

CMRRR# 7006 3450 0003 6308 2854

December 28, 2007

Elena M. Tkacz
Resource Planner
Department of Natural Resources and Environmental Control
Coastal Zone Act Permitting program
89 Kings Highway
Dover, DE 19901

Dear Ms. Tkacz:

The Premcor Refining Group Inc. (Premcor), a subsidiary of Valero Energy Corporation, owns and operates a petroleum refinery in Delaware City, Delaware. Premcor is applying to the Department of Natural Resources and Environmental Control (DNREC) for a Coastal Zone Permit to complete the 20 ppm FCCU NO_x Project.

The objective of the project is to reduce NO_x emissions from the existing Fluid Catalytic Cracking Unit (FCCU). On July 6, 2006, Premcor entered into an Agreement with the State of Delaware related to "NO_x Emissions Reductions From FCCU" (Agreement). This project is being proposed to comply with the terms of Section III of the Agreement. Specifically, Premcor will achieve by May 1, 2009, a NO_x emission rate from the FCCU of 20 ppm, measured as a 365 day rolling average and 40 ppm measured as a 7 day rolling average, both limits at 0% oxygen on a dry basis.

An air permit application for the project was submitted on June 1, 2007. Because the project is being undertaken strictly for pollution control purposes (i.e., refining capacity will not be increased and no new products will be generated as a result of the project), Premcor submitted a Coastal Zone Status Decision on August 21, 2007. On November 14, 2007, DNREC Secretary John Hughes ruled that the project is regulated by the Coastal Zone Act and that a Coastal Zone Act permit is required.

The enclosed permit application has been prepared in accordance with DNREC's Regulations Governing Delaware's Coastal Zone. One original and three (3) copies of the application are enclosed for your review. A check in the amount of \$3,000 was provided with the Coastal Zone Status Decision request.

If you have any questions about this submittal, please contact me at (302) 834-6405.

Sincerely,



Thomas S. Godlewski, Jr.
Senior Environmental Engineer

\enclosures

Premcor Refining Group, Inc., Delaware City, Delaware

Application for a Coastal Zone
Permit for the DCR 20 PPM
NO_x FCCU Project

December 2007

Environmental Resources Management
350 Eagleview Boulevard
Suite 200
Exton, Pennsylvania 19341

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APPLICATION FOR A COASTAL ZONE ACT PERMIT

Amended March 2005

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

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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 to that effect and clearly state why the section is not applicable to your project.
2. Where sufficient space is not provided on the application form for requested information, attach extra pages referencing each answer by the appropriate part and question number.
3. Submit three complete copies of the permit application to:

Department of Natural Resources & Environmental Control
89 Kings Highway
Dover, DE 19901
4. Comply if required, or as requested by the DNREC Secretary, with 7 Delaware Code, Chapter 79, Section 7902. If requested, but not made part of your application it 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 "State of Delaware."
6. This application for a Coastal Zone Act Permit is a public document. Do not include information that you do not wish the public to review. 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, Section 5 (Requests for Confidentiality), for the proper procedure in requesting confidentiality.
7. On the last page of text in this application, the applicant shall clearly print their name.

PART 1

APPLICANT AND SITE IDENTIFICATION

1.1 Identification of the permit applicant:

Name: **The Premcor Refining Group Inc. (Premcor), a subsidiary of Valero Energy Corporation, Delaware City Refinery (DCR)**
Mr. Andrew Kenner - Vice President and General Manager

Address: **4550 Wrangle Hill Road, Delaware City, New Castle County, DE 19706**

Telephone No.: **302-834-6400**

Fax No: **302-834-6498**

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

Name:

Address:

Telephone No.:

Fax No.:

Include written authorization from client for being authorized agent for this application.

1.3 Project property location (street address):

The proposed project will be located within the property boundaries of Premcor's Delaware City Refinery (DCR), which is located at 4550 Wrangle Hill Road, Delaware City, New Castle County, DE 19706

1.4 Provide a general map of appropriate scale to clearly show project site:

See Figures 1 - 4.

The signed Evidence of Local Zoning and Planning Approval is provided on the following page.

PART 2
EVIDENCE OF LOCAL ZONING AND PLANNING APPROVAL

I, _____, for _____
(Name of County, City of Town)

do hereby affirm that the project proposed by _____
(Name of Applicant)

located at _____, in
(Address)

the _____ 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.

(Signature)

(Title)

(Date)

This part is essential for a complete 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 another form or document than this one to demonstrate "evidence of local zoning approval," but such documents must be signed and dated by the proper official.

Christopher A. Coons
County Executive



Charles L. Baker
General Manager

Department of Land Use

June 21, 2007

**In reply, refer to:
07-0563-V**

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

Dear Ms. Wyke:

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

A review of the Official Zoning Map of New Castle County indicates that the subject parcels are zoned **HI (Heavy Industrial)**, which permits **heavy industrial uses and petroleum refining and related industries (including the addition of new pollution control equipment to reduce NOx emission from the existing Fluid Catalytic Cracking Unit)**, pursuant to UDC Section 40.33.270.C.

A Record Minor Land Development Plan for SO2 Scrubber Project for Valero, Delaware City Refinery (instrument number 200703280028868) was recorded in the Office of the Recorder of Deeds for New Castle County on March 28, 2007. 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,



David Culver
Planning Manager



Joseph M. Abele, AICP
Planner III

PART 3

PROJECT PROPERTY RECORD

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

**The Premcor Refining Group Inc., Delaware City Refinery
4550 Wrangle Hill Road, Delaware City, New Castle County, DE 19706**

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

Not applicable

3.3 Name and address of lessee(s):

Not applicable

3.4 Is the project premises under option by permit applicant?

No. The project Site is owned by the applicant.

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

All work associated with the proposed project will occur within the boundaries of the DCR. All land included within the refinery boundary is zoned Heavy Industrial (HI).

PART 4

PROJECT OPERATIONS

- 4.1 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):

Premcor operates the Fluid Catalytic Cracking Unit (FCCU) (Unit 23) as an integral part of its DCR operations. To comply with the Agreement entered into by Premcor and the State of Delaware on July 6, 2006 (Agreement), Premcor is proposing to install additional pollution control equipment on the existing FCCU for operation in 2009. Specifically, Premcor intends to install Wet Gas Scrubbing Plus (WGS+) technology downstream of the existing Belco wet gas scrubber (WGS) and Cansolv Absorber to reduce NO_x emissions from the FCCU.

The proposed Project, titled DCR 20 PPM FCCU NO_x Project (Project), is being conducted solely to decrease NO_x emissions from the FCCU to 20 PPM NO_x on a dry, O₂-free basis in accordance with Section IV of the Agreement.

As part of the WGS+ technology installation, Premcor will modify the current Wastewater Treatment Plant (WWTP). The modification will consist of converting the first of 2 aerobic reactor tanks, operated in series, to an anoxic reactor tank. The addition of an anoxic step will significantly reduce the amount of nitrates from the WGS+ purge stream that ultimately are discharged with the refinery wastewater. The anticipated project-related nitrate loading reduction is expected to be between 80 and 90 percent.

NOTE: When discussing nitrates within this application, Premcor is referring to nitrate as N (NO₃-N).

The Project will not increase the throughput or production rates of any existing processes.

Details regarding the WGS+ Project components are provided in the Project Description of the associated DNREC Air Permit Application (Attachment A (Section 2)).

- 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;

This project will require the use and storage of three new chemicals. These new chemicals (sodium sulfite, bleach (sodium hypochlorite), and sodium chlorite - all in solution) are used to enhance the removal of NO_x using WGS+ technology.

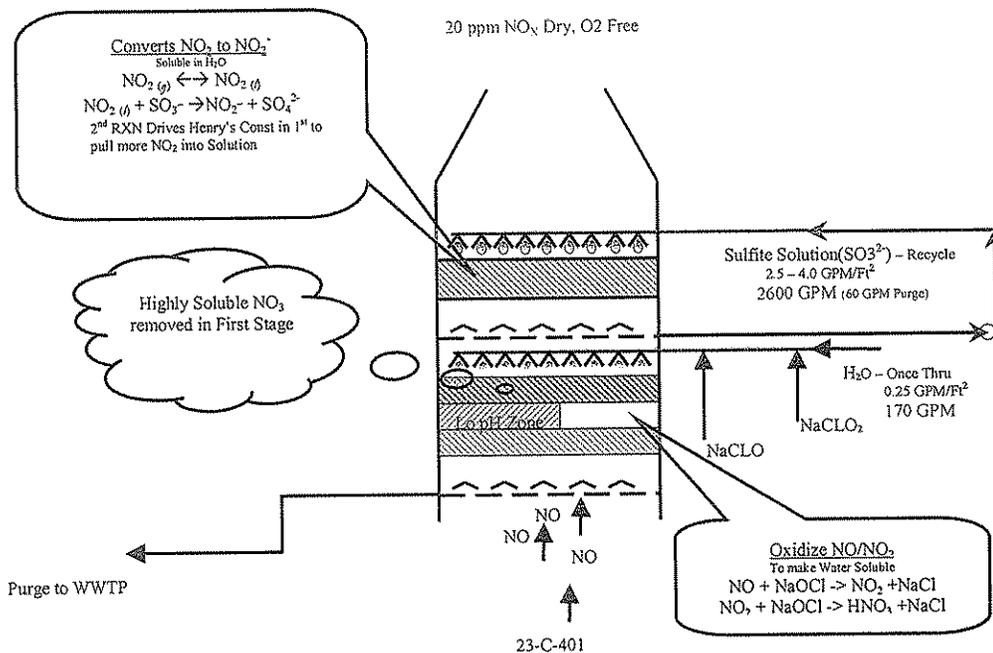
An MSDS sheet for each of the new materials is included in Attachment B (Section 2).

No new raw materials, intermediate products, by-products or final products will be used or generated as a result of this Project.

This Project will not result in the increase of air emissions and will reduce permitted NO_x emissions (a known ozone/smog precursor) from the facility by approximately 512.5 tpy; thereby reducing the potential for smog formation.

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

A WGS+ Process Schematic is provided below. A complete process flow diagram for the pollution control project (including the proposed modifications to the WWTP) is provided in Attachment C (Section 2).



- 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 Project will require the addition of three (3) new aboveground storage tanks.

The tanks will store the chemicals required for the treatment of NO_x in the FCCU effluent gas at the WGS (sodium sulfite, bleach (sodium hypochlorite), and sodium chlorite all in solution). Each tank, to be comprised of plastic, will be 12 feet in diameter by 18 feet tall. These tanks will be located off-plot on the east side of the 4th Street access road (see Figure 4).

These chemicals are regulated CERCLA materials and will be registered per Title 7 Del. C., Chapter 74A, *The Jeffrey Davis Aboveground Storage Tank Act* and will comply with all associated Regulations (including secondary containment and release preparedness plans).

Appropriate secondary containment will be connected to the facilities existing stormwater management system to allow for the release of rain water following storm events.

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

All new and modified equipment associated with the changes to the FCCU is described in the detailed project description provided in Attachment A (Section 2) and shown on the process flow diagrams provided in Attachment C (Section 2).

- e. list any new buildings or other facilities;

No new buildings will be constructed as a result of this Project. Some new equipment will be installed in previously disturbed areas as described below. Where applicable, Premcor will obtain all necessary approvals from New Castle County's Land Use Department.

Installation of WGS+ will result in a 30 to 40-foot increase in the current stack height of the FCCU WGS stack resulting in a final stack height of 225-235 feet above grade. The additional height will be supported using steel supports from grade. Installation of these supports will likely require the disturbance of approximately 500 square feet of existing pavement (0.01 acres).

Premcor will install three (3) new storage tanks (with associated secondary containment) and a truck unloading area on the east side of the existing 4th Street access road (see Figure 4). Premcor may also construct a rail car siding (pull-off) from the existing rail line to allow for the potential for rail delivery of the new materials required by this Project. All of the areas proposed for disturbance currently consist of a gravel substrate. The land area required for the installation of these Project features totals approximately 12,632 square feet (0.29 acres). The secondary containment required by the new tanks (included in the disturbance estimate above) will likely consist of lined dikes. The tanks and secondary containment will be constructed in accordance with *The Jeffrey Davis Aboveground Storage Tank Act*.

The newly stored materials will be piped to the WGS+ using new, Teflon-lined, carbon steel pipe which will be supported by existing racks.

The modifications to the WWTP will not require any new buildings or facilities. The modification will occur within the existing footprint of the existing WWTP.

- f. if this project represents a totally new facility at a new or existing facility, what will be the new rate of maximum production, and;

The Project will not result in a change in refinery production rates. The purpose of the Project is solely to decrease NO_x emissions in the FCCU effluent gas to 20 PPM on a dry, O₂-free basis.

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

The Project will not result in a change in refinery production rates. The purpose of the Project is solely to decrease NO_x emissions in the FCCU effluent gas to 20 PPM on a dry O₂-free basis.

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

The proposed project will not alter the typical/current operating schedule of the DCR. The operating schedule will continue to be 24 hours a day, 7 days a week, 52 weeks a year. The refinery currently operates with two, twelve-hour shifts and will continue with this schedule after the proposed Project is implemented.

- 4.3 Provide a site plan of this project with (see Figure 4):

- 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.

- 4.4 How many acres of land in total are required for this proposed project, both existing, utilized, developed land (if any), and new land?

All land proposed for use by the Project is within the property boundary of the DCR and is zoned and utilized for Heavy Industrial operations. The Project does not require the use of new land. The acres of existing utilized/developed land required for the Project are provided in the following table.

Proposed Project	Use of existing utilized/developed land (acres)
Three (3) New Storage Tanks	0.09
Truck Unloading Area	0.05
Railcar Pull-off	0.14
Steel Stack Supports	0.01
Total	0.29

PART 5A

ENVIRONMENTAL IMPACTS

Air Quality

5.1 Describe project emissions (new and/or increased over current) by type and amount under maximum operating conditions:

This Project will result in decrease in the currently allowable NO_x emissions from the FCCU of 512.5 TPY. This pollution control project will not change either the composition or the quantity of the other permitted allowable air pollutants from the FCCU. Project air emissions are summarized below.

Emission Changes associated with DCR 20 PPM FCCU NO_x Project

<u>Pollutant</u>	<u>Amount (lbs/hr)</u>	<u>tons/year</u>
a. NO _x	-117	-512.5
b. SO ₂	0	0
c. H ₂ SO ₄	0	0
d. CO	0	0
e. TSP	0	0
f. VOC	0	0
g. Pb	0	0

Premcor is proposing to reduce the permitted FCCU NO_x emissions from 719.5 to 207 tpy. Additional information regarding the proposed emission changes associated with the Project is provided in Attachment A (Section 2). The Project results in a net decrease in facility air emissions, therefore, no offsets are required.

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

The WGS+ process is a relatively simple, reliable process. If the WGS+ process experienced a malfunction (such as a pump failure), NO_x emissions would increase temporarily. While this is the most likely malfunction, the specific operational malfunction or human error would determine the potential changes.

Operational failures and human error scenarios will be assessed during unit-specific training sessions, and appropriate response and mitigation procedures will be developed and implemented to address potential events.

- 5.2 Describe any pollution control measures to be utilized to control emissions to the levels cited above in 5.1.

Premcor will use the existing Low NO_x burners in the FCCU CO Boiler in combination with WGS+ to meet the proposed NO_x emission limit. The mechanics of this pollution control system are detailed in Attachment A (Section 2).

- 5.3 Show evidence that applicant has, or will have, the ability to maintain and utilize this equipment listed in 5.3 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.)

Premcor will operate and maintain the facilities associated with the Project in compliance with all applicable regulations.

Operations and maintenance will be conducted by skilled operations and maintenance staff, and will be complimented by specialized contractor skills as necessary. Premcor will update the operations and refinery procedures, as necessary, to include the facilities associated with this Project. The existing refinery staff has a working knowledge of the basic equipment included in the facilities and will be trained to safely and successfully operate and maintain this equipment.

Water Quality

- 5.4 Describe any new wastewater discharge or increase over current discharge levels due to this proposed project:

This Project will result in a 250 GPM increase in wastewater discharge to the existing wastewater treatment plant (WWTP) (Outfall 601) and subsequently to the Delaware River (Outfall 001).

The nitrate, sulfide and chloride concentrations in the wastewater will increase as a result of this air pollution control project. A detailed table including anticipated loading is provided in Attachment D (Section 2). A summary of the incremental increase in loadings to the Delaware River is provided below.

Incremental Increase in Loadings to the Delaware River (Outfall 001)

Constituent	Incremental Increase in Concentration (mg/L)	Incremental Increase in Mass (TPY)	Percent Increase over Current Discharge Rates*
NO ₃ ⁻ (as N)	0.06	33	3
SO ₄ ²⁻	12.8	6846	3.1
Cl	2	1267	0.08

* Assumes 85% conversion (denitrification) in modified WWTP).

As previously stated, the modifications to the WWTP will reduce the increased nitrate load by 80 to 90%. After control (assuming 85% control), the incremental increase in nitrate loading to the Delaware River will be 0.06 mg/L or 33 TPY; representing only a 3% increase over current discharge rates.

In addition to the above, the Project will also result in an increase in the loading of sodium bicarbonate (baking soda) to the existing WWTP effluent. The loading of sodium bicarbonate is not tracked individually in Attachments D or G since the constituent is common and innocuous.

The additional wastewater discharge points will flow from the WGS+, through the WWTP to the existing Outfall 601, combine with stormwater and non-contact cooling water discharges, and discharge to the Delaware River (Outfall 001).

- 5.5 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 and routed to the refinery's on-site WWTP for treatment and disposal. No changes to the employee sanitary wastewater disposal are proposed as a result of the Project.

- 5.6 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.

See the response to question 5.4 above.

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

No discharge effluent will enter a public sewer system.

- 5.9 Identify the number, location, and name of receiving waters of stormwater discharges:

Stormwater will continue to be connected via the refinery's existing stormwater management system; consisting of Outfalls 002 – 009. Stormwater entering this system flows to the refinery's WWTP where it is treated and released through NPDES Outfalls 601 and 101 prior to release into the Delaware River at NPDES Outfall 001.

- a. describe the source of stormwater run-off (roofs, storage piles, parking lots, etc.;

Runoff results when precipitation falls on the roofs of existing buildings, equipment, and paved surfaces of the DCR. The new impervious surface will consist of a new truck unloading area, a railcar siding (pull-off) and secondary containment areas for the new tanks.

- b. describe the pollutants likely to be in the stormwater;

The make-up of the stormwater is not anticipated to change as a result of the Project. Current refinery stormwater runoff likely contains suspended solids which are treated at the refinery WWTP prior to discharge at NPDES Outfall 001 (Delaware River).

- c. 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;

All stormwater is routed to the refinery's existing WWTP through the storm sewer system. Treated discharge will

continue meet the requirements of both the NPDES permit and DNREC's proposed Surface Water Quality Standards prior to discharge to the Delaware River.

- d. what amount of stormwater run-off increase over current levels will result from this proposed project;

The proposed Project requires the disturbance of 0.29 acres of gravel area. The entire disturbed gravel area will be paved as a result of the project. The new impervious surface is expected to generate approximately only 0.60 million gallons per year (roughly 1,600 GPD) of additional stormwater; therefore, no significant increase in stormwater run-off is anticipated as a result of this Project.

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

Other than connecting the three (3) new impervious surface areas associated with the truck unloading area, tank secondary containment, and railcar siding to the existing stormwater Drainage system; there is no proposed change to the existing stormwater drainage system. These new areas will be connected to the current subsurface system. The exact location of these connections has not yet been determined. The current system will continue to safely carry stormwater to the refinery WWTP (Outfall 601) and NPDES Outfall 001 without flooding the project site or neighboring areas down gradient.

- 5.10 Will this project use a new water intake device, or increase the use (flow) from an existing intake device? If, yes, please state:

The Project will not require the addition of any new water intake devices.

The following activities will require the use of additional process water (250 GPM). The water will either be purchased from the current water supply vendor or be provided by on-Site recycled water.

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

This project will require an additional 250 GPM (360,000 GPD) of process water. This water will be purchased from the current water supply vendor or will consist of recycled water from the sour water stripper bottoms (or another on-Site source).

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

The Project does not require additional draw from the existing Delaware River intake and no new intakes will be required to support this Project. Therefore, the existing devices are believed to be adequate to protect aquatic life and no additional controls are proposed.

- 5.11 Will this proposed project result in a thermal discharge of water, or an increase in the flow or temperature of a current thermal discharge? If yes, state:

Although there will be an 250 GPM increase in the thermal discharge from the facility, the DCR will remain in compliance with the thermal discharge temperature limit of 110°F as stated in State Permit No. WPCC 325601/74-NPDES Permit No. DE 0000256.

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

This Project will not result in a new thermal discharge or an increase in the temperature of the existing thermal discharge. The project will result in a 360,000 GPD increase in the existing thermal discharge from the wastewater treatment plant to the Delaware River.

The WGS+ purge water will be sent to the WWTP, through existing retention basins Nos. 5 and 6, and ultimately to the Delaware River (Outfall 001). As stated above, the discharge will meet the thermal discharge temperature limit of 110°F as stated in State Permit No. WPCC 325601/74-NPDES Permit No. DE 0000256.

- b. after all cooling water mechanisms have been applied to the hot water, 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?

In accordance with State Permit No. WPCC 32560/74-NPDES Permit No. DE 0000256, the facility is currently permitted to discharge wastewater to the Delaware River at a temperature of 110°F.

Based on data obtained from the New Jersey Department of Environmental Protections Marine Water Monitoring web page (<http://www.state.nj.us/dep/wmm/bmw/cumberland.htm>), maximum, average, and minimum water temperature results

measured from a tributary of the Delaware River across from the DCR have been recorded, in degrees Fahrenheit as 73.4, 55.4, and 32, respectively. The delta T would be 54.6 °F on average, 36.6 °F in summer and 78 °F in winter. Please note that this is not a change from the currently permitted condition.

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

Premcor plans to use current air cooling water methods (air coolers, cooling towers and retention basins (Nos. 5 and 6) to meet the permit limit.

All wastewater associated with the Project and from the facility will continue to be within the permitted temperature limit of 110°F.

- 5.12 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?

All wastewater generated by this project will be combined with the current refinery wastewater, and treated at the WWTP prior to discharging to the Delaware River (Outfall 001) where it will ultimately mix with the waters of the Delaware River. According to the WGS+ technology provider (Hamon Research-Cottrel, HRC), the proposed activities will create a change in existing discharge. As detailed in the response to question 5.4, nitrate, sulfate and chloride concentrations will increase by 0.06 mg/L (3%), 12.8 mg/L (3.1%) and 2 mg/L (0.08%) respectively at the 001 Outfall. Sodium bicarbonate will also increase as noted in Attachments D and G.

There are currently no water quality standards for nitrates in the Delaware River. There are no known State of Delaware Surface Water Quality Standards for either sulfite or chloride. Although there will be an increase in each of these constituents, no Water Quality Standards will be exceeded.

The environmental affect resulting from the increases are anticipated to be insignificant as detailed in Part 5C.

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

Oil is not an anticipated component of any portion of the Project's wastewater stream. All wastewater streams will be treated at the WWTP prior to final discharge at Outfall 001.

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

The Project is not anticipated to significantly increase settleable solids or floating solid wastes in the surface water discharge. The existing WWTP removes floating solid wastes and the majority of settleable solids prior to discharge through Outfall 601. The facility's NPDES Permit requires that the discharge from both Outfall 601 and 001 be "free from floating solids, sludge deposits, debris, oils and scum." Premcor is also required to monitor for total suspended solids at Outfall 601. Premcor will continue to meet this permit condition.

- 5.15 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 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.)

Premcor currently employs trained State-licensed operating personnel who operate the refinery WWTP. Premcor will operate the Project facilities and associated equipment in compliance with all applicable regulations. Operations and maintenance will be conducted by the skilled refinery operations and maintenance staff, and will be supplemented by specialized contractor skills when necessary. The existing refinery staff has a working knowledge of the existing equipment and operations and is trained to safely and successfully operate and maintain this equipment. Existing staff will be trained on the proper operation and maintenance on the modified WWTP unit.

Water Quantity

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

As stated previously, if needed, additional water will be purchased from the current water supply vendor. The facility may also make use of recycled water to meet the additional water demands. Potable water supplies will not be required to support this project.

- 5.17 If wells are to be used, identify the aquifer to be pumped and the depth, size and pumping capacity of the wells and state whether or not a permit has been applied for.

Not Applicable. The additional water supply required by this project will be met by existing on-site sources, or purchased from the current water supply vendor. Well water will not be required.

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

See response to question 5.10. Water usage will be consistent and will not vary with season, time of day or any other factor.

- 5.19 How close is the proposed well(s) to any well on adjacent lands?

Not Applicable. The additional water supply required by this project will be met by existing on-site sources or purchased from the current water supply vendor. Well water will not be required.

Solid Waste

- 5.20 Describe each type and volume of any solid waste (inc. biowastes) generated by this project and the means used to transport, store, and dispose of the waste(s).

The only solid waste anticipated is additional spent aviation regulation light bulbs. Premcor currently uses these bulbs and disposes of them using procedures consistent with their RCRA Universal waste designation. All hazardous waste is stored in 55-gallon drums on one of the facility's three (3) 90-day pads. The waste is transported via either truck or rail to an appropriate disposal location. Premcor will continue using their existing disposal practices for this type of waste. This waste is disposed of outside of the coastal zone.

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

There will be no on-site recycling, re-use or reclamation of the solid wastes to be generated as a result of the Project.

- 5.22 Will any waste material generated by this project be destroyed on-site? If so, how would that be done?

Waste material generated by the Project will not be destroyed on Site.

Hazardous Waste

- 5.23 Will this proposed project result in the generation of any hazardous waste as defined by the “Delaware Regulations Governing Hazardous Waste?”

The increased solid waste stream (additional spent aviation light bulbs), although insignificant (20 light bulbs changed once every four to five years), are considered hazardous and will be treated as a hazardous waste.

- 5.24 If so, identify which hazardous waste, the amount of each, and how it is generated.

See the response to question 5.20.

- 5.25 Describe the transport of any hazardous waste and list the permitted hazardous waste haulers to be utilized.

See the response to question 5.20. Premcor uses a hazardous waste broker to select hazardous waste haulers. The waste hauler is selected by the broker based on economics and schedule. Premcor is not proposing to revise its current hazardous waste transportation methods as a result of this Project.

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

See the response to questions 5.20 through 5.25.

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

The DCR currently generates hazardous waste.

Habitat Protection

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

The land proposed for use by the Project is within the property boundaries of the DCR and is within the area of actively operating refinery units. The Site consists of land currently zoned and utilized for Heavy Industrial (HI) operations.

- 5.29 Will the proposed project result in the loss of any wetland habitat? If so, answer the following:

The land proposed for use by the Project is within the property boundaries of the DCR and is within the area of actively operating refinery units. Wetland habitat will not be impacted as a result of the proposed project (see Figure 4).

- a. will any wastewater and/or stormwater be discharged into a wetland, and;

No wastewater or stormwater will be discharged into a wetland.

- b. if so, will the discharge water be of the same salinity as the receiving wetlands?

Not Applicable. No wastewater or stormwater will be discharged into a wetland.

- 5.30 Will the proposed project result in the loss of any undisturbed natural habitat or public use of tidal waters? If so, how many acres?

The Project will occur in uplands zoned and used for Heavy Industrial operations, falling within the refinery's existing boundaries and within the area of actively operating refinery units. Therefore, the project will not result in the loss of any undisturbed natural habitat or public use of tidal waters.

The additional discharge to the Delaware River will not alter the current public use of the tidal waters of the Delaware River. For security purposes, the facility is fenced and guarded and public access to the Delaware River is not available on Site.

- 5.31 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? If so, list them.

Agency letters (United States Fish and Wildlife, and the National Marine Fisheries) indicate that there are no State or Federally threatened or endangered species present on the land based portion of the Site or within the vicinity of the Site. The Delaware River, in the vicinity of the Site supports both Atlantic sturgeon (*Acipenser oxyrinchus*), a species of local and regional concern, and the short-nosed sturgeon (*Acipenser brevirostrum*) a Federally Endangered species). This project will not affect these species of concern. Copies of the Agency's response letters have been provided as Attachment E (Section 2).

- 5.32 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).

This Project will not affect the species of concern mentioned in the response to question 5.31 above. This project does not require any construction in or adjacent to the Delaware River. In addition the

intake velocity from the Delaware will not be increased, resulting in no impact to the sturgeon. There are no known land-based threatened or endangered species present on or in the immediate vicinity of the facility.

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

Copy of the Agency letters stating that there are no known threatened or endangered species on, or in the vicinity of the Site, have been included in Attachment E (Section 2).

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

The proposed project does not require any filling, dredging or draining that could affect any waterways or wetlands.

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

No dredging is proposed as part of this Project.

Other Environmental Effects

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

The Project is not anticipated to generate any noticeable change in heat, glare, noise, vibration, radiation, electromagnetic interference, and odors.

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

None of the Project components are anticipated to have the potential to effect the environment outside of the fence-line and therefore, do not require the minimization or monitoring of potential environmental effects (heat, glare, noise, vibration, radiation, electromagnetic interference, or odors).

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

The facility is currently fenced and guarded for safety purposes and does not allow public access to the Delaware River.

- 5.39 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 and safety provisions planned for this project to minimize any accidents.

The proposed Project's potential to pollute could change in numerous ways in the unlikely event of a major mechanical malfunction or human error. However, the WGS+ operation is simple, reliable process.

The specific operational malfunction or human error would determine the specific result of the projects potential to pollute. To minimize the potential of a major equipment malfunction or human error, Premcor maintains its operations, maintenance and emergency response procedures on a unit-specific basis, and provides training to refinery personnel. Additional training will be provided to all appropriate plant personnel, following construction, but prior to operation of the Project facilities. This training will provide detailed maintenance, safety, operational, response procedures and a thorough evaluation of various scenarios involving operational equipment failures, as well as human error.

- 5.40 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.

The air, water, solid and hazardous waste streams, emissions, or discharges could change in numerous ways in the unlikely event of a major mechanical malfunction or human error. The specific operational malfunction or human error would determine the potential changes.

Operational failures and human error scenarios will be assessed during unit-specific training sessions, and appropriate response and mitigation procedures will be developed and implemented to address potential events.

The most likely changes to air, water, solid and hazardous waste streams, emissions, or discharges associated with a mechanical malfunction or human error are addressed below:

Air/Emissions: The most predictable event, could be a potential temporary increase in NO_x emissions associated with a malfunction at the new control device (WGS+) until the source of the problem could be diagnosed and corrected.

Water: A malfunction of the modified WWTP could result in an increase in nitrate loading to the Delaware River.

Solid/Hazardous Waste: Spent light bulbs constitute the waste stream generated by this Project. A process malfunction is not likely to impact the quantity of solid waste generated.

Discharges: The project does not require any new raw materials or produce a new product. However, the Project requires the storage of new treatment chemicals (sodium chlorite, sodium hypochlorite reagent solutions and sulfite slurry solution). Should a malfunction occur, the contents of the three new storage tanks could be released. These tanks will all be constructed and contained in accordance with Title 7 Del. C., Chapter 74A, *The Jeffrey Davis Aboveground Storage Tank Act* and with all associated Regulations (including secondary containment and release preparedness plans) thus significantly minimizing the potential for environmental impact.

PART 5B

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?

Circle one below:

YES

NO

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

PART 5C

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.

The Project will result in a significant decrease in air emissions and will only slightly increase discharges to the Delaware River. The detailed offset proposal is provided in the following sections and in the offset matrix provided as Attachment F (Section 2). Discussion of the impacts of this project is below.

Air Quality Impacts

This Project is a pollution control project which will, with the installation of WGS+, result in a 512.5 tpy decrease in potential NO_x emissions from the FCCU. There is no actual or potential increase in air emissions; therefore, no offsets are proposed.

The DCR is located within a non-attainment area for ozone. The removal of NO_x from air will reduce a known ozone precursor and thus move the geographic area closer to compliance with critical environmental air regulations. This reduction in NO_x emissions will result in a significant overall environmental benefit.

Water Quality Impacts

The Project will result in a 250 GPM/ 360,000 GPD increase in wastewater. This wastewater will contain 33, 6,846, and 1,267 tpy of nitrate, sulfate, and chloride, respectively. These increases represent a 3, 3.1, 0.08 percent increase above existing wastewater concentrations. The increase in concentration of these constituents is a direct result of the air project required by DNREC to reduce NO_x emissions from the FCCU CO Boiler (as required by Agreement). The increase in loading to the Delaware River is more than offset by the significant decreases in air emissions.

Based on the information provided in the following paragraphs, Premcor believes that the increased loading rates to the Delaware River will not result in a negative environmental impact to the Coastal Zone.

The DCR is located within Zone 5 of the Delaware River as designated by the Delaware River Basin Commission (DRBC). National, State and Delaware River Basin Commission. Water Quality Standards were reviewed for limits on nitrates, sulfites and chloride and no limits were identified for refining in Zone 5 of the Delaware River.

According to Part III Water Quality Regulations of the DRBCs Administrative Manual (amended through 27 September 2006) the following water uses are to be protected:

- **Industrial water supplies after reasonable treatment,**
- **Maintenance of resident fish and other aquatic life,**
- **Propagation of resident fish,**
- **Passage of anadromous fish,**
- **Wildlife**
- **Recreation**
- **Navigation**

The type and quantity of constituents added to the Delaware River as a result of this project are not expected to impact any of the above listed protected uses.

The DRBC has provided Stream Quality Objectives for the following metrics:

- **Dissolved Oxygen**
- **Temperature**
- **pH**
- **Phenols**
- **Threshold Odor Number**
- **Synthetic Detergents**
- **Radioactivity**
- **Bacteria**
- **Turbidity**
- **Alkalinity**
- **Toxic Pollutants**

Premcor will continue to meet the limits for these constituents (as applicable) as specified in their current NPDES permit.

The DRBC also suggests the following Effluent Quality Requirements:

- All wastes shall receive secondary treatment
- Disinfection
- Public Safety
- Limits on the following:
 - Suspended Solids
 - Oil and Grease – Industrial Wastewater Discharges (US EPA standards)
 - Allocation of Capacity
 - Intermittent Streams

The discharges from the Project will flow to the WWTP prior to being released to the Delaware River via Outfall 001. The wastewater generated by this Project will not require disinfection as it will not contain human excreta or disease producing organisms. The discharge will not result in a menace to public health or safety at the point of discharge. All limits specified in the NPDES for the listed parameters (as applicable) will be met. The allocation of capacity requirements and intermittent stream requirements are not applicable to the DRBC.

Constituent Loading

As described in the paragraph above, this Project will result in an increase in nitrates, sulfate, and chloride discharges to the WWTP and to the Delaware River.

Premcor has provided a mass balance of each constituent, to demonstrate how each constituent will move from the FCCU stack to the purge stream, from the purge stream to the wastewater treatment plant, and from the wastewater treatment plant back into the atmosphere or into the Delaware River. The mass balance is provided as Attachment G (Section 2).

The balance begins at the wet gas scrubber (WGS). The balance conservatively assumes no NO_x emissions from the WGS (i.e. all NO_x is removed from the stack gases). This assumption ensures maximum nitrate in the purge water from the WGS for the purpose of estimating effluent concentrations to the Delaware River. The purge water from the WGS combines with storm and process water from the facility and flows to the wastewater treatment plant (WWTP). Following treatment, the WWTP discharge (Outfall 601) combines with noncontact cooling water and recovered ground water and is discharged through Outfall 001 to the Delaware River.

The facility currently has a National Pollutant Discharge Elimination System (NPDES) permit (Permit Number DE 0000256) that imposes effluent limitations from the WWTP (Outfall 601) and the Delaware River (Outfall 001).

The facility does not currently have a concentration limit on nitrate, chloride or sulfate. Outfall 001 has a Total Residual Chlorine limit which is monitored once per week while chlorinating.

In the proximity of the Site, the Delaware River has a contributing freshwater flow of approximately 15,400 cfs. The concentration of nitrates, sulfide and chloride added to the Delaware at this location, after complete mixing in the Delaware River, are estimated to be 0.00 mg/L, 0.45 mg/L and 0.08 mg/L, respectively.

Premcor has evaluated the influence of the increase in loadings to the Delaware River and has provided the following reasons (by constituent) as to why the increases are not expected to cause environmental harm. Premcor does not anticipate any negative environmental impacts to result from the implementation of this project. Overall, this project will result in a net environmental benefit as a result of the significant decrease in potential NO_x emissions.

Nitrate

As noted above, there is no national water quality standard for nitrates. While nitrate (nitrogen) loading to the river is proposed to increase as a result of the project, the contribution from the 20 PPM FCCU NO_x project is very small (0.06 mg/L at Outfall 001). The total nitrate concentration in the DCR effluent, including the 20 PPM NO_x project is calculated to be 2.1 mg/L). The nitrate concentration in the Delaware River fluctuates around a mean value of 1.5 mg/L. To protect dissolved oxygen content in the Delaware River from decreasing, Delaware may set a Total Maximum Daily Load (TMDL) for total nitrogen of 3 mg/L (based on the 95th percentile of ambient data)¹. As indicated above, both the current total nitrogen concentration in Delaware River and the facility effluent (before and after implementation of the 20 PPM FCCU NO_x project) are less than the potential TMDL and will continue to be following implementation of the project. After complete mixing within the Delaware River, the incremental increase of nitrates from the 20 PPM FCCU NO_x project was calculated to add less than 0.003 mg/L to the

¹ Towards the Goal of Setting Nutrient Criteria For The Delaware Estuary – DRBC
Premcor DCR Upgrade and Optimization Project
Application for a Coastal Zone Permit

Delaware River. Back-up calculations and assumptions supporting the concentrations presented above are provided within Attachments D and G (Section 2).

As reported in The Delaware River Basin Commission document titled “Towards the Goal of Setting Nutrient Criteria for the Delaware Estuary”, the current nutrient concentrations (including nitrates) in the Delaware River are elevated but are not resulting in typical signs of eutrophication (i.e., fish kills, algal blooms, etc.) and the nutrient levels do not appear to result in other aquatic impacts. In addition, the nutrients in the River are being used effectively by downstream resources.

It is also very important to note that the DCR is located within a non-attainment area for ozone. The removal of NO_x from air will reduce a known ozone precursor and thus move the geographic area closer to compliance with critical environmental air regulations. This reduction in NO_x emissions will result in a significant overall environmental benefit.

The following bulleted items provide a clear indication that the incremental nitrate load to the Delaware River will not result in any harm to the environment over the present use:

- The Delaware River is not showing signs of eutrophication in spite of currently elevated nutrient levels;**
- The effluent concentration of nitrates from Outfall 001 at the DCR and the current nitrate concentrations in the Delaware River are below the proposed TMDL;**
- The increase in project-related nitrates to the Delaware River are negligible (0.06 mg/L) after complete mixing in the Delaware River (0.002 mg/L);**
- There is no national water quality standard for nitrates; and**
- The DCR is located within a non-attainment area for ozone and will be removing NO_x from the air; thus helping to achieve compliance with environmental air standards.**

Premcor concludes, based on a thorough evaluation of the data, that the incremental increase in nitrate concentration in the Delaware River will not cause any additional harm to the

environment over the present use. In fact, there will be a neutral impact on the Delaware River water quality and an environmental benefit to air quality.

No additional offsets beyond those provided by the air emission reduction project are proposed.

Sulfate

The DCR is located within an estuarine portion of the Delaware River. The typical concentration of sulfate in seawater is approximately 2,700 mg/L and freshwater typically contains sulfates at a concentration of 7 mg/L.

The stretch of the Delaware River near the DCR is comprised of brackish water, with the percentage of seawater present varying based on freshwater flow of the river and tidal effects. The daily average percentage of seawater in the river varies from a few percent up to over 25% during the course of the year. Further, daily variation around this average due to tidal effects can be as great as +/- 30 to 50% of the average value. (See Attachment H for summary of salinity data.)

Compared to the typical amounts and variability of seawater present in the river near the DCR, the estimated refinery effluent concentration of sulfates following this Project (420.7 mg/L) is well inside the range of sulfates in the river attributable to the presence of saltwater (up to 900+ mg/L).

The 20 PPM FCCU NO_x project will add 12.8 mg/L of sulfate to the current DCR effluent total. This quantity represents only a 3.1% increase over current loading. After total dilution within the Delaware River the additional sulfate concentration will be only 0.45 mg/L.

The following bulleted items provide clear indications that the incremental sulfate load to the Delaware River will not result in any additional harm to the environment over the present use:

- The total effluent concentration of sulfate at the DCR Outfall 001 following project implementation (420.7 mg/L) is essentially equivalent to the calculated salinity in the vicinity of the DCR (412 mg/L @ 15% Seawater/85% freshwater) and well within the range of sulfate fluctuation within the river (up to 900+ mg/L);
- The increase in project-related sulfates to the Delaware River is negligible (0.45 mg/L after complete mixing),

when compared to the sulfates due to salinity of the Delaware River in the vicinity of the DCR (up to 900 mg/L).

- There is no national water quality standard for sulfate.

Premcor concludes, based on a thorough evaluation of the data, that the project (including the incremental increase in sulfate) will not cause any additional harm to the environment over the present use. In fact, there will be a neutral impact on the Delaware River water quality and an environmental benefit to air quality.

No additional offsets beyond those provided by the air emission reduction project are proposed.

Chloride

Although there are no standards available for Zone 5 of the Delaware River, the Delaware River Basin Commission (DRBC) has developed chloride standards for Zones 2 and 3. The standards are 50 mg/L max 15-day average and 180 mg/L max 15-day average, respectively. The Zones for which the DRBC has developed criteria are more pristine than highly industrialized Zone 5. Although Premcor is in a highly industrialized area, the estimated chloride concentration to the Delaware (before mixing) is less than the standards for Zones 2 and 3. No offsets are proposed.

Premcor is currently required to monitor the pollutant loading at various frequencies depending on the pollutant and to report the results of the required monitoring to the DNREC monthly.

No additional offsets beyond those provided by the air emission reduction project are proposed.

Thermal Discharge

The total increase in potential thermal discharge is 360,000 GPD. As described in response to question 5.11, these sources will remain in compliance with the thermal discharge temperature limit of 110°F as stated in State Permit No. WPCC 325601/74-NPDES Permit No. DE 0000256. Because the Project-related thermal discharge will not increase the thermal discharge temperature to the Delaware River, no offsets are proposed.

Water Quantity

Additional process water will be required as a result of this Project. The additional water, beyond what can be provided from on-Site sources (i.e., recycled SWS water), or will be provided by the Delaware River via the current water supply vendor. The water supply vendor's primary resources are located within the Delaware River Water Basin. Although additional process water is required as part of the Project, the water will be returned to the Delaware River after treatment. The project does not require groundwater; therefore, there are no anticipated impacts to the local aquifers.

Because the necessary process water is being returned to the Delaware River following treatment, no offsets are proposed.

Solid Waste

The Project is expected to result in minimal additional quantities of solid waste (approximately 20 additional aviation light bulbs every four to five (4 – 5) years) (see Section 5.20). The additional solid waste will be treated in accordance with its RCRA Universal Waste classification.

The additional solid waste will be disposed of outside the Coastal Zone, therefore; there is no proposed impact to the Coastal Zone and no offsets are proposed for the slight increase in hazardous waste associated with this Project.

Other Environmental Effects

There may be a slight increase in heat, noise and vibration within the immediate vicinity of the new equipment; however, these increases are expected to be minimal and will not result in any impact outside the fence-line of the facility; therefore, no environmental offsets are proposed.

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

The WGS+ project, including the WWTP modification is proposed to occur in the second quarter of 2009.

- B. What will the environmental benefits will be and when they will be achieved.

The environmental benefit will be the reduction of 512.5 tons per year of permitted NO_x emissions in an area classified as severe non-attainment for ozone. The reductions will be

achieved immediately upon operation of the WGS+ system. The installation is proposed for the second quarter of 2009.

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

Premcor monitors air emissions at the facility; this monitoring will clearly demonstrate the reduction in NO_x emissions from the facility. Premcor will also monitor nitrate loading from Outfall 001 as required by their current NPDES permit.

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

Premcor will continue to monitor air emissions from the Facility as required by their current air permit. The success of this project and the proposed offsets will be seen in the short and long term in loading and emissions monitoring results. Premcor will also continue to monitor nitrate loading from Outfall 001 as required by their current NPDES permit.

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

There are no negative impacts associated with the offset project.

- F. 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 facility lies in an area where air quality has been adversely affected by numerous industrial operations. Because of this, the air quality in the region is one of the most pressing environmental concerns. Significantly decreasing air emissions from the Premcor facility will contribute to better air quality in the region. The reduction of air emissions constitutes the entire purpose of this project. To create this significant reduction in air emissions, Premcor is proposing an emission reduction strategy that requires an increase in nitrate, sulfate and chloride rates to the Delaware River.

Although Premcor does not believe that the potential increased nitrate loading rate without treatment would be significant, Premcor is incorporating a modification to the WWTP as part of the Project to reduce nitrate loading from the new stream by 80 to 90%.

Premcor believes that this project will result in a net environmental benefit within the Coastal Zone.

Air quality will be improved as a result of the project and the effects on water quality are negligible. Habitat/land Cover, aesthetics, and living resources are not affected by this project. Premcor believes this project is supportive of the Department's environmental goals and indicators.

The offset proposals must clearly and demonstrably* 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.

The applicant must complete the Coastal Zone Environmental Impact Offset Matrix. This matrix can be found on the same web site as this application. The matrix is found at 'CZA Matrix' just below this site. 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.

In the above, the entire offset proposal, including the matrix, shall be available to the public, as well as the evidence of past voluntary environmental enhancements.

* 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.

The Offset Matrix is provided as Attachment F (Section 2) of this application.

PART 6

ECONOMIC EFFECTS

Construction

The information provided in this section consists of rough estimates which are subject to change.

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

This project will require approximately 50 workers prior to the turnaround (30 from Delaware) and 150 for the turnaround, 30 from Delaware).

- 6.2 Estimate the weekly construction payroll.

The estimated weekly payroll is estimated to be \$300,000/week pre-turnaround and \$1,575,000 per week during the turnaround.

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

A rough estimated value of construction supplies and services to be purchased in Delaware is estimated to be 8,020,000 (+/- 50%).

- 6.4 State the expected dates of construction initiation and completion.

The Project may be initiated in 2008 and completed by 2009.

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

There is no anticipated negative economic impact associated with the loss of natural habitat, air quality or water.

The project will decrease the potential NO_x emissions from the facility by approximately 512.5 tons per year.

As previously described, the project will increase water use from the Delaware River but will remain within the currently permitted limits. The additional cooling water and process water requirements are not

expected to result in any exceedances of the State Water Quality Standards, and the discharge to the Delaware River will meet the requirements of the refinery NPDES Permit. The water quality of the Delaware River will not be degraded and will not impact any potential water-dependent businesses.

Operations

- 6.6 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.

It is not currently expected that any permanent employees will be hired as a result of the Project.

- 6.7 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.

No permanent employees are expected to be hired as a result of the Project.

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

It is not anticipated that any permanent employees will be hired as a result of the Project.

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

The estimated taxes associated with the project have not yet been determined. Taxes will be based on the actual capital cost of the project. The final project cost has not yet been determined.

PART 7

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:

The Project will not require any of the following support facilities or services, except where noted.

Roads
Bridges
Piers and/or docks

Railroads – As described previously, the Project may include the installation of a new siding for unloading of the new chemicals. Premcor would use existing spurs.

Microwave towers
Traffic signals
Special fire protection services not now available

Pipelines – The project will require additional pipes to be run from the new tanks to the WGS+ system. The Project will require 400 feet of Teflon-lined pipe for the two reagent lines and 250 feet of carbon steel piping from the sulfite storage tank. These new lines will be constructed aboveground on an existing rack and will not require any land disturbance.

Sewer expansion – Aside from the tie in from the new impervious surfaces (truck unloading area, tank secondary containment, railcar siding) there will be no modification to the facility sewer system. It is anticipated that the stormwater to the existing system will conservatively increase by approximately 1,600 GPD. The facility currently has the capacity to manage this additional load.

Energy related facilities expansion – None of the proposed projects will require a physical energy related facilities expansion; however, the project will require a minimal increase in steam and electrical use. The additional steam and electrical requirements will come from existing on-site sources.

PART 8

AESTHETIC EFFECTS

The proposed project is to occur solely within the existing footprint of the refinery boundary. All new and modified facilities will be consistent with the current aesthetics at the facility (i.e., heavy industrial); therefore, there will be no aesthetic change in the facility's current appearance.

- 8.1 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 DCR. Project equipment will be installed within existing structures within the current footprint of the facility and will not be visible from a residential area, public park, or other public meeting place. The new tanks will not be visible from a public road. The approximate 30 to 40-foot increase in stack height may be visible from a public road; however, height of this stack is lower than other on-Site stacks (i.e., this stack won't stand out from the overall aesthetic of the facility). To passerby the new facilities would likely be indistinguishable from the existing facility.

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

Chelsea, a privately owned domestic single dwelling recognized for its architecture and engineering, is listed on the National Register of Historic Places. Chelsea is located approximately 0.7 miles from the Site. This domestic dwelling will not be impacted as a result of the proposed Project.

- 8.3 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.

The Project will be aesthetically compatible with the existing facility and the surrounding land use and will not stand out to the public. Due to the compatibility of the Project to the existing land use, landscaping and screening are not proposed.

PART 9

EFFECTS ON NEIGHBORING LAND USES

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

The nearest year-round resident to the refinery is more than one mile from the DCR.

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

The Project will be completely located within the property boundaries of the refinery and will not affect use of existing public or private recreational facilities or resources.

- 9.3 Will the proposed project utilize or interfere with agricultural areas?

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

- 9.4 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 affect existing businesses, commercial or manufacturing uses. Local commercial establishments may benefit as a result of the temporary influx of workers required to support the project.

If applicable, the applicant needs to comply with 7 Del. Code, Chapter 79, as part of this application.

CERTIFICATION BY APPLICANT

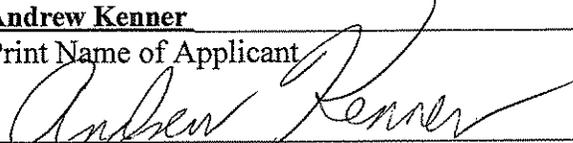
I hereby certify that all the information contained in this Permit Application and in any attachments is true and complete to the best of my belief.

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 .

Andrew Kenner

Print Name of Applicant


Signature of Applicant

Vice President and General Manager

Title

12/27/07
Date

Cza-p-applic-03

Section 2 - Attachments

*Attachment A – Project
Description
(Section 2 from Air Permit
Application Submitted June 1,
2007)*

The DCR 20 PPM FCCU NO_x Project does not include any proposed changes to the FCCU operation or capacity. Therefore, there are no impacts on the FCCU feed streams, product streams, heaters, tank throughputs, product handling or fuel usage. The unit operations described in this section will focus on upstream, downstream and ancillary units that may be affected or impacted by the modifications at the FCCU WGS. The primary modification proposed for the FCCU:

- Install new Wet Gas Scrubbing Plus (WGS+) technology downstream of the existing Belco WGS and Cansolv Absorber.

Potential emission changes resulting from the proposed modifications, including associated units, are discussed in Section 3 and are included in the permitting analysis. The changes are only to equipment which handles the flue gas from the FCCU regenerator and the FCCU reactor and regenerator will not be modified as part of this project. The following sections provide a detailed description of the FCCU regenerator flue gas flow path and proposed modifications for the proposed project.

2.1

FCCU CO BOILER

The FCCU CO Boiler is used to recover chemical energy from the FCCU regenerator flue gas stream. In the FCCU CO Boiler, CO and any other incompletely combusted species in the FCCU regenerator flue gas stream are subjected to further combustion. The heat from this exothermic process is captured through the generation of 600 psi steam. In compliance with the Agreement, in 2006, DCR installed Low NO_x burners (LNB) in the FCCU CO Boiler to reduce NO_x emissions.

From the CO Boiler, the gas flows to an existing Belco WGS and Cansolv absorber for control of SO₂ and particulates. To further reduce NO_x emissions from the FCCU CO Boiler effluent gas, Premcor will be installing the WGS+ process.

2.2

WET GAS SCRUBBING PLUS (WGS+)

The WGS+ process incorporates NO_x control following the existing Belco WGS and Cansolv absorber. A process flow diagram is provided in Attachment B, along with a site map showing the location of the proposed project.

WGS+ will be installed into an expanded (lengthened) scrubber vessel downstream of the SO₂ and particulate removal steps. The WGS+ process reduces NO_x from the FCCU flue gas through a process which first oxidizes and partially scrubs NO with an oxidant and then provides additional absorption and reaction of the oxidized NO₂.

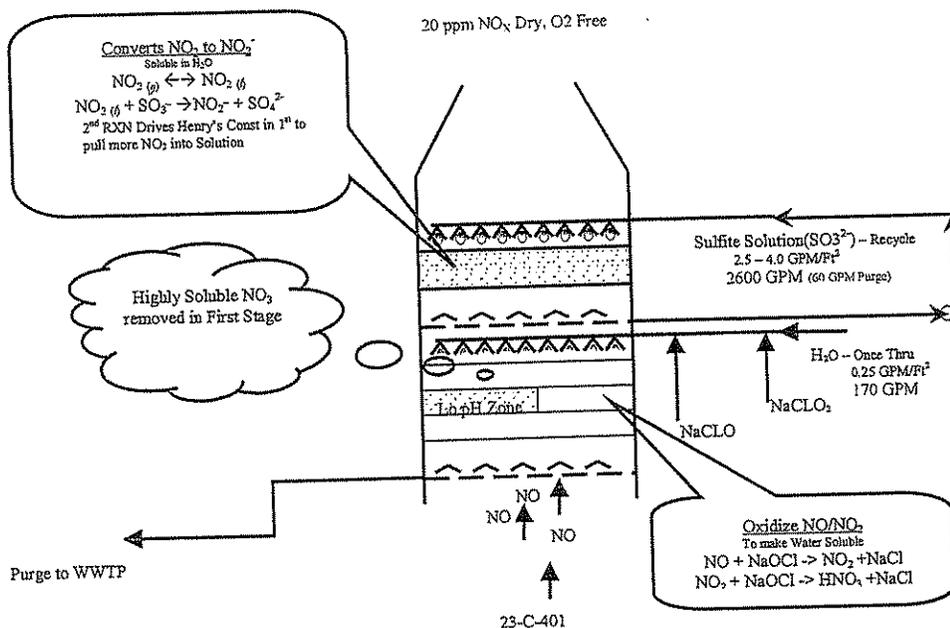
In the first stage of WGS+, a 10 foot section of Koch-Glitch Flexipack provides a contact area for the oxidization of NO with a once-through mix of fresh makeup water, sodium hypochlorite and sodium chlorite. This oxidizing reagent solution is uniformly distributed above the packing through spray distribution piping and spray nozzles. The liquor from this oxidizing section is collected on and removed from new chimney tray.

An additional absorption section and chimney tray, including an additional 10 foot section of grid, is added above this oxidizing section to provide for high NO_x removal efficiency. A solution (buffer solution with sodium sulfite, bisulfite, and sulfates), which enhances the NO_x removal in this stage, is sprayed on the absorption section uniformly through spray nozzles. A chevron demister is provided above the packing to minimize entrainment of small droplets generated by the spray nozzles.

The reaction liquid stream from the top, absorption grid, which is a nitrate-rich spent solution, is collected on the upper chimney tray and routed into a recirculation tank for reuse. A small purge stream is also taken and added to the once-through solution from the oxidation section. The total purge stream of approximately 250 gallons per minute (gpm) of purge water is sent to the existing wastewater treatment plant (WWTP).

Figure 2-1 provides a visual depiction of the system and associated chemistry.

Figure 2-1 WGS+ Process Schematic



Note: All process flow information shown in Figure 2-1 is preliminary and will be updated during design phase.

The required sodium chlorite and sodium hypochlorite reagent solutions will be purchased and stored in new aboveground storage tanks (ASTs). These tanks will be registered as applicable per Title 7 Del. C., Chapter 74A, *The Jeffrey Davis Above Ground Storage Tank Act*.

The required sulfite slurry solution will be stored in a new AST. This tank will be registered as applicable per Title 7 Del. C., Chapter 74A, *The Jeffrey Davis Above Ground Storage Tank Act*. An evaluation is underway to determine if the sulfite solution will be purchased or generated on-site.

2.3

FUGITIVE EMISSION COMPONENTS

There are no new fugitive emissions associated with the DCR 20 PPM FCCU NO_x Project. There is no proposed change to the FCCU operation or capacity. Therefore, there are no impacts on the FCCU feed streams, product streams, heaters, tank throughputs, product handling or fuel usage. New equipment (tanks and associated piping) being added will only handle inorganic reagents and will not be sources of fugitive emissions.

2.4 **ANCILLARY EMISSION UNITS**

The DCR 20 PPM FCCU NO_x Project does not include any proposed changes to the FCCU operation or capacity. Thus, associated downstream units including process heaters and crude, intermediate, and product storage will not experience an increase in emissions as a result of this project.

Incremental fresh water demand associated with the DCR 20 PPM FCCU NO_x Project is outlined below. Additionally, the incremental load to the WWTP is also outlined.

2.4.1 **Fresh Water Demand**

Premcor estimates that an additional flow of approximately 250 gpm will be required for the WGS+ system. The additional flow is expected to come from purchased water. There is no impact on the existing cooling water capabilities of the refinery and therefore, no associated emissions.

2.4.2 **Purge Water to WWTP**

The approximate 250 gpm purge from the WGS+ system will contain no organics and thus no VOCs or associated air emissions. The incremental water flow to the WWTP can easily be handled within current operations.

2.5 **PRELIMINARY PROJECT SCHEDULE**

Table 2-1 provides a preliminary project schedule for the DCR 20 PPM FCCU NO_x Project. This project schedule is a preliminary estimate and is subject to updates as planned construction/operation is authorized, started, and completed. However, any changes to the schedule will fully recognize the requirements of the Agreement.

Table 2-1 **Preliminary Project Schedule for the DCR 20 PPM FCCU NO_x Project**

PLANNED WORK	ESTIMATED START DATE
WGS+ Upgrade Begins	2 nd Quarter 2008
FCCU T/A	2 nd Quarter 2009
Startup of NO _x Control Equipment	May 2009

*Attachment B – MSDS for
Sodium Sulfite, Bleach (Sodium
Hypochlorite), and Sodium
Chlorite*



1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sodium Bisulfite Solution **Formula:** NaHSO₃ **Molecular Weight:** 104.06
Chemical Name: Sodium Bisulfite **Chemical Family:** Bisulfite, sodium salt
Synonyms: Sodium Bisulphite, Aqueous Solution; Sodium Hydrogen Sulfite; Sodium disulfite; Sulfurous acid, monosodium salt; Sodium acid sulfite
Product Use: For the manufacture of perfume, pharmaceuticals, photochemicals, bleaching agent, and papermaking.

Chemtrade Logistics
111 Gordon Baker Road
Suite 301
North York, ONT
M2H 3R1
(416) 496-5856
1-866-887-8805

Chemtrade Logistics
11450 Cherrier Street
Montreal East, PQ
H1B 1A6
1-888-840-4720

Emergency Telephone Number
Chemtrec 1-800-424-9300
Canutec (613) 996-6666

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Hazardous Ingredients</u>	% by Wt.	CAS Number
Sodium Bisulfite	35 - 44%	7631-90-5
<u>Non-Hazardous Ingredients</u>		
Water	56 - 65%	7732-18-5

3. HAZARD INFORMATION

EMERGENCY OVERVIEW:

Δ **Danger!** Contains material, which causes damage to the following organs: mucous membranes, respiratory tract, skin, eye, lens or cornea. Incompatible with acids and oxidizers (acidification will liberate sulfur dioxide gas). Thermal decomposition products are corrosive and/or toxic and include oxides of sulfur.

Sodium Bisulfite is a clear, colorless to light yellow liquid with distinctive odor. Pungent odor of Sulfur Dioxide.

Hazardous Material Information System (U.S.A.)

Health	*	2
Fire Hazard		0
Reactivity		0
Personal Protection		C

National Fire Protection Association (U.S.A.)





Sodium Bisulfite, Solution

3. HAZARD INFORMATION (continued)

POTENTIAL HEALTH EFFECTS:

	ACGIH (TLV)(2003)	NIOSH REL (2001)	OSHA PEL (1989)
Sodium Bisulfite	5 mg/m ³ (TWA)	5 mg/m ³ (TWA -10 hrs)	Δ 5 mg/m ³ (TWA)

In contact with the skin: Sodium Bisulfite may cause symptoms of skin irritation such as reddening, swelling, rash, scaling or blistering.

In contact with the eyes: Vapors from this product are irritating to the eyes. This product causes irritation, redness, and pain. May cause burns if left untreated.

Inhaled: Product is irritating to the nose, throat and respiratory tract.

Ingested: May cause allergic reaction in some asthmatics. Ingestion of large amounts may cause nausea, gastrointestinal upset and abdominal pain. May cause central nervous system(CNS) depression, nausea and vomiting, diarrhea, violent colic and death.

Long Term Exposure:

Existing Medical Conditions Possibly Aggravated By Exposure: Breathing of fumes may aggravate acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis. May cause allergic reactions in sulfide sensitive individuals.

Carcinogenicity Data:

Sodium bisulfite is not classified by NTP (National Toxicology Program), not regulated as carcinogenic by OSHA (Occupational Safety and Health Administration), and has been evaluated by IARC (International Agency for Research on Cancer) as a Group 3 (are not classifiable as to their carcinogenicity to humans). ACGIH (American Conference of Governmental Industrial Hygienists) classifies it as an A4= Not classifiable as a human carcinogen.

4. FIRST AID MEASURES

Precaution: Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

Skin contact: Flush skin with running water for a **minimum** of 20 minutes. Start flushing while removing contaminated clothing. If irritation persists, repeat flushing. Obtain medical attention **IMMEDIATELY**. Do not transport victim unless the recommended flushing period is completed or flushing can be continued during transport.



Sodium Bisulfite, Solution

4. FIRST AID MEASURES (continued)

For minor skin contact, avoid spreading material on unaffected skin. Discard heavily contaminated clothing and shoes in a manner which limits further exposure. Otherwise, wash clothing separately before reuse.

Eye contact: Immediately flush eyes with running water for a **minimum** of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention **IMMEDIATELY**. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

Inhalation: Move victim to fresh air. Give artificial respiration **ONLY** if breathing has stopped. Give Cardiopulmonary Resuscitation (CPR) if there is no breathing **AND** no pulse. Obtain medical attention **IMMEDIATELY**.

Ingestion: **DO NOT INDUCE VOMITING.** If victim is alert and not convulsing, rinse mouth and give ½ to 1 glass of water to dilute material. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. **IMMEDIATELY** contact local poison control centre. Vomiting may need to be induced but should be directed by a physician or a poison control centre. **IMMEDIATELY** transport victim to an emergency facility.

5. FIRE FIGHTING MEASURES

Flash Point (method): Not applicable, product is non-flammable

Autoignition Temperature: Not combustible

Flammability Limits in air(%): UEL: Not applicable LEL: Not applicable

Fire Extinguishing Media: For small fires use dry chemical, carbon dioxide or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam or flood fire area with water. Do not get solid stream of water on spilled material.

Special Fire Fighting Procedures: Oxides of Sulfur may be present during a fire. Use self-contained breathing apparatus and full protective clothing are recommended. Gas tight suits are required in extreme (>1000 ppm) concentrations of Sulfur dioxide. Evacuate residents who are downwind of fire. Prevent unauthorized entry to fire area. Dike area to contain runoff and prevent contamination of water sources. Neutralize runoff with lime, soda ash or other suitable neutralizing agents (see Deactivating Chemicals, Section 6). Cool containers that are exposed to flame with streams of water until fire is out.

Other Fire or Explosion Hazards: Thermal decomposition products are toxic and include oxides of Sulfur. Sodium sulfide may be formed after dried solution residues are heated. This is an explosive hazard and strongly alkaline in contact with water.



6. ACCIDENTAL RELEASE MEASURES

Steps to be taken in the event of a spill or leak: Remove all ignition sources. Ventilate area. Use appropriate Personal Protection Equipment. Prevent liquid from entering sewers or waterways. Dike with inert material (sand, earth, etc.). Stop or reduce leak if safe to do so. Collect into containers for reclamation or disposal only if container is suitable to withstand the material. Consider insitu neutralization and disposal. Ensure adequate decontamination of tools and equipment following clean up. Comply with Federal, Provincial/State and local regulations on reporting releases.

Deactivating Chemicals: Alkali materials such as dilute sodium hydroxide, Lime, limestone, sodium carbonate (soda ash), sodium bicarbonate, dilute aqua ammonia. Sulfur dioxide may be released during neutralization.

Waste Disposal Methods: Dispose of waste material at an approved waste treatment/disposal facility, in accordance with applicable regulations. Do not dispose of waste with normal garbage or to sewer systems.

Note - Clean-up material may be a RCRA Hazardous Waste on disposal.
- Spills are subject to CERCLA reporting requirements: RQ = 5000 lbs (2270 kg)

7. HANDLING AND STORAGE

Precautions: Wear appropriate Personal Protection Equipment. Keep ignition sources away from Sodium Bisulfite storage, handling and transportation equipment. Keep containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled. **Do not expose to strong acids as this will liberate sulfur dioxide gas.**

Handling Procedures and Equipment: Rubber lined carbon steel or certain stainless steel materials are suitable for use. Contact CHEMTRADE LOGISTICS for specific recommendations when handling Sodium Bisulfite.

Storage Temperature: Store above freezing point (Section 9). Ideal storage temperatures are between and 20 and 27 degrees Centigrade.

Storage Requirements: Store in corrosion-proof area away from incompatible substances. Store in tightly closed container, preferably the supplier container. Store in a cool, well, ventilated location away from heat, sparks and flames. Storage tanks should be constructed from polyethylene, polypropylene, fiberglass-reinforced plastic (FRP), cross-linked polyethylene (XLPE), or 316 stainless steel to avoid corrosion problems. Tanks should be vented into an alkaline fume recovery system or scrubber. Storage tanks should be protected from water ingress, and maintained structurally in a safe and reliable condition.

Other Precautions: On exposure to air the product will lose some sulfur dioxide and gradually oxidize to sulfate. Both acidification and heating accelerate the release of sulfur dioxide fumes.



8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Recommendations listed in this section indicate the type of equipment which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

Δ Engineering Controls: Provide exhaust ventilation or other controls to keep the airborne concentrations of vapors below their respective occupational exposure limits. Ensure the eyewash stations and safety showers are proximal to the workstation location.

Respiratory Protection: A NIOSH/MSHA approved air-purifying respirator equipped with acid gas/fume, dust, mist cartridges for concentrations up to 50mg/m³ or 20 ppm as sulfur dioxide. A powered air-purifying respirator with acid gas cartridges for up to 50 ppm sulfur dioxide. A full-facepiece air-supplied respirator if concentrations are for up to and higher than 100 ppm sulfur dioxide.

Skin Protection: Impervious (i.e., neoprene, PVC, rubber) gloves, coveralls, boots and/or other acid resistant protective clothing.

Eye Protection: Tight-fitting chemical goggles and face shield.

Other Personal Protective Equipment: Where there is a danger of spilling or splashing, acid resistant aprons or suits should be worn. Trouser legs should be worn outside (not tucked in) rubber boots. Safety showers and eyewash fountains should be installed in storage and handling areas.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid

Appearance and Odour: Clear, colourless to light yellow liquid with distinctive odour. Pungent odour of Sulfur dioxide.

Odour Threshold: No data

Boiling Point: 104°C (220°F)

Melting/Freezing Point: Approximately 6°C (43°F)

Vapour Pressure: 32 mmHg at 20°C, 78 mm Hg (10.4 kPa) at 37.7°C

Specific Gravity at 25°C (77°F) 1.33 for 38%

Δ Vapour Density: (Air=1): Highest known value is 0.62 (Air=1) (Water)

Bulk Density: Not applicable (see specific gravity)

Evaporation Rate: Not applicable

Solubility: Miscible in all proportions in water.

pH: 3.8 to 5.2



10. STABILITY AND REACTIVITY

Stability: Under Normal Conditions: On exposure to air the product will lose some sulfur dioxide and gradually oxidize to sulfate. Under Fire Conditions: Decomposes to form oxides of sulfur.

Conditions to Avoid: High temperatures, sparks, open flames and all other sources of ignition. Temperatures at or near boiling point causes evolution of Sulfur dioxide.

Materials to Avoid: Strong oxidizers, may cause strong exothermic reaction. Lewis or mineral acids (acidification will liberate sulfur dioxide gas).

Hazardous Decomposition or Combustion Products: Thermal decomposition products are toxic and include oxides of Sulfur.

Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

<u>Ingredient Name</u>	<u>Test</u>	<u>Result</u>	<u>Route</u>	<u>Species</u>
Δ Sodium Bisulfite Solution	LD50	2000 mg/kg	Oral	Rat

Carcinogenicity Data: Sodium bisulfite is not classified by NTP (National Toxicology Program), not regulated as carcinogenic by OSHA (Occupational Safety and Health Administration), and has been evaluated by IARC (International Agency for Research on Cancer) as a Group 3 (are not classifiable as to their carcinogenicity to humans). ACGIH (American Conference of Governmental Industrial Hygienists) classifies it as an A4 = Not classifiable as a human carcinogen.

Reproductive Effects: Not available

Mutagenicity Data: Evidence of mutagenic activity in bacteria, microorganisms, and DNA.

Teratogenicity Data: Not available

Synergistic Materials: None known



12. ECOLOGICAL INFORMATION

Ingredient Name	Species	Period	Result
Sodium Bisulfite Solution	Mosquito fish. (LC50)	96 hour(s)	240 ppm

Products of Biodegradation : These products are sulfur oxides (SO₂, SO₃). Some metallic oxides.
Toxicity of the Products of Biodegradation : The products of degradation are toxic.

13. DISPOSAL CONSIDERATIONS

- Responsibility for proper waste disposal is with the owner of the waste. Work with the appropriate regulatory bodies to ensure compliance with regulations.
 - Consider the collection of residual Sodium Bisulfite into containers for reclamation or disposal only if the container is suitable to withstand the material.
 - Consider insitu neutralization and disposal.
 - Clean-up material may be a RCRA Hazardous Waste on disposal.
 - Provincial/State or local regulations or restrictions are complex and may differ from Federal regulations.
 - The information applies to the material as manufactured; processing, neutralizing, use or contamination may make the information inappropriate, inaccurate or incomplete.
-

14. TRANSPORT INFORMATION

U.S. (Under DOT)

Shipping Name: RQ, Bisulfites, aqueous solutions, n.o.s.
Hazard Class or Division: 8
Product Identification No. (PIN): UN 2693
Packing Group: III
Reportable Quantity (RQ) = 5000 lbs (2270kg)

Canada (Under TC)

Shipping Name: Bisulfite, aqueous solution, n.o.s. (sodium bisulfite)
Classification(s): 8
Product Identification No. (PIN): UN 2693
Packing Group: III

Δ ERG 154



15. REGULATORY INFORMATION

U.S.A.

SARA Title III HAZARD CATEGORIES AND LISTS

<u>Product Hazard Categories</u>		<u>Lists</u>	
Acute (Immediate) Health:	Yes	Extremely Hazardous Substance (40 CFR 355, SARA Title III Section 302)	n/a
Chronic (Delayed) Health:	No	CERCLA Hazardous Substance (40 CFR 302.4)	Yes
Fire:	No	Toxic Chemical (40 CFR 372.65, SARA Title III Section 313)	Yes
Reactivity:	No		
Sudden Release of Pressure:	No		

Reportable Quantity (RQ) under U.S. EPA CERCLA: RQ=5000 lb

TSCA Inventory Status: Reported/Included

Right-To-Know: Illinois, Massachusetts, New Jersey, Pennsylvania

Δ California prop. 65: No products were found.

CANADA

Workplace Hazardous Materials Information System (WHMIS)

Δ WHMIS Classification(s): Class D-2B Material causing other toxic effects (TOXIC)
Class E – Corrosive

CEPA DSL: All components listed.

Δ WHMIS Health Effects Index: Corrosive Material
Sensitizing Material

WHMIS Ingredient Disclosure List: Confirmed A; Meets criteria for disclosure at 1% or greater.

EINECS Number: 231-548-0

16. OTHER INFORMATION

Additional Information and References

1. "CHEMINFO" through "CCINFOdisc", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada, Aug 1999.
2. CHEMLIST, American Chemical Society, Nov 1999.
3. DOSE, Royal Society of Chemistry, Aug 1999
4. **HSDB-Hazardous Substances Data Bank** , through "CCINFO disc", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada, (November, 1999).
5. RTECS- Registry of Toxic Effects of Chemical Substances, On-line search, Canadian Centre for Occupational Health and Safety RTECS database, Aug 1999.
6. Transportation of Dangerous Goods Act and Regulations, Canadian Centre for Occupational Health and Safety, Aug 1999.
7. Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, 1999.

Revision Indicators:

Δ in the left margin indicates a revision or addition of information since the previous issue.



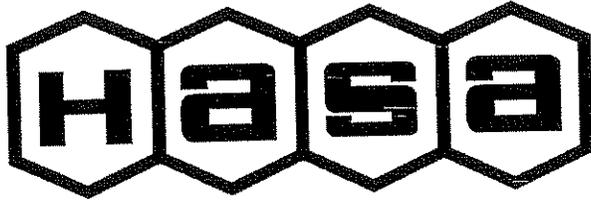
16. OTHER INFORMATION (continued)

Legend:

CAS #	- Chemical Abstracts Service Registry Number
CERCLA	- Comprehensive Environmental Response, Compensation, and Liability Act
CFR	- Code of Federal Regulations
DOT	- Department of Transportation
EPA	- Environmental Protection Agency
LC ₅₀	- The concentration of material in air expected to kill 50% of a group of test animals
LD ₅₀	- Lethal Dose expected to kill 50% of a group of test animals
LEL	- Lower Explosive Limit
MSHA	- Mine Safety and Health Administration
NIOSH	- National Institute for Occupational Safety and Health
PEL	- Permissible Exposure Limit
PVC	- Polyvinyl chloride
RCRA	- Resource Conservation and Recovery Act
SARA	- Superfund Amendments and Reauthorization Act of the U.S. EPA
STEL	- Short Term Exposure Limit
TC	- Transport Canada
TDG	- Transportation of Dangerous Goods Act/Regulations
TLV	- Threshold Limit Value
TSCA	- Toxic Substances Control Act
TWA	- Time-Weighted Average
UEL	- Upper Explosive Limit

Prepared by Chemtrade Logistics 1-866-887-8805

The information contained herein has been prepared by CHEMTRADE LOGISTICS Inc. and is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and CHEMTRADE LOGISTICS Inc. will not be liable for any damages, losses, injuries or consequential damages that may result from the use or reliance of any information contained herein.



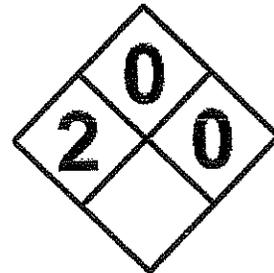
12.5% SODIUM HYPOCHLORITE SOLUTION

Material Safety Data Sheet

Emergency 24 Hour Telephone: CHEMTREC 800.424.9300

Corporate Headquarters:

Hasa Inc.
23119 Drayton Street
Saugus, California 91350
Telephone • 661.259.5848
Fax • 661.259.1538



HASA 12.5% SODIUM HYPOCHLORITE SOLUTION
 Material Safety Data Sheet MSDS No. 106

IDENTIFICATION OF PRODUCT

Product Name:	HASA 12.5% Sodium Hypochlorite Solution
Common Chemical Names:	Hypochlorite solution sodium salt, sodium hypochlorite
Chemical Names of Ingredients [$>1.0\%$ by weight]:	Sodium hypochlorite
Chemical Family:	Inorganic halogen compound
CAS Registry Number:	7681-52-9
Empirical Formula:	NaOCl
Molecular Weight:	74.45

PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure:	12.1 mm Hg at 20°C [12.5% solution]	Flash Point:	Not Applicable.
Weight/Gallon:	10.0 lbs. (4.54 kg.)	pH:	11.2 – 11.4
Density [liquid]:	1.20 at 20°C (68°F)	Odor:	Slight Bleach
Bulk Density:	Not Applicable.	Boiling Point:	Decomposes
Melting Point:	Not Applicable.	Freezing Point:	-20° Fahrenheit
Physical State:	Liquid Solution	Color:	Straw Yellow
Solubility in Water:	Complete	Stability:	Stable

PHYSICAL HAZARDS

Potential for Fire:	None. Nonflammable and combustible liquid.
Potential for Explosion:	None. Nonflammable and combustible liquid.
Reactivity:	Violent reactions with amines, ammonium aldehyde, ammonium carbonate, aziridine, methanol, phenylacetonitrile, ammonium nitrate, ammonium oxylate, ammonium phosphate, cellulose, ethylene imine. Do not mix acids, aqua ammonia, or other organic or inorganic chemicals with this product.

HEALTH HAZARDS	
Signs and Symptoms of Exposure:	Eyes and skin irritation. Chemical burns to broken skin.
Medical Conditions Aggravated by Exposure:	No data available.
Oral [ingestion] LD ₅₀ :	No data available.
Dermal [skin absorption] LD ₅₀ :	No data available.
Inhalation [breathing] LC ₅₀ :	No data available.
Eye Irritation:	Irritating. May cause eye damage.
Skin Irritation:	Mild irritation. Not considered to be a skin sensitizer.
OSHA PEL:	None established.
ACGIH TLV/TWA:	None established.

POTENTIAL ROUTE [S] OF ENTRY	
Inhalation [Breathing]:	Unlikely to occur. Vapor may cause irritation to upper respiratory tract.
Dermal [Skin]:	Contact with broken skin may cause burning, blistering, and tissue destruction if not washed off immediately.
Eyes:	Corrosive to eyes.
Ingestion:	Not anticipated. May cause severe chemical burns to esophagus and to stomach lining.

CARCINOGENIC [CANCER POTENTIAL] INFORMATION	
National Toxicological Program [NTP] <i>Sixth Annual Report on Carcinogens:</i>	Not listed.
<i>International Agency for Research on Cancer [IARC] Monographs, V. 1-53, Supps. 1-8:</i>	Not listed.
Listed by Federal OSHA as Carcinogens:	Not listed.
<p>Safe Drinking Water and Toxic Enforcement Act of 1986 [Proposition 65, California only]: Small quantities – less than 100 ppm (parts per million) – of impurities, including bromates, may be found in all chlorinating products, including this product. Bromates are derived from bromides, which are present in sodium chloride (table salt) from which chlorine is manufactured. Additional small quantities of bromates may be generated during the disinfection process. Bromates are known by the State of California to cause cancer when administered by the oral (drinking or ingesting) route. Read and follow label directions and use care when handling or using this product. The US Environmental Protection Agency has established a maximum contaminant level (MCL) for bromates in drinking water at 10 ppb (parts per billion). Application of this product in accordance with label directions at use dilution will not exceed this level.</p> <p>This warning is provided pursuant to Proposition 65, the Safe Drinking Water and Toxic Enforcement act of 1986, Chapter 6.6 of the California Health and Safety Code, which requires the Governor of California to publish a list of chemicals “known to the state to cause cancer or reproductive toxicity.” This list is compiled in accordance with the procedures established under the proposition, and can be obtained on the internet from California’s Office of Environmental Health Hazard Assessment at http://www.oehha.ca.gov. There are over 700 chemical substances on this list.</p>	

GENERAL PRECAUTIONS FOR SAFE USE AND HANDLING

Open containers carefully. Sodium hypochlorite solutions are packaged with vented closures. Do not use containers which are leaking or show evidence of having leaked. Mix only with water. Do not mix with other chemicals. Use clean, dry utensils when mixing. Do not discharge this product or mixtures of this product into lakes, streams, ponds, bays, estuaries, or the ocean. Sodium hypochlorite is toxic to aquatic organisms at very low levels.

PERSONAL PROTECTION AND HYGIENE

Wear goggles or face shield and rubber gloves when handling. Remove and wash contaminated clothing before reuse. Wash hands after handling.

CLEAN-UP OF SPILLS

Store this product in a cool, dry area, away from sunlight and heat to avoid deterioration. In case of spill, flood area where spill has occurred with large quantities of water. With permission from local authorities, diluted product may be flushed to a sanitary sewer. Product may also be absorbed with sand or diatomaceous earth. Absorbed products must be disposed of in accordance with applicable Federal, State, and/or local regulations. Contact HASA, Inc. for guidance.

FIRST AID

Eye Contact:	Flush with water. Remove contact lenses [if applicable]. Hold eyelids open. Continue flushing with water for 15 minutes. Get prompt medical attention.
Skin Contact:	Wash affected area with water for 15 minutes. Get medical attention.
Ingestion [swallowing]:	Drink large quantities of milk or gelatin solutions. If these are not available drink large quantities of water. DO NOT induce vomiting. DO NOT give vinegar or other acids. Get prompt medical attention.

FEDERAL/STATE LISTS/REGISTRATION/S/REPORTING REQUIREMENTS

CERCLA Hazardous Substance [Section 1010 [4], P.L. 96-510]:	RQ=100 lbs [80 gallons for 12.5% solution]
Extremely Hazardous Substance [40 CFR 355, Appendix A]:	Not listed.
Pesticide Product 7 U.S.C. 136 et seq.:	Registered as a pesticide product by Federal EPA.
Toxic Substance under TSCA:	Not reported.
Pesticide Product [various State Laws]:	Registered as pesticide product in states where marked.

MATERIAL CLASSIFICATION

OSHA Hazard Communication Standard, Department of Labor, Occupational Safety and Health Division, 29 CFR 1910.1200:	Irritant
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Hazardous Materials Transportation Regulations, Department of Transportation (Federal) 49 CFR 172.101	
Proper Shipping Description [1 gallon or less]:	Consumer Commodity, ORM-D
Proper Shipping Description [greater than 1 gallon]:	Hypochlorite Solutions, 8, UN1791, P.G. III

National Fire Protection Association NFPA 704 [1990]:	2-0-0
BOCA National Fire Prevention Code/National Building Code [1999 editions]:	Irritant
Standard Fire Prevention Code/Standard Building Code [1997 editions]:	Irritant
Uniform Fire Code/Uniform Building Code [1997 editions]:	Irritant
Uniform Fire Code Standards 79-3, Uniform Fire Code, V. II [1997 edition]:	2-0-0

RETURNABLE CONTAINERS

Returnable (deposit) containers must be resealed and the contents drained therefrom prior to return to the distributor or manufacturer for credit. Do not offer leaking or damaged containers for transportation. Call HASA, Inc. or your distributor for instructions.

Please Note: The information contained herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge and belief. NO WARRANTY OR GUARANTEE, expressed or implied, is made regarding the product performance, product stability, or as to any other condition of use, handling, transportation, and storage. Customer use, handling, transportation, and storage may involve additional safety and/or performance considerations. Our technical personnel will be happy to respond to questions regarding safe handling, storage, transportation and use procedures. The safe handling, storage, transportation and use procedures remain the sole responsibility of the customer. No suggestions for handling, storage, transportation or use are intended as or to be construed as recommendations which may infringe on any existing patents or violate any Federal, State, and/or local law and/or regulation, ordinance, standard, etc.. This Material Safety Data Sheet has been prepared by HASA, Inc. staff from test reports and other information available in the public domain.

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MATERIAL SAFETY DATA SHEET Sodium Chlorite

Date: July 2001

I Company Identification

Company Name: BHS Marketing / Western Briquette
Mailing Address: P.O. Box 27955 SLC, UT 84127-0955
Physical Address: 2320 West Indiana Ave. SLC, UT 84104
Telephone: (801) 973-8232
Fax: (801) 973-8838
Emergency Number: Chemtrec (800) 424-9300

II Product Identification

Product Name: Technical Sodium Chlorite Solution 31.25, 31% Active Sodium Chlorite, Textone L , Textone XL
Synonyms: 25% Active Sodium Chlorite
Chemical Formula: Sodium chlorite
Sodium chloride
Sodium sulfate
Sodium chlorate
Water
Cas Number: 7758-19-2
7647-14-5
7757-82-6
7775-09-9
7732-18-5
Percent (Min.): 25-34%
1-6%
0-2%
0-3%
59-74%
Chemical Family:
Hazardous Material:

01/VL

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III Typical Physical Properties

Physical Appearance:	Clear, water white to slightly yellow liquid
Odor:	Slight chlorine odor
Boiling Point:	-7°C for 25% Solution 5°C for 31% Solution
Solubility in Water:	Complete
Specific Gravity:	1.23-1.30 at 25/25°C
% Volatile by Volume:	59-74%
Vapor Density:	10.1-10.6 lbs/gal @25°C
Vapor Pressure:	No Data PH @ 25°C >12

IV Reactivity Data

Chemical Stability:	Stable
Materials to Avoid:	Temperatures above 175°C (374°F) (dry material) Evaporation to dryness; dried material can ignite upon contact with combustibles> Exposure to sunlight or ultraviolet light can reduce product strength.
Hazardous:	Explosive and toxic chlorine dioxide gas will be generated on contact with acids or chlorine.
Polymerization:	Will not occur

VI Toxicological Information

ACUTE TOXICITY

Inhalation:	Inhalation may cause irritation of the mucous membranes and respiratory tract. Symptoms may include coughing, bloody nose, and sneezing. Severe overexposure may cause lung damage.	
Animal Toxicology:	Inhalation LC ⁵⁰ :	No available data
	Dermal LD ⁶⁰ :	>2 g/kg (rabbit)
	Oral LD ⁵⁰ :	165 mg/kg (rat)

CHRONIC TOXICITY

Inhalation:	There is no data available on the chronic effects of inhaling sodium chlorite.
Skin:	There are no studies or reports on the repeated effects of dermal exposure to sodium chlorite. Because of the acute effects, repeated direct contact may be unlikely.
Ingestion:	The chronic ingestion of low concentrations of this product has been studied in laboratory animals. Concentrations in

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the drinking water of 100.ppm and higher have been shown to cause mild anemia and a minor suppression of thyroid functions in laboratory animals. All effects were reversible after cessation of treatment.

Clinical studies of communities using sodium chlorite as a disinfectant found no adverse effects in the human population studied. However, other studies have suggested that those individuals deficient in an enzyme (G6PD) utilized in hemoglobin synthesis might be susceptible to the development of anemia if exposed repeatedly.

Repeated exposures to solutions of chlorine dioxide at concentrations of 10-100 ppm have produced slight effects upon the thyroid in younger animals and the hematologic system. Exposures to these concentrations can reduce the cellular and blood levels of glutathione, an agent which is protective against the oxidizing effect of this chemical. Exposure of laboratory animals above 100 ppm in the drinking water have shown a decrease in blood cell glutathione, red blood cell count and hemoglobin. In some studies these levels also caused a slight decrease in thyroid hormones, especially younger animals.

Carcinogenicity:

Sodium chlorite is not listed by NTP, IARC, OSHA, EPA, or any other authority as a carcinogen. Carcinogenicity studies conducted in mice and rats did not show an increase in tumors in animals exposed to sodium chlorite in their drinking water.

Mutagenicity:

Sodium chlorite has been evaluated for possible mutagenic effects in several laboratory tests. Sodium chlorite tested positive in the Ames Salmonella reverse mutation assay without metabolic activators and caused chromosomal aberrations in an in vitro Chinese hamster fibroblast cell line without metabolic activators. Sodium chlorite also tested positive in the mouse micronucleus assay when administered intraperitoneally (directly into the body cavity), but was not mutagenic when administered orally. The significance of these test results for human health is unclear because the oxidizing effects of the chlorite or salting effects of sodium may significantly affect the ability of the tests to accurately detect mutagens.

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Reproduction Effects:

Sodium chlorite has not been found to be teratogenic in studies in which animals have been exposed up to 100 ppm in the drinking water. Male rats repeatedly exposed to concentrations of 100 ppm or greater in the drinking have shown slight effects on sperm motility. No effects were observed at 10 ppm and no effects were observed on fertility rate, histology of the male reproductive system or conception rate of animals exposed at 10 ppm or higher.

The CMA conducted a two-generation reproductive rat study with developmental neurotoxicity to evaluate the effects of sodium chlorite on reproduction and pre- and post-natal development when administered orally via drinking water for two successive generations. Sodium chlorite was administered at 0,35,70, and 300 ppm in drinking water to male and female Sprague Dawley rats for ten weeks prior to mating. Dosing continued during the mating period, pregnancy and lactation. The final report concluded that there were no meaningful treatment related effects at any dose level for systemic, reproductive/developmental, and developmental neurological end points. Hematological effects and reduced body weight gains were observed in some treatment groups.

V Hazard Data

Acute

Eye Contact:

Direct contact may cause severe irritation and/or burns with symptoms of redness, itching, swelling, and possible destruction of tissue.

Skin Contact:

Direct contact may cause severe irritation and/or burns with symptoms of redness, itching, swelling, and possible destruction of tissue.

Ingestion:

Ingestion may cause gastroenteritis with any or all of the following symptoms: nausea, vomiting, lethargy, diarrhea, bleeding or ulceration. Acute ingestion of large quantities may also cause anemia due to the oxidizing effects of the chemical.

Inhalation:

Inhalation of vapors or mists may cause irritation of the mucous membranes and respiratory tract. Symptoms may include coughing, bloody nose, and sneezing. Severe overexposures may cause lung damage.

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Medical Conditions Aggravated By Exposure:

Deficiency in G6PD enzyme and other red blood cell diseases.

Interactions w/ Other Chemicals Which Enhance Toxicity:

None known or reported.

VI Recommended First Aid Measures

Eye Exposure:	Immediately flush eyes with large amounts of water for at least 15 minutes while frequently lifting the upper and lower eyelids. Consult a physician immediately.
Skin Exposure:	Remove contaminated clothing. Immediately flush exposed skin areas with large amounts of water for at least 15 minutes. Consult a physician if burning or irritation of the skin persists. Contaminated clothing must be laundered before re-use.
Inhalation Exposure:	Move patient to fresh air and monitor for respiratory distress. If cough or difficulty in breathing develops, administer oxygen, and consult a physician immediately. In the event that breathing stops, administer artificial respiration and obtain emergency medical assistance immediately.
Ingestion Exposure:	DO NOT induce vomiting. Drink large quantities of water. Consult a physician immediately. DO NOT give anything by mouth if the person is unconscious or having seizures.
Notes to Physician:	Chlorine dioxide vapors are emitted when this product contacts acids or chlorine. If these vapors are inhaled, monitor patient closely for delayed development of pulmonary edema which may occur up to 48-72 hours post-inhalation.

VII Fire Fighting Measures

Flash Point:	Not applicable
Extinguishing Media:	Not applicable- Choose extinguishing media suitable for surrounding materials.
Special Firefighting Procedures:	Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Use flooding quantities of water as fog spray. This product becomes a fire or explosion hazard if allowed to dry, so use water spray to keep fire-exposed containers cool. Extinguish fire using agent suitable for surrounding fire.

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Firefighters should wear full protective clothing (chemically impermeable, full encapsulated suit) and positive pressure self-contained breathing apparatus. This product becomes a fire or explosive hazard if allowed to dry.

Autoignition Temp: Not applicable
Flammable Limits in Air (percent by Volume):
Not applicable

VIII Accidental Release Measures

Evacuation procedures must be placed into effect. Evacuate all non-essential personnel. Hazardous concentrations in air may be found in local spill area and immediately downwind. Utilize emergency response personal protective equipment prior to the start of any response. This product may represent an explosion hazard, in the form of explosive chlorine dioxide gas if it contacts acids or chlorine. Remove all sources of ignition, such as flames, hot glowing surfaces or electric arcs. Stop source of spill as soon as possible and notify appropriate personnel.

Notify all downstream water users of possible contamination.

Create a dike or trench to contain all liquid material. Spill materials may be absorbed using clay, soil, or non-flammable commercial absorbents. Continue to keep damp, if allowed to dry, dried material can ignite in contact with combustible materials. Do not place spill materials back in their original container. Containerize and label all spill materials properly. Decontaminate all clothing and, if permitted, the spill area using strong detergent and flush with large amounts of water.

IX Handling & Storage

Handling: Do not get in eyes, or on skin, or clothing. Do not taste or swallow. Do not handle with bare hands. Use only thoroughly clean, dry utensils when handling. Avoid breathing fumes. This product becomes a fire hazard if allowed to dry. Remove and wash contaminated clothing to avoid fire.

1717 E. Fargo • Nampa, ID 83687 • Phone 208-466-8437 • Fax 208-466-8989
www.bhsmarketing.com

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This solution contains sodium chlorite. Dry sodium chlorite is a strong oxidizing agent. Mix only into water. Contamination may start a chemical reaction with generation of heat, liberation of hazardous gases (chlorine dioxide a poisonous, explosive gas), and possible fire and explosion. Do not contaminate with garbage, dirt, organic matter, household products, chemicals, soap products, paint products, solvents, acids, vinegar, beverages, oils, pine oil, dirty rags, or any other foreign matter.

Storage Conditions: Do not store at temperatures above 100°C (212°F)
Do not expose to direct sunlight or ultraviolet light

Avoid contact with combustible or readily oxidizable materials; sulfur-containing rubber.

Shelf Life Limitations: 2 years

Incompatible Materials For Storage Or Transport:

Acids, reducing agents, combustible material, oxidizers (such as hypochlorites), paints, sulfur, solvents.

X Exposure Controls/ Personal Protection

Engineering Controls

Eye Protection:

Wear chemical goggles. A face shield should be worn in addition to goggles where splashing or spraying is a possibility.

Skin Protection:

Wear Neoprene gloves, boots, and apron.

Respiratory Protection:

Wear a NIOSH/MSHA approved acid gas respirator plus dust/mist pre-filters if any exposure to dust or mist is possible.

Ventilation Protection:

Local exhaust ventilation is recommended if vapors, mists Or aerosols are generated. Otherwise, use general exhaust ventilation.

Other Protection:

Emergency eye wash and safety showers must be provided in the immediate work area. Thoroughly wash all contaminated clothing.

Exposure Guidelines:

None established

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XI Transportation Requirements

DOT Identification No.: UN 1908
D.O.T. Ship Name: Chlorite Solution, 8, UN 1908,II
Placard Required: Corrosive, 1908, Class 8
Label Required: Corrosive, Class 8
Label as required by EPA and by OSHA Hazard
Communication Standard, and any applicable state and
local regulations.
IMO Requirements: EmS No.; 8.06 MFAG Table No.; 741
IMDG Code Page No.; 8137

XII DISPOSAL CONSIDERATIONS

All disposals of this material must be done in accordance with local, state and Federal regulations. Waste characterization and compliance with disposal regulations are the responsibilities of the waste generator.

Spill Residue

If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following EPA hazardous waste designation: D002. Also, it will be subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly. As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility.

XIII ECOLOGICAL INFORMATION

This product is toxic to fish and aquatic organisms. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to the discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority.

Environmental Fate

Water: Sodium chlorite in water will eventually degrade to sodium chloride
Soil: Sodium chlorite, in contact with acidic soil could generate chlorine dioxide.

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Ecotoxicity

Acute TL₅₀ for Rainbow Trout: 50.6 mg/l

Acute LC₆₀ (96hours) for Rainbow Trout: 290 mg/l

Acute TL₅₀ for Bluegill: 208 mg/l

Acute LC₅₀ (96 hours) for Bluegill: 265-310 mg/l

Acute LD₅₀ Mallard Ducks: 0.49-1.00 g/kg (gavage)

Acute LD₆₀ Bobwhite Quail: 0.66 g/kg (gavage)

Acute LC₆₀ (48 hours) for Daphnia Magna: 0.29 mg/l

Sodium chlorite in the diet of birds was not acutely toxic. Eight day dietary LC₆₀'s in Mallard ducks and bobwhite quail were both greater than 10,000 ppm in the diet.

XIV REGULATORY INFORMATION

U S Federal Regulations

Reportable Quantity (RQ)

Not applicable

Toxic Substances Control Act

Listed on TSCA Inventory

Superfund Amendments And Reauthorized Act (SARA) Title III

Components identified with an asterisk (*) in Section 2 are subject to the reporting Requirements of Section 313 of Title III of the 1988 Superfund Amendments and Reauthorization Act (SARA) and 40 CFR Part 372.

Sara Hazard Categories (40 CFR 370.2)

HEALTH: Immediate (acute), delayed (chronic) PHYSICAL: Fire

International Regulations

Canada

Workplace Hazardous Materials Information System (WHMIS) Classification

WHMIS Classifications applicable to this product:

E (Corrosive Material) based on assignment to TDG Class 8

Canadian Environmental Protection Act (CEPA)

All components of this product are on the Domestic Substance List (DSL)

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Hazardous Products Act

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR).

Europe

EINECS No.: 231-836-6

State Regulations

California Proposition 65

Sodium chlorite does not appear on the California Proposition 65 list.

XV OTHER INFORMATION

NFPA Ratings

Health 3, Flammability 0, Reactivity 1

Medical Emergencies: Call toll-free 24 hours a day for emergency toxicological information 888/211-9412

Other Emergency Information: Call 316/524-5751 (24 hours)

For any other information contact:

Vulcan Chemicals
Technical Service Department
P.O. Box 385015
Birmingham, AL 35238-5015
800/873-4898
8 AM-5PM, central time
Monday through Friday

Notice: Vulcan Chemicals believes the information contained herein is accurate; however, Vulcan Chemicals, makes no guarantees with respect to such accuracy and assumes no liability in connection with the use of the information contained herein by any party. The provision of the information contained herein and the provision of information by or reliance on Vulcan's Technical Service Department is not intended to be and should not be construed as legal advice or as ensuing compliance with any federal, state or local laws and regulations. Any party using this product should review all such laws, rules or regulations prior to use.

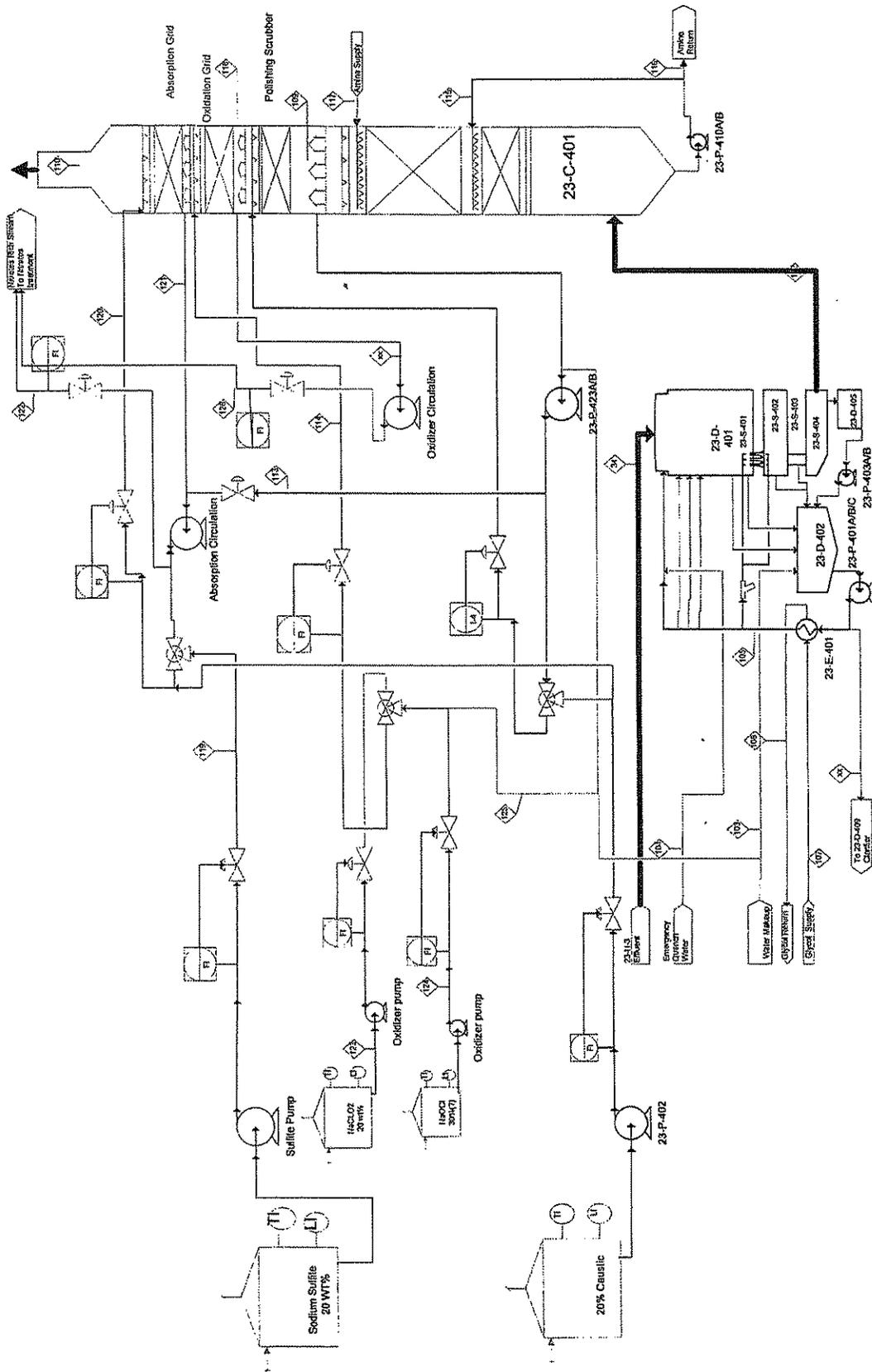
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Date of preparation: September 22, 2000

Form 3239-640

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www.bhsmarketing.com

*Attachment C – Process Flow
Diagrams*



WGS+ PFD	
PFD02	3-6-07

*Attachment D – Refinery
Effluent - Constituent Loading
Summary Table*

Attachment D - Summary of Predicted Effluent Concentrations (601 and 001 Outfalls)

NITRATE LOADING SUMMARY

Outfall 601 Waste Water Treatment Plant Nitrate Effluent

Constituent	Current Discharge		Incremental Increase		Total Resulting Discharge	
	Concentration (mg/L)	Mass (TPY)	Concentration (mg/L)	Mass (TPY)	Concentration (mg/L)	Mass (TPY)
NO ³ (as N)	22	310	2	33	24	529

Notes: Calculations assume average 9.2 mgd effluent flow from Outfall 601. Data collected by Premcor (average of March - May 2007 study (5 samples)).

Outfall 001 Delaware River Nitrate Effluent

Constituent	Current Discharge		Incremental Increase		Total Resulting Discharge		Discharge after Mixing Completely in Delaware River	
	Concentration (mg/L)	Mass (TPY)	Concentration (mg/L)	Mass (TPY)	Concentration (mg/L)	Mass (TPY)	Concentration (mg/L)	Mass (TPY)
NO ³ (as N)	2.04	1089	0.06	33	2.10	1121	0.002	33

Notes: Calculations assume 350 mgd effluent flow from Outfall 001 to Delaware River. Based on 1.5 mg/L value for river (DRBC data, NO₂-N + NO₃-N) base nitrate load from WWTP (June 2007 Sampling).

NATURALLY OCCURRING SALINE SPECIES (Sulfate, Chloride) SUMMARY

Outfall 601 Waste Water Treatment Plant Effluent - Naturally Occurring Saline Species

Constituent*	Current Discharge		Incremental Increase		Total Resulting Discharge	
	Concentration (mg/L)	Mass (TPY)	Concentration (mg/L)	Mass (TPY)	Concentration (mg/L)	Mass (TPY)
SO ₄ ²⁻	266	3720	488	6846	754	10566
Cl ⁻	0	0	90	1267	90	1267

*Value calculated from SO₄ loading consistent with FCUP Project (20394 lbs SO₄/d) and (922 MGD flow (601)).

Outfall 001 Delaware River Effluent - Naturally Occurring Saline Species

Constituent*	Current Discharge		Incremental Increase		Total Resulting Discharge		Discharge after Mixing Completely in Delaware River	
	Concentration (mg/L)	Mass (TPY)	Concentration (mg/L)	Mass (TPY)	Concentration (mg/L)	Mass (TPY)	Concentration (mg/L)	Mass (TPY)
SO ₄ ²⁻	407.8	217966	12.8	6846	420.7	224212	0.45	6846
Cl ⁻	2894	1542291	2	1267	2896	1543558	0.08	1267

Notes: Calculations assume 350 mgd effluent flow from Outfall 001 to Delaware River. Predicted Maximum Concentration at Outfall 001 consistent with FCUP CZ Application (capturing salinity of cooling water, etc.) + Predicted Additional Concentration from current Project. Current Discharge Estimated from Salinity of River near DCR.

*Sodium bicarbonate is also a component of the WGS+ purge.

Composition of River Water

Typ. Concentrations in seawater		Typ. Concentrations in freshwater	
SO ₄	2707 mg/L	SO ₄	6.6 mg/L
Cl ⁻	19812 mg/L	Cl ⁻	0 mg/L

% Seawater in River at DCR = 0.25% to ~ 35%

Assumed % of seawater for balance calculations: 15%

Note: Sulfate and Chloride Concentrations range considerably in the river due to variable salinity level.

Sulfate concentration can range up to 900+ ppm and chloride concentration can range up to 6,000+ ppm. (See Attachment H.)

*Attachment E – Threatened and
Endangered Species Agency
Response Letters*



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL
DIVISION OF FISH & WILDLIFE
NATURAL HERITAGE & ENDANGERED SPECIES

4876 HAY POINT LANDING ROAD
SMYRNA, DELAWARE 19977

TELEPHONE: (302) 653-2880
FAX: (302) 653-3431

August 23, 2006

Bonnie Ludlow
Environmental Resources Management
350 Eagleview Blvd. Suite 200
Exton, PA 19341-1155

*RE: Facilities upgrades and expansion (within existing footprint of facility)
Valero Energy Corporation petroleum factory, 4550 Wrangle Hill Rd
Delaware City, DE
Applicant: Valero Energy Corporation*

Dear Ms. Ludlow:

Thank you for contacting the Natural Heritage and Endangered Species program about information on rare, threatened and endangered species, unique natural communities, and other significant natural resources as they relate to the above referenced project.

A review of our database indicates that there are currently no records of state-rare or federally listed plants, animals or natural communities at or adjacent to this project site within the land based area. However, there are fish species of concern that are documented from this area of the river. Specifically, this portion of the river is utilized by Atlantic sturgeon, *Acipenser oxyrinchus*, a species of local and regional concern, during spring, summer, and early fall. Spawning sites are believed to be upriver from this site. The Federally Endangered short-nosed sturgeon, *Acipenser brevirostrum*, also spawn upriver of the proposed project site (April-June) and then commence post-spawning downstream migrations through the proposed area during late spring and summer.

This area of the river supports a diverse assemblage of fish species and functions as a nursery and spawning area for some of them. Please see the table below, which is a list of species collected by our Division's otter trawl in this area of the river (in order of largest number caught to least). Although most of these species are not listed as rare, threatened or endangered, most are an important resource in terms of recreational and commercial fisheries. If you need additional information, please contact Craig Shirey, Fisheries Section Manager at (302) 739-9914.

<i>Common Name</i>	<i>Scientific Name</i>	<i>Common Name</i>	<i>Scientific Name</i>
Atlantic croaker	<i>Micropogonias undulatus</i>	Northern pipefish	<i>Syngnathus fuscus</i>
Hogchoker	<i>Trinectes maculatus</i>	American shad	<i>Alosa sapidissima</i>
Weakfish	<i>Cynoscion regalis</i>	Blueback herring	<i>Alosa aestivalis</i>
Bay anchovy	<i>Anchoa mitchilli</i>	White catfish	<i>Ameiurus catus</i>
White perch	<i>Morone americana</i>	Black drum	<i>Pogonias cromis</i>
Striped bass	<i>Morone saxatilis</i>	Bluefish	<i>Pomatomus saltatrix</i>
Spot	<i>Leiostomus xanthurus</i>	Sea lamprey	<i>Petromyzon marinus</i>
Blue crab	<i>Callinectes sapidus</i>	Eastern silvery minnow	<i>Hybognathus regius</i>
Channel catfish	<i>Ictalurus punctatus</i>	Bluegill	<i>Lepomis macrochirus</i>
Alewife	<i>Alosa pseudoharengus</i>	Silver perch	<i>Bairdiella chrysoura</i>
American eel	<i>Anguilla rostrata</i>	Striped searobin	<i>Prionotus evolans</i>
Asiatic clam	<i>Corbicula corbicula</i>	Northern stargazer	<i>Astroscopus guttatus</i>
Northern kingfish	<i>Menticirrhus saxatilis</i>	Atlantic silverside	<i>Menidia menidia</i>
Naked goby	<i>Gobiosoma bosc</i>	Shortnose sturgeon	<i>Acipenser brevirostrum</i>
Summer flounder	<i>Paralichthys dentatus</i>	Carp	<i>Cyprinus carpio</i>
Atlantic rangia	<i>Rangia cuneata</i>	Atlantic sturgeon	<i>Acipenser oxyrinchus</i>
Brown bullhead	<i>Ameiurus nebulosus</i>	Silver hake	<i>Merluccius bilinearis</i>
Atlantic menhaden	<i>Brevoortia tyrannus</i>	Spotted hake	<i>Urophycis regia</i>
Gizzard shad	<i>Dorosoma cepedianum</i>	Penaeid shrimp	<i>Penaeus sp.</i>

We are continually updating records on Delaware's rare, threatened and endangered species, unique natural communities and other significant natural resources. If the start of the project is delayed more than a year past the date of this letter, please contact us again for the latest information. If you have any questions, please contact me at (302) 653-2883 ext. 126.

Sincerely,

Edna J. Stetzar

Edna J. Stetzar

Biologist/Environmental Review Coordinator

(Please see Invoice on next page)



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

AUG - 4 2006

Bonnie Ludlow
Environmental Resources Management
350 Eagleview Boulevard, Suite 200
Exton, Pennsylvania 19341-1155

Dear Ms. Ludlow,

This is in response to your letter dated July 12, 2006 regarding a proposed upgrade project at Valero Energy Corporation's petroleum refinery located along the Delaware River in Delaware City, Delaware. Valero plans to upgrade and expand the facility's existing Crude Unit and its associated equipment and potential Sour Water Stripper Project. All project related activities will occur within the existing footprint of the facility. Your letter notes that the project may require additional draw from the Delaware River through an existing permitted intake structure.

A population of the federally endangered shortnose sturgeon (*Acipenser brevirostrum*) is present in the Delaware River from the lower bay upstream to at least Scudders Falls, New Jersey. Tagging studies by O'Herron et al. (1993) found that the most heavily used portion of the river appears to be between river mile 118 below Burlington Island and river mile 137 at the Trenton Rapids. From November through March, adult sturgeon overwinter in dense sedentary aggregations in the upper tidal reaches of the Delaware between river mile 118 and 131. The areas around Duck Island and Newbold Island seem to be regions of intense overwintering concentrations. 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 (O'Herron 1993). Due to the relatively active nature of these fish, the use of the river during the winter is difficult to predict. The overwintering location of juvenile shortnose sturgeon is not known but believed to be on the freshwater side of the oligohaline/fresh water interface (O'Herron 1990). In the Delaware River, the oligohaline/freshwater interface occurs in the area between Wilmington, Delaware and Marcus Hook, Pennsylvania.

Spawning in the Delaware River may occur from late March through early May, dependent on water temperatures (8-15°C). While actual spawning has not been documented in this area, the concentrated use of the Scudders Falls region in the spring by large numbers of mature male and female shortnose sturgeon indicate that this is a major spawning area (O'Herron et al. 1993). After spawning, shortnose sturgeon move rapidly downstream to the Philadelphia area. Historically, sturgeon were relatively rare below Philadelphia due to poor water quality. In the past decade, the water quality in the Philadelphia area has improved leading to an increased use of the lower river by shortnose sturgeon. After adult sturgeon migrate to the area around Philadelphia, many adults return upriver to between river mile 127 and 134 within a few weeks, while others

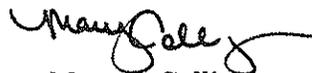


gradually move to the same area over the course of the summer (O'Herron 1993). By November, adult sturgeon have returned to the overwintering grounds around Duck Island and Newbold Island.

While the area above Philadelphia is of primary importance to shortnose sturgeon in the Delaware River, shortnose sturgeon are present below Philadelphia. Brundage and Meadows (1982) have reported incidental captures in commercial gillnets in the lower Delaware. During a study focusing on Atlantic sturgeon, Shirey et al. (1999) captured 9 shortnose sturgeon in 1998. During the June through September study period, Atlantic and shortnose sturgeon were found to use the area on the west side of the shipping channel between Deep Water Point, New Jersey and the Delaware-Pennsylvania line. The most frequently utilized areas within this section were off the northern and southern ends of Cherry Island Flats in the vicinity of the Marcus Hook Bar. A total of 25 shortnose sturgeon have been captured by Shirey in this region of the river from 1992 - 2004, with capture rates ranging from 0-10 fish per year (Shirey, personal communication, April 2006). Shortnose sturgeon have also been documented on the trash racks of the Salem nuclear power plant in Salem, New Jersey. The intakes for this plant are located in Delaware Bay. While the available information does not identify the area below Philadelphia as a concentration area for adult shortnose sturgeon, it is apparent that this species does occur in the lower Delaware River and upper Delaware Bay. Based on the available information, juvenile and adult shortnose sturgeon may be present in the Delaware City area from late spring through early fall, with the highest concentration present in the summer months. Neither eggs or larvae are likely to be so far downstream and the youngest life stage likely to be present are yearlings.

It does not appear that any in-water construction is proposed as part of the current project. As noted above, the project is likely to increase the amount of water withdrawn from the River. If intake velocities are great enough, shortnose sturgeon may be vulnerable to impingement and entrainment. Yearling and older shortnose sturgeon are capable of avoiding intake velocities of 2 feet/second (fps) or less (Kynard et al. 2005). Provided that the increase in draw at the facility will not cause intake velocities to be greater than 2 fps, no effects to shortnose sturgeon will occur as a result of this project. ERM should submit confirmation to NMFS that the intake velocities at the facility are 2 fps or less. If intake velocities are greater than 2 fps, further coordination with NMFS may be necessary. Should you have any questions about these comments or about the section 7 consultation process in general, please contact Julie Crocker at (978)281-9300 ext. 6530.

Sincerely,



Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

Cc: Greene, F/NER4

*Attachment F – Environmental
Offset Matrix*

COASTAL ZONE ENVIRONMENTAL IMPACT OFFSET MATRIX

Applicant: Premcor Refining Group Inc. Delaware City Refinery
 Project: FCCU 20 PPM NO_x Project
 CZA Offset Review Reference: (DNRREC Only)

Application Date:
 Amendments:
 Offset Review Date: (DNRREC Use Only)
 Matrix Amendment:

ENVIRONMENTAL IMPACTS	(Applicant's Use) DESCRIBE ENVIRONMENTAL IMPACTS	PAGE NO. (In Section I)	(Applicant's Use) DESCRIBE ENVIRONMENTAL OFFSET PROPOSAL!	PAGE NO. (In Section I)	OFFSET EFFICIENCY Yes, No or N/A																
Air Quality (Applicant to List Below by Parameter)	<p>The changes in overall emissions rates due to this project are summarized below.</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>tons/year</th> </tr> </thead> <tbody> <tr> <td>a. NO_x</td> <td>-512.5 (reduction in permitted emissions, 719.5 TPY currently vs. 207 TPY proposed)</td> </tr> <tr> <td>b. SO₂</td> <td>0</td> </tr> <tr> <td>c. H₂SO₄</td> <td>0</td> </tr> <tr> <td>d. CO</td> <td>0</td> </tr> <tr> <td>e. PM/PM-10</td> <td>0</td> </tr> <tr> <td>f. VOC</td> <td>0</td> </tr> <tr> <td>g. Pb</td> <td>0</td> </tr> </tbody> </table> <p>* See Air Permit Application Attached to this application for further detail.</p>	Pollutant	tons/year	a. NO _x	-512.5 (reduction in permitted emissions, 719.5 TPY currently vs. 207 TPY proposed)	b. SO ₂	0	c. H ₂ SO ₄	0	d. CO	0	e. PM/PM-10	0	f. VOC	0	g. Pb	0	Part 5.1, page 12.	<p>The DCR is located within a non-attainment area for ozone. The removal of NO_x from air will reduce a known ozone precursor and thus move the geographic area closer to compliance with critical environmental air regulations. This reduction in NO_x emissions will result in a significant overall environmental benefit. No offset is required.</p>	NA	
Pollutant	tons/year																				
a. NO _x	-512.5 (reduction in permitted emissions, 719.5 TPY currently vs. 207 TPY proposed)																				
b. SO ₂	0																				
c. H ₂ SO ₄	0																				
d. CO	0																				
e. PM/PM-10	0																				
f. VOC	0																				
g. Pb	0																				
Water Quality Surface	<p>The nitrate, sulfate and chloride concentrations in the wastewater will increase as a result of this air pollution control project. The incremental increases in pollutant loading are summarized below.</p> <table border="1"> <thead> <tr> <th>Constituent</th> <th>Incremental Increase in Concentration (mg/L)</th> <th>Incremental Increase in Mass (TPY)</th> <th>Percent Increase over Current Discharge Rates</th> </tr> </thead> <tbody> <tr> <td>NO₃ (as N)</td> <td>0.06</td> <td>33</td> <td>3.0</td> </tr> <tr> <td>SO₄</td> <td>12.8</td> <td>6845</td> <td>3.1</td> </tr> <tr> <td>Cl</td> <td>2</td> <td>1267</td> <td>0.08</td> </tr> </tbody> </table> <p>The values in the table above are based on an assumed value of 85% conversion of nitrates in the WWTP as a result of the WWTP modifications planned by Valero. (See discussion to the right).</p> <p>For the reasons described in detail in Section 5.4 of Section 1, sulfate and chloride loading will not be offset.</p>	Constituent	Incremental Increase in Concentration (mg/L)	Incremental Increase in Mass (TPY)	Percent Increase over Current Discharge Rates	NO ₃ (as N)	0.06	33	3.0	SO ₄	12.8	6845	3.1	Cl	2	1267	0.08	Part 5.4, beginning on page 14.	<p>Premcor is proposing to modify their current wastewater treatment facility to significantly reduce the potential increase in nitrate load from the facility as a result of this project. The proposed change will reduce the increase loading by 80 to 90%. This reduction will be achieved by installing the first of two aerobic treatment reactor tanks to an anoxic reactor tank. The addition of this anoxic stage will significantly reduce the amount of nitrates from the WGS* purge stream that ultimately are discharged with the refinery wastewater.</p> <p>This offset proposal significantly decreases the anticipated nitrate loading resulting from this DNRREC-required air emission reduction project.</p> <p>While this project does increase loadings to the WWTP effluent, Premcor believes that the significant reduction in facility NO_x air emissions creates a significant net environmental benefit within the Coastal Zone.</p>	Part 5C, beginning on page 26.	
Constituent	Incremental Increase in Concentration (mg/L)	Incremental Increase in Mass (TPY)	Percent Increase over Current Discharge Rates																		
NO ₃ (as N)	0.06	33	3.0																		
SO ₄	12.8	6845	3.1																		
Cl	2	1267	0.08																		
Groundwater	None.																				
Water Quantity Surface	<p>The Project will create additional water demand for process purposes (approximately 250 GPM (360,000 GPD)). The water will be provided by existing on-site sources and the Delaware River, either by direct withdrawal from the facility's permitted intake stream or by purchase from a third party water supply vendor. The water supply vendor's primary use for the Project, this water will be returned to the Delaware River following treatment. Because there is no net decrease in the surface water of the Delaware River, no offsets are proposed for the intake of process water.</p> <p>None.</p>	Part 5.10, beginning on page 16.	<p>No net change in surface water usage. No offset proposed.</p>																		
Groundwater	None.																				
Water Use For	<p>The Project will require approximately 250 GPM (360,000 GPD) of process water. This water will be purchased from the current water supply vendor or will consist of recycled water from the sour water stripper bottoms (or another on-site source). All of this process water will be returned to the Delaware River via treated wastewater. Because the process water will be returned to the Delaware River, no environmental offsets are proposed as a result of the increased demand. However, Premcor is proposing offsets for the estimated nitrate loading associated with the increased wastewater discharge.</p> <p>No new cooling water is anticipated for this project.</p>	Part 5.10, beginning on page 16.	<p>See discussion above (under Surface Water Quality).</p>																		
Processing																					
Cooling		Part 5.10, beginning on page 16.																			

COASTAL ZONE ENVIRONMENTAL IMPACT OFFSET MATRIX

Applicant: Precursor Refining Group Inc. Delaware City Refinery
 Project: FCCU 20 PPM NO_x Project
 CZA Offset Review Reference: (DNREC Only)

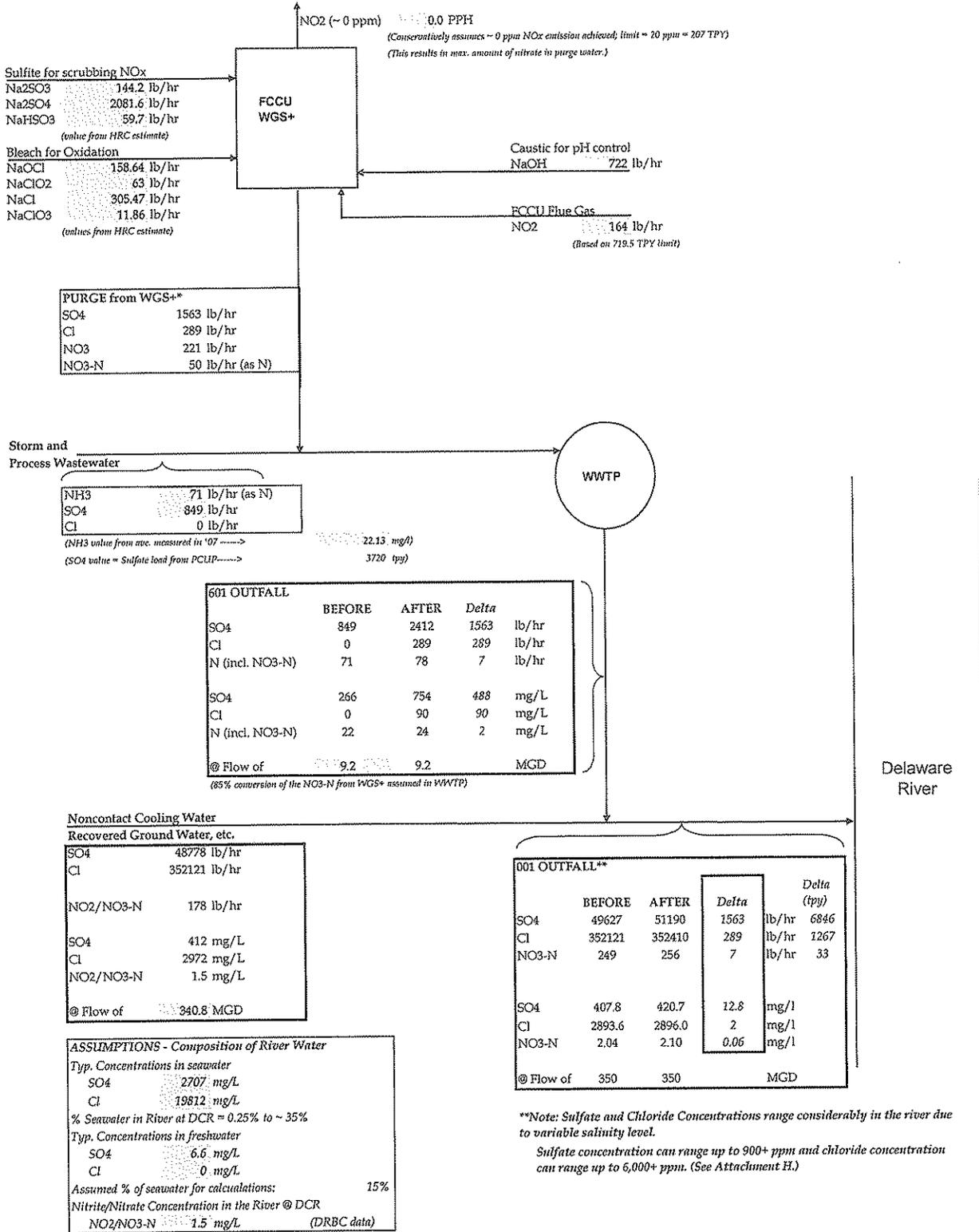
Application Date:
 Amendments:
 Offset Review Date: (DNREC Use Only)
 Matrix Amended:

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)	OFFSET SUFFICIENCY Yes, No or N/A
Effluent Removal	<p>Precursor is proposing to modify their current wastewater treatment facility to significantly reduce the proposed increase in nitrate load from the facility. The proposed change will reduce the nitrate loading from the WGS+ purge by 80 to 90%. This reduction will be achieved by changing the first of two aerobic treatment reactor tanks to an anoxic reactor tank. The addition of an anoxic step will significantly reduce the amount of nitrate from the WGS+ purge stream that ultimately are discharged with the refinery wastewater.</p> <p>The total reduction in pollutant loading (assuming an 85% reduction) results in approximately 186 tons per year of nitrate load from the WGS+ process being reduced to nitrogen. Therefore, the project will only increase nitrate loading to the Delaware River by 33 tons per year as compared to a potential, uncontrolled, 219 tons of nitrate per year.</p> <p>The proposed modifications to the effluent removal system (WWT/P) will not result in any negative environmental effect.</p>		Additional pollutant loading is addressed in the surface water quality Section of the Offset Matrix.		
Solid Waste	<p>The project will result in a very slight increase in solid waste. Because the solid waste is considered a hazardous waste, it is addressed in the following section.</p>	Part 5.20, beginning on page 20.	N/A		
Hazardous Waste	<p>The hazardous waste generated will consist of spent caustic regeneration light bulbs. The increased solid waste stream is considered negligible. The light bulbs are changed once every four to five years and will be disposed of as hazardous waste outside of the Coastal Zone. Because the waste will be disposed of outside the Coastal Zone, no offsets are proposed.</p>	Part 5.23, beginning on page 20.	N/A		
Habitat	<p>This project may require up to 0.29 acres of land disturbance; however, all land proposed for disturbance has been previously disturbed and currently consists of gravel or pavement. No habitat will be impacted as a result of the proposed project, therefore, no offsets are proposed.</p>	Part 4.4, page 11.	N/A		
Wetlands	None.		N/A		
Flora Fauna	None.		N/A		
Drainage/Flood Control	<p>The proposed Project requires the disturbance of 0.29 acres of gravel/leaved area. The entire disturbed gravel area will be paved as a result of the project. The new impervious surface is expected to generate approximately 0.60 million gallons per year (roughly 1,600 GPD) of additional stormwater; therefore, no significant increase in stormwater run-off is anticipated as a result of this Project.</p> <p>Due to the minimal increase in potential stormwater, no offsets are proposed.</p>	Part 5.9, beginning on page 15.	N/A		
Erosion ¹	<p>No gravelfields will be disturbed as part of the proposed Project; therefore, no erosion is anticipated.</p>	Part 4.4, page 11.	N/A		
Land Use Effects	<p>The Project will not impact the coastal zone outside of the DCR property boundary.</p>	Part 5.36, page 23.	N/A		
Glac	None.				
Heat	None.				
Noise	None.				
Ozone	None.				
Vibration	None.				
Radiation	None.				
Electro-Magnetic Interference	None.				
Other Effects	None.				
Threatened & Endangered Species	<p>No threatened or endangered species are anticipated to be impacted as a result of the proposed project.</p>	Part 5.31, page 22.	N/A		
Impacts From:	<p>No new environmental impacts from raw materials, intermediate products, by products, or final products are anticipated as a result of the Project.</p>	Part 4.1a, page 7.	N/A		
Raw Material	None.				
Intermediate Products	None.				
By-Products	None.				
Final Products	None.				

¹ See paragraph 1.1.b in "Secretary Assessment"

*Attachment G – Refinery
Effluent Mass Balance*

Attachment G - Constituent Material Balance - FCCU 20 PPM NOx Project - Purge Water Discharge following Modification to WWTP



*Attachment H – Salinity in
Delaware River (Reedy Island)*

Estimation of Salinity from Conductivity Data (Reedy Island)

Assumptions

seawater 35 ppt
 freshwater 0 ppt (usually < 0.5)

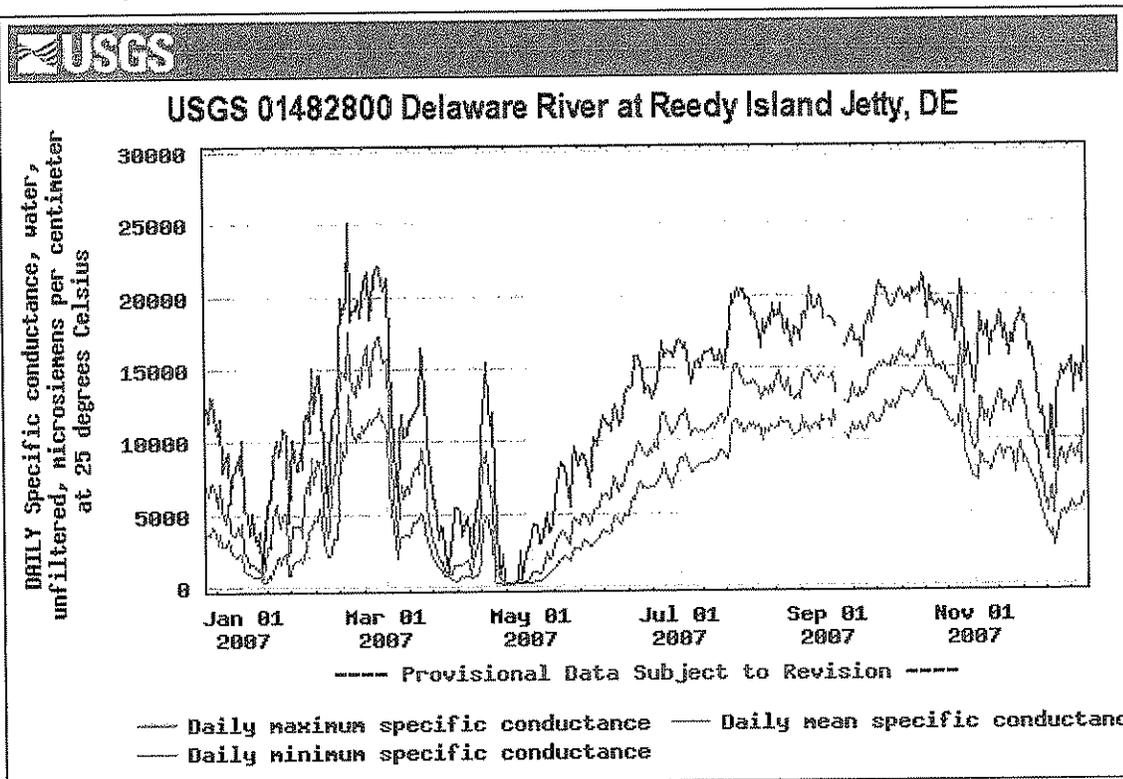
Conductivity	Salinity	Corresponding % seawater	Sulfate Concentration from Seawater (ppm)	Chloride Concentration from Seawater (ppm)
20000 us/cm	11.9 ppt	34.0%	925	6736
15000 us/cm	8.7 ppt	24.9%	678	4925
10000 us/cm	5.6 ppt	16.0%	439	3170
7500 us/cm	4.1 ppt	11.7%	323	2321
5000 us/cm	3 ppt	8.6%	238	1698

Conductivity to Salinity Conversion based on "Standard Methods for the Examination of Water and Wastewater", see also <http://www.fivecreeks.org/monitor/sal.html>

Conductivity Data Source: USGS Data Station:

http://waterdata.usgs.gov/nwis/uv/?site_no=01482800&PARAMeter_cd=00095,00010,00300,00400

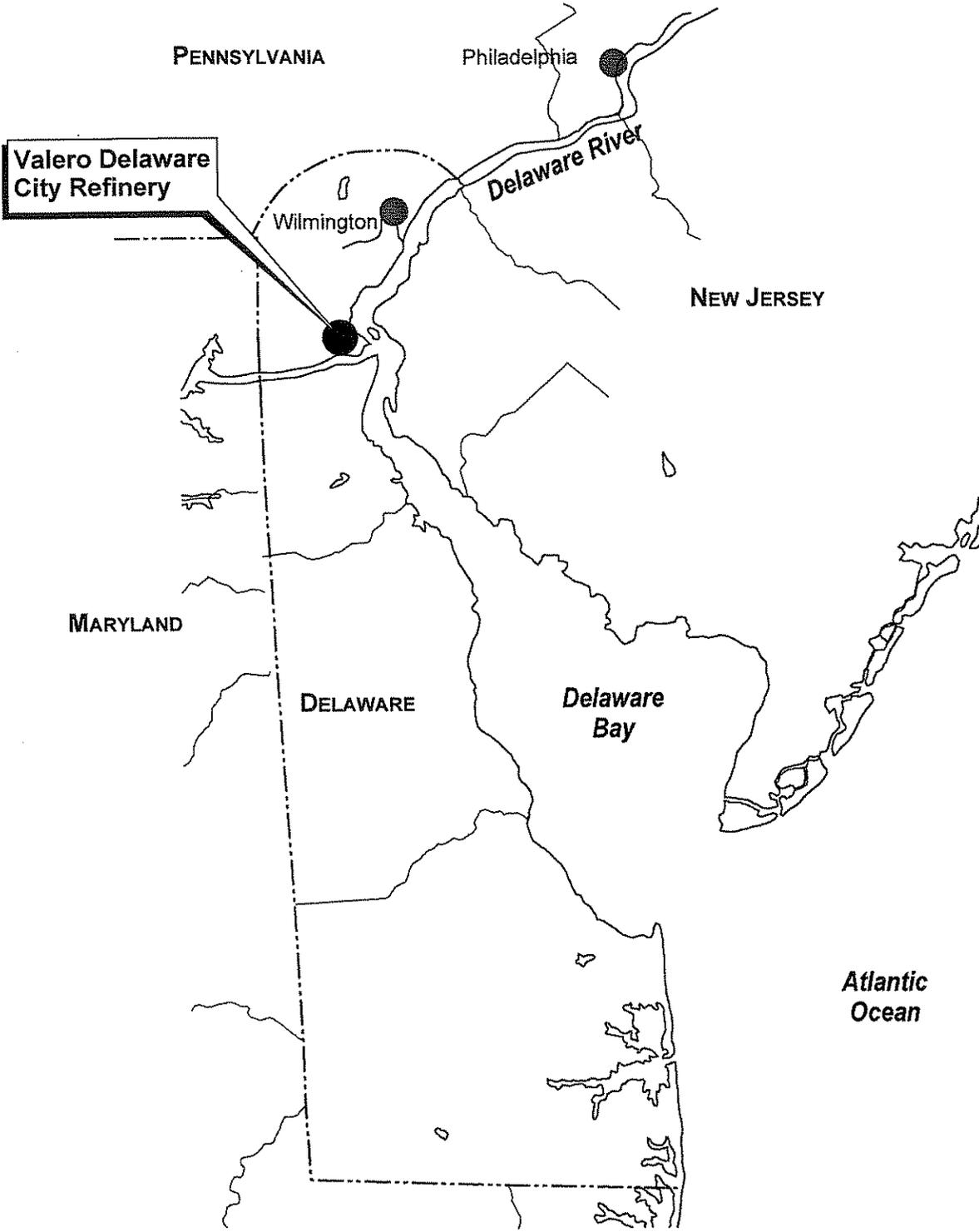
2007 Daily Conductivity Data at Reedy Island Jetty



Section 3 - Figures

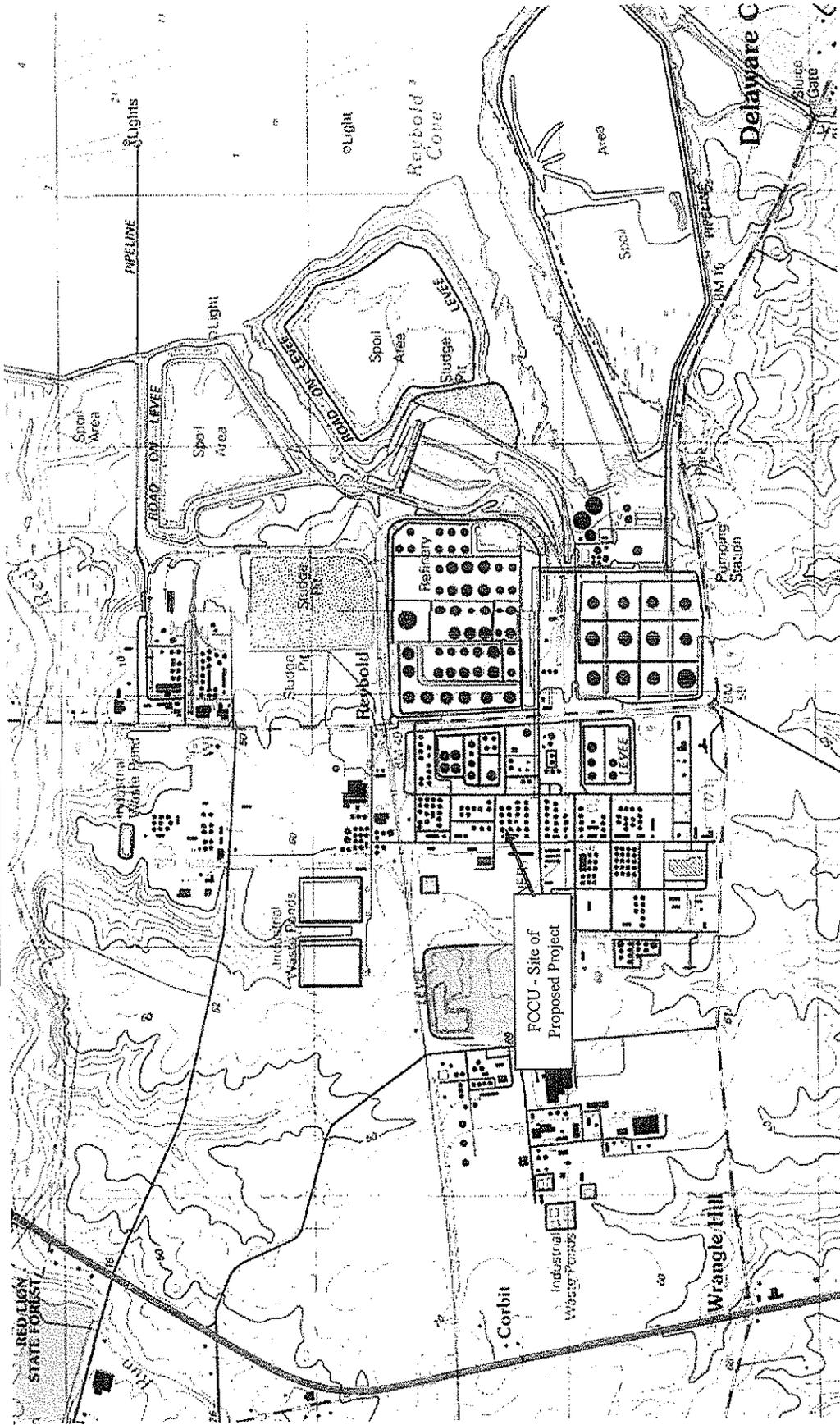
*Figure 1 – Regional Location
Map*

Figure 1
Regional Location Map
Valero Energy Corporation
Delaware City, Delaware



*Figure 2 – Location of Primary
Components of 20 PPM FCCU
NO_x Project*

DCR 20 PPM FCCU NO. Project
Location of Proposed Project Work



USGS TOPOGRAPHIC MAP (7.5 MIN SERIES)
SHOWING THE LOCATION OF PREMCOR
DELAWARE CITY REFINERY

*Figure 3 – Locations of Proposed
Project Work*

Figure 3. DCR PPM FCCU NO_x Project
Locations of Proposed Project Work

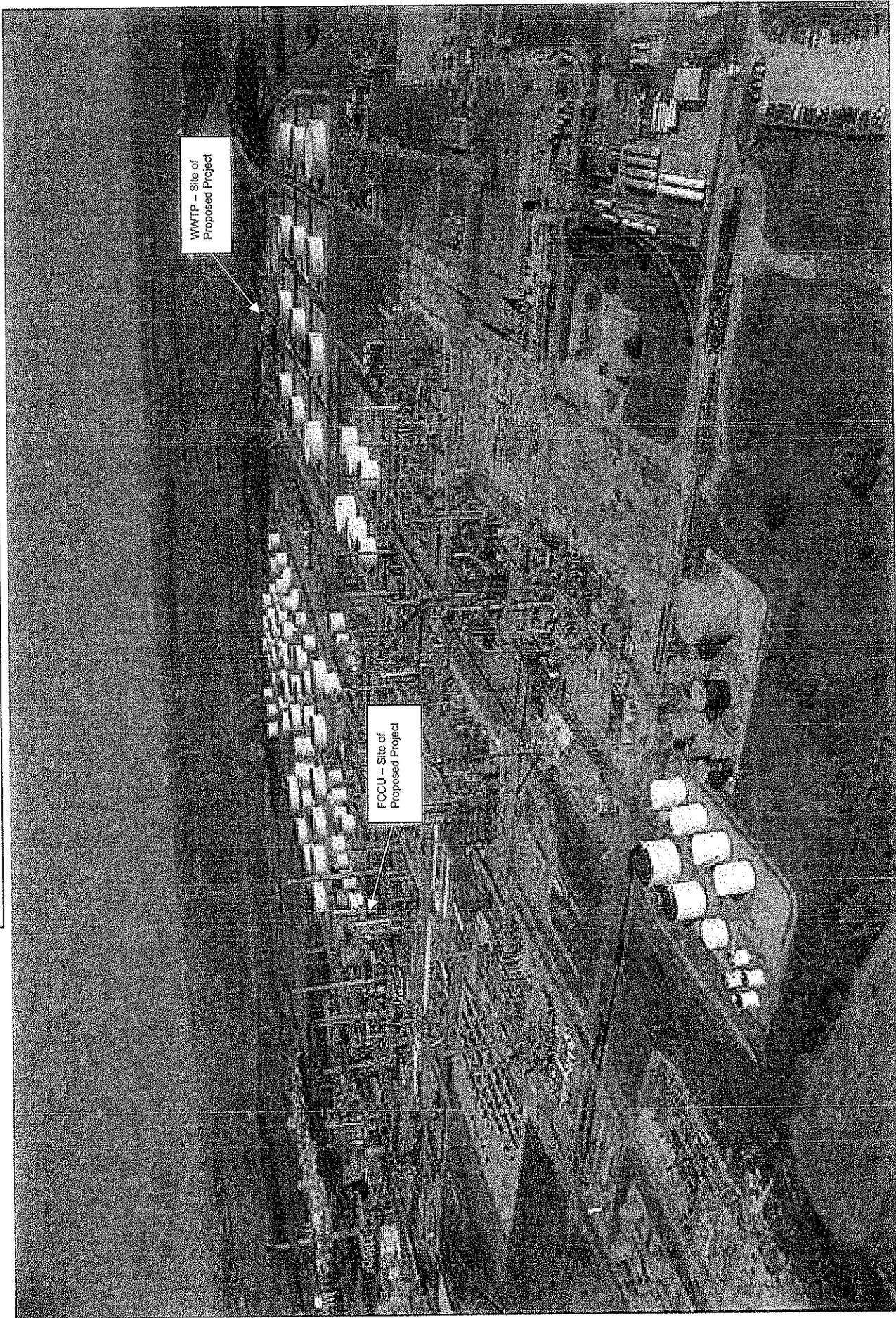
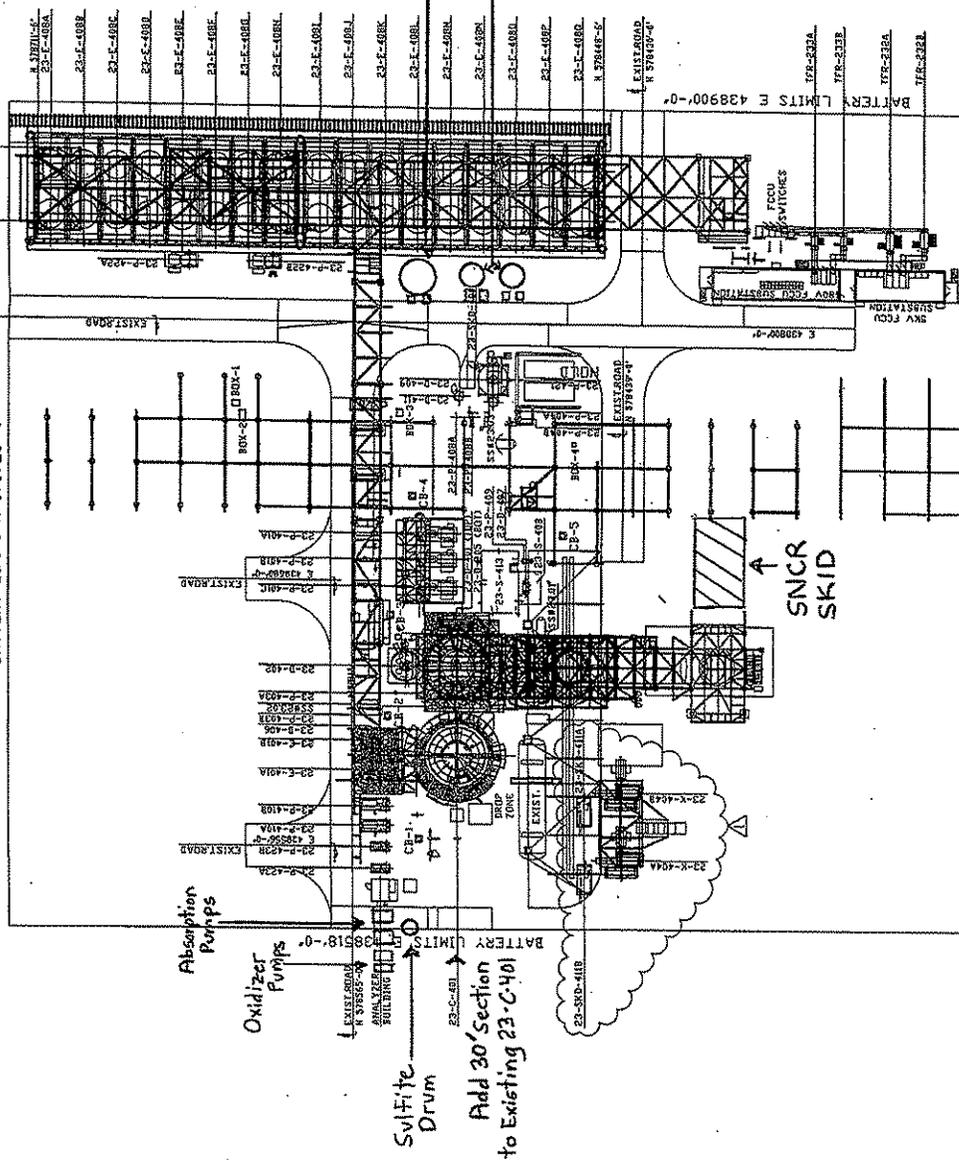


Figure 4 – Site Plan

ECCU 2.0 PPM NOx PROJECT
WGS + PRELIMINARY PLOT PLAN
 BATTERY LIMITS N 57825'-0"



NOTES 1"
 1. HIGH POINT OF FINISHED SURFACE IS 63'-0"



Sulfite Make-up
 Tank and Pumps
 Bleach and Chlorite
 Tanks and Pumps

Caustic
 Storage
 Tank &
 Pumps at
 Utilities

BATTERY LIMITS N 57825'-0"

BATTERY LIMITS E 43890'-0"

BATTERY LIMITS E 43890'-0"

REGENERATIVE SO ₂ SCRUBBER PROJECT UTIL PLANS FOCUS AREA		PROJECT NO. 38-206-19 SHEET NO. 25 DATE 11/15/11	
PROJECT NO. 38-206-19 SHEET NO. 25 DATE 11/15/11		PROJECT NO. 38-206-19 SHEET NO. 25 DATE 11/15/11	
PROJECT NO. 38-206-19 SHEET NO. 25 DATE 11/15/11		PROJECT NO. 38-206-19 SHEET NO. 25 DATE 11/15/11	

PREPARED BY: [Name] CHECKED BY: [Name] DATE: 11/15/11	PROJECT NO. 38-206-19 SHEET NO. 25 DATE 11/15/11
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