



**CALUMET SHREVEPORT LUBRICANTS & WAXES, LLC
CALUMET SHREVEPORT REFINERY
TITLE V MODIFICATION**

**APPENDIX B
ENVIRONMENTAL IMPACT QUESTIONS**

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ENVIRONMENTAL IMPACT QUESTIONS (IT QUESTIONNAIRE)

Introduction

Calumet is proposing to construct the 2006 Expansion Project at the Shreveport Refinery. The 2006 Expansion Project includes the construction of new units, upgrade of existing units, and the addition of vessels and heaters. As a result of the 2006 Expansion Project, Calumet proposes to increase the capacity of the refinery from 50,000 to 65,000 barrels per day.

The expansion project will include the following refinery upgrades:

- Construction and operation of a 15,000 barrel per day Diesel Hydrotreater, including a new 33 MMBTU/hr fuel gas fired heater and a new 32 MMBTU/hr fuel gas-fired heater. Both heaters will utilize Lo-NOx burner configuration.
- Reactivation of the Sour Crude and No. 1 Vacuum Unit to process up to 20,000 barrels per day, including a new 56 MMBTU/hr fuel gas-fired heater and a 37 MMBTU/hr fuel gas-fired heater, both with Lo-NOx burner configuration.
- Modification of the existing Sulfur Recovery Unit by adding a parallel unit to increase capacity to 44 long tons per day. The burner on the Incinerator will be upgraded to 9.2 MMBTU/hr.
- Modification of the No. 1 Platformer to add a reactor and a 3 MMBTU/hr fuel gas-fired heater with Lo-NOx burner configuration.
- Modification of the No. 2 Platformer to add a reactor and a 3 MMBTU/hr fuel gas-fired heater with Lo-NOx burner configuration.
- Modification of the DDD Unit to process 12,000 barrels per day and add a high pressure stripper, a new reactor, and a 9.69 MMBTU/hr fuel gas-fired heater with Lo-NOx burner configuration.
- Installation and operation of a new 47.1 MMBTU/hr natural gas-fired boiler with Lo-NOx burner.
- Construction and operation of Hydrogen Purification Plats PSA Vessels for process improvement.

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- Modification of the Penex Unit to add reactor vessels for process improvement.
- Construction and operation of a new hydrogen plant including a new natural gas-fired 66 MMBTU/hr heater with Lo-NOx burner configuration.
- Tank throughput changes associated with crude, distillates, fuel oil, heavy oil, and waxes.
- Adjustment to fugitive component emissions to account for additional piping fugitive emissions.

Under PSD rules, the 2006 expansion project's emissions increases are not considered significant.

The 2006 Expansion Project will increase the volume of wastewater discharged from the Refinery. The total mass of pollutants discharged is expected to increase, but not the concentration. The increases are relatively minor and will meet the limits of the facility's LPDES permit, as well as the requirements of the Publicly Owned Treatment Works to which the Refinery discharges its effluent.

Solid and hazardous waste generation is not expected to increase noticeably as a result of the 2006 Expansion Project.

The Expansion Project and its Environmental Context

The Refinery understands that it must execute its fiduciary responsibilities while minimizing the Refinery's impact on the environment. The Refinery believes that the best way to do this is expanding its existing facility and making use of the multiple systems it already has in place to protect human health and the environment. Building the expansion capacity elsewhere would be more costly for the Refinery and the environment.

In environmental terms, building the capacity elsewhere would entail the following environmental costs which are minimized or eliminated with expansion of the existing facility:

- The embodied energy of the new infrastructure

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- The potential impact to surface waters and wetlands from constructing a new facility's infrastructure
 - Roads
 - Pipelines
 - Process units
- Ecosystem disruptions at greenfield sites
- Problems caused by a reduction in institutional, operational, and environmental knowledge

By expanding the existing facility, the Refinery can readily integrate the new equipment and operations into its existing, substantial and comprehensive environmental and safety programs.

The Refinery's Existing Environmental and Safety Programs

The Shreveport Refinery utilizes the following pollution control equipment and practices to minimize emissions:

Air Pollution Control

Shreveport Refinery utilizes effective air pollution control equipment and practices to minimize air emissions.

- Vapor collection system for process vents and a flare to control the vented hydrocarbons,
- Low-emission burners on many process heaters,
- Numerous hydrocarbon control measures,
- A stringent leak detection and repair (LDAR) program,
- Energy efficiency programs to reduce the amount of fuel burned,
- Wastewater monitoring to control emissions, and
- Advanced instrumentation to monitor and control the facility's operations.

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Process and Stormwater Control

- Process wastewater from the facility is managed in the refinery's existing wastewater treatment plant and is discharged to Brushy Bayou, authorized by and LPDES Permit. The SO₄ stream from the Belco Oxidation Tower is discharged to the publicly owned treatment works (POTW).
- Rainfall collected from outside the process areas is discharged through permitted outfalls that are monitored for potential contamination. The results of this monitoring are reported to the LDEQ in accordance with discharge permit requirements.
- Secondary containment dikes are provided for storage tanks and loading areas to isolate spills.
- Refinery personnel adhere to the Storm Water Pollution Prevention Program.

Waste Management

Calumet treats or disposes of any solid waste produced in accordance with all applicable federal, state and local laws and regulations, and it has an active waste minimization program.

Emergency Response

Calumet maintains an emergency response plan that is coordinated with the Local Emergency Planning Committee.

Accident Prevention

- The facility complies with state and federal regulations that address the accidental release and offsite consequence for toxic and/or flammable substances. These rules contain requirements for hazard assessment, release prevention, emergency response and risk management.

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- Calumet avoids potential adverse effects, such as the release of hazardous chemicals, by designing systems and training personnel to:
 - reduce the potential for release of hazardous chemicals;
 - minimize the amount of any release, should one occur;
 - promptly inform appropriate agencies regarding possible offsite impacts, as required by law; and
 - quickly respond to mitigate any adverse effects of the release.

- To reduce the potential for a release of hazardous chemicals to the environment, Calumet has designed and selected systems to properly contain hazardous chemicals in accordance with good engineering practices. Materials of construction for tanks, equipment, piping and accessories are compatible with process fluids in order to minimize failure from corrosion, stress cracking, or fatigue. Periodic inspections and preventative maintenance of all equipment is performed to ensure all process and safety systems remain in optimum operating condition.

Note: For additional information on the Refinery's accident prevention program, please go to the end of this section.

Training

Operations, maintenance and support personnel are trained in the use of appropriate safety equipment, and are able to quickly identify the potential hazards associated with all chemicals and processes within Shreveport Refinery.

Personnel training is provided in (but not limited to) the following areas:

- Identifying and communicating process and chemical hazards
- Compliance with permit requirements (air and water)
- Waste management

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- The facility's Storm Water Pollution Prevention Plan and Spill Prevention, Control and Countermeasures Plan (SPCC).
- The Refinery's Safety Program, including:
 - Personal Protective Equipment;
 - Confined Space Entry;
 - Emergency Response Procedures;
 - Hot Work Procedures;
 - Lockout/Tagout Procedures; and
- Contractor Safety

IT QUESTIONNAIRE

- 1. Have the potential and real adverse environmental effects of the proposed facility (activity) been avoided to the maximum extent possible?**

Yes. Expansion of the Refinery is the most efficient means by which the Refinery can meet its financial goals. It is also the route that minimizes to the greatest extent possible the impact this added refining capacity has on the environment. From an air pollution standpoint, the greatest potential increase in emissions from the expansion is the addition of numerous heaters. Each of the new heaters has been equipped with ultra-efficient burners and heat recovery systems that minimize both the total fuel burned and the emissions generated from each unit of fuel burned. The result is that the increases in emissions from the proposed project fall below the "significant increase" level found in PSD regulations.

Several process units are being upgraded in the expansion. This means that each of the upgraded units will be evaluated through the Hazard Operability (HAZOP) program, which means each unit will undergo a thorough safety review. The goal of this review is to eliminate accidents which lead to both injuries and the release of pollutants.

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The expanded facility will continue to operate under the facility's existing safety and environmental programs, which means the expanded operations should integrate smoothly with programs that have already demonstrated exemplary protection of human health and the environment.

No new surface transportation routes, pipelines or land area outside the Refinery's existing boundaries will be affected by the proposed expansion.

- 2. Does a cost benefit analysis of the environmental costs balanced against the social and economic benefits of the proposed facility (activity) demonstrate that the latter outweighs the former?**

Yes. This response is necessarily qualitative in nature, but it is overwhelmingly clear that the benefits of the project outweigh its environmental costs.

Environmental Costs

The real environmental costs of this project are the increases in air pollution emissions and wastewater discharges.

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Air Pollution Environmental Costs:

The air pollution costs are related to the increase in actual air pollutant emissions:

	Particulate Matter (tpy)	Sulfur Dioxides (tpy)	Nitrogen Oxides (tpy)	Carbon Monoxide (tpy)	Volatile Organic Compounds (tpy)
Net Change for Contemporaneous Period	10.57	31.81	23.55	61.10	19.57
PSD Significant Emission Rate	15	40.00	40.00	100.00	40.00

In this case, the most reliable barometer of environmental costs of air pollution is whether the emissions increase trigger detailed ambient air impact analyses, and this project does not. This means that the State and Federal agencies charged with protecting the ambient air quality do not view this project as a significant threat to the quality of air in the region of the Refinery.

Water Pollution Costs:

The Refinery discharges its wastewater to Brushy Bayou under and LPDES Permit. The SO₄ stream from the Belco Oxidation Tower discharges to the City of Shreveport publicly owned treatment works. Any increases in pollutant loadings to the city will result in a charge back to the Refinery. The key barometer of environmental cost here is whether the POTW can meet its discharge limits, and thereby continue to protect the quality of the water body to which the POTW discharges. No adverse affect at the POTW is anticipated as result of this project, so no environmental cost will be incurred.

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Waste Management Costs:

No environmental costs beyond those already accounted for in the construction of the waste management facilities used by the Refinery will be incurred as a result of this project.

Social and Economic Benefits

The construction and operation of the proposed expansion will add numerous jobs to the local economy. Additions to the work force could on average include:

1. 75 to 100 temporary construction jobs, and
2. 10 to 15 full-time employees to operate and maintain expanded facility.

The construction phase of the project would also benefit local businesses with additional sales of construction material, pipe, building supplies, electrical components, fuel, food, and rent for temporary housing.

The construction and ongoing operation of the refinery results in a substantial increase in local and state tax revenue. The general categories of taxes and their approximate values include:

- Parish Property Tax, Ad Valorem Tax, and School Tax – The Parish and other local tax authorities will assess an annual tax on the property estimated at 1% of the facility's appraised value. For example, if the value of the Refinery is increased by \$100 million, its owners would be assessed in the range of \$1,000,000 annually in property and other local taxes.
- Corporate Income Tax – State and Federal income taxes are assessed on the income generated by refining activity.
- Sales Tax – The construction of the expansion will require the purchase of a large amount of equipment such as compressors, pipe, instrumentation, building

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materials, meters, etc. For example, the expansion may include \$50 million of tangible equipment. This purchase would generate \$2,000,000 in state sales tax revenue (at a state sales tax rate of 4%) and \$2,875,000 in parish sales tax revenue (at a rate of 5.75%).

3. Are there alternative projects which would offer more protection to the environment than the proposed facility (activity) without unduly curtailing non-environmental benefits?

The proposed project is to expand an existing facility. Building a new facility that would meet the goals of the expanded facility would create greater economic and environmental costs¹. The Refinery owns no other facility that could be expanded to meet the goals of this project. Scrapping the expansion project makes no sense in light of the minor environmental costs of the project. Therefore, there are no attractive alternative projects that offer more protection to the environment and similar economic benefit when compared to the proposed project.

4. Are there alternative sites which offer more protection to the environment than the proposed facility (activity) site without unduly curtailing non-environmental benefits?

No. Because the Refinery proposes to expand its existing facility, a traditional alternative site analysis is not appropriate here. The surrounding community and environment are well adapted to the presence of the Refinery, portions of which commenced operation in the late 1930s (Calumet purchased the facility from Pennzoil-Quaker State in 2001). The cost of changing sites is not economically feasible.

The site is in an area that currently has no zoning ordinances. However, the surrounding area has been developed for industrial use. The facility has good access to transportation

¹ The total environmental impact of a new facility would be greater than expanding the existing facility. It is unlikely that emissions or discharges would decrease. Yet the environmental impact from construction of a new site would surely be greater than that of expanding the existing facility.

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via highways and rail. The potential for transportation incidents is minimal. The roads and railways near the site are maintained to accommodate industrial traffic.

- 5. Are there mitigating measures which would offer more protection to the environment than the facility (activity) as proposed without unduly curtailing non-environmental benefits?**

No. All necessary, appropriate, required and forward-thinking mitigating measures have been incorporated into the Refinery's existing and proposed facility. Please see the introduction to this section for a description of the refinery's environmental protection programs.

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SUPPLEMENTAL INFORMATION ON THE REFINERY'S ACCIDENT PREVENTION PROGRAM

The following is a summary of the accident prevention program in place at the Shreveport Refinery.

The Shreveport Refinery requires employees to participate in all facets of process safety management and accident prevention. Examples of employee participating range from updating and compiling technical documents and chemical information to participating as an incident investigation team member. Employees have access to all information created as part of the facility's accident prevention program.

The Shreveport Refinery maintains a variety of safety documents that addresses the hazards of the chemicals, the safe operation of the process, the technology of the processes, and the equipment used in the processes. Specific departments within the plant are assigned responsibility for maintaining up-to-date process safety information. Chemical-specific information provided in material safety data sheets (MSDS) includes exposure hazards and emergency response/exposure treatment considerations. MSDSs are readily available through Shreveport Refinery's computer system. The plant also maintains records of materials of construction, design pressure and temperature ratings, electrical area classifications, piping and instruments diagrams (P&ID), etc.

The Shreveport Refinery has a comprehensive program to ensure that hazards associated with the various processes are identified and controlled. Within the program, each process is systematically examined to identify reasonably foreseeable hazards and ensure that adequate controls are in place to manage these potential hazards. The plant uses the hazard and operability (HAZOP) analysis technique to perform these evaluations. The incident investigation team's findings are electronically traced and assigned to appropriate departments for resolution. To ensure that the process controls and/or process hazards do not eventually deviate significantly

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from the original process hazard analysis, the Shreveport Refinery periodically updates and revalidates the hazard analysis results.

The Shreveport Refinery maintains written procedures that address various modes of process operations, such as (1) unit startup, (2) normal operations, (3) temporary operations, (4) emergency shutdown, (5) normal shutdown, and (6) initial startup of a new process. These procedures are periodically reviewed and annually certified as current and accurate. In addition to operating procedures, the facility has long-standing safe work practices in place to ensure both worker and process safety.

The Shreveport Refinery uses contractors for routine maintenance activities, maintenance during shutdown periods, and construction activities. Contractors performing these activities are subject to stringent safety requirements to assure that they: (1) perform their work in a safe manner, (2) have appropriate environmental and safety knowledge, (3) are aware of the hazards of the workplace, (4) understand what they should do in the event of an emergency, (5) understand and follow site environmental and safety rules, and (6) inform plant personnel of any hazards or releases that they may encounter during their work. A contractor's prior environmental, health and safety performance is reviewed and must meet certain standards prior to being placed on the facility's Approved Contractor list.

The Shreveport Refinery promptly investigates all incidents that resulted, or could reasonably have resulted in a fire/explosion, toxic gas release, major property damage, environmental loss, or personal injury. The goal of each investigation is to determine the facts and develop corrective actions to prevent recurrence of a similar incident. Incident investigation reports can be reviewed during future process hazard assessments and process hazard assessment revalidations.

To ensure that the accident prevention program is functioning properly, audits are periodically conducted to determine whether the procedures and practices required by the accident prevention program are being implemented. The final resolutions of each finding are documented and the two most recent audit reports are retained.

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The processes at the facility have inherent hazards that must be efficiently managed to ensure continued safe operation. Collectively, the previously summarized prevention program activities help prevent potential accident scenarios that could be caused by equipment failures or human errors.

Some release containment and control methods used at the Shreveport Refinery include:

- Process relief valves that discharge to a closed flare system to capture and incinerate releases;
- Remotely activated valves that discharge to a closed flare system for emergency depressuring;
- Manual and remotely operated emergency shutdown valves to permit isolation of the process;
- Hardwire alarms for specific process parameters;
- Automated emergency shutdown systems for specific parameters;
- Computer control of specific process parameters for maximizing process stability;
- Curbing and diking to contain potential liquid releases;
- Grade paved and sloped to oily water sewer system designed to collect spills;
- Firewater system, supplied by multiple fire water pumps, with hydrants and monitors throughout the facility;
- Fire extinguishers located throughout the facility;
- Water spray systems installed on specific pieces of equipment;
- Portable fire fighting equipment;
- Trained emergency response personnel; and
- On-site spill containment and recovery equipment.

The Shreveport Refinery maintains a written emergency response program, which is in place to protect worker and public safety, as well as the environment. The program consists of procedures for responding to a release of a regulated substance, including the possibility of a fire or explosion if a flammable substance is accidentally released. The procedures address all

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aspects of emergency response, including reporting of an emergency, first aid and medical treatment for exposures, evacuation plans, accounting for personnel, notification of local emergency response, and post incident cleanup and decontamination requirements. The overall emergency response program for the Shreveport Refinery is coordinated with the Local Emergency Planning Committee (LEPC).

Thus, Calumet operates and manages on-site activities in a manner that minimizes any potential damage to the surrounding area.