA offgas are clean, gaseous fuels derived from solid fuels. The steam/power block will include at least three combined cycle gas turbines, each with duct burners, and will cogenerate electric power and steam for use in the refinery. Each combined cycle gas turbine will be capable of combusting more than 250 MMBtu/hr heat input of fossil fuel. The planned project does not provide for any outside sales of electrical output to any utility power distribution system; in any event, the plant will not supply more than one-third of its potential electric output capacity to any utility power distribution system for sale.

### **NSPS Subparts J and Ja – General Applicability**

Subpart J, "Standards of Performance for Petroleum Refineries," includes emissions standards for fuel gas combustion devices at § 60.104(a)(1). In the absence of further rulemaking, these standards would apply to all fuel gas combustion devices at the HEC. However, on May 14, 2007, EPA published in the *Federal Register* proposed revisions to subpart J. On the same day, EPA published a proposed new rule, subpart Ja, also entitled "Standards of Performance for Petroleum Refineries." It is my understanding that EPA has entered into a settlement that requires final agency action on these proposals by early 2008. If the revisions to subpart J and the issuance of subpart Ja are finalized as proposed, then the fuel gas combustion devices at HEC would be exempt from subpart J requirements and would instead be subject to the requirements of subpart Ja.

Both subpart J and subpart Ja define the term fuel gas broadly, to include "any gas which is generated at a petroleum refinery and which is combusted." This definition and its application to a configuration such as that of the proposed HEC are ambiguous, especially in light of the decision of the 3<sup>rd</sup> Circuit Court of Appeals in *Star Enterprise v. EPA*.<sup>1</sup> However, based on a careful review of the court's decision and the factual differences between the HEC and the Star Enterprise facilities, I have concluded that the HEC IGCC power plant gasification block is a part of the HEC refinery. I reached this conclusion primarily on the basis that the HEC IGCC power plant will not be a separate economic entity; unlike the Star Enterprise facilities, the IGCC power plant at HEC will exist solely for the purpose of supporting the primary economic activity of the HEC, which is petroleum refining. I therefore determined that the syngas produced in the HEC IGCC power plant gasification block is fuel gas, and that the HEC IGCC combined cycle gas turbines are fuel gas combustion devices under the current subpart J and are other fuel gas combustion devices under the proposed subpart Ja. I request your concurrence with this determination.

### **NSPS Subpart Da – General Applicability**

Subpart Da, "Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978," was amended on February 27, 2006, and again on June 13, 2007, specifically to address IGCC. Based on my review of the amended applicability criteria at 40 C.F.R. § 60.40Da, I have

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<sup>1</sup> No. 98-6321, 235 F.3d 139.

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determined that each combined cycle gas turbine in the HEC IGCC power plant, including both the stationary combustion turbine component and the duct burner component of each unit, is an affected facility under subpart Da. I reached this conclusion because each combined cycle gas turbine meets all of the applicability criteria set forth at § 60.40Da(b):

(b) Combined cycle gas turbines (both the stationary combustion turbine and any associated duct burners) are subject to this part and not subject to subpart GG or KKKK of this part if:

- (1) The combined cycle gas turbine is capable of combusting more than 73 MW (250 MMBtu/hr) heat input of fossil fuel (either alone or in combination with any other fuel); and
- (2) The combined cycle gas turbine is designed and intended to burn fuels containing 50 percent (by heat input) or more solid-derived fuel not meeting the definition of natural gas on a 12-month rolling average basis; and
- (3) The combined cycle gas turbine commenced construction, modification, or reconstruction after February 28, 2005.

However, I noted in my review that § 60.40Da(a) appears to define the affected facility narrowly, in a manner that includes only electric utility steam generating units. The combined cycle gas turbines in the HEC IGCC power plant do not meet the definition of electric utility steam generating unit at § 60.41Da because they will not supply more than one-third of their potential electric output capacity to a utility power distribution system for sale. I interpreted that paragraph § 60.40Da(b) is a separate applicability criterion, rather than a clarification of § 60.40Da(a). I request your concurrence with this determination.

#### **NSPS Subpart Da – Applicability of NO<sub>x</sub> Emissions Standards**

For affected facilities that commenced construction after February 28, 2005, subpart Da includes two separate NO<sub>x</sub> emissions standards depending on whether the facility is an IGCC electric utility steam generating unit. The combined cycle gas turbines in the HEC IGCC power plant do not meet the definition of IGCC electric utility steam generating unit at § 60.41Da because they will not supply more than one-third of their potential electric output capacity to a utility power distribution system for sale. Therefore, I concluded that the combined cycle gas turbines in the HEC IGCC power plant are subject to the standards at § 60.44Da(e)(1) rather than the standards at § 60.44Da(f).<sup>2</sup> I request your concurrence with this conclusion.

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<sup>2</sup> It should be noted that the potentially applicable NO<sub>x</sub> emissions standards are not substantially different, with output-based limits of 1.0 lb/MWh gross energy output applying under normal operating conditions, and the standards under § 60.44Da(e)(1) are slightly more stringent because they do not provide for a higher limit during occasional periods of liquid fuel firing. It should also be noted that we anticipate the emission limit representing Best Available Control Technology ("BACT") for NO<sub>x</sub> emissions will be 0.1 lb/MWh or less, so the requested determination regarding applicability of NO<sub>x</sub> emissions standards under subpart Da is necessary only for administrative purposes and will not affect the facility's NO<sub>x</sub> emissions.

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**NSPS Subpart Da – Applicability of Mercury Emissions Standards**

Subpart Da includes mercury emissions standards only for IGCC electric utility steam generating units and for other types of coal-fired electric utility steam generating units. The combined cycle gas turbines in the HEC IGCC power plant do not meet the definitions of IGCC electric utility steam generating unit or coal-fired electric utility steam generating unit at § 60.41Da because they will not supply more than one-third of their potential electric output capacity to a utility power distribution system for sale. Therefore, I concluded that the combined cycle gas turbines in the HEC IGCC power plant are not subject to the standards at either § 60.45Da(a) or § 60.45Da(b). I request your concurrence with this conclusion.

**NSPS Subpart Db – General Applicability**

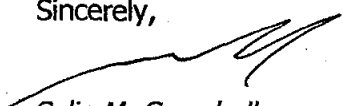
Because I concluded that the heat recovery steam generator component of each combined cycle gas turbine in the HEC IGCC power plant meets the applicability criteria at 40 C.F.R. § 60.40Da, as described above, I also concluded that these steam generating units are exempt from subpart Db pursuant to 40 C.F.R. § 60.40Db(e). I request your concurrence with this determination.

**NSPS Subpart KKKK – General Applicability**

Because I concluded that the stationary combustion turbine component of each combined cycle gas turbine in the HEC IGCC power plant meets the applicability criteria at 40 C.F.R. § 60.40Da, as described above, I also concluded that these stationary combustion turbines are exempt from subpart KKKK pursuant to 40 C.F.R. § 60.40Db(b). I request your concurrence with this determination.

Should you have any questions or require additional information, please contact me at (919) 845-1422, extension 30. I appreciate your prompt attention to this matter.

Sincerely,



Colin M. Campbell  
Project Manager

cc: Preston Phillips, Hyperion  
Brian Gustafson, SD DENR