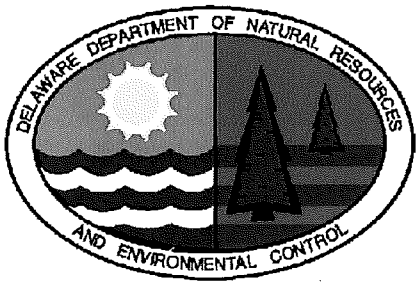


APPLICATION FOR A COASTAL ZONE ACT PERMIT

State of Delaware
Department of Natural Resources & Environmental Control
Office of the Secretary

December 2014
DCRC Low Sulfur Fuels Project
Delaware City Refining Company LLC

Table of Contents

Permit Application Instructions

1. Complete all parts of the application. For sections which are not applicable to your project, do not leave blank; present a statement that clearly states why the section is not applicable to your project.

2. Because all applicants' projects are different, this word document template will provide you flexibility for needed space to answer the questions. Please insert additional lines for text where needed for your application. If appropriate, attach extra pages referencing each answer by the corresponding section and question number.

3. Submit eight complete hard copies of the permit application to:

   Office of the Secretary
   Department of Natural Resources & Environmental Control
   State of Delaware
   89 Kings Highway
   Dover, DE 19901

   In addition to the eight hard copies, submit a complete electronic "pdf" copy of the permit application and a copy of the Offset Matrix in Microsoft Word format on cd-rom.

4. Comply, if required, or as requested by the DNREC Secretary, with 7 Delaware Code, Chapter 79, Section 7902. If requested, but not completed, your application will not be considered administratively complete until this form is reviewed.

5. Be sure to include your permit application fee of $3,000; otherwise the application will not be considered administratively complete. Make checks payable to the "State of Delaware."

6. Be advised that the application for a Delaware Coastal Zone Act Permit is a public document, which may be displayed at DNREC offices, public libraries, and the web, among others. If this application requires you to place confidential information or data in the application to make it administratively complete, note the Delaware Freedom of Information Act (29 Delaware Code, Chapter 100) and DNREC's Freedom of Information Act Regulation, Section 6 (Requests for Confidentiality), for the proper procedure in requesting confidentiality.

Note: This application template was last revised by DNREC on January 30, 2008. Please discard any previous versions.

PART 1

CERTIFICATION BY APPLICANT

Under the penalty of perjury pursuant to 11 Delaware Code §1221-1235, I hereby certify that all the information contained in this Delaware Coastal Zone Act Permit Application and in any attachments is true and complete to the best of my belief.

I hereby acknowledge that any falsification or withholding of information will be grounds for denial of a Coastal Zone Permit.

I also hereby acknowledge that all information in this application will be public information subject to the Delaware Freedom of Information Act, except for clearly identified proprietary information agreed to by the Secretary of the Department of Natural Resources & Environmental Control.

José Dominguez
Print Name of Applicant

Signature of Applicant

Refinery Manager
Title

12/31/14
Date

PART 2

APPLICANT INFORMATION AND SITE IDENTIFICATION

2.1 Identification of the applicant:

Company Name: **Delaware City Refining Company LLC.**
Address: **4550 Wrangle Hill Road, Delaware City, Delaware 19706**
Telephone: **302-834-6000**
Fax: **302-836-6505**

2.2 Primary contact: Please list the name, phone number and email of a preferred contact within your company in case the DNREC needs to contact you regarding this permit application.

Thomas Godlewski
302-834-6053
Thomas.Godlewski@pbfenergy.com

2.3 Authorized agent (if any): **None**

Name:
Address:
Telephone:
Fax:

If you have an authorized agent for this permit application process, provide written authorization from client for being the authorized agent.

2.4 Project property location (street address):

The proposed project will be located within the property boundaries of Delaware City Refinery Company LLC. (DCRC), which is located at 4550 Wrangle Hill Road, Delaware City, Delaware 19706.

2.5 In a separate attachment, provide a general map of appropriate scale to clearly show the project site.

See Figures 1 and 2

2.6 Is the applicant claiming confidentiality in any section of their application?

NO

If yes, see instructions on page 3.

PART 3

PROJECT SUMMARY

Provide a one-page summary describing the proposed project. Include a brief quantitative description of the anticipated environmental impacts, and how the Environmental Offset Proposal will "clearly and demonstrably" more than offset any negative impacts.

The Delaware City Refinery Company (DCRC) Low Sulfur Fuels Project (Project) primarily involves the installation of new hydrogen production equipment. The Project will also allow the retirement of three (3) package boilers. The Project is central to the DCRC's plans to produce lower sulfur fuels for use in Delaware's Coastal Zone and the surrounding region.

While the Refinery currently produces a range of fuels (diesel, fuel oil, gasoline, etc.), this Project will enhance clean fuel production for use in the region; the Refinery will reduce the sulfur in high-sulfur distillate stocks to produce ultra-low sulfur diesel. The Project will also support reduction in the sulfur content of gasoline produced at the Refinery. Overall, DCRC projects that approximately 20,440 tons of sulfur will be removed from refinery streams. This correlates to a reduction of 40,880 tons per year of sulfur dioxide (SO_2) emissions that would result from the combustion of such fuels.

The air emissions generated by the Project will be more than offset by emission reductions at the Refinery. Similarly, operation of the equipment to be installed in this Project will not require the construction of any new water intake on the Delaware River, nor any increase in flow at the existing water intake on the river. Demineralized boiler water make-up will decrease due to the shutdown of the three (3) existing package boilers. Demineralized water will continue to be supplied by existing groundwater wells. The other Project water requirements will be met using a third party supplier that would secure such water from sources outside the Coastal Zone. Additionally, construction and operation of the Project will not interfere with the Refinery's continued efforts to reduce water withdrawals from the Delaware River. Wastewater discharges from the refinery to the Delaware River are expected to increase insignificantly (0.3% of current discharge rates).

As demonstrated through this application, this Project will be beneficial to the environment. In addition, construction of the Project will substantially benefit the local economy within Delaware's Coastal Zone, as the Project will generate jobs during construction. Notwithstanding the economic challenges facing petroleum refineries in the Northeastern United States (as evidenced by multiple refinery closures in this region over the last several years), upon completion of the Project, the Refinery will be one of the premier refining

facilities on the eastern seaboard and will be well positioned to compete in the 21st century to provide Delawareans clean fuels and energy.

PART 4
PROJECT PROPERTY RECORD AND EVIDENCE OF LOCAL ZONING AND PLANNING APPROVAL

PROJECT PROPERTY RECORD

4.1 Name and address of project premises owner(s) of record:

Project Property Owner:
Delaware City Refining Company LLC.
1 Sylvan Way – Corporate Office
Parsippany, NJ 07054

Project Property:
Delaware City Refining Company LLC.
765 School House Road & 4448 Wrangle Hill Road
New Castle, DE 19720

Project Property Tax Parcel Number:
Parcel 2B – 12-008.00-014

4.2 Name and address of project premises equitable owner(s):

The Project Property is owned by the Delaware City Refining Company LLC.

4.3 Name and address of lessee(s):

The Project Property is not leased.

4.4 Is the project premises under option by permit applicant?

No. The Project site is owned by the applicant.

4.5 What is the present zoning of the land for this entire project site?

Heavy Industrial (HI). A copy of the New Castle County – Verification of Zoning and Use Letter is included as Attachment A.

EVIDENCE OF LOCAL ZONING AND PLANNING APPROVAL

I, **Joseph M. Abele, Jr.,** for **New Castle County** do hereby affirm that the project proposed by Delaware City Refining Company, LLC, **which is located at 765 School House Road and 4448 Wrangle Hill Road in New Castle, DE 19720 (TP #12-008.00-014),** in the **Heavy Industrial (HI) zoning district** is in **full compliance with the Zoning Code** as it applies to this project.

The above named applicant's project is in compliance with the adopted Comprehensive Development Plan for the geographic area within which the project will be located.

Planner III
New Castle County Department of Land Use

December 15, 2011

This part is essential for a complete Coastal Zone Act Permit Application. No application will be considered administratively complete without it. While the applicant is strongly advised to use this form, the local zoning jurisdiction may utilize a different form or document to demonstrate "evidence of local zoning approval," provided such documents are signed and dated by the proper official.

Note that this 2011 version of the zoning letter is provided pending receipt of an updated zoning determination from DNREC.

PART 5

PROJECT OPERATIONS

5.1 Describe the characteristics of the manufactured product and all the process and/or assembly operations utilized by the proposed project. Include in the description (use attachments if necessary):

This Project consists primarily of the construction and future operation of new hydrogen production equipment to enable the Refinery to enhance clean fuel production.

To support production of these cleaner fuels, new hydrogen production equipment will be installed. Hydrogen is an integral part of the desulfurization processes and a new stream of hydrogen will be provided by the new hydrogen production equipment. Equipment upstream and downstream of the new equipment (specifically, the hydrocracker, hydrotreater, sulfur plant) will experience an ancillary increase in utilization/production as a result of the Project.

The Project will include new hydrogen production equipment consisting of the following sources: a one-train steam methane reformer, a high temperature shift reactor, pressure swing adsorption system, an electrically driven high pressure hydrogen compressor, a cooling tower (2,000 GPM), a hydrogen flare and fugitive piping and equipment components. The Project will also include support equipment, such as an aqueous ammonia tank.

A process flow diagram for the Project is provided in Attachment B.

a. the raw materials, intermediate products, by-products and final products and characteristics of each. Review any materials' risk of carcinogenicity, toxicity, mutagenicity and/or the potential to contribute to the formation of smog. Provide material safety data sheets (MSDS) if available;

Operation of the new hydrogen production equipment will require commercial pipeline natural gas, water, and refinery offgas as raw materials and will produce gaseous hydrogen (H_2) product, gaseous carbon dioxide (CO_2) and steam for use elsewhere in the refinery. Ammonia will also be used in the Selective Catalytic Reduction unit for the control of NO_x emissions.

All classes of raw materials and intermediate and final products identified in this response are currently utilized or produced at the Refinery. Material safety data sheets for the

raw materials and products associated with this Project can be found in Attachment C.

b. the step-by-step procedures or processes for manufacturing and/or assembling the product(s). Provide a flow diagram to illustrate procedures;

A process flow diagram for the Project has been provided in Attachment B.

c. the nature of the materials mentioned above in 4.1(a) as to whether or not the materials require special means of storage or handling;

The operations installed as part of the Project will primarily utilize natural gas as feedstock, and will produce gaseous hydrogen (H_2) product, gaseous carbon dioxide (CO_2) and steam.

These materials and fuels are currently produced by DCRC. Fuels require special handling, due primarily to flammability ratings (see MSDS sheets, provided as Attachment C, for more detail). DCRC will handle and store the materials in accordance with current Refinery practices, which conform to established industry standards and regulatory requirements designed to minimize the potential for any unsafe condition. Among other practices, appropriate materials will be stored within impervious secondary containment in accordance with applicable Spill Prevention, Control and Countermeasure (SPCC) requirements.

In summary, all materials proposed to be stored or handled in connection with the Project are typical of the materials that are presently stored or handled in the Refinery, and will continue to be managed in accordance with established Refinery procedures.

d. list the machinery (new and/or existing) to be utilized by this project;

The key new hydrogen production equipment to be utilized includes the following: a one-train steam methane reformer (including fugitive piping and equipment components), a high temperature shift reactor, pressure swing adsorption system, an electrically driven high pressure hydrogen compressor, a cooling tower (2,000 GPM), and a dedicated hydrogen flare. The Project will also include support equipment, such as an aqueous ammonia tank.

e. list any new buildings or other facilities to be utilized;

Permanent new buildings and facilities to be utilized may include but are not limited to the following: process analyzer building, Continuous Emissions Monitoring System (CEMS) shelter, Distributed Control Shelter (DCS), and a Power Distribution Center (PDC) building.

f. list the size and contents of any anticipated aboveground or underground storage tank systems that may be constructed or utilized in support of facility operations;

Engineering is still underway, but the proposed Project may include 1,000 gallons of aqueous ammonia in aboveground tankage. The listed volume may be contained in a single tank or distributed among multiple tanks.

g. if this project represents an increase or decrease in production at an already existing facility, what will be the new rate of maximum production?

Coastal Zone Permit No. 355 for the Refinery issued by the Department in 2004 defines "new activity" as any proposed activity that will cause the Crude Unit throughput rate to exceed the benchmark throughput of 191,100 barrels per day of crude oil, determined on a twelve (12) month rolling average time period.

The Project will not require or result in any increase in the Crude Unit benchmark throughput rate.

h. if this project represents a totally new facility at a new or existing site, what will be the maximum production rate?

This Project does not represent a totally new facility.

5.2 Describe daily hours of plant operations and the number of operating shifts.

The proposed Project will not alter the current typical operating schedule of the Refinery. The operating schedule will continue to be 24 hours a day, 7 days a week, 52 weeks a year. The Refinery will be operated on 2 to 3 shifts per day.

5.3 Provide a site plan of this project with:

a. a north arrow;

b. a scale of not less than one inch to 200 feet;

c. identity of the person responsible for the plan, including any licenses and their numbers;

d. the acreage of the applicant's entire property and acreage of the proposed project;

e. property lines of entire property;

f. lines designating the proposed project area for which application is being made, clearly distinguished from present facilities and operating areas (if any);

g. existing and proposed roads, railroads, parking and loading areas, piers, wharfs, and other transportation facilities;

h. existing water bodies and wetlands and proposed dredge and fill areas, and;

i. existing and proposed drainage ways, gas, electric, sewer, water, roads, and other rights-of-way.

See Figure 3

5.4 How many acres of land in total are required for this proposed project? –

Existing/ currently utilized/ developed land: **6.1 acres (including up to three (3) laydown areas)**
New land: **0** acres.

5.5 Has the property been involved with a state or federal site cleanup program such as Superfund, Brownfields, HSCA Voluntary Cleanup Program, RCRA Corrective Action, Aboveground or Underground Storage Tank Cleanup Programs? If so please specify which program.

Certain areas of the Refinery property are subject to RCRA Corrective Action (Permit No. HW09A13). Of the thirty-six (36) current or historic Solid Waste Management Units (SWMUs) on the site identified in the RCRA Permit, only one (SWMU 10) is located within the Project area. EPA issued a no further action letter for SWMU 10 (Areas subject to Process Area Washdown) – see Attachment D.

5.6 With regards to environmental cleanup actions, has a Uniform Environmental Covenant, Final Plan of Remedial Action, or no further action letter been issued by the Department? If so are the planned construction activities consistent with the requirements or conditions stated in these documents?

As stated in response to question 5.5, EPA, issued a letter indicating no further action with respect to SWMU 10. Any project activities that may affect SWMU 10 will not require or result in any property use that is inconsistent with EPA's statements within the "No Further Action" letter.

PART 6A

ENVIRONMENTAL IMPACTS

Air Quality

6.1 Describe project emissions (new, as well as any increase or decrease over current emissions) by type and amount under maximum operating conditions:

The following table summarizes the estimated emissions associated with the new equipment to be installed pursuant to this project (see NOTE to table below).

Pollutant	Project Increase/Decrease (tons/year)
NO_2*	*
SO_2	**0.1**
CO	**24.2**
VOC	**8.6**
PM / PM_{10} / $PM_{2.5}$	**12.7/12.3/12.2**
H_2SO_4	**0.01**

* Total NO_x emissions from all sources at the Refinery are subject to a facility-wide NO_x emissions limit. NO_x emissions from the Project will remain within the Refinery's facility-wide NO_x cap.

NOTE: The air permit application also includes other projected emissions impacts from existing refinery process units. Because these impacts will be accommodated without a request for new or expanded emission authorizations, those impacts are excluded from this analysis.

This project will result in the production of low sulfur fuels. Relative to sulfur levels in current production, this project will remove an estimated 50 long tons per day of sulfur from these fuel. This is equivalent to a reduction of 40,880 tons per year of SO_2 emissions associated with the combustion of the fuels. See the Environmental Impact Offset Matrix for more details.

Please see Part 6C and Attachment E for a detailed description of the environmental benefits associated with the Refinery's production of low sulfur fuels.

6.2 Describe how the above emissions change in the event of a mechanical malfunction or human error.

In selecting and designing equipment, structures and processes for this Project, DCRC undertakes to ensure that the Project will consist of and employ state of the art technology to achieve efficient and effective operation of the intended processes, while limiting adverse

environmental impacts. As one component of this effort, systems were selected and designed to minimize the potential for malfunction. Further, consistent with current practice at the Refinery, DCRC will develop procedures, and train appropriate operating personnel in the implementation of such procedures, for the efficient and effective operation of all new equipment and processes. DCRC will also develop and implement, in consideration of manufacturers' specifications and other relevant information, maintenance procedures and schedules to maximize continuous operation of the relevant equipment, and minimize malfunctions that may cause unintended shutdown and interruption to production activity.

Consistent with its Refinery-wide Process Safety Management program, DCRC performs process hazard analyses of operations or equipment utilizing substances identified as posing potential hazards. Implementation of these process hazard analyses on a routine basis assists the Refinery in identifying and correcting equipment-or process-based conditions that may increase the probability of a malfunction.

By regulatory definition, a malfunction may arise due to aberrational conditions that could not reasonably have been foreseen nor prevented, notwithstanding effective maintenance and operational practices. Further, even in the best run operations by the most highly trained personnel, human error may nonetheless occur on an isolated basis. In recognition of these circumstances, DCRC has developed extensive procedures to ensure the identification of and prompt response to any unintended operating condition that may give rise to adverse impacts to the environment or the surrounding community.

DCRC includes appropriate monitors and even alarm systems on relevant equipment to provide early warning to Refinery personnel of aberrational operating conditions associated with a malfunction or other situations. DCRC has invested in substantial resources at the Refinery to enable prompt response to any such aberrational operating condition to minimize its duration and impact. Further, DCRC works cooperatively with surrounding government response organizations and personnel and maintains routine communication with such personnel to ensure that additional resources can be immediately brought to bear to support DCRC's own activities in the event of an unintended aberrational operating event.

As previously described, because a malfunction, by regulatory definition, may be unforeseeable and not preventable, it is not possible to describe, in all circumstances, the potential impact to air, water, solid and hazardous waste stream, emissions or discharge resulting from a malfunction. However, consistent with its efforts to minimize

any adverse affect associated with a malfunction, DCRC has identified potential impacts to environmental media that could result from unintended operating conditions.

Relative to air quality, a malfunction or an unintended operating condition could result in an increase in air emissions of any of the regulated parameters associated with operations of new equipment. By way of example, a malfunction of the SCR emission control device for a process heater would result in a temporary increase in NO_x emissions.

As stated above, however, DCRC has undertaken to consider such potential scenarios in the design, construction, maintenance and operation of new equipment. In addition, applicable regulatory standards establish multiple redundancies to minimize adverse effects associated with malfunctions or other aberrational conditions. Finally in this context, by preparing for such potential circumstances, DCRC has identified and made available resources to minimize any potential adverse effects.

6.3 Describe any pollution control measures to be utilized to control emissions to the levels cited above in 6.1.

<u>Nitrogen Oxides (NO_x)</u>
Selective Catalytic Reduction (SCR) systems will be installed to reduce NO_x emissions from the flue gases exhausted from the new process heater. These SCR systems will be designed to reduce NO_x emissions by approximately 75 - 86%.

<u>Particulate Matter (PM)</u>
PM emissions from the process heater will be controlled by burning only natural gas and employing good combustion control practices. Cooling tower PM emissions will be minimized by using fan air coolers in combination with a wet cooling tower equipped with high efficiency drift eliminators.

<u>Volatile Organic Compounds (VOC)</u>
The new equipment to be installed as part of the Project will process natural gas as both a feedstock and as a fuel. Natural gas contains very low levels of VOC constituents.

VOC emissions from the process heater will be limited by adhering to good combustion control practices.

<u>Other</u>
In general, emissions of multiple regulated constituents are most

effectively limited by designing relevant systems and equipment with the objective of energy efficiency, including a high degree of heat integration. By incorporating energy efficiency into equipment design considerations, operational costs can be controlled by limiting the generation and release of waste energy, in the form of heat, and maximizing the energy value of all combustion operations by integrating all energy generation with system demands. In this respect, emissions are not generated in the first instance because less fuel must be combusted, and equipment can operate at reduced loads.

In addition, emission reductions are otherwise considered as a critical design component, consistent with substantial advancements in the effective design and efficient operation of equipment components associated with this Project. Moreover, the skilled, experienced and trained operating personnel at the Refinery are knowledgeable in, and adhere to, project procedures and work practices designed to minimize emissions in all aspects of process operations. Finally in this context, relevant equipment will combust natural gas which results in lower concentrations of combustion byproducts within the exhaust gases.

6.4 Show evidence that applicant has, or will have, the ability to maintain and utilize this equipment listed in 6.3 in a consistently proper and efficient manner. (For example, provide college transcripts and/or records of training courses and summary of experience with this pollution control equipment of person(s) responsible for pollution control equipment, and/or provide copies of contracts with pollution control firms to be responsible for maintaining and utilizing this equipment.)

Operations and maintenance of the new equipment will be conducted by skilled operations and maintenance staff, and will be complimented by specialized contractor skills as necessary. DCRC will update the operations and refinery procedures, as necessary, to include the facilities associated with the Project. Current personnel at the Refinery have experience in operating the existing hydrogen plant, process heaters, and ancillary equipment at the Refinery. The new equipment installed as part of the Project will be very similar in nature to equipment that is currently located at the Refinery. Therefore, the existing Refinery staff has a strong working knowledge of the equipment and processes that will be operated as a result of this Project. The personnel will nonetheless be trained to safely and successfully operate and maintain the new equipment.

Water Quality

6.5 Describe wastewater discharge (new, as well as any increase or decrease over current discharge levels) due to project operations:

For this Project, the use of fan air coolers has been maximized; however, additional cooling is required. Therefore, a cooling tower is included in the Project, but its size and the blowdown have been minimized through the use of combined air and water cooling. Cooling tower blowdown is required to maintain proper chemistry of the cooling tower to prevent corrosion and scaling.

The Refinery's current WWTP loading is approximately 7,000 GPM which is ultimately discharged to the Delaware River (Outfall 001). Operation of the equipment installed as part of the Project will result in the discharge of certain wastewater streams. On balance, these changes in wastewater discharge result in a negligible (0.3%) increase in wastewater discharge from Refinery operations. This essentially unmeasurable increase is well within the Refinery's currently permitted discharge limits. The following table identifies the expected sources of wastewater discharge associated with the Project, along with current projected discharge rates:

Waste Water Discharge Source	Estimated New Discharge Levels (GPM)	Estimated Increase/Decrease in Current Discharge Levels (GPM)
Cooling tower blowdown	13	13
Boiler blowdown	8	8
Removal of three (3) package boilers	0	(5)
Total Increase in Waste Water Discharge	-	**16**

Discharges from the Refinery during operation of new hydrogen production equipment will be of similar quality and character to that currently discharged from the Refinery.

6.6 Describe the current method of employee sanitary wastewater disposal and any proposed changes to that system due to this proposed project.

The employee sanitary wastewater is currently pretreated prior to discharge. No increase in treatment capacity or other system changes are required to support this Project.

6.7 Identify the number, location, and name of receiving water outfall(s) of any and all process wastewater discharge (new or current) affected by this proposed project. Provide NPDES Permit Numbers for each discharge affected.

See the response to question 6.5 above.

Outfall 001 is permitted in State Permit No. WPCC 3256C/74-NPDES Permit No. DE 0000256.

6.8 If any effluent is discharged into a public sewer system, is there any pretreatment program? If so, describe the program.

No effluent will be discharged to a public sewer system.

6.9 Stormwater:

a. Identify the number, location, and name of receiving waters of stormwater discharges. Provide permit number for each discharge.

Stormwater that is collected on the footprint of the new hydrogen production equipment will be treated as industrial stormwater and drained to the existing Refinery stormwater sewer system for treatment at the Refinery's existing WWTP, and then discharged to the Delaware River via Outfall 001.

b. Describe the sources of stormwater run-off (roofs, storage piles, parking lots, etc).

Runoff will result when precipitation falls on the roofs of buildings, equipment, and paved or gravel surfaces.

c. Describe the amount of stormwater run-off increase over current levels that will result from the proposed project.

At Project completion stormwater will negligibly increase (approximately 0.5 GPM) over current levels due to conversion of 2.1 acres from compacted gravel to pavement. A small grass area may be temporarily impacted during construction but will be returned to grass following construction, resulting in no impact to current stormwater run-off levels (Figure 4). Two additional support areas are compacted gravel and will remain compacted gravel. Stormwater contacting all of the newly paved surfaces will be collected and routed to the existing WWTP at the Refinery.

Based on an average rain fall of 43.1 inches, the Project will result in an estimated annual average increase of approximately 0.5 GPM of stormwater to the WWTP and the Delaware River. Discharge will remain within permitted discharge limits.

d. Describe any pollutants likely to be in the stormwater.

The make-up of the stormwater will be of similar quality and character as the Refinery's current stormwater discharge.

e. Describe any pollution control device(s) or management technique(s) to be used to reduce the amount of stormwater generated, and devices to improve the quality of the stormwater run-off prior to discharge.

Industrial stormwater will continue to be managed in accordance with the approved Storm Water Pollution Prevention Program (SWPPP) developed and implemented at the Refinery in accordance with the applicable NPDES permit. The project will provide for a sedimentation and erosion plan for the construction phase of the project.

Industrial stormwater that is collected on the footprint of the new unit will be drained to the refinery stormwater sewer system for treatment at the refinery's existing WWTP.

f. Describe any new or improved stormwater drainage system required to safely carry off stormwater without flooding project site or neighboring areas down gradient.

No new drainage system is required to avoid material risks of flooding the project site or neighboring areas down gradient.

6.10 Will this project use a new water intake device, or increase the use (flow) from an existing intake device?

The Project will not require the use of any new water intake device or increase the flow from an existing intake device. The withdrawal from the Delaware River intake will not increase.

The increased water demand (approximately 139 GPM) for the new hydrogen production equipment will be sourced from existing permitted groundwater wells (within permitted limits). Cooling water will be provided by a public water supply vendor (approximately 53 GPM).

If yes, state:

a. the volume of water to be withdrawn, and;

b. describe what will be done to prevent entrainment and/or entrapment of aquatic life by the intake device.

6.11 Will this proposed project result in a thermal discharge of water, or an increase in the flow or temperature of a current thermal discharge?

No.

If yes, state:

a. the volume of the new flow or increase from the existing thermal discharge, both in flow and amount of heat;

b. how warm will the water be when it is discharged into a receiving waterway, discharge canal, or ditch, and what will be the difference in discharge temperature and ambient temperature (delta T) at various seasons of the year after all cooling water mechanisms have been applied to the hot water?

c. the equipment and/or management techniques that will be used to reduce the thermal load of the discharge water.

6.12 Will any proposed new discharge or change in existing discharge cause, or have potential to cause, or contribute to, the exceedence of applicable criteria appearing in the "State of Delaware Surface Water Quality Standards"?

No.

If yes, explain:

6.13 Describe any oils discharged to surface waters due to this proposed project.

No oils will be discharged to surface waters due to this Project.

6.14 Describe any settleable or floating solid wastes discharged to surface waters due to this project.

The Project is not anticipated to increase settleable solids or floating solid wastes in any discharge to surface water.

6.15 Show evidence that the applicant has, or will have, the ability to maintain and utilize any water pollution control equipment listed in questions 5.5 through 5.14 in a consistently proper and efficient manner. (For example, provide operator license numbers, college transcripts and/or training courses and summary of prior experience with this pollution control

equipment of person(s) responsible for pollution control equipment, and/or provide copies of contracts with pollution control firms.)

DCRC employs trained, State-licensed personnel to operate the Refinery's WWTP. WWTP operator licenses are on file with the Department.

Operations and maintenance of the new equipment will be conducted by skilled operations and maintenance staff, and will be complimented by specialized contractor skills as necessary. DCRC will update the operations and refinery procedures, as necessary, to include the facilities associated with the Project. Current personnel at the Refinery have experience in operating the hydrogen plant, process heaters, and ancillary equipment currently existing at the Refinery, very similar to the equipment that will be constructed and operated as part of the Project. Therefore, the existing Refinery staff has a strong working knowledge of the equipment that will be operated as part of the Project. The personnel will nonetheless be trained to safely and successfully operate and maintain the new equipment.

6.16 Estimate the amount of water to be used for each specified purpose including cooling water. State daily and maximum water use in the unit of gallons per day for each purpose and source of water. State if water use will vary with the seasons, time of day, or other factors.

The Project will require approximately 99,050 GPD of process water, 101,150 GPD for steam, and 76,400 GPD of makeup cooling water during routine operation. These estimates include the reduction in boiler make-up water associated with the removal of the three (3) package boilers.

It is not currently anticipated that water use will materially vary with season or time of day.

6.17 Identify the source of water needed for the proposed project, including potable water supplies.

As noted above the demineralized water to support the new hydrogen production equipment will be drawn from existing permitted groundwater wells. Make-up water for the cooling towers will be supplied by the third party supply vendor to provide cooling water.

To the extent that DCRC purchases water from a third party to supply the Project, the potential third party water supplier draws its water supply from multiple surface water sources: Crum, Pickering, Neshaminy, Ridley and Chester Creeks, as well as the Schuylkill and Delaware Rivers and Upper Merion Quarry. The Delaware River

water withdrawal occurs in Pennsylvania; therefore, water would not be withdrawn from this third party water supplier from Delaware's Coastal Zone.

6.18 Are wells going to be used?

Existing permitted groundwater wells will be used to support the Project as described above.

If yes:

a. Identify the aquifer to be pumped and the depth, size and pumping capacity of the wells.

No new wells will be drilled to meet the demand of the Project. The refinery will use existing wells with pre-established, permitted allocations. Any water withdrawal from these existing wells to support the Project will remain within the existing permitted pumping capacity of the wells.

b. Has a permit been applied for to do this?

Not applicable.

c. How close is the proposed well(s) to any well(s) on adjacent lands?

Not applicable.

Solid Waste

6.19 Will this project result in the generation of any solid waste?

Yes.

If yes, describe each type and volume of any solid waste (including biowastes) generated by this project, and the means used to transport, store, and dispose of the waste(s).

Solid waste generated during operation of equipment installed as part of the Project is expected to be consistent with the waste streams currently generated by the existing hydrogen plant. Plant staff will insure proper characterization of wastes generated in connection with the Project and make arrangements for proper shipment and disposal of wastes at appropriate facilities.

All construction and demolition waste materials associated with the construction of the Project will be disposed of outside of the Coastal Zone.

The general description and estimated quantities of solid waste anticipated to be generated as a result of the Project are summarized in the table below:

Waste Description	Estimated Waste Amount
Construction and Demolition (C&D) waste	Total of 5,000 yd^3/ over the construction phase
Spent lube oil	Two (2) 55-gal drum/month
Desulfurization catalyst	1 changeout every (approximately) 2.5 years @ 600 ft^3/changeout
High temperature shift (HTS) catalyst	1 changeout every 5 years @ approximately 600 ft^3/total changeout
Reforming catalyst	1 changeout every 5 years @ approximately 500 ft^3/total changeout
SCR catalyst	1 changeout every 5 years [1]
Plant trash (municipal waste) from "office" dumpster	2 yd^3 @ 1x/week
Plant "industrial trash" dumpster	10 yd^3 @ 1x/6 months

[1] The sizing of the SCR selected for the project will determine catalyst changeout volumes.

Wastes will be stored in appropriate containers, such as 55-gallon drums, and transported via either truck or rail to an appropriate disposal location outside of the Coastal Zone.

6.20 Will there be any on-site recycling, re-use, or reclamation of solid wastes generated by this project?

No.

If yes, describe:

6.21 Will any waste material generated by this project be destroyed on-site?

No.

If yes, how will that be done?

Hazardous Waste

6.22 Will this proposed project result in the generation of any hazardous waste as defined by the "Delaware Regulations Governing Hazardous Waste"?

This Project may generate hazardous wastes (catalysts) that are similar in nature to those currently generated at the Refinery.

If any soils excavated during construction are identified as hazardous waste, they will be managed as described in the response to question 6.23 below.

If yes, identify each hazardous waste, its amount, and how it is generated:

Catalysts used in conjunction with specific process units or emission control equipment associated with the Project must be replaced, in whole or in part, on a periodic basis, due to degradation in performance associated with decreased reactivity, fouling or other routine operational circumstances. Certain of these catalysts may be characterized as hazardous waste upon generation as a solid waste, at changeout. The anticipated quantities of all such catalyst waste streams are provided in the table included within the response to Question 6.19.

Construction activity for the Project will involve excavation of certain soil materials. To the extent that any excavated soils are otherwise properly characterized as hazardous waste, they will be managed as such. It is not practical to currently project whether any such soils should be characterized as hazardous wastes, or the quantity of such soils.

6.23 Describe the transport of any hazardous waste and list the permitted hazardous waste haulers that will be utilized.

DCRC is not proposing to revise its current hazardous waste transportation methods as a result of this Project. DCRC will continue to use a third party hazardous waste coordinator to assist in the selection of hazardous waste transporters (based on multiple factors and consistent with current practice).

6.24 Will the proposed project cause the applicant to store, treat, and/or dispose of hazardous waste?

No.

If yes, describe:

6.25 Does the applicant currently generate any hazardous waste at this site?

Yes.

If yes, describe:

DCRC currently generates hazardous waste related to its Refinery operations. These hazardous wastes are generated and managed in

accordance with applicable regulatory standards, and include but are not limited to: crude tank and slurry tank bottoms, API separator sludges, spent SCR catalyst, refinery primary sludges, benzene contaminated media, laboratory wastes, contaminated personal protective equipment, and spill clean-up residues. The hazardous waste streams are containerized and shipped offsite to permitted waste treatment and disposal sites.

Habitat Protection

6.26 What is the current use of the land that is to be used for the proposed project?

The property comprising the Refinery encompasses 1,729 acres of land which is currently zoned and utilized for Heavy Industrial (HI) operations.

The Project area (approximately 4 acres [or 0.2 percent of the Refinery property]), consists of a combination of the following land cover types: active industrial, parking (pavement and gravel), vegetated uplands - scrub-shrub), and rail line.

The majority of the Project site consists of pavement and gravel.

6.27 Will the proposed project result in the loss of any wetland habitat?

No wetland impacts will occur as a result of the Project.

6.28 Will any wastewater and/or stormwater be discharged into a wetland?

No wastewater or stormwater will be discharged into a wetland.

If yes, will the discharge water be of the same salinity as the receiving wetlands?

6.29 Will the proposed project result in the loss of any undisturbed natural habitat or public use of tidal waters?

Neither undisturbed natural habitat nor public use of tidal waters will be lost as a result of this Project.

The refinery property is currently zoned and utilized for Heavy Industrial (HI) operations. The land proposed for use by the Project is within the property boundaries of the refinery and is entirely within the active Refinery.

For security purposes, the facility is fenced and guarded and public access to the Delaware River is not available on Site; therefore, public use of tidal waters adjacent to the Refinery will be unchanged as a result of the proposed Project.

If yes, how many acres?

6.30 Do threatened or endangered species (as defined by the DNREC and/or the Federal Endangered Species Act) exist at the site of the proposed project, or immediately adjacent to it?

DCRC submitted a general information request to DNREC and NOAA to assess the potential presence of threatened and endangered species. At the time of the submittal, DCRC had not finalized project details or potential process locations within the Site boundary as a result the State and NOAA provided general response letters. Copies of these letters are provided in Attachment F.

Previous Agency letters for a larger project area yet primarily within the active Refinery area indicated that there were no State or Federally threatened or endangered species present on the site proposed for the Project, nor immediately adjacent to it. Copies of these letters are also provided in Attachment F.

The letter identified the potential presence of bog turtle habitat within the Refinery boundary. Bog turtle (*Glyptemys muhlenbergii*) habitat consists of freshwater wetlands with open canopies, mucky soils, and tussock vegetation, but they can occur in more marginal habitats as well. All of the proposed Project work will occur within the active (disturbed) Refinery boundary and will not occur in or within the vicinity of wetlands (Figure 1). No bog turtles or their habitat will be adversely impacted by the proposed Project.

The letter also identified a bald eagle (*Haliaeetus leucocephalus*) nest and northern long-eared bats (*Myotis septentrionalis*) within the vicinity of the Refinery.

Based on a follow-up phone call with Kate Fleming, Wildlife Biologist/Environmental Review Coordinator with DNREC Division of Fish and Wildlife, the bald eagle nest within the vicinity of the Site is outside the suggested buffer zones (330 ft. to 660 ft. from a nest). Therefore, neither bald eagles nor their habitat will be impacted by the proposed Project.

The northern long-eared bat is proposed to be federally listed. The bat's habitat consists of caves and mines in the winter, and cavities of live or dead trees in the summer. The active Refinery area is devoid

of caves and mines and no trees will be disturbed as part of this Project. Therefore, neither northern long-eared bats nor their habitat will be disturbed as part of the project.

The USFWS GIS database indicates that intertidal mudflats occur within the Refinery site boundary. All project work will occur within the active Refinery boundary and will not occur in or within the vicinity of the mapped intertidal mudflats (Figure 1).

The Delaware River, within the vicinity of the Refinery, is a spring migration pathway to summer foraging areas for non-spawning shortnose sturgeon *(Acipenser brevirostrum).* Juvenile Atlantic sturgeon *(Acipenser oxyrinchus)* are present in the River in the vicinity of the Refinery in Spring and early summer. Both the shornose sturgeon and the Atlantic sturgeon are listed as endangered species under federal law (see NOAA's National Marine Fisheries letter provided in Attachment F). The Project does not require any in water work; therefore, none of the listed species will be impacted as a result of Project activities. Additionally the project does not add any new pollutants to the waste water stream discharged to the Delaware River and the volume of discharge will also remain consistent to current conditions (negligible 0.3% increase).

6.31 Will this proposed project have any effect on these threatened or endangered species (as defined by the DNREC and/or the Federal Endangered Species Act)?

The Project work will occur entirely on land and will not affect the Delaware River, which is the habitat for the threatened or endangered species identified in response to Question 6.30.

6.32 What assurances can be made that no threatened or endangered species exist on the proposed project site?

Copies of the Agency letters referenced in response to Question 6.30 have been included in Attachment F. See also the response to Question 6.31.

6.33 Describe any filling, dredging, or draining that may affect nearby wetlands or waterways.

No filling, dredging, or draining will occur as a result of the Project.

6.34 If dredging is proposed, how much will occur and where will the dredged materials go for disposal?

Not Applicable.

Other Environmental Effects

6.35 Describe any noticeable effects of the proposed project site including: heat, glare, noise, vibration, radiation, electromagnetic interference, odors, and other effects.

The new equipment, structures and operations associated with the Project will be consistent in kind, character and scope with the existing Refinery operations. One new flare will be installed as part of the Project. The maximum elevation of this flare will be less than the maximum elevation of existing equipment at the Refinery. The Project is not anticipated to cause any noticeable change in heat, glare, noise, vibration, radiation, electromagnetic interference, and odors outside the fence-line during normal operation.

6.36 Describe what will be done to minimize and monitor such effects.

DCRC has considered the potential effects of the Project on the surrounding community in all aspects of the design of the Project, notably including proposed project location. By siting the Project within the existing Refinery boundary, among existing structures, equipment and operations that are similar in kind, character and scope as the proposed new equipment, DCRC has undertaken to eliminate or at least minimize any noticeable perceived effects of the proposed project relative to such factors as heat, glare, noise, vibration, radiation, electromagnetic interference, odors and other effects. Further, in the context of design and selection of specific equipment, DCRC has ensured that all such equipment reflects state of the art technology designed to efficiently accomplish the intended production purpose while minimizing potentially objectionable community impacts. Further, DCRC will develop procedures and train appropriate operating personnel, to ensure that the equipment associated with the Project is operated in accordance with good and intended work practices and thereby minimize the potential for malfunctions that may give rise to aberrational odors, noise or other perceived impacts.

6.37 Describe any effect this proposed project will have on public access to tidal waters.

The Project will not affect public access to tidal waters.

6.38 Provide a thorough scenario of the proposed project's potential to pollute should a major equipment malfunction or human error occur, including a

description of backup controls, backup power, and safety provisions planned for this project to minimize any such accidents.

In selecting and designing equipment, structures and processes associated with the Project, DCRC undertakes to ensure that the project will consist of and employ state of the art technology to achieve efficient and effective operation of the intended processes, while limiting adverse environmental impacts. As one component of this effort, systems were selected and designed to minimize the potential for malfunction. Further, consistent with current practice at the Refinery, DCRC will develop procedures, and train appropriate operating personnel in the implementation of such procedures, for the efficient and effective operation of all new equipment and processes associated with the Project. DCRC will also develop and implement, in consideration of manufacturers' specifications and other relevant information, maintenance procedures and schedules to maximize continuous operation of the relevant equipment, and minimize malfunctions that may cause unintended shutdown and interruption to production activity.

Consistent with its Refinery-wide Process Safety Management program, DCRC performs process hazard analyses of operations or equipment utilizing substances identified as posing potential hazards. Implementation of these process hazard analyses on a routine basis assists the Refinery in identifying and correcting equipment-or process-based conditions that may increase the probability of a malfunction.

By regulatory definition, a malfunction may arise due to aberrational conditions that could not reasonably have been foreseen nor prevented, notwithstanding effective maintenance and operational practices. Further, even in the best run operations by the most highly trained personnel, human error may nonetheless occur on an isolated basis. In recognition of these circumstances, DCRC has developed extensive procedures to ensure the identification of and prompt response to any unintended operating condition that may give rise to adverse impacts to the environment or the surrounding community.

DCRC includes appropriate monitors and even alarm systems on relevant equipment to provide early warning to Refinery personnel of aberrational operating conditions associated with a malfunction or other situations. DCRC has invested in substantial resources at the Refinery to enable prompt response to any such aberrational operating condition to minimize its duration and impact. Further, DCRC works cooperatively with surrounding government response organizations and personnel and maintains routine communication with such personnel to ensure that additional resources can be

immediately brought to bear to support DCRC's own activities in the event of an unintended aberrational operating event.

6.39 Describe how the air, water, solid and hazardous waste streams, emissions, or discharge change in the event of a major mechanical malfunction or human error.

Please see response to Question 6.38 regarding the nature and response to malfunctions or other aberrational operating conditions potentially associated with the Project.

As previously described, because a malfunction, by regulatory definition, may be unforeseeable and not preventable, it is not possible to describe, in all circumstances, the potential impact to air, water, solid and hazardous waste stream, emissions or discharge resulting from a malfunction. However, consistent with its efforts to minimize any adverse affect associated with a malfunction, DCRC has identified potential impacts to environmental media that could result from unintended operating conditions.

Relative to air quality, a malfunction or an unintended operating condition could result in an increase in air emissions of any of the regulated parameters associated with operations of new equipment. By way of example, a malfunction of the SCR emission control device for a process heater would result in a temporary increase in NO_x emissions.

Similarly, an aberrational operating condition could result in a temporary increase in discharges from the existing WWTP to the Delaware River, for example in the event of a malfunction cooling tower.

Although a malfunction event is not likely to materially change the character or nature of waste generation associated with the Project, such malfunction may temporarily increase the generation rate of certain waste streams, potentially including spent filters or spent catalysts.

If, notwithstanding effective design, construction and maintenance of all storage vessels associated with the Project, a release or other unintended discharge from such storage vessels should occur, the release would likely be contained within secondary containment specific to the vessel, or other systems designed to prevent migration of the discharge. In the unlikely event that such containment systems suffered a simultaneous malfunction, streams would likely be captured and directed to the wastewater treatment plant, but an

unintended discharge to surface water or groundwater would remain possible.

As stated above, however, DCRC has undertaken to consider such potential scenarios in the design, construction, maintenance and operation of new equipment. In addition, applicable regulatory standards establish multiple redundancies to minimize adverse effects associated with malfunctions or other aberrational conditions. Finally in this context, by preparing for such potential circumstances, DCRC has identified and made available resources to minimize any potential adverse effects.

PART 6B

ENVIRONMENTAL OFFSET PROPOSAL REDUCTION CLAIM

Is applicant claiming the right to have a reduced offset proposal due to past voluntary improvements as defined in the "Regulations Governing Delaware's Coastal Zone"?

NO

If yes, provide an attachment to the application presenting sufficient tangible documentation to support your claim.

PART 6C

ENVIRONMENTAL OFFSET PROPOSAL

If the applicant or the Department finds that an Environmental Offset Proposal is required, the proposed offset project shall include all the information needed to clearly establish:

A. A qualitative and quantitative description of how the offset project will more than offset the negative impacts from the proposed project.

Additional detail regarding environmental offsets is provided in the Offset Matrix in Attachment E.

To the extent that the Project will result in any net adverse environmental impact, such impact will be substantially more than offset by environmental benefits associated with the project, especially upon considering additional environmental benefits achieved through voluntary efforts by the Refinery, discussed in this application.

The intended purpose of the Project is to enhance clean fuel production from existing refinery units, primarily in the form of ultra-low sulfur distillate products. More specifically, the Project is designed to convert refinery heavy residual streams into clean-burning ultra-low sulfur fuels (diesel, home heating oil, and gasoline). The project will enable removing approximately 50 long tons per day of sulfur from distillates, which, when combusted in fuels, is the equivalent of 40,880 tons per year of SO_2. Significant reductions in regional emissions as a result of using lower sulfur home heating oil will provide an environmental benefit to the region. Burning of ultra-low sulfur diesel fuel not only reduces SO_2 emissions, it also helps catalytic convertors on automobiles to operate better – improving their ability to control nitrogen oxide emissions. Therefore, use of this cleaner fuel will support a decrease in ozone generating precursors throughout the region as well. A substantial portion of these emission reductions can be expected to occur within the Coastal Zone or to affect the Coastal Zone by virtue of transport of air emissions/combustion byproducts from "upwind" sources.

Additionally, a total of three (3) package boilers will be removed from the facility, further reducing facility emissions.

Although the Project will necessarily result in certain air emissions, wastewater discharges and solid waste generation, all such emissions, discharges and waste generation are of a similar kind and character as the emissions, discharges and wastes currently generated from Refinery operations.

With respect to specific air emissions, NO_x emissions attributable to the Project cannot cause any increase relative to the facility-wide NO_x emissions cap already applicable to the Refinery, because NO_x emissions from the Project will be subject to, and therefore must remain within, the Refinery's total NO_x emissions limit.

Further, air emissions will be subject to specific limitations and standards imposed through air quality permitting separately addressed for the project. As reflected in the air permit application, the project does not trigger Prevention of Significant Deterioration or non-attainment New Source Review, meaning the project does not significantly impact air quality in the region.

Considering the sulfur dioxide emission reductions resulting from this Project and the emission reductions associated with the retirement of the three (3) package boilers, DCRC believes this project does not require any additional offsets.

With respect to water use and wastewater discharge, as detailed in the application, the Project will not result in the construction of any new water intake or the increase in flow from any existing water intake on the Delaware River. No new groundwater wells will be required to support the project and any groundwater withdrawn from existing wells will not require any increase in permitted capacity. As also detailed in the application, overall wastewater discharge will essentially remain unchanged (0.3% increase) as a result of the Project.

B. How the offset project will be carried out and in what period of time.

Land Impacts (Wetland/habitat/flora)

No Project impacts are anticipated.

Air

The facility-wide emissions at the Refinery will decrease following operation of the new hydrogen production equipment and the removal of three (3) existing package boilers. The package boilers are expected to be removed from service as soon as steam is being

reliably produced from the new hydrogen production unit. As there will be no increase in facility-wide emissions at the Refinery, no additional offsets are required.

The reduction in regional sulfur emissions due to the combustion of the cleaner fuels produced by the Project will occur following commencement of operation and use of the lower sulfur fuels. Full production is anticipated to be achieved by November 2016.

C. What will the environmental benefits will be and when they will be achieved.

See Responses to Paragraphs A and B above.

D. What scientific evidence there is concerning the efficacy of the offset project in producing its intended results.

The specific environmental offsetting projects identified by DCRC through this application rely upon extensive regulatory agency assessments of available benefits from specific offsetting activities. In particular, any air qualify benefits from air emission reductions of the specific pollutants addressed by this offset plan have been demonstrated, based upon extensive scientific evaluation, and recognized generally by government authorities as environmentally beneficial.

E. How the success or failure of the offset project will be measured in the short and long term.

Please see response to Paragraph D.

F. What, if any, negative impacts are associated with the offset project.

There are no negative impacts associated with the environmental mitigation and offset projects identified in this permit application.

How the offset will impact the attainment of the Department's environmental goals for the Coastal Zone and the environmental indicators used to assess long-term environmental quality within the Coastal Zone.

The specific environmental benefits associated with the Project, as well as the environmental benefits related to the additional offsetting and mitigation projects discussed in this application, are entirely consistent with the Department's environmental objectives for the Coastal Zone and accepted environmental indicators for long-term environmental quality. The Project will

produce fuels with substantially lower sulfur concentration, thereby directly resulting in enhanced air quality in the Coastal Zone through the combustion of such fuels as replacement for higher emitting fuels. Implementation of the Project essentially without a corresponding increase in wastewater discharge or flow at the existing intake on the Delaware River reflects the ability to achieve significant environmental improvements through the Project without any adverse water impacts. Adherence to all regulatory standards regarding air quality offsets not only ensures satisfaction of and compatibility with environmental regulatory standards, but the realization of the objectives of such standards in terms of maintaining environmental protection (particularly in the Coastal Zone) in the context of project development activities.

1. The offset proposals must "*clearly and demonstrably*"[1] more than offset any new pollution from the applicant's proposed project. The applicant can claim (with documentation) evidence of past voluntary environmental investments (as defined in the Regulations) implemented prior to the time of application. Where the Department concurs with the applicant that such has occurred, the positive environmental improvement of the offset proposal against the new negative impact can be somewhat reduced.

2. The applicant must complete the Coastal Zone Environmental Impact Offset Matrix. This matrix can be found on the CZA web page (http://www.dnrec.delaware.gov/Admin/CZA/CZAHome.htm, or by clicking on this link. On page one, the applicant must list all environmental impacts in the column labeled "Describe Environmental Impacts." In the column to the immediate right, the applicant should reference the page number of the application or attachment which documents each impact listed. In the "Describe Environmental Offset Proposal" column, applicant must state what action is offsetting the impact. The offset action shall be referenced by page number in the column to the right to show how the offset will work. The applicant shall not utilize the far right column. *Please ensure the matrix is complete, detailed, and as specific as possible, given the allotted space. Also, thoroughly proof-read to ensure there are no spelling or grammatical errors.* The applicant must submit a completed matrix both in hardcopy and electronic form.

[1] For purposes of this requirement, the DNREC will interpret the phrase "clearly and demonstrably" to mean an offset proposal that is obviously so beneficial without detailed technical argument or debate. The positive environmental benefits must be obviously more beneficial to the environment than the new pollution that minimal technical review is required by the Department and the public to confirm such. The total project must have a positive environmental impact. The burden of proof is on the applicant.

3. Please note: the entire offset proposal, including the matrix, shall be available to the public, as well as the evidence of past voluntary environmental enhancements.

PART 7

ECONOMIC EFFECTS

Construction

7.1 Estimate the total number of workers for project construction and the number to be hired in Delaware.

It is currently anticipated that approximately 150 workers will be engaged in direct Project construction activities. All workers will be employed in Delaware (at the Refinery location). It is anticipated that 80% will be from the region, including Delaware and the local union, and 20% will be from outside of the local area.

7.2 Estimate the weekly construction payroll.

The weekly payroll is estimated to be $630,000.

7.3 Estimate the value of construction supplies and services to be purchased in Delaware.

An estimate of construction services and supplies to be purchased in Delaware is $30,000,000.

7.4 State the expected dates of construction initiation and completion.

The Project will be initiated as soon as appropriate permitting is complete. Initiation is targeted for April 2015 with completion by November 2016.

7.5 Estimate the economic impact from the loss of natural habitat, or any adverse economic effects from degraded water or air quality from the project on individuals who are directly or indirectly dependent on that habitat or air or water quality (e.g. commercial fishermen, waterfowl guides, trappers, fishing guides, charter or head boat operators, and bait and tackle dealers).

For these reasons described in detail in this application, there is no projected adverse economic impact associated with the Project due to loss of natural habitat or degraded water or air quality.

Operations

7.6 State the number of new employees to be hired as a direct result of this proposed project and how many of them will be existing Delaware residents and how many will be transferred in from other states.

Construction of the Project will substantially benefit the local economy within Delaware's Coastal Zone, as the Project will generate jobs during construction.

7.7 If employment attributable to the proposed project will vary on a seasonal or periodic basis, explain the variation and estimate the number of employees involved.

Not Applicable

7.8 Estimate the percent distribution of annual wages and salaries (based on regular working hours) for employees attributable to this project:

Not Applicable

7.9 Estimate the annual taxes to be paid in Delaware attributable to this proposed project:

State personal income taxes:	**$ 3,000,000 (during construction) and Not Applicable (during operation)**
State corporate income taxes:	**Not Applicable**
County and school district taxes:	**Not Applicable**
Municipal taxes:	**Not Applicable**

Manufacturing and Gross Receipt Taxes: $ 1,100,000

Total estimated annual tax to be paid to Delaware as a result of the Project (after completion of construction phase): Not Applicable.

PART 8

SUPPORTING FACILITIES REQUIREMENTS

Describe the number and type of new supporting facilities and services that will be required as a result of the proposed project, including, but not limited to:

a. Roads

It is not anticipated that any new or expanded public roads will be required to support the Project. No new roads or road improvements are required within the Refinery boundary.

b. Bridges

It is anticipated that no new public bridges, or improvements to existing public bridges, will be required to support the Project.

c. Piers and/or docks

No new piers or docks are required to support this Project.

d. Railroads

No new railroads are required to support this Project.

e. Microwave towers

No microwave towers are required as part of this Project.

f. Special fire protection services not now available.

It is not anticipated that any new special fire protection services will be required for the Project. Instead, the existing firewater loop will be expanded; a new firewater deluge may be installed for critical equipment.

g. Traffic signals

There are no traffic signals required for this Project.

h. Sewer expansion

Neither the construction nor operation will involve any connection to public sewer; therefore no public sewer expansion is required in

connection with the Project. DCRC will instead make necessary adjustments to existing wastewater infrastructure within the Refinery to accomplish necessary expansion of that system and installation of additional tie-ins for flow to the existing WWTP.

i. Energy related facilities expansion

DCRC is expected to provide all of the power required by the new hydrogen production equipment. Two new feeder lines will be added from an existing substation within the Refinery to the new hydrogen production equipment substation (see Figure 3).

j. Pipelines

No new regional pipelines will be required for this Project.

As otherwise detailed in Project plans, new lines (sewer water, fire water, process water, and natural gas lines) will be installed between the active refinery area and the new hydrogen production equipment. These pipelines will all be located within the Project area identified on Figure 3.

In addition to the pipelines described above, one new gas line will be installed by Eastern Shore Natural gas. This new line will run from School House Road to the western edge of the new hydrogen production equipment. This line will be installed by Eastern Shore Natural Gas (ES&G).

k. Bulk Hydrogen Loading

Not Applicable.

l. Laydown Areas

The construction phase of the Project will include up to three (3) support facilities (laydown areas) as shown on Figure 3.

PART 9

AESTHETIC EFFECTS

9.1 Describe whether the proposed project will be located on a site readily visible from a public road, residential area, public park, or other public meeting place (such as schools or cultural centers).

The proposed Project will not change the current aesthetic quality of the Refinery. Project equipment will be installed directly adjacent to existing structures within the Refinery boundary and are not expected to be readily distinguishable from existing Refinery structures from the vantage point of any residential area, public-park, or other public meeting place, although new equipment may be visible from a public road.

9.2 Is the project site location within a half mile of a place of historic or scenic value?

According to the National Historic Registry database 2014 there are six (6) locations within a half mile radius the Project Site, (Chelsea; Delaware City Historic District; Eastern Lock of the Chesapeake and Delaware Canal; Fairview; Fort Delaware on Pea Patch Island, and Fort Dupont Historic District), none of which will be affected by Project activities.

9.3 Describe any planned attempt to make the proposed facility aesthetically compatible with its neighboring land uses. Include schematic plans and/or drawings of the proposed project after it is complete, including any landscaping and screening.

Equipment associated with the Project will be of a similar kind, character, scope and appearance as existing equipment at the Refinery, and therefore will be aesthetically compatible with the existing Refinery and the surrounding land use. Due to the compatibility of the Project to the existing land use, landscaping and screening are not proposed. Plot plans and other layout information for the Project are included in the attachments to this application.

PART 10

EFFECTS ON NEIGHBORING LAND USES

10.1 How close is the nearest year-round residence to the site of this proposed project?

The nearest year-round residence is located approximately 1910 feet from the outer edge of the Project area. All Project activities will occur within the existing Refinery boundary; therefore, the distance to the nearest year-round residence will be unchanged.

10.2 Will this proposed project interfere with the public's use of existing public or private recreational facilities or resources?

The Project will be located completely within the property boundaries of the Refinery and will not affect use of existing public or private recreational facilities or resources. Federal regulations imposing strict security measures prevent public access to the Refinery site.

10.3 Will the proposed project utilize or interfere with agricultural areas?

The Project will occur within the property boundaries of the Refinery and will not use or interfere with agricultural areas.

10.4 Is there any possibility that the proposed project could interfere with a nearby existing business, commercial or manufacturing use?

The Project will occur within the property boundaries of the Refinery and will not interfere with nearby existing businesses, commercial or manufacturing uses. Certain local commercial establishments will likely benefit as a result of the temporary influx of workers required to support the Project.

END OF APPLICATION

ATTACHMENTS TO FOLLOW

Attachment A
Zoning Letter

Paul G. Clark
County Executive

David M. Culver
General Manager

Department of Land Use
December 15, 2011

In reply, refer to:
2011-0718-V

Maura Cirilli, Engineer
Delaware City Refining Company, LLC
4550 Wrangle Hill Road
Delaware City, DE 19706

Dear Ms. Cirilli:

The New Castle County Department of Land Use is in receipt of your request for a verification of zoning and use for tax parcel number 12-008.00-014, which is located at 765 School House Road & 4448 Wrangle Hill Road in New Castle, Delaware.

A review of the Official Zoning Map of New Castle County indicates that the subject parcel is zoned **HI (Heavy Industrial)**, which **permits heavy industrial uses and petroleum refining and related industries (including a hydrocracking/hydrogen plant),** pursuant to *New Castle County Code* Section 40.33.270.C.

A Record Resubdivision Plan for a Coke Barn (instrument number 201010130054631) was recorded in the Office of the Recorder of Deeds for New Castle County on October 13, 2010. The approval and recordation of this plan indicate compliance with the subdivision and zoning code in effect at that time. A copy of the recorded plan is enclosed for your information. Any new construction or changes in use to that shown on the recorded plan will require compliance with current UDC regulations.

Please be advised that this letter only verifies whether the type of use that exists or is proposed on the site – to the extent you described it in your zoning verification application – is permitted, not permitted, or permitted under limited circumstances in the zoning district. This letter is not a permit and does not offer any guarantee that any other required plans, applications, certifications, or variances for your project will be approved.

If your project involves an expansion of the existing use, a change of use, alterations to the building or site, demolition, or new construction, one or more permits may be needed before you can initiate the use. The following is a summary of Department of Land Use permits, certificates, and plans that may be required for your project:

Any new use or change of use in an existing building may require:

1. **Limited Use Permit**. If the existing or proposed use is identified as a "limited use" on the first page of this letter you will need to apply for a Limited Use Permit. This application must be accompanied by a site plan, or other supporting documentation, demonstrating that the special standards for that use are met. Refer to Articles 3 and 31 of the Unified Development code for additional information.
2. **Certificate of Use**. To either institute a new use, or expand an existing use, in an existing building you must obtain a Certificate of Use. The Department will determine whether the building meets the BOCA Code (building code) and parking requirements for such use. Refer to Chapter 6, Article 2 of the New Castle County Code (Building and Property Regulations) for additional information.

Any new construction, or alteration or expansion of existing buildings and features on the site may require:

3. **Major or Minor Land Development Plan**. If your project will subdivide land or add more than 1,000 square feet of gross floor area, you must submit a major or minor land development plan. The plan will be reviewed for compliance with the land development criteria outlined in the Unified Development Code. During review of the plan, the Department may hold public hearings and may identify other applications, plans, studies, or permits that need to be submitted before development can commence. Refer to Article 31 of the Unified Development Code for general requirements.
4. **Parking Plan.** If your project requires installation, expansion, or reconfiguration of a parking lot, you will need to submit a parking plan. Refer to Articles 3 and 31 of the Unified Development Code for general requirements.
5. **Building Permit / Demolition Permit / Sign Permit**. If your project will involve altering or enlarging a building (including mechanical systems), demolishing all or part of a building, or installing new signs, you must obtain permits for those activities. During the review of these applications, the Department may identify other applications, plans, studies, or permits that need to be submitted before development can commence. Before the new or improved building can be inhabited, a **Certificate of Occupancy** must be secured from the Department. Refer to Chapter 6, Article 2 of the New Castle County Code (Building and Property Regulations) for additional information.

This summary of Department of Land Use permit applications is intended only for general informational purposes and is not intended to be inclusive of the comprehensive requirements contained in the New Castle County Code. Please be advised that some of the review processes described above may also require recommendations or decisions from County boards (Planning Board, Historic Review Board, Board of Adjustment, and Resource Protection Area Technical Advisory Committee) or outside agencies. New Castle County must abide by regulations imposed on it by a variety of State and Federal agencies. Accordingly, any of the County permits described above may be subject to additional review processes that address environmental concerns; resource protection; public health, safety, and welfare; and a variety of other issues. In some cases, landowners may need to address the requirements of those agencies independently.

Landowners contemplating a change of use, future development, or alterations to buildings and land are encouraged to engage the services of an engineer, land surveyor, and/or attorney for advice on any physical constraints that may limit development of the property, and guidance on what permits may be needed to commence a new use or development.

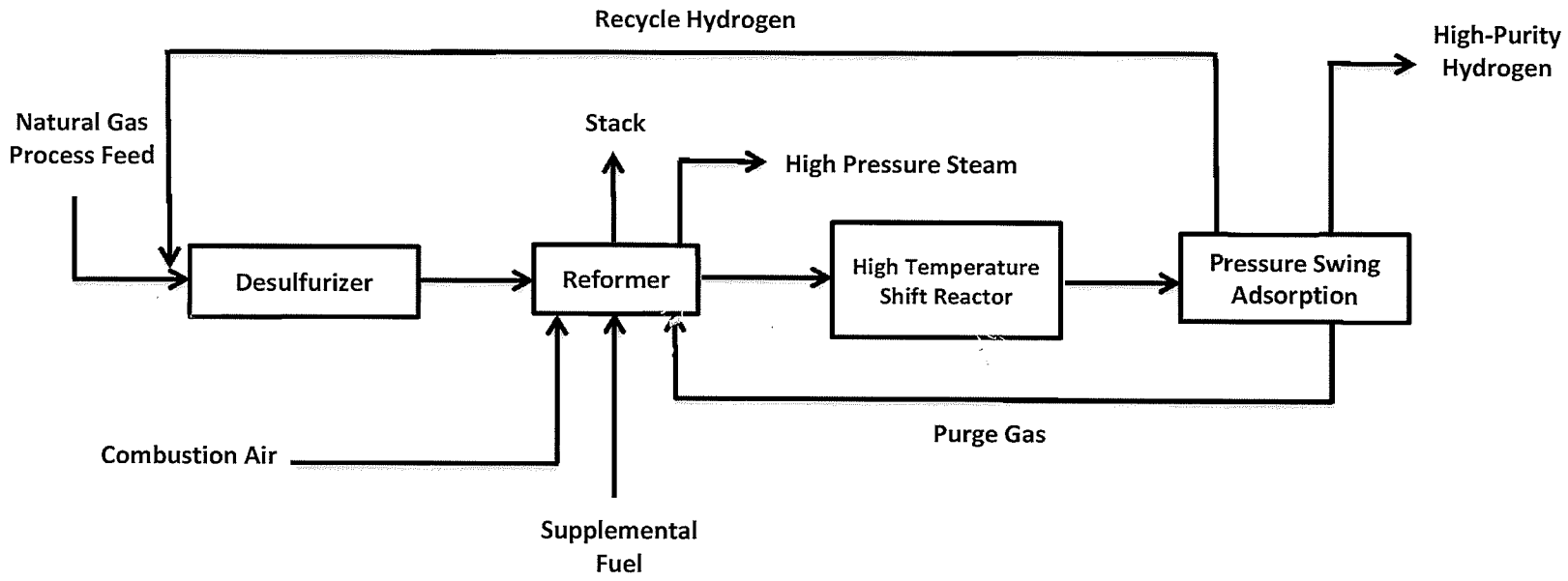
General questions regarding the plan review process; building, demolition, and sign permits; and Certificates of Use/Occupancy, can be answered by the Department at 395-5400. Thank you for your attention to this matter.

Sincerely,

Joseph M. Abele, AICP
Planner III

Attachment B
Process Flow Diagram

DCRC Low Sulfur Fuels Project
Process Flow Diagram



Attachment C
Material Safety Data Sheets

Delaware City
Refining Company

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: ULSD2

Product Use: Fuel

Synonym: Ultra Low Sulfur Diesel 2

Manufacturer:
Delaware City Refining Company
4550 Wrangle Hill Road
Delaware City, DE. 19706

Telephone Numbers:
Chemtrec: 1-800-424-9300 (24 hr. Transportation Emergency)
Delaware City Refining: 1-302-834-6271 (24 hr. Number)

2. COMPOSITION /INFORMATION ON INGREDIENTS

Component	CAS Number	Typical Vol%
Fuels, Diesel, No. 2	68476-34-6	100%
Naphthalene	91-20-3	0 – 5%

3. HAZARDS IDENTIFICATION

Emergency Overview:

Danger! Combustible liquid and vapor. Vapors may form explosive mixtures with air. Vapors may cause flash fire or explosion. Vapors are heavier than air and may travel along the ground, explosive mixtures are easily formed. Harmful or fatal if swallowed. Pulmonary aspiration hazard. While ingesting or vomiting, may enter lungs and produce damage. High vapor concentration may cause dizziness. May cause skin irritation.

Potential Health Effects:

Inhalation:

Excessive exposure may cause irritation to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, drowsiness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

Skin:

May cause moderate to severe skin irritation. Prolonged and repeated contact will result in drying, cracking and possibly dermatitis. These skin conditions are only likely to result in situations where poor personal hygiene is practiced.

Eye:

Contact may cause slight irritation.

Ingestion:

Harmful or fatal if swallowed. Pulmonary aspiration hazard. While ingesting or vomiting, may enter lungs and produce damage. Irritating to mouth, throat, and stomach. May produce central nervous system effects, which includes dizziness, loss of balance and coordination, unconsciousness, coma and even death.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen and continue to monitor. Get immediate medical attention.

Skin:

Remove contaminated clothing. Wash with soap and water for 20 minutes. Get medical attention if irritation develops or persists. Wash clothing before reuse.

Eye:

Flush eye with water for 20 minutes. Get medical attention.

Ingestion:

Do not induce vomiting! Do not give liquids! Get medical attention immediately.

5. FIRE-FIGHTING MEASURES

Extinguishing Media:

Regular foam, Dry chemical, Carbon dioxide, Water stream may be ineffective on fire.

Fire Fighting Instructions:

Use water spray to cool fire exposed tanks and containers. Wear structural fire fighting gear. The use of fresh air equipment such as Self Contained Breathing Apparatus (SCBA) or Supplied Air Respirators should be worn for fire-fighting if exposure or potential exposure to products of combustion is expected.

Flammable Properties:

Flash Point F:	130 Min
Autoignition Point F:	489-545
Lower Explosive Limit %:	1.3
Upper Explosive Limit %:	6.0

Combustible liquid and vapor. Will be easily ignited by heat, sparks and open flames. Vapor may form explosive mixtures with air. Vapors may travel to the source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Runoff to sewer may create fire and explosion hazard. STATIC ACCUMULATOR. This liquid may form an ignitable vapor-air mixture in closed tanks or containers. As result of flow, agitation, etc. electrostatic charges can be generated.

6. ACCIDENTAL RELEASE MEASURES

Carefully contain and stop the source of the spill, if safe to do so. Keep sparks, flames and other sources of ignition away. Collect leaking liquid in sealable containers. Contain spilled liquid with inert material (e.g., dry sand or earth), then place in chemical waste container. Prevent runoff into sewers and waterways. Advise the Environmental Protection Agency (EPA) and appropriate state agencies, if required. Use appropriate personal protective equipment as stated in Section 8 of this MSDS.

7. HANDLING AND STORAGE

Handling:

Follow all MSDS/label precautions even after container is emptied because it may retain product residue. Use only in a well-ventilated area. Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Wash thoroughly after handling. Never siphon by mouth. "Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioned, or properly disposed of. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities.

STATIC ACCUMULATOR. This liquid may form an ignitable vapor-air mixture in closed tanks or containers. This liquid may accumulate static electricity even when transferred into properly grounded containers. Bonding and grounding may be insufficient to remove static electricity.

Static electricity accumulation may be significantly increased by the presence of small quantities of water. Always bond receiving container to the fill pipe before and during loading, following NFPA-77 and/or API RP 2003 requirements. Automatic gauging devices and other floats in vessels or tanks which contain static accumulating liquids should be electrically bonded to the shell.

Bonding and grounding alone may be inadequate to eliminate fire and explosion hazards associated with electrostatic charges. In addition to bonding and grounding, efforts to mitigate the hazards of an electrostatic discharge may include, but are not limited to, ventilation, inerting and/or reduction of transfer velocities. Always keep the nozzle in contact with the container throughout the loading process. Do not fill any portable containers in or on a vehicle. Special precautions, such as reduced loading rates and increased monitoring, must be observed during "switchloading" operations (i.e. loading this material in tanks or shipping compartments that previously contained middle distillates or similar products).

Non-equilibrium conditions may increase the risks associated with static electricity such as tank and container filling, tank cleaning, sampling, gauging, loading, filtering, mixing, agitation, etc. Dissipation of electrostatic charges may be improved with the use of conductivity additives when used with other mitigating efforts, including bonding and grounding.

Storage:

Keep away from heat, sparks, and flame. Keep container closed when not in use. Store in a cool place in original container and protect from sunlight. Outside or detached storage is preferred. NFPA class II storage. Flash point is greater than 100 degrees F and less than 140 degrees F.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines:

Fuels, Diesel, No 2	100 mg/m3 TLV (Skin) ACGIH	
Naphthalene	10 ppm TWA OSHA	15 ppm STEL OSHA

Consult With a Health and Safety Professional for Specific Selections

Engineering Controls:

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protection

Eye Protection:

Safety glasses and/or goggles are recommended where there is a possibility of splashing or spraying.

Skin Protection:

Protective gloves are recommended to protect against contact with the product: Nitrile, >8hrs; Viton, >8hs; Polyvinyl Chloride, >4hrs.

Respiratory Protection:

Concentration in air determines the level of respiratory protection needed. Use only NIOSH certified respiratory equipment.

Half-mask air purifying respirator with organic vapor cartridges is acceptable for exposures to ten (10) times the exposure limit. Full-face air purifying respirator with organic vapor cartridges is acceptable for exposures to fifty (50) times the exposure limit. Exposure should not exceed the cartridge limit of 1000 ppm. Protection by air purifying respirators is limited. Use a positive pressure-demand full-face supplied air respirator or SCBA for exposures greater than fifty (50) times the exposure limit. If exposure is above the IDLH (Immediately Dangerous to Life and Health) or there is the possibility of an uncontrolled release, or exposure levels are unknown, then use a positive pressure-demand full-face supplied air respirator with escape bottle or SCBA. Wear a NIOSH-approved (or equivalent) full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Other:

Where splashing is possible, full chemically resistant protective clothing and boots are required. The following materials are acceptable for use as protective clothing: Nitrile, Viton or Polyvinyl Chloride. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Remove contaminated clothing and wash before reuse. For non-fire emergencies, positive pressure SCBA and structural firefighter's protective clothing will provide only limited protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Straw, yellow liquid, petroleum odor

Boiling Range F:	347 – 690
Liquid Conductivity pS/m:	0.1 est
Specific Gravity:	0.82 - 0.876
Solubility:	Nil
Vapor Pressure mmHg:	Nil
Volatility %:	100

10. STABILITY AND REACTIVITY

Stability:

Stable

Conditions to Avoid:

Heat, sparks, sources of ignition

Incompatibility:

Strong oxidizing agents, nitrates

Hazardous Decomposition:

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL INFORMATION

Dermal LD50 Rabbit: > 2.0 g/kg
Inhalation LC50 Rat: >5.0 mg/l
Oral LD50 Rat: >5.0 g/kg

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

Carcinogenicity Status No 2 Fuel:

ACGIH (American Conference of Government Industrial Hygienists): A3 – Confirmed animal carcinogen with unknown relevance to humans.

IARC (International Agency for Research on Cancer): Distillate (light) fuel oils are not classifiable as to their carcinogenicity to humans (Group 3).

Component Toxicity:

ULSD2 MSDS Date 3/10/2011

Overexposure to naphthalene, a minor component of this product, may cause skin, eye and respiratory tract irritation, anemia, loss of vision, nervous system effects and kidney and thymus damage. Also, exposure to naphthalene has produced "respiratory tract" tumors in laboratory animals.

Carcinogenicity Status Naphthalene:
ACGIH (American Conference of Government Industrial Hygienists) A4; Not classified as a human carcinogen.

IARC (International Agency for Research on Cancer) Group 2B; Naphthalene is possibly carcinogenic to humans.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data
Pimephales promelas (fresh water fish) 96 hr LC50 = 31 mg/l
Jordenella floridae (fresh water fish) 96 hr LC50= 54 mg/l

Diesel Oil is considered to be harmful to aquatic life with long lasting effects.

Biodegradation
Diesel fuels are biodegradable. The process is dependent on temperature. In colder waters diesel fuel tends to become more persistent than in temperate waters. On release to the environment the lighter components will generally evaporate, the remainder may become dispersed in the water column or absorbed to soil or sediment. It is expected that the heavier hydrocarbon components would degrade in soil in the presence of oxygen.

13. DISPOSAL INFORMATION

Discarded product and spill residues may meet the RCRA hazardous waste definition for ignitability (USEPA ID # D001). Always consult Federal, State and local waste regulations to determine appropriate waste disposal options. The generator of a waste is responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

14. TRANSPORT INFORMATION

DOT Proper Shipping Name:	Diesel fuel
DOT Hazard Class and Packing Group:	3, PG III
DOT Identification Number:	UN1202
DOT Shipping Label:	Flammable Liquid

***NA1993 can be used for domestic transport, combustible liquid**

15. REGULATORY INFORMATION

Inventory Status:

The components of this product are listed on the following chemical inventories:
Australia, Canada, China, European, Korea, New Zealand, Philippines and the United States.

United States (Naphthalene):

CERCLA/SARA - Section 313 - Emission Reporting (max wt% 6.2)
CERCLA/SARA - Haz Substances and their RQs

This product contains the following EPCRA section 313 chemicals subject to the reporting requirements of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372): Maximum Wt% Naphthalene- CAS Number 91-20-3, 6.2%. This information must be included in all MSDSs that are copied and distributed for this material.

State Regulatory Status (Naphthalene):

Massachusetts - Right To Know List
New Jersey - Department of Health RTK List
New Jersey - Env Hazardous Substances List
Pennsylvania - RTK - Environmental Hazard List
Pennsylvania - RTK (Right to Know) List
California - Proposition 65 - Carcinogens List

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health: Yes, Chronic Health: Yes, Fire Hazard: Yes, Pressure Hazard: No
Reactive Hazard: No

16. OTHER INFORMATION

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

NFPA® HAZARD RATING

HEALTH: 2
FIRE: 2
REACTIVITY: 0

HMIS® HAZARD RATING

HEALTH: 2
FIRE: 2
PHYSICAL: 0

ULSD2 MSDS Date 3/10/2011

Delaware City
Refining Company

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Natural Gas

Product Use: Refinery Byproduct

Synonym: DCR 1453

CAS Number: 8006-14-2

Manufacturer:
Delaware City Refining Company
4550 Wrangle Hill Road
Delaware City, De. 19706

Telephone Numbers:
Chemtrec: 1-800-424-9300 (24 hr. Transportation Emergency)
Delaware City Refining: 1-302-834-6271 (24 hr. Number)

2. COMPOSITION /INFORMATION ON INGREDIENTS

Composition	Cas#	Low	High (% Vol)
Methane	74-82-8	90	100%
Ethane	74-84-0	0	10%

3. HAZARDS IDENTIFICATION

Emergency Overview

Danger! Extremely flammable. Gas may cause flash fire or explosion. The gas mixes well with air, explosive mixtures are easily formed. The gas is lighter than air. Liquefied gas is extremely cold. Contact may cause frostbite. Gas reduces oxygen available for breathing. Overexposure may lead to serious disturbances of heart rhythm and nervous system effects, including drowsiness, dizziness, nausea, headaches, paralysis, loss of consciousness and even death (by suffocation).

Potential Health Effects

Inhalation:
Overexposure may lead to serious disturbances of heart rhythm and nervous system effects, including drowsiness, dizziness, nausea, headaches, paralysis, loss of consciousness, respiratory distress and even death. Death may occur as a result of simple asphyxia (due to lack of oxygen in the breathing mixture). Initial euphoria due to hypoxemia (decreased oxygen in blood) may impair the ability to escape.

Skin:
Contact with skin may produce cold burns (frostbite).

Eye:
Contact with eye may produce cold burns (frostbite).

Ingestion:
Ingestion unlikely to occur under normal conditions because of physical state.

4. FIRST AID MEASURES

Inhalation
Remove to fresh air, taking all appropriate steps to avoid fire, explosion and inhalation hazards to the rescuers. If not breathing, give artificial respiration. If breathing is difficult, give oxygen and continue to monitor. Get immediate medical attention.

Skin
If frostbite has occurred, seek medical attention immediately; do NOT rub the affected areas or flush them with water. In order to prevent further tissue damage, do NOT attempt to remove frozen clothing from frostbitten areas. If frostbite has NOT occurred, immediately and thoroughly wash contaminated skin with soap and water.

Eye
If eye tissue is frozen, seek medical attention immediately; if tissue is not frozen, immediately and thoroughly flush the eyes with large amounts of water for at least 15 minutes, occasionally lifting the lower and upper eyelids. If irritation, pain, swelling or lacrimation persist, get medical attention as soon as possible.

Ingestion
First aid not normally required

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Extinguish fire by shutting off the source of the gas or liquid. Vapors may travel to source of ignition and flash back.

Fire Fighting Instructions

DO NOT extinguish a gas fire unless effective immediate shut-off of gas flow is possible. Explosive vapors are present as long as the gas or liquid flow continues. Allow gas or liquid to burn if flow cannot be turned off. Flame impingement on unprotected container walls can result in catastrophic failure of the container and significant consequences to surrounding equipment and personnel. If early application of water spray to fire exposed containers is not possible, evacuate all personnel from the area and wait for the fire to burn out. Use water spray from unmanned nozzles to cool fire exposed tanks and containers. Wear structural fire fighting gear with MSHA/NIOSH approved or equivalent pressure demand self-contained breathing apparatus.

Flammable Properties

Flash Point	Flammable gas
UEL	15% (Methane)
LEL	5% (Methane)
Auto Ignition Temp	999 F

6. ACCIDENTAL RELEASE MEASURES

Keep personnel upwind and uphill from leak. Prevent ignition, stop leak and ventilate the area. Vapor may be controlled using a water fog. Water streams should not be directed to the liquid as this will cause the liquid to boil and generate more vapors. If this material is released into a work area, evacuate the area immediately. Use appropriate personal protection.

7. HANDLING AND STORAGE

Handling

Use spark-proof tools and explosion-proof equipment. Use only in a well-ventilated area. Avoid breathing vapor. Avoid contact with eyes, skin, and clothing.

Storage

Natural Gas cylinders should be stored outdoors or in adequately ventilated storerooms. Cylinder storage locations should be well-protected, well-ventilated, dry and separated from combustible materials. Cylinders should never knowingly be allowed to reach a temperature of 125F. Consult NFPA and / or OSHA codes for additional information.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

ACGIH TLV: 8 hr Time Weighted Avg (TWA): 1000 ppm. /Aliphatic hydrocarbon gases: alkane (C1-C4)

OSHA:Permissable Exposure Limit: Simple asphyxiant. The limiting factor is the available oxygen which shall be at least 18%

Engineering Controls

Use with adequate ventilation. Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product. Use explosion-proof ventilation. High concentrations in the air cause a deficiency of oxygen with the risk of unconsciousness or death. Check oxygen content before entering area.

Personal Protection

Consult With a Health and Safety Professional for Specific Selections

Eye Protection

If there is a risk of eye contact when handling natural gas, suitable eye protection such as goggles and/or faceshield should be used.

Skin Protection

To protect against liquid, wear insulated gloves.

Respiratory Protection

Full-face supplied air respirator with escape bottle or SCBA is required. Check oxygen content before entering area.

Other

Where splashing is possible, full chemically resistant protective clothing and boots are required.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance /Odor	Colorless, Odorless gas,
Boiling Point F	-423
Specific Gravity	0.069 (gas)
Vapor Pressure	163 atm

MW 2.02

10. STABILITY AND REACTIVITY

Stability

Stabile

Conditions to Avoid

Heat, sparks, open flames, sources of ignition

Incompatibility

Isolate from oxygen, halogens, and other oxidizing materials.

Hazardous Decomposition

Combustion may produce, smoke and soot.

11. TOXICOLOGICAL INFORMATION

Symptoms and signs of toxicity depend on duration of asphyxiant concentration in the ambient air, exposure duration, respiratory effort, and individual vulnerability (eg, older age, cardiovascular disease).

Mild to Moderate Poisoning: Decreased night vision, headache, nausea, compensatory increase of respiration and pulse. Oxygen saturation may be below 90%, even in asymptomatic or mildly symptomatic patients.

SEVERE POISONING: Decreased alertness, somnolence, dizziness, fatigue, euphoria, memory loss, decreased visual acuity, cyanosis, loss of consciousness, dysrhythmias, myocardial ischemia, pulmonary edema, seizures, and death. Oxygen saturation may be 80% or lower.

12. ECOLOGICAL INFORMATION

Because of the high volatility, natural gas is not likely to cause ground or water pollution. Natural gas released into the environment will disperse into the atmosphere where they will undergo photochemical degradation. Natural gas is not expected to bioaccumulate.

13. DISPOSAL INFORMATION

Do not attempt to dispose of residual or unused quantities. Residual product within a process system may be burned at a controlled rate if a suitable combustion unit is available. Residual product in a cylinder should be returned to the supplier. Venting of gases to the atmosphere

should be avoided. Follow federal, state and local regulations. Contract to authorized disposal service. If disposed of, unused material meets the criteria for RCRA Hazardous Waste classification (ignitable compressed gas).

14. TRANSPORT INFORMATION

Proper Shipping Name:	Natural Gas, Compressed
Hazard Class:	2.1 (Flammable Gas)
DOT Identification Number:	UN 1971
DOT Shipping Label:	Flammable Gas

15. REGULATORY INFORMATION

Inventory Status

The components of this product are listed on the following inventories:

United States (TSCA Inventory) Canada, Korea, Europe, Austrialia

State Right to Know for

Massachusetts

New Jersey

Pennsylvania

Title III Classifications Sections 311, 312

Acute:	Yes
Chronic:	Yes
Reactivity:	No
Sudden Release of Pressure:	Yes

16. OTHER INFORMATION

NFPA® HAZARD RATING		HMIS® HAZARD RATING	
HEALTH:	2	HEALTH:	1
FIRE:	4	FIRE:	4
REACTIVITY:	0	PHYSICAL:	0

Delaware City
Refining Company

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Hydrogen

Product Use: Refinery

Synonym: Hydrogen produced at Unit 37

Manufacturer:
Delaware City Refining Company
4550 Wrangle Hill Road
Delaware City, De. 19706

Telephone Numbers:
Chemtrec: 1-800-424-9300 (24 hr. Transportation Emergency)
Delaware City Refining: 1-302-834-6271 (24 hr. Number)

2. COMPOSITION /INFORMATION ON INGREDIENTS

Composition	Cas#	Low	High (% Vol)
Hydrogen	1333-74-0	100	100

3. HAZARDS IDENTIFICATION

Emergency Overview

Danger! Extremely flammable. Gas may cause flash fire or explosion. The gas mixes well with air, explosive mixtures are easily formed. The gas is lighter than air. Liquefied gas is extremely cold. Contact may cause frostbite. Gas reduces oxygen available for breathing. Overexposure may lead to serious disturbances of heart rhythm and nervous system effects, including drowsiness, dizziness, nausea, headaches, paralysis, loss of consciousness and even death (by suffocation).

Potential Health Effects

Inhalation

Overexposure may lead to serious disturbances of heart rhythm and nervous system effects, including drowsiness, dizziness, nausea, headaches, paralysis, loss of consciousness, respiratory distress and even death. Death may occur as a result of simple asphyxia (due to lack of oxygen in the breathing mixture). Initial euphoria due to hypoxemia (decreased oxygen in blood) may impair the ability to escape.

Skin

Contact with skin may produce cold burns (frostbite).

Eye

Contact with eyes may produce cold burns (frostbite).

Ingestion

Ingestion unlikely to occur under normal conditions because of their physical state

4. FIRST AID MEASURES

Inhalation

Remove to fresh air, taking all appropriate steps to avoid fire, explosion and inhalation hazards to the rescuers. If not breathing, give artificial respiration. If breathing is difficult, give oxygen and continue to monitor. Get immediate medical attention.

Skin

If frostbite has occurred, seek medical attention immediately; do NOT rub the affected areas or flush them with water. In order to prevent further tissue damage, do NOT attempt to remove frozen clothing from frostbitten areas. If frostbite has NOT occurred, immediately and thoroughly wash contaminated skin with soap and water.

Eye

If eye tissue is frozen, seek medical attention immediately; if tissue is not frozen, immediately and thoroughly flush the eyes with large amounts of water for at least 15 minutes, occasionally lifting the lower and upper eyelids. If irritation, pain, swelling or lacrimation persist, get medical attention as soon as possible.

Ingestion

First aid not normally required

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Extinguish hydrogen fires by shutting off the source of the gas or liquid. Vapors may travel to source of ignition and flash back.

Fire Fighting Instructions

DO NOT extinguish a gas fire unless effective immediate shut-off of gas flow is possible. Explosive vapors are present as long as the gas or liquid flow continues. Allow gas or liquid to burn if flow cannot be turned off. Flame impingement on unprotected container walls can result in catastrophic failure of the container and significant consequences to surrounding equipment and personnel. If early application of water spray to fire exposed containers is not possible, evacuate all personnel from the area and wait for the fire to burn out. Use water spray from unmanned nozzles to cool fire exposed tanks and containers. Wear structural fire fighting gear with MSHA/NIOSH approved or equivalent pressure demand self-contained breathing apparatus.

Flammable Properties

Flash Point	Flammable gas
UEL	74.2%
LEL	4.1%
Auto Ignition Temp	932

Hydrogen fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.) Vapors may travel to source of ignition and flash back.

6. ACCIDENTAL RELEASE MEASURES

Keep personnel upwind and uphill from leak. Prevent ignition, stop leak and ventilate the area. Vapor may be controlled using a water fog. Water streams should not be directed to the liquid as this will cause the liquid to boil and generate more vapors. If this material is released into a work area, evacuate the area immediately. Use appropriate personal protection.

7. HANDLING AND STORAGE

Handling

Use spark-proof tools and explosion-proof equipment. Use only in a well-ventilated area. Avoid breathing vapor. Avoid contact with eyes, skin, and clothing.

Storage

Hydrogen cylinders should be stored outdoors or in adequately ventilated storerooms. Cylinder storage locations should be well-protected, well-ventilated, dry and separated from combustible materials. Cylinders should never knowingly be allowed to reach a temperature of 125F. Consult NFPA and / or OSHA codes for additional information.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

TLV: Simple asphyxiant

Engineering Controls

Use with adequate ventilation. Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product. Use explosion-proof ventilation. High concentrations in the air cause a deficiency of oxygen with the risk of unconsciousness or death. Check oxygen content before entering area.

Personal Protection

Consult With a Health and Safety Professional for Specific Selections

Eye Protection

If there is a risk of eye contact when handling hydrogen, suitable eye protection such as goggles and/or faceshield should be used.

Skin Protection

To protect against liquid, wear insulated gloves.

Respiratory Protection

Full-face supplied air respirator with escape bottle or SCBA is required. Check oxygen content before entering area.

Other

Where splashing is possible, full chemically resistant protective clothing and boots are required.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance /Odor	Colorless, Odorless gas,
Boiling Point F	-423
Specific Gravity	0.069 (gas)
Vapor Pressure	163 atm
MW	2.02

10. STABILITY AND REACTIVITY

Stability

Stabile

Conditions to Avoid

Heat, sparks, open flames, sources of ignition

Incompatibility

Isolate from oxygen, halogens, and other oxidizing materials.

Hazardous Decomposition

Combustion may produce, smoke and soot.

11. TOXICOLOGICAL INFORMATION

Symptoms and signs of toxicity depend on duration of asphyxiant concentration in the ambient air, exposure duration, respiratory effort, and individual vulnerability (eg, older age, cardiovascular disease).

Mild to Moderate Poisoning: Decreased night vision, headache, nausea, compensatory increase of respiration and pulse. Oxygen saturation may be below 90%, even in asymptomatic or mildly symptomatic patients.

SEVERE POISONING: Decreased alertness, somnolence, dizziness, fatigue, euphoria, memory loss, decreased visual acuity, cyanosis, loss of consciousness, dysrhythmias, myocardial ischemia, pulmonary edema, seizures, and death. Oxygen saturation may be 80% or lower.

12. ECOLOGICAL INFORMATION

Because of the high volatility, Hydrogen is not likely to cause ground or water pollution. Hydrogen released into the environment will disperse into the atmosphere where they will undergo photochemical degradation. Hydrogen is not expected to bioaccumulate.

13. DISPOSAL INFORMATION

Do not attempt to dispose of residual or unused quantities. Residual product within a process system may be burned at a controlled rate if a suitable combustion unit is available. Residual product in a cylinder should be returned to the supplier. Venting of gases to the atmosphere should be avoided. Follow federal, state and local regulations. Contract to authorized disposal service. If disposed of, unused material meets the criteria for RCRA Hazardous Waste classification (ignitable compressed gas).

14. TRANSPORT INFORMATION

Proper Shipping Name:	Hydrogen, Compressed
Hazard Class:	2.1 (Flammable Gas)
DOT Identification Number:	UN 1049
DOT Shipping Label:	Flammable Gas

15. REGULATORY INFORMATION

Inventory Status

The components of this product are listed on the following inventories:

United States Canada
Korea Europe
Australia

State Right to Know for

Massachusettes

New Jersey

Title III Classifications Sections 311, 312

Acute:	Yes
Chronic:	Yes
Reactivity:	No
Sudden Release of Pressure:	Yes

16. OTHER INFORMATION

NFPA® HAZARD RATING		HMIS® HAZARD RATING	
HEALTH:	0	HEALTH:	1
FIRE:	4	FIRE:	4
REACTIVITY:	0	PHYSICAL:	0

Delaware City
Refining Company

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Hydrogen Sulfide

Product Use: Byproduct, Waste Stream

Synonym: H_2S, Sewer Gas

Manufacturer:

Delaware City Refining Company
4550 Wrangle Hill Road
Delaware City, DE. 19706

Telephone Numbers:
Chemtrec: 1-800-424-9300 (24 hr. Transportation Emergency)
Delaware City Refining: 1-302-834-6271 (24 hr. Number)

2. COMPOSITION /INFORMATION ON INGREDIENTS

Component	CAS Number	Typical Vol%
Hydrogen Sulfide	7783-06-4	100

3. HAZARDS IDENTIFICATION

Emergency Overview:

Danger! Flammable gas. May cause flash fire or explosion. Can form explosive mixtures with air. The gas is heavier than air and may travel along the ground; distant ignition possible. Hydrogen Sulfide Gas can be harmful or fatal if inhaled. The Hydrogen Sulfide "rotten-egg" odor is not reliable as a warning because the gas can rapidly cause a loss of the sense of smell. May cause nervous system effects. May cause skin, eye, throat and respiratory tract irritation and damage. Liquefied gas is extremely cold. Contact may cause frostbite. Entry into confined spaces without proper respiratory protection is extremely dangerous.

Potential Health Effects:

Inhalation:

Acute human exposure to hydrogen sulfide can result in the following neurological effects or symptoms: disturbed equilibrium, nausea, headache, poor memory, insomnia, irritability, delirium, severe dizziness, unusual sweating, neurobehavioral changes, convulsions, and

tremors. Paralysis of the olfactory nerves also occurs. Although hydrogen sulfide has an unpleasant "rotten egg" odor, this is an unreliable warning signal because olfactory fatigue (decreased ability to smell odor) occurs at concentrations of 150-200 ppm. Cardiovascular effects have been noted after acute exposures to high concentrations of hydrogen sulfide via inhalation. Death usually occurs after respiratory distress.

Skin:

Direct contact with liquid H2S can cause burns or frostbite. Prolonged exposure to hydrogen sulfide, even at relatively low levels, may result in painful dermatitis (skin inflammation).

Eye:

Direct contact with liquid H2S can cause burns or frostbite. Has direct action on mucous membranes. Eye irritation results from local inflammation of the conjunctiva (membrane covering eye) and cornea. In severe cases, corneal erosion with blurred vision may also occur. Occasionally, corneal ulceration may occur, resulting in impaired vision. In general, irritation of the eyes occurs at a concentration of H2S of 50 ppm; however, conjunctivitis or "sore eyes" have been observed upon exposures in the range of 5-100 ppm

Ingestion:

Not applicable. Hydrogen sulfide (H2S) is a gas with a low boiling point (-60.33 °C). [gas at ambient temperature and pressure]

Target Organs:

Eyes, respiratory system, central nervous system.

4. FIRST AID MEASURES

Inhalation:

Remove victim from exposure; if breathing has stopped, give artificial respiration; administer oxygen if needed; obtain medical assistance, consult physician..

Skin:

In case of cold burns (frostbite) caused by rapidly expanding or vaporizing liquids, get medical attention promptly. Remove contaminated clothing.

Eye:

Immediately flush eyes with plenty of water. Get medical attention, if irritation persists.

Ingestion:

First aid not normally required.

5. FIRE-FIGHTING MEASURES

Extinguishing Media:

Water spray.

Fire Fighting Instructions:

Do not extinguish fire unless flow can be stopped. Use water to keep fire exposed containers cool & to protect men effecting shut off. Use water in flooding quantities as fog. Apply water from as far a distance as possible. Use water spray to knock-down vapors. The use of fresh air equipment such as Self Contained Breathing Apparatus (SCBA) or Supplied Air Respirators should be worn for fire-fighting if exposure or potential exposure to products of combustion is expected. Evacuate area and fight fire from a safe distance. Emergency responders should avoid self-exposure to hydrogen sulfide.

Flammable Properties:

Hydrogen sulfide is heavier than air. May travel considerable distance to source of ignition and flashback. Hydrogen sulfide may explode if ignited in an enclosed area.

Flash Point:

Flammable Gas

Auto-ignition Temperature:

500 Deg F

Upper Explosion Limit:

44%

Lower Explosion Limit:

4%

6. ACCIDENTAL RELEASE MEASURES

Keep people away. Avoid contact with gas. Wear goggles and self-contained breathing apparatus. Shut off ignition sources and call fire department. Evacuate area in case of large discharges. Stay upwind and use water spray to ``knock down'' vapor. Notify local health and pollution control agencies. Protect water intakes.

7. HANDLING AND STORAGE

Handling:

Avoid skin and eye contact with Hydrogen sulfide. Avoid breathing gas. Use only in a well-ventilated area.

Storage:

Keep away from heat, sparks, and flame. Keep container closed when not in use. Store in a cool dry place. Do not store in direct sunlight.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines:

ACGIH= STEL 15 ppm, TWA 10 ppm

OSHA = 20 ppm (ceiling concentration)

OSHA PEL TWA = 10 ppm

NIOSH – TWA/CEILING = 10 Min Ceiling Value: 10 ppm (15 mg/m3)

Engineering Controls:

Use with adequate ventilation. Ventilation is normally required when handling or using this product to keep exposure to airborne contaminants below the exposure limit. Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product.

Personal Protection:

Consult With a Health and Safety Professional for Specific Selections

Eye Protection:

Wear appropriate eye protection to prevent eye contact with the liquid that could result in burns or tissue damage from frostbite. Use chemical goggles and face-shield to protect against splashing.

Skin Protection:

Wear appropriate personal protective clothing to prevent the skin from becoming frozen from contact with the liquid or from contact with vessels containing the liquid. Teflon > 4hrs, Tychem 10 000 > 8hrs, Insulated Neoprene

Respiratory Protection:

For hydrogen sulfide (H2S), full-face supplied air respirator with escape bottle or SCBA is required. Full-face supplied air respirator with escape bottle or SCBA is required for concentrations above the exposure limit(s). Emergency or planned entry into unknown

concentration or IDLH conditions: Any self-contained breathing apparatus that has a full face-piece and is operated in a pressure-demand or other positive-pressure mode. Any supplied-air respirator that has a full face-piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Other:

Quick drench facilities and/or eyewash fountains should be provided within the immediate work area for emergency use where there is any possibility of exposure to liquids that are extremely cold or rapidly evaporating.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Colorless gas
Odor:	Rotten egg odor, odorless at poisonous concentrations
Boiling Point:	-76 F
Specific Gravity:	0.916 at -60°C (liquid)
Vapor Gas Density:	1.2
Vapor Pressure:	15,600 mm Hg at 25 °C
Odor Threshold:	0.0047 ppm
Solubility (Water):	5.3 g/L at 50 F

10. STABILITY AND REACTIVITY

Stability:

Stable at normal temperatures and pressure.

Incompatibility:

Hydrogen sulfide can explode when exposed to flame or when mixed with nickel carbonyl and oxygen. Rapidly oxidized and may ignite in contact with a range of metal oxides. Fuming nitric acid reacts with hydrogen sulfide with incandescence. Strong acids and alkalies should be avoided.

Hazardous Decomposition:

Toxic gases are generated in fire.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity:

Oral LD 50: N/A Gas at ambient temperature

Skin LD 50: N/A Gas at ambient temperature
Inhalation LC50 (Rat): LC_{50} = 444- 501 ppm 4 Hours
Monkeys (Rhesus) – LC_{50} = 500 ppm (30 min)

HYDROGEN SULFIDE is a poisonous gas that may be fatal if inhaled. This gas interferes with the ability of the body to use oxygen. May produce nervous system effects, including drowsiness, dizziness, confusion, nausea, headaches, tremors, loss of memories, brain damage, paralysis, coma and even death. May produce serious disturbances of heart rhythm. May produce increased sensitivity to light, blurred vision and blindness. May produce skin and respiratory tract irritation, shortness of breath, fluid in the lungs and lung injury. Respiratory tract irritation is noticeable at 50 ppm. The irritant effect of H2S extends throughout the entire respiratory tract. Cough, sore throat, hoarseness, runny nose, and chest tightness are the most common symptoms of exposure between 50 and 250 ppm. May produce a temporary skin color change. Has produced brain, liver and lung damage in laboratory animals.

12. ECOLOGICAL INFORMATION

Environmental Fate and Pathways

The persistence of hydrogen sulfide is affected by ambient temperature and other atmospheric variables including humidity, sunshine, and presence of other pollutants. Once released into the atmosphere it will behave like many other gaseous pollutants and be dispersed and eventually removed. Residence times in the atmosphere range from about one day to more than 40 days, depending upon season, latitude, and atmospheric conditions.

Biodegradation:

Several species of soil, aquatic, and marine microorganisms oxidize hydrogen sulfide to elemental sulfur.

Ecotoxicity

Hydrogen sulfide is very toxic to aquatic life.

13. DISPOSAL INFORMATION

Venting of gases to the atmosphere should be avoided. Follow federal, state and local regulations. Contract to authorized disposal service.

14. TRANSPORT INFORMATION

DOT Proper Shipping Name: Hydrogen sulfide, (liquefied)
DOT Hazard Class and: 2.3 (poison gas)

DOT Identification Number: UN1053
DOT Shipping Label: Flammable gas poison gas

15. REGULATORY INFORMATION

US EPA: Hydrogen Sulfide
CAA - 1990 Hazardous Air Pollutants
CERCLA/SARA - Haz Substances and their RQs
CERCLA/SARA - Section 302 EHS and TPQs
CERCLA/SARA - Section 302 EHS EPCRA RQs
CERCLA/SARA - Section 313 - Emission Reporting

National Inventory
Australia (AICS), Canada - Domestic Substances List, China, European EINECS ,
Japan - (ENCS), Korea - Existing and Evaluated, Philippines Inventory (PICCS), United States,
TSCA - Sect. 8(b) Inventory

STATE RTK
Massachusetts - Right To Know List
New Jersey - Department of Health RTK List, Env Hazardous Substances List, Special Hazardous Substances
Pennsylvania - RTK (Right to Know) List

Title III Classifications Sections 311,312:
Acute: **Chronic:** Yes, **Fire:** Yes, **Reactivity:** No, **Sudden Release of Pressure:** Yes

16. OTHER INFORMATION

NFPA® HAZARD RATING
HEALTH: 4
FIRE: 4
REACTIVITY: 0

HMIS® HAZARD RATING
HEALTH: 4
FIRE: 4
PHYSICAL: 0

Delaware City
Refining Company

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Carbon Dioxide

Product Use: Industrial/Commercial

Synonym: CO2

Manufacturer:
Delaware City Refining Company
4550 Wrangle Hill Road
Delaware City, DE. 19706

Telephone Numbers:
Chemtrec: 1-800-424-9300 (24 hr. Transportation Emergency)
Delaware City Refining: 1-302-834-6271 (24 hr. Number)

2. COMPOSITION /INFORMATION ON INGREDIENTS

Composition	Cas#	Low	High (% Vol)
Carbon Dioxide	124-38-9	100	100

3. HAZARDS IDENTIFICATION

Emergency Overview

Danger! Carbon Dioxide is heavier than air and may accumulate in low ceiling spaces. Gas reduces oxygen available for breathing. Overexposure may lead to serious disturbances of heart rhythm and nervous system effects, including, dizziness, nausea, headaches, paralysis, and a loss of consciousness. Prolonged exposure to Carbon Dioxide rich atmospheres may be fatal. Carbon Dioxide in a liquefied state is extremely cold. Contact may cause frostbite.

Potential Health Effects

Inhalation

Overexposure may lead to serious disturbances of heart rhythm and nervous system effects, including drowsiness, dizziness, nausea, headaches, paralysis, loss of consciousness and even death. High concentrations in immediate area can displace oxygen and can cause dizziness, unconsciousness, suffocation and death with longer exposure. Keep people away from such gas without self-contained breathing apparatus.

Skin
Contact with skin may produce cold burns (frostbite).

Eye
Contact with eyes may produce cold burns (frostbite).

Ingestion
Ingestion unlikely to occur under normal conditions because of their physical state

Target Organs:
Cardiovascular system, lungs, blood, central nervous system.

Exposure Routes:
Inhalation, skin and/or eye contact (liquid)

Medical Conditions Aggravated By Exposure:
Overexposure may aggravate existing cardiovascular disease, and pulmonary disorders associated with impaired respiratory function.

4. FIRST AID MEASURES

Inhalation
Remove to fresh air, taking all appropriate steps to avoid fire, explosion and inhalation hazards to the rescuers. If not breathing, give artificial respiration. If breathing is difficult, give oxygen and continue to monitor. Get immediate medical attention.

Skin
If frostbite has occurred, seek medical attention immediately; do NOT rub the affected areas or flush them with water. In order to prevent further tissue damage, do NOT attempt to remove frozen clothing from frostbitten areas. If frostbite has NOT occurred, immediately and thoroughly wash contaminated skin with soap and water.

Eye
If eye tissue is frozen, seek medical attention immediately; if tissue is not frozen, immediately and thoroughly flush the eyes with large amounts of water for at least 15 minutes, occasionally lifting the lower and upper eyelids. If irritation, pain, swelling or lacrimation persists, get medical attention as soon as possible.

Ingestion
First aid not normally required

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Carbon Dioxide does not burn. Use extinguishing agent appropriate for surrounding fire.

Fire Fighting Instructions

Containers may explode in fire. Use water spray to keep fire-exposed containers cool. Wear structural fire fighting gear. As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Evacuate area and fight fire from a safe distance.

Flammable Properties

Flash Point	Non Combustible
UEL	No Data
LEL	No Data
Auto Ignition Temp	No Data

Non combustible. Poisonous gases are produced in fire. Flow or agitation may generate electrostatic charges and may ignite any explosive mixture present.

6. ACCIDENTAL RELEASE MEASURES

Keep personnel upwind and uphill from leak. Prevent ignition, stop leak and ventilate the area. If this material is released into a work area, evacuate the area immediately. Carbon Dioxide gas penetrates easily through walls and ceilings. Water spray may be used to reduce vapors, but spray may not prevent ignition in closed spaces. Use appropriate personal protection. Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire. Use non-sparking hand tools.

7. HANDLING AND STORAGE

Handling

Use spark-proof tools and explosion-proof equipment. Use only in a well-ventilated area. Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Electrically bond and ground cylinder when transferring liquid product.

Storage

Carbon Dioxide should be stored outdoors or in adequately ventilated storerooms. Cylinder storage locations should be well-protected, well-ventilated, dry and separated from combustible materials. Cylinders should never knowingly be allowed to reach a temperature of 125F. Consult NFPA and / or OSHA codes for additional information

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Carbon Dioxide	ACGIH (TLV-TWA) 5,000 ppm, STEL 30,000 ppm
	OSHA (PEL-TWA) 5,000 ppm
	IDLH 40,000 ppm

Engineering Controls

Use with adequate ventilation. Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product.

Personal Protection

Consult With a Health and Safety Professional for Specific Selections

Eye Protection

If there is a risk of eye contact when handling liquefied Carbon Dioxide, suitable eye protection such as goggles and/or face-shield should be used.

Skin Protection

To protect against liquid, wear insulated gloves.

Respiratory Protection

Full-face supplied air respirator with escape bottle or SCBA is required for concentrations above the exposure limit(s). Emergency or planned entry into unknown concentrations or IDLH conditions: Any self-contained breathing apparatus that has a full face-piece and is operated in a pressure-demand or other positive-pressure mode.

Other

Where splashing is possible, full chemically resistant protective clothing and boots are required.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance /Odor	Colorless, odorless gas, compressed in liquefied form.
Boiling Point F	-313
Specific Gravity	0.791@ -312.7 F
Vapor Pressure	>35 atm.

MW	28
Vapor Density (Air=1)	0.97

10. STABILITY AND REACTIVITY

Stability

Stabile

Conditions to Avoid

Heat, sparks, open flames, sources of ignition.

Incompatibility

Carbon Dioxide is not compatible with oxidizing agents (perchlorates, peroxides, permanganates, chlorates, nitrates, chlorine, bromine and fluorine) and reducing agents (Lithium and Sodium) and strong bases (sodium hydroxide). Carbon Dioxide reacts with water to form Carbonic acid.

Hazardous Decomposition

Combustion may produce carbon monoxide and other asphyxiants.

11. TOXICOLOGICAL INFORMATION

Carbon Dioxide

LC50 4 hr (Inhalation) Rat = 470,000 ppm /30 min

Inhalation causes increased respiration rate, headache, subtle physiological changes for up to 5% concentration and prolonged exposure. Higher concentrations can cause unconsciousness and death. Solid can cause cold contact burns. Liquid or cold gas can cause freezing injury to skin or eyes similar to a burn. Severe poisoning can affect the brain causing personality changes and loss of vision. May cause toxicity to human reproduction or development.

12. ECOLOGICAL INFORMATION

Aquatic Ecotoxicity:

Not available

13. DISPOSAL INFORMATION

Venting of gases to the atmosphere should be avoided. Follow federal, state and local regulations. Contract to authorized disposal service.

14. TRANSPORT INFORMATION

Proper Shipping Name:	Carbon Dioxide
Hazard Class:	2.2
DOT Identification Number:	UN2187

15. REGULATORY INFORMATION

Inventory Status

The components of this product are listed on the following inventories:
United States (TSCA), Canada, Korea, Europe and Australia.

State Right to Know for Carbon Dioxide:
Pennsylvania, New Jersey, Massachusettes

Title III Classifications Sections 311, 312

Acute: Yes, **Chronic:** Yes **Reactivity:** Yes, **Sudden Release of Pressure:** Yes

16. OTHER INFORMATION

Carbon Dioxide decreases the amount of available Oxygen. Routinely measure Oxygen content to make sure it is at least 19.5% by volume.

NFPA® HAZARD RATING		HMIS® HAZARD RATING	
HEALTH:	2	HEALTH:	2
FIRE:	4	FIRE:	4
REACTIVITY:	2	PHYSICAL:	2

Attachment D
SWMU 10 - No Further Action Letter

SAF - Plant HW/SW EPA Corrective Action

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

In reply refer to: 3HW52

SEP 2 2 1992

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RECEIVED
SEP 2 4 1992
C. F. HERSEIM

Mr. R.G. Soelkle
Star Enterprise
2000 Wrangle Hill Road
Delaware City, Delaware 19706

Re: Review Star Enterprise's IPOPRS Report
RCRA Permit ID No. DED 002 329 738

Dear Mr. Soelkle:

The Environmental Protection Agency (EPA) has performed a review of the Identification of Potential for an Occurring or Past Release Study (IPOPRS) Report submitted by Star Enterprise in May 1991.

EPA accepts the recommendations provided by Star Enterprise in the IPOPRS report. However, EPA has added two (2) additional conditions to the Star Enterprise recommendations in order to approve the IPOPRS report:

1. For SWMU 20(A): Waste Water Treatment Plant, soil samples as part of the Verification of Release Study (VRS) shall be performed for the Final Effluent Filter Area as well as for the Off-Loading Area for the Recovered Crude Holding Tank.

2. For SWMU 20(B): Waste Water Treatment Plant and SWMU 21: Guard Basins 5 and 6, sediment and groundwater samples shall be included in the VRS as well as soil samples.

For SWMU 1 - Former Coke Storage Area, and SWMU 16 - Excavated Materials Mound, a conditional, no further action was granted for soil media in accordance with Permit Modification 1. However, groundwater contamination in this area still needs to be addressed. Currently, further investigations are being performed by ICI Americas for the Delaware City PVC site (Superfund site

west of Star Enterprise) to characterize the groundwater contamination. Meanwhile, EPA recommends that Star Enterprise cooperate with ICI Americas in this investigation, i.e. permitting ICI Americas reasonable access to Star Enterprise property and sharing any site information related to groundwater contamination in this area. EPA reserves the right to require Star Enterprise to conduct additional investigations or remediation, if necessary, to address the existing groundwater contamination in this area.

Within sixty (60) days, as required in permit condition II.B.4, the Permittee shall submit a Verification of Release Study (VRS) Workplan for units identified in the permit and for units identified in the IPOPRS as requiring a VRS. For units where Interim Measures (I.M.) are recommended, the Permittee shall submit, within 60 days, evidence that Interim Measures have been implemented or submit a workplan to implement the proposed Interim Measures.

EPA has also reviewed the Request for Information Report submitted under section 3007 of RCRA in May 1991. This report contained information regarding 13 units (accumulation areas) at the facility. EPA recommends Star Enterprise voluntarily include soil sampling for Unit F: Used Drum Storage Area and Unit K: Heat Exchanger Bundle Cleaning Area in the VRS workplan described above or consider performing Interim Measures. Otherwise, EPA will modify the permit in accordance with 40 CFR § 270.41 to require corrective action at these units (see permit condition II.J.). Please advise us of your decision.

Enclosed find a summary of the final EPA recommendations.

Finally, EPA wants to inform Star Enterprise of the following regulatory implications. The SWMU 20(b) section in the IPOPRS report states that dredge materials from this SWMU have been deposited, in the past, in the area identified as Dredge Material Storage Area No. 2. Even though material may have been deposited in this area prior to being regulated under RCRA, if it is determined that these materials would have been listed hazardous waste, for example K048-52 or F037-38, and these materials are now removed, they would be classified as newly generated hazardous waste and would have to meet the current applicable RCRA regulations, including the LDR treatment standards. This would no doubt have an effect on any remediation plans for this SWMU.

Should you have any questions, please contact Wanda Martinez at (215) 597-3658.

Sincerely,

Robert L. Allen, Chief
RCRA Programs Branch

Enclosure

cc: John J. Humphries, EPA
Randy Sturgeon, EPA
Karen J'Anthony, DNREC
Michael Harasika, Star Enterprise

SUMMARY OF SWMUs AND RECOMMENDATIONS

STAR ENTERPRISE
DELAWARE CITY REFINERY
EPA ID No. DE 002 329 738

SWMU	Recommendation
1. Former Coke Storage Area	No further action for soil (Permit Modification 1)
3. Neutralization Tanks 1 and 2	IM - Repair concrete pad IM - Extend concrete curbing VRS (soil)
4. Flyash Piping and Pumping System	Repair trenches Remove solids from trenches and collection basin
5. Old Flyash Pond	Close under DNREC direction
6. New Flyash Pond	Operated under DNREC direction
8. Railroad Tank Car Loading Area	No further action
9. Facility Sewer System	VRS (soil)
10. Process Area Washdown	No further action
12. Used Solvent Storage Area	VRS
15. Tank Bottom Weathering Areas	VRS (soil)
16. Excavated Material Mounds	No further Action for soil (Permit Modification 1)
17. Former Pit on Route 9	No further Action
18. Fire Training Area	VRS (soil) IM - Remove drums and stained soil
20. Wastewater treatment Plant	
(a) WWTP	VRS (soil, sediment and groundwater)
(b) Stormwater Channel and Guard Basin 4	VRS (soil, sediment and groundwater)
21. Guard Basin 5 and 6	VRS (soil, sediment and groundwater)
22. Oil Treatment/Reprocessing System	No further action

SWMU	Recommendation
24.(b) Dredge Material Storage Area 2	VRS (soil and groundwater)
24.(c) Other Dredge Material Areas	No further Action
26. Tetraethyl Lead Pit	VRS
27. Units which Manage Water Treatment System Waste or wastewaters (5)	No further action
28. Crude/Product Tank Farm Separators	No further action
29. Sulfur Impoundment	No further action
30. Sewer Overflow Area	VRS (soil)
31. Slurry Oil Dumpster	VRS (soil)
32. Oily Sewer Back-up Areas	VRS (soil)
Accumulation Areas	
Unit F: Used Drum Storage Area	VRS or IM
Unit K: Heat Exchanger Bundle Cleaning Area	VRS or IM

Attachment E
Offset Matrix

Applicant: Delaware City Refinery Company LLC.
Project: DCRC Low Sulfur Fuels Project
CZA Offset Review Reference: (DNREC Only)

COASTAL ZONE ENVIRONMENTAL IMPACT OFFSET MATRIX

Application Date: December 2014
Amendments:
Offset Review Date: (DNREC Use Only)
Matrix Amended:

ENVIRONMENTAL IMPACTS	(Applicant's Use) DESCRIBE ENVIRONMENTAL IMPACTS	PAGE NO. (In Section 1)	(Applicant's Use) DESCRIBE ENVIRONMENTAL OFFSET PROPOSAL[1]	PAGE NO. (In Section 1)	(DNREC Use Only) OFFSET SUFFICIENCY Yes, No or N/A
Air Quality (Applicant to List Below by Parameter)	The following table summarizes the estimated changes in potential emissions from the Refinery including the addition of the new hydrogen production equipment.	Part 6.1, page 15	As a result of the installation of the new hydrogen production equipment, more steam will be available for refinery use. Consequently, the refinery will be able to surrender operating permits for the existing (3) package boilers at the refinery. The facility-wide emissions effect of the surrendering of the authorization to operate these package boilers is summarized below:		

Source	NO_x (TPY)	SO_2 (TPY)	H_2SO_4 (TPY)	CO (TPY)	VOC (TPY)	PM (TPY)	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	NH_3 (TPY)
Reformer Process	N/A	0.1	0.01	19.2	3.9	12.2	12.2	12.2	6.6
Flare Pilots/Purge	N/A	0.003	---	2.0	0.7	---	---	---	---
Cooling Tower	---	---	---	---	---	0.4	0.1	0.001	---
Steam Generation System	---	---	---	3.0	4.0	---	---	---	2.7
Total Emissions (TPY)	**N/A**	**0.1**	**0.01**	**24.2**	**8.6**	**12.6**	**12.3**	**12.2**	**9.3**

* Total NO_x emissions from all sources at the Refinery are subject to a facility-wide NO_x emissions limit. NO_x emissions from the Project will remain within the Refinery's facility-wide NO_x cap.

Air emissions will be subject to specific limitations and standards imposed through air quality permitting separately addressed for the project. As reflected in the air permit application, the project does not trigger Prevention of Significant Deterioration or non-attainment New Source Review, meaning the project does not significantly impact air quality in the region.

Source	NO_x (TPY)	SO_2 (TPY)	H_2SO_4 (TPY)	CO (TPY)	VOC (TPY)	PM (TPY)	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	NH_3 (TPY)
Total Project Related Emissions (See Impacts Table)	N/A	0.1	0.01	24.2	8.6	12.6	12.3	12.2	9.3
Package Boiler Shutdowns	N/A	-29.6	-4.8	-44.7	-1.9	-13.7	-13.7	-13.7	-8.9
Total Emissions (TPY)	**N/A**	**-29.5**	**-4.8**	**-20.6**	**6.7**	**-1.0**	**-1.3**	**-1.4**	**0.4**

The intended purpose of the Project is to enhance clean fuel production from existing refinery units, primarily in the form of ultra-low sulfur distillate products. More specifically, the Project is designed to convert heavy residual streams produced at the refinery into clean-burning ultra-low sulfur fuels (diesel, home heating oil, and gasoline). The production of these cleaner (lower sulfur) fuels will result in the reduction in SO_2 emissions when combusted. Significant reductions in regional emissions as a result of using lower sulfur home heating oil will provide an environmental benefit to the region. Burning of ultra-low sulfur diesel fuel not only reduces SO_2 emissions, it also helps catalytic convertors on automobiles to operate better – improving their ability to control nitrogen oxide emissions. Therefore, use of this cleaner fuel will support a decrease in ozone generating precursors throughout the region as well. A substantial portion of these emission reductions can be expected to occur within the Coastal Zone or to affect the Coastal Zone by virtue of transport of air emissions/combustion byproducts from "upwind" sources.

Total Reduction of SO_2 emissions associated with the removal of sulfur from refinery products: 40,880 TPY

As a result of the sulfur dioxide emission reductions resulting from this Project and the emission reductions associated with the retirement of the three package boilers, DCRC believes this project will "clearly and demonstrably" more than offset any negative impacts associated with its implementation.

Applicant: Delaware City Refinery Company LLC.
Project: DCRC Low Sulfur Fuels Project
CZA Offset Review Reference: (DNREC Only)

COASTAL ZONE ENVIRONMENTAL IMPACT OFFSET MATRIX

Application Date: December 2014
Amendments:
Offset Review Date: (DNREC Use Only)
Matrix Amended:

ENVIRONMENTAL IMPACTS	(Applicant's Use) DESCRIBE ENVIRONMENTAL IMPACTS	PAGE NO. (In Section 1)	(Applicant's Use) DESCRIBE ENVIRONMENTAL OFFSET PROPOSAL[1]	PAGE NO. (In Section 1)	(DNREC Use Only) OFFSET SUFFICIENCY Yes, No or N/A
Water Quality					
Surface	As a result of water consumption in the Project and the fact that much of the water used is evaporated in the new cooling tower, the Project will negligibly increase (16.5 GPM or 0.3%) the amount of wastewater generated by the facility, sent to the WWTP and ultimately discharged to the Delaware River. As such, pollutant loading to the WWTP is also expected to remain consistent with current levels and will be of similar quality and character to the water presently discharging to the WWTP. The facility will continue to comply with their existing discharge permit limits. Because the Project will not change the quality and character of the water discharged to the Delaware River and the discharge will continue to meet permitted discharge limits, there are no negative impacts to the Coastal Zone and no offsets are proposed.	Part 6.5, beginning on page 18	Compliance with all conditions of issued New Castle County, State of Delaware, United States Army Corps of Engineer Permits. As a result of the sulfur dioxide emission reductions resulting from this Project and the emission reductions associated with the retirement of the three package boilers, DCRC believes this project will "clearly and demonstrably" more than offset any negative impacts associated with its implementation without any further offsets proposed.		
Groundwater	The Project will require makeup feed water for the new cooling tower and for then new hydrogen production equipment. The demineralized water required for the new hydrogen production equipment will come from existing permitted wells while the new cooling tower make-up water will come from a third party public water supply vendor. Removal of three (3) existing package boilers will decrease the demand on the existing groundwater wells, resulting in a net decrease in water draw from the existing wells. Because the wells are existing, there is a proposed decrease in draw, and the demand remains within the current permit limits, there are no potential negative impacts to the Coastal Zone associated with this additional water withdrawal; therefore, no offsets are proposed.	Parts 6.17, beginning on page 23, and 6.18 beginning on page 24	Not Applicable		
Water Quantity					
Surface	The Project will result in additional surface water demand of 53 GPM to provide water to the cooling tower. The cooling tower makeup water will be provided by a third party public water supply vendor. The expected vendor draws some or all of their water from the following surface water sources: Crum, Pickering, Neshaminy, Ridley and Chester Creeks, as well as the Schuylkill and Delaware Rivers and Upper Merion Quarry. The Delaware River water withdrawal is in Pennsylvania; therefore, water will not be withdrawn from Delaware's Coastal Zone. The Project will result in a 16.5 GPM increase in discharge to the WWTP and the Delaware River through Outfall 001. Of this 16.5 GPM increase, approximately 0.5 GPM is associated with the increase in stormwater from the conversion of 2.1 acres from compacted gravel to pavement. The additional 16 GPM increase is discharge is associated with operation of the new hydrogen production equipment including the cooling tower. This increase (16.5 GPM) is negligible as compared to the Refinery discharge of 7,000 GPM (0.3% increase). As the Project results in essentially no increase in direct surface water discharge to the Delaware River, and water demands will be met either using water from existing permitted wells or from water sourced from outside Delaware's Coastal Zone, the Project does not negatively impact the Coastal Zone and no offsets are proposed.	Part 6.5, beginning on page 18	As a result of the sulfur dioxide emission reductions resulting from this Project and the emission reductions associated with the retirement of the three package boilers, DCRC believes this project will "clearly and demonstrably" more than offset any negative impacts associated with its implementation without any further offsets proposed.		
Groundwater	The Project will require approximately a total of 139 GPM of process use and steam production. Makeup water will be provided by existing groundwater wells. Project groundwater usage will be achieved within the permitted groundwater withdrawal limits. Because the wells are existing and the demand is within the current permit limits, there are no potential negative impacts to the Coastal Zone associated with this additional water withdrawal; therefore, no offsets are proposed.	Parts 6.17, beginning on page 23, and 6.18 beginning on page 24	Shutdown of the three (3) existing package boilers occurring simultaneously with the Project will result in a decrease of 251 GPM of draw from the existing groundwater wells. Therefore, groundwater intake will decrease by 112 GPM.		

Applicant: Delaware City Refinery Company LLC.
Project: DCRC Low Sulfur Fuels Project
CZA Offset Review Reference: (DNREC Only)

COASTAL ZONE ENVIRONMENTAL IMPACT OFFSET MATRIX

Application Date: December 2014
Amendments:
Offset Review Date: (DNREC Use Only)
Matrix Amended:

ENVIRONMENTAL IMPACTS	(Applicant's Use) DESCRIBE ENVIRONMENTAL IMPACTS	PAGE NO. (In Section 1)	(Applicant's Use) DESCRIBE ENVIRONMENTAL OFFSET PROPOSAL[1]	PAGE NO. (In Section 1)	(DNREC Use Only) OFFSET SUFFICIENCY Yes, No or N/A
Water Use For:					
Processing	The Project will require approximately a total of 139 GPM of process use and steam production as well as 53 GPM of makeup cooling water during routine operation. Three of the Refinery package boilers will be removed, decreasing water intake by 251 GPM. Therefore, the overall net water intake from the Refinery will be reduced by approximately 59 GPM. This water for process use and steam will come from existing permitted groundwater wells. The increase in groundwater usage will be achieved within the permitted groundwater withdrawal limits. Because the wells are existing and the demand is within the current permit limits, there are no potential negative impacts to the Coastal Zone associated with this additional water withdrawal; therefore, no offsets are proposed.	Parts 6.10, page 21	Not Applicable		
Cooling	Installing a recirculating cooling tower rather than a once through system significantly reduces the amount of water usage versus once through cooling water from the Delaware River. The proposed cooling tower will recirculate 2,000 GPM of cooling tower water which would otherwise have been discharged to the River. The make-up water required for the cooling towers is estimated to be 53 GPM. Cooling tower makeup water will be supplied by a third party water supply vendor with water sources outside the Coastal Zone; as such, there are no potential negative impacts to the Coastal Zone associated with the increase in cooling tower make up water and no offsets are proposed.	Part 6.5, beginning on page 18	Not Applicable		
Effluent Removal	There are no proposed changes to the effluent removal system. No additional pollutant loading is expected as a result of this Project (see Surface water quality section of the offset matrix).	Part 6.9, beginning on page 20	Not Applicable		
Solid Waste	Solid wastes will be generated as a result of construction and operation of the new hydrogen production equipment. Solid waste will include but not be limited to: construction debris, non-hazardous parts washer solvents, multiple varieties of spent catalyst, plant trash. All of the generated solid waste will be transported outside of the Coastal Zone for either recycling or disposal. Because the waste will be disposed of outside the Coastal Zone, no offsets are proposed.	Part 6.19, beginning on page 24	Not Applicable		
Hazardous Waste	Hazardous waste may be generated by this Project. Waste classification testing will be conducted on each new stream prior to disposal. If hazardous waste is generated, it will be transported outside of the Coastal Zone for recycling or disposal; therefore, no offset is proposed.	Part 6.22, page 25	Not Applicable		
Habitat	The refinery property is currently zoned and utilized for Heavy Industrial (HI) operations. The land proposed for use by the Project is within the property boundaries of the DCR and is entirely within the active refinery. Construction and operation of the Project will not result in loss of habitat. No undisturbed natural habitat will be lost as a result of this Project; therefore, no offset is proposed.	Part 6.26 and 6.29, page 27	Not Applicable		
Wetlands	None	Part 6.27, page 27	Not Applicable		
Flora Fauna	None	Part 6.26, 6.27, and 6.29, page 27	Not Applicable		

Applicant: Delaware City Refinery Company LLC.
Project: DCRC Low Sulfur Fuels Project
CZA Offset Review Reference: (DNREC Only)

COASTAL ZONE ENVIRONMENTAL IMPACT OFFSET MATRIX

Application Date: December 2014
Amendments:
Offset Review Date: (DNREC Use Only)
Matrix Amended:

ENVIRONMENTAL IMPACTS	(Applicant's Use) DESCRIBE ENVIRONMENTAL IMPACTS	PAGE NO. (In Section 1)	(Applicant's Use) DESCRIBE ENVIRONMENTAL OFFSET PROPOSAL[1]	PAGE NO. (In Section 1)	(DNREC Use Only) OFFSET SUFFICIENCY Yes, No or N/A
Drainage/Flood Control	The stormwater flow will be tied in to the existing stormwater management system and will not create changes in drainage or flooding patterns. As a result of an increase in impervious surfaces (pavement from compacted gravel), stormwater runoff to the WWTP is expected to increase above current conditions by approximately 0.5 GPM; however, when added to the other Project water discharges (16 GMP), the overall Project increase is negligible (0.3% increase) in comparison to the overall Refinery discharge of approximately 7,000 GPM. The estimated increase in stormwater runoff (and overall Project discharges) is negligible; therefore, there will be no impact to the Coastal Zone and no offset is required.	Part 6.9, beginning on page 20	Not Applicable		
Erosion[2]	Because the Project will result in a land disturbance of greater than 5,000 square feet, all of the proposed activities will be conducted under an Erosion and Sedimentation Control Plan (E&S Plan) to be approved by DNREC. DCRC will construct the Project in accordance with the approved E&S Plan. These conditions will require the minimization of erosion and sedimentation; therefore, no offsets, beyond compliance with the approved E&S Plan are proposed.	Part 6.9, beginning on page 20	Compliance with DNRC-approved E&S Plan.		
Land Use Effects	The Project will not impact the coastal zone outside of the DCRC property boundary.	Part 6.35, page 30			
Glare	None.	Part 6.35, page 30			
Heat	None.	Part 6.35, page 30			
Noise	None.	Part 6.35, page 30			
Odors	None.	Part 6.35, page 30			
Vibration	None.	Part 6.35, page 30			
Radiation	None.	Part 6.35, page 30			
Electro-Magnetic Interference	None.	Part 6.35, page 30			
Other Effects	New processing equipment and one new flare will be installed as part of the Project. The maximum elevation of the flare will be less than that of existing surrounding refinery facilities. Because the maximum elevation of the flare will be within the existing refinery features, no offset is proposed.	Part 6.35, page 30			
Threatened & Endangered Species	No threatened or endangered species or their habitats are anticipated to be negatively effected as a result of the proposed Project. Atlantic and shortnose sturgeon, both Federally Endangered species, may be present in the Delaware River within the vicinity of the refinery (see NOAA's National Marine Fisheries Service and DNREC's Natural Heritage and Endangered Species Program letters provided in Attachment F); however no work is proposed to occur within or immediately adjacent to a water body. Additionally, bog turtle habitat (potentially on-site), northern log-eared bats, and a bald eagle nest were noted in the vicinity of the Refinery. The habitats for these species are not located within the active Refinery area. All activities will occur outside the DNREC's suggested buffer (330 to 660 ft.) for work within the vicinity of a bald eagle nest. Because none of the habitats required by these species will be impacted as part of this Project, no offset is proposed.	Part 6.30, 6.31 and 6.32, pages 28 and 29	Not Applicable		
Impacts From:	No new environmental impacts/risks from raw materials, intermediate products, by-products, or final products are anticipated as a result of this Project. All materials will continue to be stored and handled in accordance with the appropriate applicable regulations.	Part 5.1, beginning on page 10	Not Applicable		
Raw Material	None.	Part 5.1, beginning on page 10			
Intermediate Products	None.	Part 5.1, beginning on page 10			
By-Products	None.	Part 5.1, beginning on page 10			
Final Products	None.	Part 5.1, beginning on page 10			

1 See paragraph I.1.b in "Secretary Assessment"
2 Construction and normal operation

Attachment F
DNREC Threatened and Endangered Species Response Letters

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF FISH & WILDLIFE
89 Kings Highway
Dover, Delaware 19901

OFFICE OF THE DIRECTOR

Phone: (302) 739-9910
Fax: (302) 739-6157

August 18, 2014

Ms. Beth Wycke
Environmental Resources Management
75 Valley Stream Parkway
Suite 200
Malvern PA 19355

Re: ERM 2014 Delaware City Refining Company General Inquiry
Tax Parcel ID's: 1200700007, 1200800014, 1200800015, 2200300001

Dear Ms. Wycke:

Thank you for contacting the Wildlife Species Conservation and Research Program (WSCRP) about information on rare, threatened and endangered species, unique natural communities, and other significant natural resources as they relate to the above referenced project.

Our Division scientists have not surveyed this project area. As such, we are unable to provide information pertaining to the existence of state-rare or federally listed plants, animals or natural communities at this project site. The comments below are provided in the absence of site-specific information. Please note that these are general comments provided in response to a general information request – they do not include recommended time of year restrictions, guidance in regards regulatory procedures related to federally protected species, or suggestions to reduce impacts to other important species and habitats. Therefore, it is not appropriate to utilize these comments as a review for specific project. If you have a specific project in mind, please contact us again with the full description of the scope of work and maps that clearly identify the project area.

A review of our database indicates that there may be suitable habitat for the federally listed bog turtle (*Glyptemys muhlenbergii*) within the boundaries provided in the review request. Bog turtles typically occur in freshwater wetlands with open canopies, mucky soils, and tussock vegetation, but they can occur in more marginal habitats as well. The bog turtle and its habitat are federally protected under the U.S. Endangered Species Act. Its presence can affect the scope of work of projects proposed within the study area.

There is an active Bald Eagle (*Haliaeetus leucocephalus*) nest within the vicinity of the project area. Bald eagles and their nests are protected under the federal Bald and Golden Eagle Protection Act (BGEPA). The U.S. Fish and Wildlife Service (USFWS) developed *National Bald Eagle Management Guidelines*, to help landowners and others minimize impacts to eagles, including disturbance, which is prohibited by the BGEPA. The guidelines focus on minimizing disturbance through the use of suggested

buffer zones (330 ft. to 660 ft. from a nest) and time-of-year restrictions for certain activities in several categories. Determinations of allowable activities within protection distances are evaluated on a case-by-case basis by USFWS biologists.

Northern long-eared bat (*Myotis septentrionalis*) have been documented within the vicinity of the study area. This species has been proposed to be federally listed as endangered under the U.S. Endangered Species Act. If listed, the presence of northern long-eared bat may affect the scope of work of future projects occurring within the study area.

There is evidence that the portion of Delaware River included in the boundary area is utilized by Atlantic sturgeon (*Acipenser oxyrinchus)* which is listed endangered under the U.S. Endangered Species Act. Spawning is believed to be upriver, but as evidenced by sonic tracking and other survey methods, juveniles occur in this area of the river in the spring/early summer. The federally endangered short-nosed sturgeon (*Acipenser brevirostrum)* also spawn upriver of the area and then commence post-spawning downstream migrations through this area of the river during late spring and summer.

The Delaware River also provides important migratory and spawning habitat for a number of other anadromous species, including striped bass (*Morone saxatilis)* and American shad (*Alosa sapidissima)*. Although these species are not listed as endangered or threatened, they are an important resource to the recreational and commercial fishing industries in Delaware.

Finally, our GIS database indicates that intertidal mudflats occur within the project area. It would be best to avoid impacts to this wetland type as it can provide habitat for fish, plants and other aquatic species.

We are continually updating our records on Delaware's rare, threatened and endangered species, unique natural communities and other significant natural resources. If a specific project is proposed, please contact us again for the latest information.

Feel free to get in touch with me if you have any questions or require additional information.

Sincerely,

Katherine M Fleming

Kate Fleming
Wildlife Biologist/Environmental Review Coordinator
(302) 735-8658
(302) 653-3431 fax
Kate.Fleming@state.de.us

(See invoice on next page)

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

AUG - 8 2014

Beth Wyke
Senior Project Manager
Environmental Resources Management
350 Eagleview Boulevard
Suite 200
Exton, PA 19341

Re: Protected Species Screening for Delaware City Refining Company, LLC, Petroleum Refinery

Dear Ms. Wyke,

This is in response to your letter we received on August 7, 2014, in which you requested information on the presence of threatened and endangered species listed by us under the Endangered Species Act (ESA) of 1973, as amended, in the vicinity of the Delaware City Refining Company, LLC petroleum refinery. The request for species information will be used to assess environmental impacts associated with potential future projects within the refinery site's boundaries.

Endangered Species Act
The following threatened and endangered species listed by us may occur in the vicinity of the proposed action(s) (e.g., the Delaware River).

Atlantic sturgeon
There are five DPSs of Atlantic sturgeon listed as threatened or endangered. Atlantic sturgeon originating from the New York Bight, Chesapeake Bay, South Atlantic and Carolina DPSs are listed as endangered, while the Gulf of Maine DPS is listed as threatened. The marine range of all five DPSs extends along the Atlantic coast from Canada to Cape Canaveral, Florida.

In the Delaware River and Estuary, Atlantic sturgeon occur from the mouth of the Delaware Bay to the fall line near Trenton, NJ, a distance of 137 miles. Generally, non-natal late stage juveniles (sometimes also referred to as subadults) immigrate into the estuary in spring, establish a home range in the summer months in the river, and emigrate from the estuary in the fall. Several studies have found similar patterns of movement that involve upstream movement in the spring-summer and downstream movement to overwintering areas in the lower estuary or nearshore ocean in the fall-winter.

In an attempt to locate spawning areas in the Delaware River, adult Atlantic sturgeon captured in marine waters off Delaware Bay in the spring were tracked. The sturgeon spent relatively little time in the river each year, generally about 4 weeks, and used the area from New Castle, DE (RM 62) to Marcus Hook (RM 81). Another sturgeon tagged in a separate study was also tracked and followed a similar timing pattern but traveled farther upstream (to RM 103) before exiting the river in early June. Based on this information and recent tagging and tracking studies carried out in 2011, the most likely spawning locations for Atlantic sturgeon are between RM 75-93 and RM 106-118. Mature adults have been tracked in these areas at the time of year when spawning is expected to occur and movements have been consistent with what would be expected from spawning adults. To date, eggs and larvae have not been documented to confirm that actual spawning is occurring in these areas. However, the presence of YOY in the Delaware River from Deepwater (RM 65) to Roebling (RM 124) during late fall to early spring provides confirmation that spawning is still occurring in this river. Based on the best available scientific information, Atlantic sturgeon are likely to be using the action area (approximately RM 60) as a migratory pathway to and from overwintering, spawning, and foraging grounds.

Shortnose Sturgeon

Endangered shortnose sturgeon (*Acipenser brevirostrum*) occur in the Delaware River from the lower Delaware Bay upstream to at least Lambertville, New Jersey (RM 148). The most heavily used portion of the river appears to be between RM 118 below Burlington Island and RM 137 at the Trenton Rapids.

In the Delaware River, movement to the spawning grounds occurs in early spring, typically in late March, with spawning occurring through early May in the area between Scudders Falls and the Trenton rapids (RM 133-139). After spawning, adult shortnose sturgeon migrate rapidly downstream to the Philadelphia area (RM 100), where they spend a few weeks, after which many adults return upriver to between RM 127 and 134, while others gradually move to the same area over the course of the summer. By the time water temperatures have reached 10°C, typically by mid-November, adult sturgeon have returned to the overwintering grounds in the Roebling (RM 124), Bordentown (RM 129), or Trenton reaches (RM 133). However, unlike sturgeon in other river systems, shortnose sturgeon in the Delaware do not appear to remain as stationary during overwintering periods. Overwintering fish have been found to be generally active, appearing at the surface and even breaching through the skim ice. Due to the relatively active nature of these fish, the use of the river during the winter is difficult to predict. Additionally, preliminary tracking studies of juveniles indicate that the entire lower Delaware River from Philadelphia (approximately RM 100) to below Artificial Island (RM 49) may be used as an overwintering area by juvenile shortnose sturgeon. There is also evidence that unlike adults, juveniles do not form dense aggregations and instead are more dispersed in overwintering areas.

Based on the best available scientific information, no spawning activity takes place in the action area, but the area from RM 49 to RM 100 may be used by overwintering juvenile shortnose sturgeon. Thus, the action area (approximately RM 60) is within the river reaches believed to be used by overwintering juvenile shortnose sturgeon (i.e., RM 49-100). Adult and juvenile shortnose sturgeon use the Delaware River as a migratory pathway to and from overwintering, spawning, and foraging grounds. Due to the distance from the spawning grounds (i.e., greater

than 30 miles upstream of the action area), shortnose sturgeon eggs or larvae, whose occurrence is limited to the waters near the spawning grounds are not expected to occur in the action area.

As listed species of Atlantic and shortnose sturgeon occur within the vicinity of your proposed project, any proposed in-water work has the potential to impact these species. As project plans develop, we recommend you consider the following mitigation/minimization measures for all of the proposed project's activities that might affect Atlantic sturgeon and shortnose sturgeon.

- For activities that increase levels of suspended sediment, consider the use of silt management and/or soil erosion best practices (i.e., silt curtains and/or cofferdams)
- For activities such as dredge material disposal that may cause the suspension of contaminated sediment, consider the use of appropriate containment measures (i.e., suitable sediment capping, upland disposal)
- For work that will increase vessel traffic within the project area, consider restricting the number of trips taken by each vessel and restricting the speed at which the vessel can travel
- For any impacts to habitat or conditions that temporarily render affected water bodies unsuitable for the above-mentioned species, consider the use of timing restrictions for in-water work.
- For pile driving or other activities that may affect underwater noise levels, consider the use of cushion blocks and other noise attenuating devices to avoid reaching noise levels that will cause injury or behavioral disturbance to sturgeon (see below for more information regarding noise criteria for injury/behavioral disturbance in sturgeon).

The Fisheries Hydroacoustic Working Group (FHWG), an interagency work group including the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), has reviewed the best available scientific information and developed criteria for assessing the potential of pile driving activities to cause injury to fish. The FHWG established dual sound criteria for injury, measured 10 meters away from the pile, of 206 dB re 1 μPa_{Peak} and 187 dB accumulated sound exposure level (dB_{cSEL}) (183 dB accumulated SEL for fish less than 2 grams). While the FHWG is based on the West Coast, species similar to Atlantic sturgeon and shortnose sturgeon were considered in developing this guidance (green sturgeon). As green sturgeon are biologically similar to Atlantic sturgeon and shortnose sturgeon, we use the criteria developed by the FHWG to assess the potential for injury to both species of sturgeon from pile driving operations.

No studies have been undertaken to determine the noise levels that would result in behavioral disturbance to either Atlantic sturgeon or shortnose sturgeon. Given the available information from studies on other fish species, we consider 150 dB re 1μPa_{RMS} to be a reasonable estimate of the noise level at which exposure may result in behavioral modifications. These behaviors could range from a temporary startle to avoidance of the noisy area.

If the proposed project involves pile driving, NMFS will need the following information to determine whether or not the project meets the criteria for avoiding injurious and/or behaviorally disturbing levels of noise.

- Number, size and type of piles

- Installation methods (i.e., impact hammer, vibratory hammer)
- Length of time each pile needs to be installed
- Duration and time of year of pile driving activity, as well as the length of each work day

Conclusion
As project details become finalized, a consultation, pursuant to section 7 of the ESA, may be necessary. If the final project plans have the potential to affect listed species, and it is being approved, permitted, or funded by a Federal agency, the lead Federal agency, or their designated non-Federal representative, is responsible for determining whether the proposed action is likely to affect the listed species. The Federal agency would submit their determination along with justification for their determination and a request for concurrence, to the attention of the ESA Section 7 Coordinator, NMFS Greater Atlantic Regional Fisheries Office, Protected Resources Division, 55 Great Republic Drive, Gloucester, MA 01930. After reviewing this information, NMFS would then be able to conduct a consultation under section 7 of the ESA. Should you have any questions about these comments or about the section 7 consultation process in general, please contact Erin Schnettler at 978-281-9378 or by email (Erin.Schnettler@noaa.gov).

Fish and Wildlife Coordination Act & Magnuson-Stevens Act
Portions of the Delaware River have been designated as Essential Fish Habitat (EFH) for a number of federally managed species. Anadromous fish species also use the Delaware River for migration and spawning, and are a food source for federally managed species. An adverse effect on prey species can be considered an adverse effect on EFH. Further EFH consultation by the federal action agency may be required as part of the Federal permit process. For a listing of EFH and further information, please go to our website at: https://www.nero.noaa.gov/habitat/index.html. If you wish to discuss this further, please contact Michelle Magliocca at (410) 573-4559 or by email (michelle.magliocca@noaa.gov).

Sincerely,

for Dave Gouveia
Acting Assistant Regional Administrator
for Protected Resources

EC: Schnettler, NMFS/PRD
Magliocca, NMFS/HCD

File Code: Sec 7/Nonfisheries/Private Firms/Technical Assistance/ERM_DCRC Refinery

Figure 1
Regional Site Location

Figure 1
Regional Location Map
Delaware City Refining Company, LLC
Delaware City, Delaware

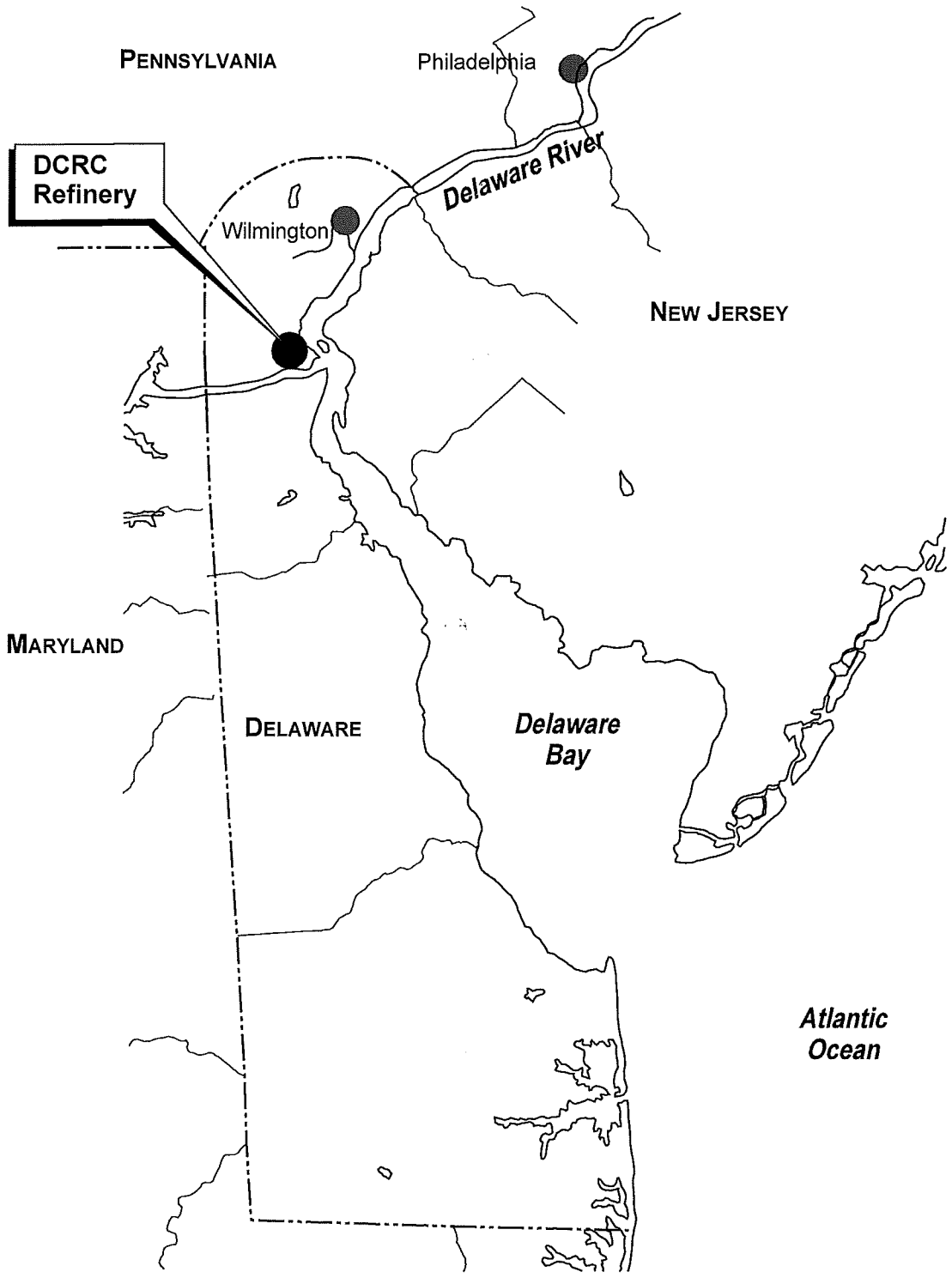
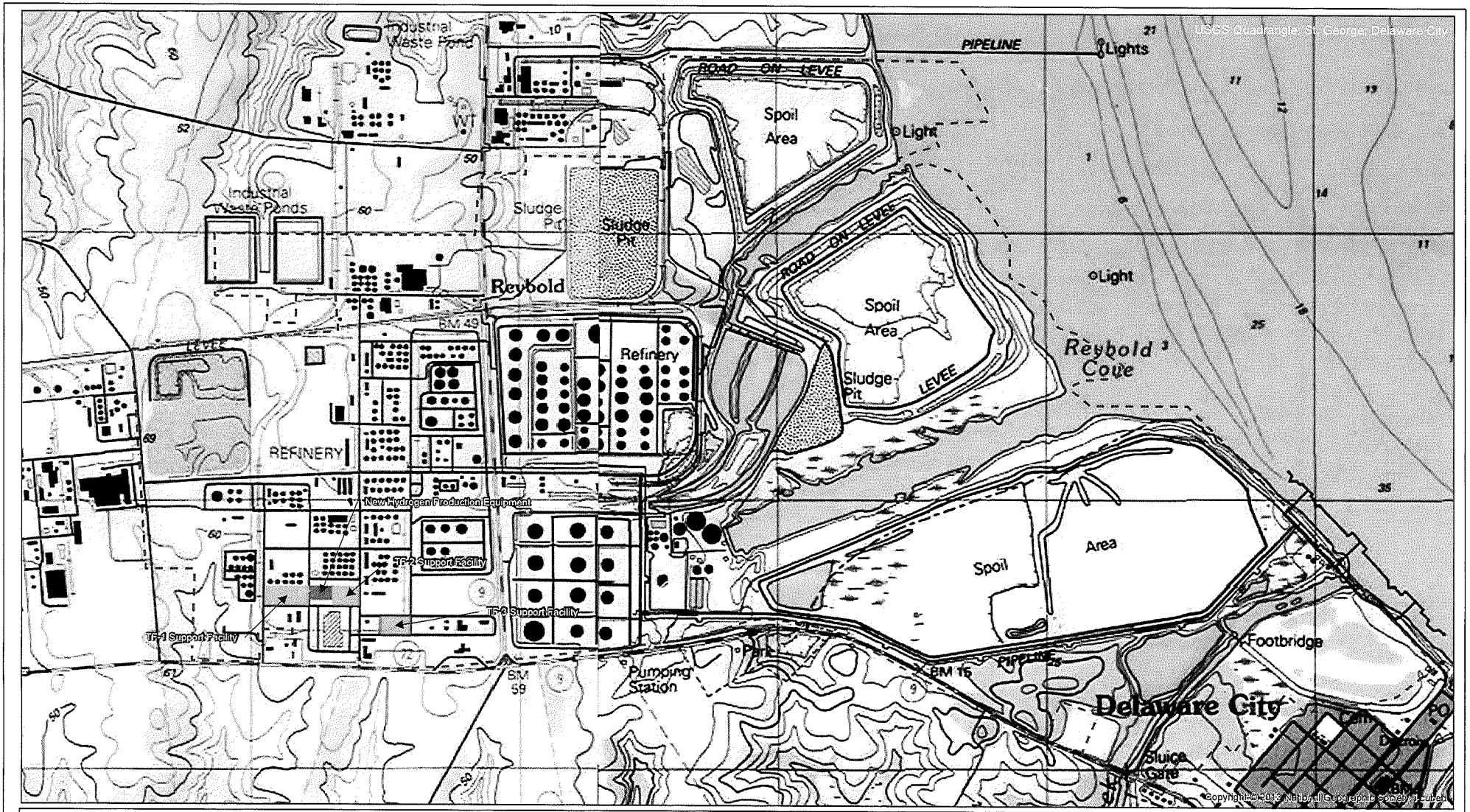


Figure 2
Project Components



Environmental Resources Management, Inc.
Philadelphia Office
484-913-0300

December 18, 2014

N
W E
S

Scale in Feet
0 250 500 1,000 1,500 2,000 2,500
Feet

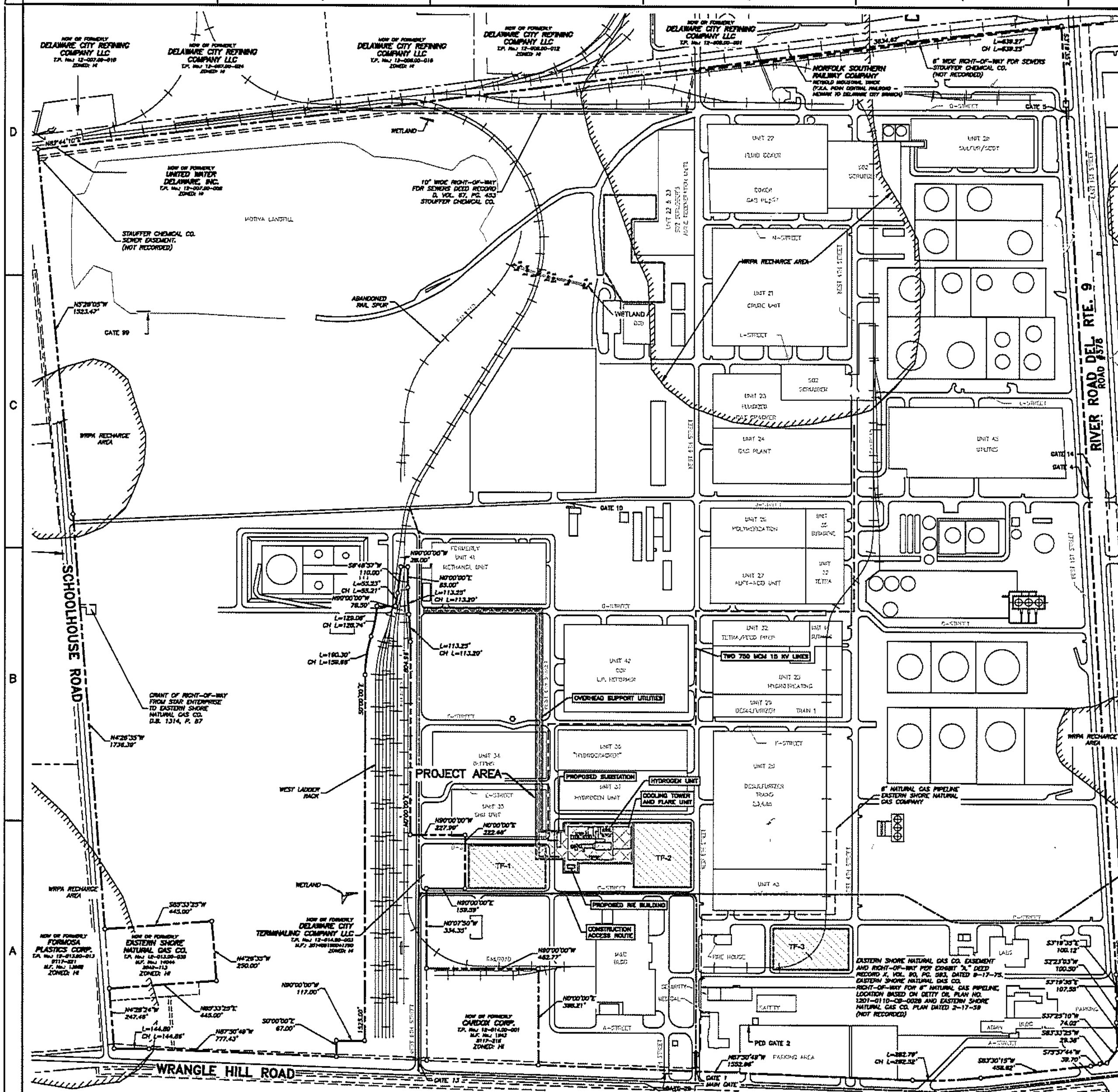
Legend

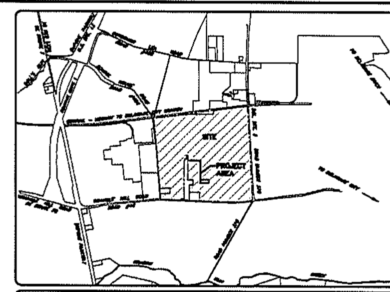
- New Hydrogen Production Equipment
- Support Facility
- Approximate Site Boundary

FIGURE 2
Location of Components of Low Sulfur Fuels Project
Delaware City Refining Compnay LLC
Delaware City, Delaware

J:\GIS\Projects\DCRC_MXD\Figure2-LocationComponents_LowSulfurFuels.mxd - 12/18/2014 | DRV

Figure 3
Site Plan





ZONING MAP No. 68 LOCATION PLAN SCALE: 1" = 2,500'

GENERAL DATA:

1. OWNER: DELAWARE CITY REFINING COMPANY LLC, 1 SYLVAN WAY-CORPORATE OFFICE, PARSIPPANY, NJ 07054, (302) 834-6000
   PROPERTY: DELAWARE CITY REFINING COMPANY LLC, 4550 WRANGLE HILL ROAD, NEW CASTLE, DE 19720
2. TAX PARCEL NO.: 12-008.00-014 (PARCEL 28-1)
3. SOURCE OF TITLE: DEED RECORD 20100601-0029890
4. MODIFIED GRID: D88/320
5. ZONING: HI - HEAVY INDUSTRIAL
6. SITE AREA: 377.3±± AC.
   PROJECT AREA: 2.1± AC. (HYDROGEN UNIT, PIPERACKS); 4.0± AC. (SUPPORT FACILITIES, REFER TO BREAKDOWN BELOW)
7. COUNCILMANIC DISTRICT: NO. 12 - JAMES W. BELL
8. DATUM: HORIZONTAL - DELAWARE CITY REFINERY PLANT DATUM; VERTICAL - N.G.V.D. 1929 (PRIOR TO 1988 NOS ADJUSTMENT)
9. THE WETLANDS BOUNDARIES DEPICTED ON THIS PLAN WERE DELINEATED IN ACCORDANCE WITH THE PROCEDURE SET FORTH IN THE "ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL," DATED 1987. SEE THE "WATERS OF THE UNITED STATES DELINEATION REPORT" PREPARED BY DUFFIELD AND ASSOCIATES, DATED MARCH 2013.
   0.06 ACRES OF WETLANDS WERE FILLED ON THIS PARCEL. REFER TO ARMY CORPS OF ENGINEERS APPROVAL NO. CENAP-OP-R-2013000310-64 (NWP 14).
10. THIS SITE LIES ENTIRELY WITHIN DELAWARE'S COASTAL ZONE. ANY HEAVY MANUFACTURING OR HEAVY INDUSTRIAL USE IS REGULATED BY THE COASTAL ZONE ACT AND SHALL REQUIRE A DECISION BY THE SECRETARY OF THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL PRIOR TO COMMENCING OPERATION.
11. ACCORDING TO THE STATE OF DELAWARE INVENTORY OF NATURAL AREAS, THIS SITE DOES NOT INCLUDE ANY CRITICAL NATURAL AREAS.
12. PARCEL 28 LIES OUTSIDE OF THE 100 YEAR FLOODPLAIN AS DEFINED IN THE FLOOD INSURANCE STUDY PREPARED FOR NEW CASTLE COUNTY BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), DATED JANUARY 17, 2007 AND SHOWN ON THE FLOOD INSURANCE RATE MAP 10003C0235J.
13. PORTIONS OF PARCEL 28 ARE LOCATED IN RECHARGE WATER RESOURCE PROTECTION AREAS (WRPA) ACCORDING TO THE WRPA MAPS DATED 1993 AND REVISED FEBRUARY 2008. THESE AREAS ARE SUBJECT TO ALL THE PROVISIONS OF DIVISION 10.380 OF THE UNIFIED DEVELOPMENT CODE.
14. SUPPORT FACILITIES SHOWN AS TF-XX ARE ALL NON-SURVEYED PROJECT USE POINTS. FACILITY LIMITS AND ACREAGE ARE BEST ESTIMATES AND SUBJECT TO CHANGE.

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- EASEMENT
- PROJECT AREA
- TF-XX SUPPORT FACILITY
- WETLANDS
- RECHARGE AREA
- CONSTRUCTION ACCESS ROUTE
- ELECTRIC SERVICE

SUPPORT FACILITY MATRIX:

TF-1	LAYDOWN & STAGING AREA	1.3 ACRES
TF-2	LAYDOWN & STAGING AREA	1.5 ACRES
TF-3	LAYDOWN & STAGING AREA	1.2 ACRES
	TOTAL	4.0 ACRES

CERTIFICATION OF PLAN ACCURACY

I, THE UNDERSIGNED, HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF DELAWARE, AND THAT THE INFORMATION SHOWN ON THIS PLAN IS IN GENERAL CONFORMANCE WITH THE COASTAL ZONE ACT PERMIT SITE PLAN REQUIREMENTS.

DOUGLAS M. GITELMAN, P.E. (DE LICENCE NO. 15660)

SIGNATURE DATE

GRAPHIC SCALE (FEET): 200 0 100 200 400 800

11x17 COPIES ARE NOT TO SCALE

VANDEMARK & LYNCH, INC. ENGINEERS • PLANNERS • SURVEYORS

UNIT # Q-6W HYDROGEN UNIT
AREA - ALL CIVIL
SITE PLAN

Delaware City Refining Company
DELAWARE CITY REFINERY, 786 GOVERNOR LEA ROAD & 786 GOVERNOR LEA ROAD, NEW CASTLE, DE 19720, (302) 834-6000
RED LION HUNDRED, NEW CASTLE COUNTY, DELAWARE

WA#
MOC#
PROCESS
OPERATIONS
PROCESS CONTROL
ENGINEERING
ORIGINAL ISSUE APPROVED/DATE

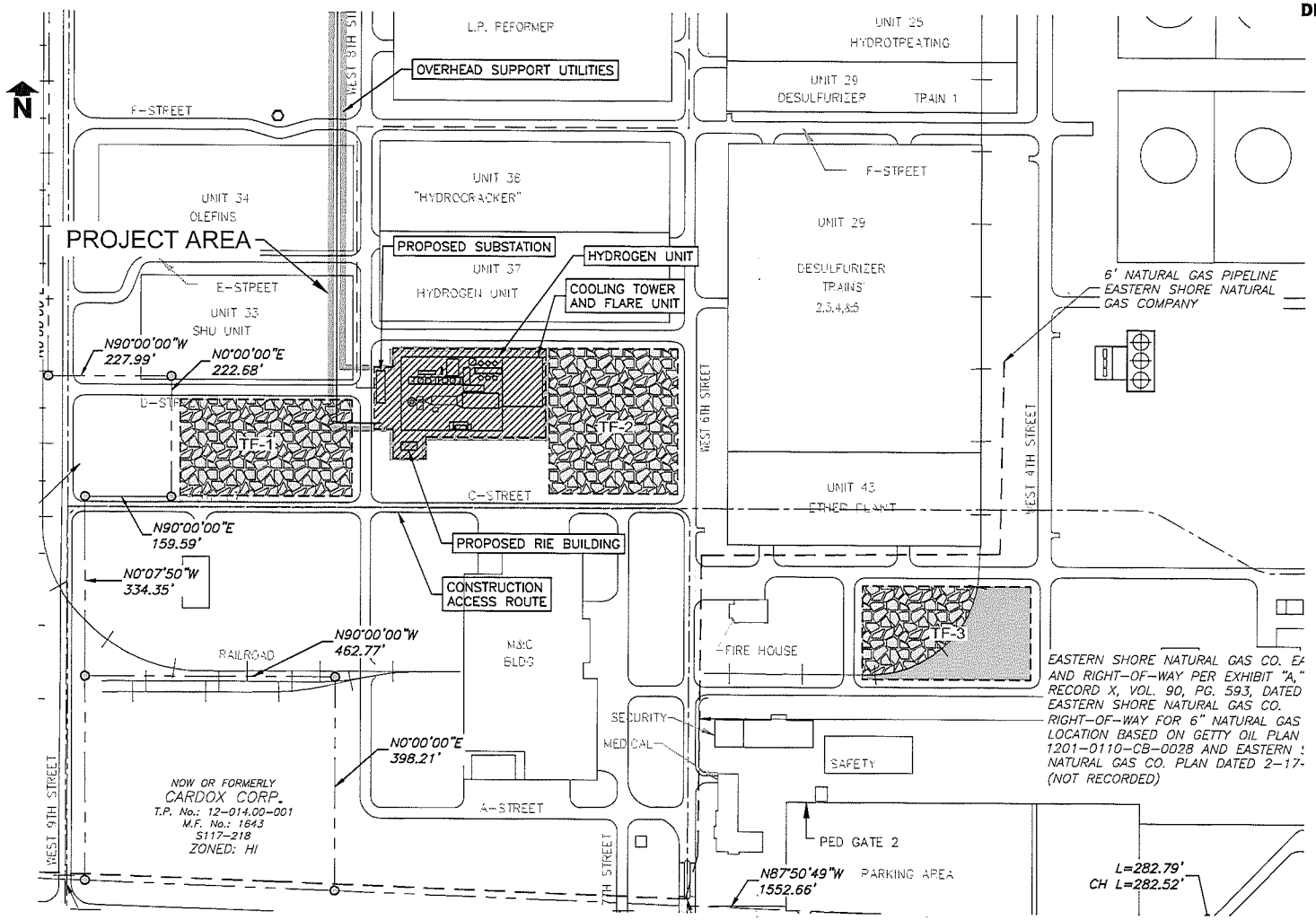
CHARGE#	FILE NAME	ENGINEER	DESIGNER	DRAFTER
	23614-08-SITE-01	DME	DME	EMG

SCALE	DRAWING NUMBER	REVISION
1" = 200'	1201 - 0110 - CD - 1692	A

DATE 12.1.14

Figure 4
Impervious Surface

FIGURE 4
EXISTING AND PROPOSED COVERTYPES
DELAWARE CITY REFINING COMPANY
NEW CASTLE, DELAWARE



G:\CAD\Drawings\Valero\025584\A201.dwg

MLB/12-18-14