Agency Interest No. 126578

PSD-LA-709 (M-1)

AUTHORIZATION TO CONSTRUCT AND OPERATE A MODIFIED MAJOR SOURCE PURSUANT TO THE PREVENTION OF SIGNIFICANT DETERIORATION REGULATIONS IN LOUISIANA ENVIRONMENTAL REGULATORY CODE, LAC 33:III.509

In accordance with the provisions of the Louisiana Environmental Regulatory Code, LAC 33:III.509,

Shintech Louisiana LLC
PO Box 358
Addis, LA 70710-0358

is authorized to construct the project at the Shintech Louisiana LLC - Plaquemine PVC Plant at

26270 Hwy 405
Plaquemine, LA 70764

subject to the emissions limitations, monitoring requirements, and other conditions set forth hereinafter.

This permit and authorization to construct shall expire at midnight on _____, 2010, unless physical on site construction has begun by such date, or binding agreements or contractual obligations to undertake a program of construction of the source are entered into by such date.

Signed this _____ day of _____, 2008.

Cheryl Sonnier Nolan
Assistant Secretary
Office of Environmental Services
Louisiana Department of Environmental Quality

BRIEFING SHEET

Shintech Louisiana LLC - Plaquemine PVC Plant
Agency Interest No.: 126578
Shintech Louisiana LLC
Plaquemine, Iberville Parish, Louisiana
PSD-LA-709 (M-1)

PURPOSE

To obtain a modification to the PSD permit for Shintech Plaquemine Plant 1 (SPP-1).

RECOMMENDATION

Approval of the proposed construction and issuance of a permit.

REVIEWING AGENCY

Louisiana Department of Environmental Quality, Office of Environmental Services, Air Permits Division

PROJECT DESCRIPTION

Shintech Louisiana, LLC (Shintech) is currently constructing the Plaquemine PVC Plant in Plaquemine, Louisiana under Title V Permit No. 1280-00118-V0 and PSD Permit No. PSD-LA-709. Shintech has requested reconciliations and modifications to these permits. These modifications and reconciliations are included in the Preliminary Determination Summary. Shintech requests the incorporation of these items into the Title V and PSD permits. The name of this plant is changed to Shintech Plaquemine Plant 1 (SPP-1).

Estimated emissions, in tons per year, are as follows:

Pollutant	Before	After	Change
PM_{10}	78.71	78.14	-0.57
SO_2	2.80	3.47	+0.67
NO_X	92.85	96.76	+3.91
CO	211.03	211.90	+0.87
VOC *	62.36	66.11	+3.75

TYPE OF REVIEW

According to the original application, carbon monoxide (CO) emissions from the plant will be above the PSD major source threshold of 100 tons/year. Nitrogen oxides (NO_X), particulate (PM/PM_{10}), and vinyl chloride (VCM) emissions will be emitted at more than their PSD significance levels. Nitrogen dioxide (NO_2) is the compound regulated as a criteria pollutant. However, significant emissions are

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based on the sum of all oxides of nitrogen (NO_X). CO, NO_2, PM/PM_{10}, and VCM emissions have been reviewed under the PSD regulations. VCM was removed from the criteria pollutant list; therefore, VCM emissions have been removed from this permit.

BEST AVAILABLE CONTROL TECHNOLOGY

There is no significant CO, NO_2, PM/PM_{10}, and VCM emissions increase with this reconciliation. No new BACT analysis is required for this PSD modification.

Per the BACT requirements of PSD-LA-709, Control of PM_{10} and CO emissions were analyzed using a "top down" approach. Good design and maintenance, good combustion practices, burning gaseous fuels, paving plant roads as much as practicable and use of mist eliminators, cyclones, scrubbers, and baghouses were determined as BACT for PM_{10} and CO emissions from affected equipment at the proposed plant.

Shintech utilizes good combustion practices, low NO_X burners (LNB), flue gas recirculation (FGR), and selective catalytic reduction (SCR) to control NO_X emissions to a degree equivalent to the Lowest Achievable Emission Rates (LAER) to fulfill BACT requirements of the PSD program.

AIR QUALITY IMPACT ANALYSIS

No new Air quality analysis was required for this modification.

ADDITIONAL IMPACTS

No new Additional Impact analysis was required for this modification.

PROCESSING TIME

Application Dated:	February 29, 2008
Application Received:	February 29, 2008
Additional Information Dated:	May 28, 2008
Effective Completeness Date:	August 20, 2008

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PUBLIC NOTICE

A notice requesting public comment on the proposed project was published in *The Advocate*, Baton Rouge, Louisiana, on <<Date>>, 200x; and in <<*Local Paper*>>, <<City>>, Louisiana, on <<Date>>, 200x. Copies of the public notice were also mailed to individuals who have requested to be placed on the mailing list maintained by the Office of Environmental Services on <<Date>>, 200x. A proposed permit was also submitted to U.S. EPA Region VI on <<Date>>, 200x and to the Federal Land Manager on <<Date>>. All comments will be considered prior to a final permit decision.

PRELIMINARY DETERMINATION SUMMARY

Shintech Louisiana LLC - Plaquemine PVC Plant
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Shintech Louisiana LLC
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August 20, 2008

I. APPLICANT

Shintech Louisiana LLC
PO Box 358
Addis, LA 707100358

II. LOCATION

Shintech Plaquemine Plant 1 is located at 26270 Highway 405 River Road South, Plaquemine, Louisiana. It is on the west bank of the Mississippi River, off Highway 405, south of Plaquemine. Approximate UTM coordinates are 675.712 kilometers East and 3350.274 kilometers North, Zone 15.

III. PROJECT DESCRIPTION

Shintech Plaquemine Plant 1 (SPP-1) is a vertically integrated polyvinyl chloride (PVC) manufacturing facility that also produces intermediate products, including chlorine (and caustic soda as a byproduct), ethylene dichloride (EDC), and vinyl chloride monomer (VCM). Process units include a chlor-alkali unit (C/A unit), a VCM unit, and a PVC unit. The C/A units use brine to produce chlorine (Cl_2) and sodium hydroxide (NaOH) by membrane-based electrolysis process. The VCM unit produces EDC by reacting ethylene and chlorine in a direct chlorination. The EDC is purified by distillation and sent to cracking furnaces to yield VCM and hydrochloric acid (HCl). The VCM is purified and sent to storage spheres. EDC that was not cracked is sent back to the EDC purification trains. HCl is recovered and used in a second EDC formation process called oxyhydrochlorination. Purified VCM is polymerized to form PVC.

Construction of SPP-1 is nearing completion; however, the plant has not begun normal operation. Shintech has identified several items in the permit that should be reconciled prior to startup of the facility. A reconciliation of Permit Nos. 1280-00118-V0 and PSD-LA-709 was requested to incorporate these items. This reconciliation does not change the Nonattainment New Source Review (NNSR), Lowest achievable Emission Rate (LAER) analysis and PSD Best Available Control Technology (BACT) analysis of the original permitting. No further analyses are needed for this action.

The PSD permit included an Air Quality Analysis. Emissions associated with the reconciliation will be added to the emissions from the currently permitted emissions of SPP-1, as well as the proposed emissions that are currently under review for SPP-2, HAPF-1, and

HAPF-2, for an evaluation of the air quality impact from the SPP complex. In addition, the EPA has promulgated a new air quality model, AERMOD, which will be used for this analysis. A modeling protocol was submitted and approved by LDEQ on January 28, 2008. Shintech will submit a modeling report of the air quality impacts from the SPP complex under separate cover.

SPP-1 is located in Iberville parish, which is a part of a nonattainment area for ozone. Shintech voluntarily used a 1 to 1.3 offset ratio in the 2005 permit. In order to be consistent with the emission offset ratio of the project, Shintech will voluntarily offset the emissions associated with this reconciliation using the 1 to 1.3 offset ratio.

The SPP complex is a major source of Toxic Air Pollutants (TAP). As with the PSD Air Quality Analysis, a modeling protocol was submitted and approved by LDEQ on January 28, 2008. Shintech submitted a modeling report of the air quality impacts from the SPP complex under separate cover.

Shintech requests the following changes and corrections to Permit No. 1280-00118-V0 and PSD Permit PSD-LA-709.

1. Emission Points – Based on design changes during the construction process, Shintech requests the addition of new emission points and modifications to existing emission points as outlined below. The changes requested below have been incorporated into the air dispersion modeling protocol submitted to the LDEQ on November 28, 2007.

   1.1 Emission Point Number (EPN) M-7 (EQT012) VCM Cooling Tower 1 and EPN M-8 (EQT013) VCM Cooling Tower 2 – The initial facility design included two cooling towers operating at approximately 80,000 gallons per minute (gpm) each. Shintech has modified the facility design to include only one cooling tower that will operate at approximately 106,000 gpm. EPN M-7 (EQT012) VCM Cooling Tower 1 stack parameters and emission rates have been updated. EPN M-8 (EQT013) VCM Cooling Tower 2 will be deleted from the airpermit. Revised EIQ sheets and supporting emissions calculations are included with this application.

   1.2 EPN P-25 IB Loading Hopper, P-26 IC Loading Hopper, and P-27 IFS Loading Hopper – Shintech has noted three additional sources of potential particulate matter emissions over the course of facility construction. These include the IB, IC, and IFS loading hoppers. IB, IC, and IFS are powders used in the PVC Plant. When the powder is loaded into the make-up tanks, and generated particulates are caught by the

blower, which passes the vent stream through a filter prior to discharge to the atmosphere.

1.3 EPN M-16 VCM Emergency Generators, EPN P-28 Emergency Combustion Equipment, EPN U-7 South Tank Yard Fire Water Pump, EPN U-8 North Yard Fire Water Pump, EPN U-9 Ship Dock Emergency Pump, EPN U-10 Utility Emergency Generator, and EPN C-6 C/A Emergency Generator – Shintech will maintain miscellaneous diesel-fired equipment at the facility for use during emergencies, such as a power outage to a main pump or unit. These engines will be fired at reduced loads will be fired at reduced loads periodically for routine maintenance and will be fired at full load for emergencies and power outages.

2. Emission Rate Tables – Certain emissions data were missing or not printed correctly in the emission rate tables in the Title V and PSD permits. It is requested that the emission rate tables in both permits be updated.

3. Amendments and corrections to Specific Requirements – Shintech has noted various regulatory applicability errors in the Specific Requirements portion of the Title V permit and seeks to reconcile these inconsistencies prior to facility startup. Revision of these requirements duplicated in the PSD permit is also requested.

3.1 EQT012 & EQT013: A performance test is not required for a cooling tower. Please remove these requirements from the permit.

3.2 Revised the requirement to conduct particulate matter (PM) and total organic compound (TOC) performance tests using Test Methods 5 and 25A from the cracking furnaces for at least 50% population.

3.3 Amended the performance testing requirements on the cracking furnaces to allow the tests to be conducted on any two of the four cracking furnaces (EQT006, EQT009, EQT010, and EQT011).

3.4 Revised the requirement to conduct particulate matter (PM) and total organic compound (TOC) performance tests using Test Methods 5 and 25A from the boilers for at least 50% population.

4. Chapter 22 Applicability to the Cracking Furnaces

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The VCM Unit Cracking Furnaces (EQT006, 009, 010, and 011) were identified in Section XI – Explanation for Exemption Status or Non-Applicability of a Source – as exempt from the requirements of LAC 33:III.2201 because the units were subject to a more stringent requirement – Lowest Achievable Emission Rate (LAER). The Cracking Furnaces are exempt from the emission limits of LAC 33:III.2201; however, according to LAC 33:III.2201.C.15, if more stringent requirement does not specify monitoring, reporting, and recordkeeping requirements, then the monitoring, reporting, and recordkeeping requirements of LAC 33:III.2201 apply.

Shintech requests incorporation of the monitoring, reporting and recordkeeping requirements of LAC 33:III.2201 into the air permit for the VCM Unit Cracking Furnaces as provided in Tables 1 and 2 of Section 3.0 of this application.

Estimated emissions in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	78.71	78.14	-0.57
SO_2	2.80	3.47	+0.67
NO_X	92.85	96.76	+3.91
CO	211.03	211.90	+0.87
VOC *	62.36	66.11	+3.75

IV. SOURCE IMPACT ANALYSIS

A proposed net increase in the emission rate of a regulated pollutant above de minimis levels for new major or modified major stationary sources requires review under Prevention of Significant Deterioration regulations, 40 CFR 52.21. PSD review entails the following analyses:

A. A determination of the Best Available Control Technology (BACT);

B. An analysis of the existing air quality and a determination of whether or not preconstruction or postconstruction monitoring will be required;

C. An analysis of the source's impact on total air quality to ensure compliance with the National Ambient Air Quality Standards (NAAQS);

D. An analysis of the PSD increment consumption;

E. An analysis of the source related growth impacts;

F. An analysis of source related growth impacts on soils, vegetation, and visibility;

G. A Class I Area impact analysis; and

H. An analysis of the impact of toxic compound emissions.

A. BEST AVAILABLE CONTROL TECHNOLOGY

Under current PSD regulations, an analysis of "top down" BACT is required for the control of each regulated pollutant emitted from a modified major stationary in excess of the specified significant emission rates. The top down approach to the BACT process involves determining the most stringent control technique available for a similar or identical source. If it can be shown that this level of control is infeasible based on technical, environmental, energy, and/or cost considerations, then it is rejected and the next most stringent level of control is determined and similarly evaluated. This process continues until a control level is arrived at which cannot be eliminated for any technical, environmental, or economic reason. A technically feasible control strategy is one that has been demonstrated to function efficiently on identical or similar processes. Additionally, BACT shall not result in emissions of any pollutant which would exceed any applicable standard under 40 CFR Parts 60 and 61.

For this reconcilation, no new BACT analyses was required.

Summary of BACT analysis for CO emissions as required by PSD-LA-709

Carbon monoxide is formed as a result of incomplete combustion. To control CO emissions, completed combustion must be guaranteed by the addition of an oxidizer (thermal or catalytic), conducting good combustion practices, or by providing good mixing of gaseous fuel.

Thermal oxidation is the first control option considered for CO emissions. Flue gas from combustion equipment could be routed through the thermal oxidizer where the gas will be heated to an operating range of 1200 - 2000°F. At this temperature, carbon monoxide and VOC will be burned to carbon dioxide. Raising exit gas to the appropriate temperature range will require a significant amount of energy and generate a large quantity of secondary emissions.

Catalytic combustion of carbon monoxide is another control option. Flue gas can be burned in a catalyst bed at 650 - 800°F. Approximately 90 percent of the carbon monoxide would be converted to carbon dioxide. Additional energy is required to heat the flue gas and send it through the catalyst bed. The catalyst bed, containing heavy metals, requires periodic replacement and recycling and/or disposal. Particulates and sulfur dioxide may plug or poison the catalyst beds.

CO emissions can also be controlled using good combustion techniques which are usually less efficient than the oxidation technologies, but they have minimal environmental and economic impact. Good combustion techniques include proper equipment designs, properly training operating personnel, maintaining appropriate fuel-to-air ratio, and maintaining written operating and maintenance procedures.

CO emissions from the boilers, thermal oxidizers, and furnaces are relatively low, less than 10 lbs/hr each. These pieces of equipment can be considered as CO thermal oxidizers themselves. Adding other oxidizers on these minor CO sources is impractical. Good combustion techniques are the best option which is determined as BACT for CO.

A small quantity of CO (0.17 lbs/hr) is periodically vented from the analyzer through the carbon canister to the atmosphere. An add-on control device for this source is impractical. No additional control is determined as BACT for CO emissions from this analyzer. The following table lists the techniques and emissions limits that meet the BACT for CO:

Table I:

EIQ	CO BACT	CO BACT Limits
EQT0039	Good combustion practices / gaseous fuel burning	0.036 lb/MM BTU
EQT0040	Good combustion practices / gaseous fuel burning	0.036 lb/MM BTU
EQT0041	Good combustion practices / natural gas fired	0.036 lb/MM BTU
EQT0042	Good combustion practices / natural gas fired	0.036 lb/MM BTU
EQT0006	Good combustion practices / natural gas fired	0.046 lb/MM BTU
EQT0009	Good combustion practices / natural gas fired	0.046 lb/MM BTU
EQT0010	Good combustion practices / natural gas fired	0.046 lb/MM BTU
EQT0011	Good combustion practices / natural gas fired	0.046 lb/MM BTU
TRT0001	Good combustion practices / gaseous fuel burning	0.11 lb/MM BTU
TRT0002	Good combustion practices / gaseous fuel burning	0.11 lb/MM BTU
EQT0007	No additional control	0.17 lb/hr
EQT0167	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0186	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0187	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0168	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0188	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0189	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0169	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0170	Good combustion practices / gaseous fuel burning	0.85 lb/MM BTU
EQT0171	Good combustion practices / gaseous fuel burning	0.85 lb/MM BTU
EQT0190	Good combustion practices / gaseous fuel burning	0.85 lb/MM BTU

EQT0174	Good combustion practices / gaseous fuel burning	0.85 lb/MM BTU
EQT0191	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0192	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0193	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0194	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0178	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0195	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0196	Good combustion practices / gaseous fuel burning	0.95 lb/MM BTU
EQT0197	Good combustion practices / gaseous fuel burning	0.85 lb/MM BTU

Summary for BACT analysis for PM/PM_{10} emissions as required by PSD-LA-709

Control techniques for PM/PM_{10} include cyclones, electrostatic precipitators (ESP), fabric filters, wet scrubbers, good combustion practices and use of gaseous fuels.

Cyclones collect particulate laden gases and force them to spin in a vortex resulting in a change in direction of the particles. The particles then drop out of the gas stream. Cyclones are generally used to reduce dust loading and collect large particles.

ESPs operate by electrically charging particles and then separating them from the gas stream with a collector of opposite charge. High voltage direct current discharge electrodes, typically wires, are suspended in the gas stream to impose a negative charge on the particles. The particles are driven to positive collecting electrodes (typically plates) located opposite the wires. Particles are removed from the collection plates by rapping devices that strike the collection and discharge electrodes. The dust falls into hoppers and is conveyed to a disposal system. ESPs are usually used to capture coarse particles at high concentrations. Small particles at low concentrations are not effectively collected by an ESP.

In the fabric filter or baghouse, particle-laden gas passes through the filter bags, retaining particles on the filters. The filters are periodically cleaned via shaking, reverse airflow, or pulse jet cleaning. During cleaning, particles are deposited in a hopper for subsequent disposal. Fabric filters are used for medium and low gas flow streams with high particulate concentrations.

PM/PM_{10} can be removed from a vent stream using a wet scrubber. Vent gas usually flows countercurrently with water, which removes particulate from the gas. Particulates are then separated from water and then disposed. Depending on the design, cyclones, ESPs, fabric filters, and wet scrubbers can achieve similar removal efficiencies.

Particulate emissions from the boilers and cracking furnaces are very fine particulates at very

low concentration, even lower than the guarantee of some control devices. Using cyclones, electrostatic precipitators (ESP), fabric filters, and wet scrubbers is impractical. Good combustion practices and use of gaseous fuels are determined as BACT for particulates emissions from boilers and cracking furnaces.

As required by 40 CFR 63, the thermal oxidizers are equipped with wet scrubbers to remove hydrogen chloride and chlorine gas. Incidentally, the scrubbers also remove some particulates from the flue gas streams. Therefore, operating the scrubbers as required by 40 CFR 63, in combination with good combustion practices and use of gaseous fuels are determined as BACT for particulates emissions from thermal oxidizers.

Vents from PVC dryers are saturated with water vapor. Particulates will quickly plug the fabric filters and ESPs. Cyclones followed by scrubbers are determined as BACT for particulate emissions from the PVC dryers.

PVC is periodically transferred to the storage silos and cleaning silo. Shintech proposed to use cyclones followed by fabric filters to capture PVC granules and control particulates emissions. Cyclones followed by fabric filters are determined as BACT for particulates emissions from these silos.

Particulate emissions from road fugitives can be either from the vehicles or from the roads. Shintech proposed to pave as much as practicable of the plant road to prevent particulates from becoming airborne. Paving is determined as BACT for particulate emissions from plant roads.

Wet cooling towers provide direct contact between cooling water and air. A small amount of water will be entrained and carried over with exit air from the towers. Suspended solids and dissolved materials in the entrained water are emitted as particulates. Because cooling towers require large surface areas and high air flow rates to transfer heat, an add-on air pollution control device would be infeasible. The cooling towers will be designed with integrated drift eliminators to minimize drift loss. This is determined as BACT for particulate emissions from the cooling towers.

The following table lists the techniques and emissions limits that meet the BACT for particulates:

Table II:

EIQ	PM/PM_{10} BACT	PM/PM_{10} BACT Limits
EQT0039	Good combustion practices / gaseous fuel burning	0.005 lb/MM BTU
EQT0040	Good combustion practices / gaseous fuel burning	0.005 lb/MM BTU
EQT0041	Good combustion practices / natural gas fired	0.005 lb/MM BTU
EQT0042	Good combustion practices / natural gas fired	0.005 lb/MM BTU

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EIQ	PM/PM_{10} BACT	PM/PM_{10} BACT Limits
EQT0004	Good design, maintenance and mist eliminators	0.08 lb/MM gal
EQT0012	Good design, maintenance and mist eliminators	0.06 lb/MM gal
EQT0021	Good design, maintenance and mist eliminators	0.057 lb/MM gal
EQT0006	Good combustion practices / natural gas fired	0.007 lb/MM BTU
EQT0009	Good combustion practices / natural gas fired	0.007 lb/MM BTU
EQT0010	Good combustion practices / natural gas fired	0.007 lb/MM BTU
EQT0011	Good combustion practices / natural gas fired	0.007 lb/MM BTU
TRT0001	Good combustion practices / gaseous fuel burning	0.0075 lb/MM BTU
TRT0002	Good combustion practices / gaseous fuel burning / scrubber	0.0075 lb/MM BTU
EQT0015	Cyclone / scrubber	0.0053 gr/dscf
EQT0025	Cyclone / scrubber	0.0053 gr/dscf
EQT0032	Cyclone / baghouse	0.01 gr/dscf
EQT0033	Cyclone / baghouse	0.01 gr/dscf
EQT0034	Cyclone / baghouse	0.01 gr/dscf
EQT0035	Cyclone / baghouse	0.01 gr/dscf
EQT0036	Cyclone / baghouse	0.01 gr/dscf
EQT0037	Cyclone / baghouse	0.01 gr/dscf
EQT0038	Cyclone / baghouse	0.01 gr/dscf
ARE0001	Paving plant road as much as practicable	0.22 lbs/hr
EQT0167	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0186	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0187	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0168	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0188	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0189	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0169	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0170	Good combustion practices / gaseous fuel burning	0.1 lb/MM BTU
EQT0171	Good combustion practices / gaseous fuel burning	0.1 lb/MM BTU
EQT0190	Good combustion practices / gaseous fuel burning	0.1 lb/MM BTU
EQT0174	Good combustion practices / gaseous fuel burning	0.1 lb/MM BTU
EQT0191	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0192	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0193	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0194	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0178	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU

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EIQ	PM/PM_{10} BACT	PM/PM_{10} BACT Limits
EQT0195	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0196	Good combustion practices / gaseous fuel burning	0.31 lb/MM BTU
EQT0197	Good combustion practices / gaseous fuel burning	0.1 lb/MM BTU
EQT0175	Good design and maintenance	0.01 gr/scf
EQT0176	Good design and maintenance	0.01 gr/scf
EQT0177	Good design and maintenance	0.01 gr/scf

Summary of BACT analysis for NO_X emissions as required by PSD-LA-709

The proposed plant will be located within a nonattainment area designated as marginal status for ozone with NO_X and VOC as precursors. NO_X emissions were reviewed under NNSR programs. NO_X emissions from the proposed facility will be less than 100 TPY, NO_X will not have to be controlled to the Lowest Achievable Emission Rates (LAERs). However, Shintech will control NO_X emissions from the plant to a degree equivalent to the LAERs to fulfill BACT requirements of the PSD program as follows:

The following table lists the techniques and emissions limits equivalent to the LAER:

Table III:

EIQ	Control Technologies	Permit Limits
EQT0039	LNB/FGR	0.040 lb/MM BTU
EQT0040	LNB/FGR	0.040 lb/MM BTU
EQT0041	LNB/FGR	0.012 lb/MM BTU
EQT0042	LNB/FGR	0.012 lb/MM BTU
EQT0006	LNB/SCR	0.009 lb/MM BTU
EQT0009	LNB/SCR	0.009 lb/MM BTU
EQT0010	LNB/SCR	0.009 lb/MM BTU
EQT0011	LNB/SCR	0.009 lb/MM BTU
TRT0001	Good combustion practices and SCR	0.025 lb/MM BTU
TRT0002	Good combustion practices and SCR	0.025 lb/MM BTU
EQT0167	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0186	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0187	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0168	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0188	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU

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EIQ	Control Technologies	Permit Limits
EQT0189	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0169	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0170	Good combustion practices / gaseous fuel burning	3.2 lb/MM BTU
EQT0171	Good combustion practices / gaseous fuel burning	3.2 lb/MM BTU
EQT0190	Good combustion practices / gaseous fuel burning	3.2 lb/MM BTU
EQT0174	Good combustion practices / gaseous fuel burning	3.2 lb/MM BTU
EQT0191	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0192	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0193	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0194	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0178	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0195	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0196	Good combustion practices / gaseous fuel burning	4.41 lb/MM BTU
EQT0197	Good combustion practices / gaseous fuel burning	3.2 lb/MM BTU

B. ANALYSIS OF EXISTING AIR QUALITY

Prevention of Significant Deterioration regulations require an analysis of existing air quality for those pollutants emitted in significant amounts from a proposed facility.

This modeling analysis was conducted for PM_{10}, CO, and NO_2. For those pollutants to be modeled, the impacts due to the contemporaneous net increase from the project (in this case, the entire allowable emission rates) were modeled to determine if the emissions increase results in a significant impact. Therefore the resulting concentrations were compared to corresponding modeling significance level (MSL) for each pollutant modeled and the corresponding average period.

Modeled concentrations of PM_{10}, CO and NO_2 for each averaging period were less than the MSL; therefore, a full impact analysis was not required.

C. NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) ANALYSIS

Refined modeling showed that PM_{10}, CO and NO_X emissions from the proposed plant will not cause or contribute to any NAAQS exceedances.

PRELIMINARY DETERMINATION SUMMARY

Shintech Louisiana LLC - Plaquemine PVC Plant
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Shintech Louisiana LLC
Plaquemine, Iberville Parish, Louisiana
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August 20, 2008

D. PSD INCREMENT ANALYSIS

Computer modeling indicated that PSD increment allowances for PM_{10}, CO and NO_X will be preserved.

E. SOURCE RELATED GROWTH IMPACTS

The modification was a direct replacement of or correction to existing units requiring no increase or decrease in personnel. Commercial, residential, and industrial growth will not be affected.

F. SOILS, VEGETATION, AND VISIBILITY IMPACTS

There will be no significant impact on area soils, vegetation, or visibility.

G. CLASS I AREA IMPACTS

Breton National Wildlife Area, the nearest Class I area, is more than 120 miles from the site, precluding any significant impact.

H. TOXIC EMISSIONS IMPACT

The selection of control technology based on the BACT analysis included consideration of control of toxic emissions.

V. CONCLUSION

The Air Permits Division has made a preliminary determination to approve the modification of the Shintech Plaquemine Plant 1 at the Shintech Louisiana LLC near Plaquemine, in Iberville Parish, Louisiana, subject to the attached specific and general conditions. In the event of a discrepancy in the provisions found in the application and those in this Preliminary Determination Summary, the Preliminary Determination Summary shall prevail.

SPECIFIC CONDITIONS

Shintech Louisiana LLC - Plaquemine PVC Plant
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Shintech Louisiana LLC
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1. The permittee is authorized to operate in conformity with the specifications submitted to the Louisiana Department of Environmental Quality (LDEQ) as analyzed in LDEQ's document entitled "Preliminary Determination Summary" dated August 20, 2008 and subject to the emission limitations listed in Table IV and BACT determinations listed in Tables I, II, and III. Specifications submitted are contained in the application dated February 29, 2008, as well as additional information dated March 28, 2008.

2. To demonstrate compliance with the limitations of this permit, permittee shall conduct compliance/emissions tests using methods specified by the cited regulations and 40 CFR 60, Appendix A, Method 7E – Determination of Nitrogen Oxides Emissions from Stationary Sources for NO_X emissions, Method 5 – Determination of Particulate Emissions from Stationary Sources for PM_{10} emissions, and Method 10 – Determination of Carbon Monoxide Emissions from Stationary Sources for CO emissions.

SPECIFIC CONDITIONS

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Table IV – Maximum Allowable Emission Rates

EQT	Description	Capacity MM BTU/hr	Maximum Permitted Emission Rates			
				PM/PM_{10}	NO_X	CO
EQT0039	U-1 - Boiler A	250	lb/hr	1.25	10.00	9.05
EQT0040	U-2 - Boiler B	250	lb/hr	1.25	10.00	9.05
EQT0041	U-3 - Boiler C	250	lb/hr	1.25	3.00	9.05
EQT0042	U-4 - Boiler D	250	lb/hr	1.25	3.00	9.05
EQT0006	M-1 - Cracking Furnace A	90	lb/hr	0.8	0.96	5.00
			tons/yr	2.94	3.50	18.26
EQT0009	M-2 - Cracking Furnace B	90	lb/hr	0.8	0.96	5.00
			tons/yr	2.94	3.50	18.26
EQT0010	M-3 - Cracking Furnace C	90	lb/hr	0.8	0.96	5.00
			tons/yr	2.94	3.50	18.26
EQT0011	M-4 - Cracking Furnace D	90	lb/hr	0.8	0.96	5.00
			tons/yr	2.94	3.50	18.26
TRT0001	M-5 - Gas Thermal Oxidizer A	72	lb/hr	0.54	1.80	7.83
TRT0002	M-6 - Gas Thermal Oxidizer B	72	lb/hr	0.54	1.80	7.83
EQT0007	M-10 - Analyzer Vent 2	N/A	lb/hr			0.17
			tons/yr			0.63
EQT0004	C-4 - C/A Cooling Tower	38750 gpm	lb/hr	0.22		
			tons/yr	0.81		
EQT0012	M-7 - VCM Cooling Tower 1	106000 gpm	lb/hr	0.46		
			tons/yr	1.67		
EQT0021	P-15 - Cooling Tower	43000 gpm	lb/hr	0.18		
			tons/yr	0.64		

SPECIFIC CONDITIONS

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EQT	Description	Capacity MM BTU/hr	Maximum Permitted Emission Rates			
				PM/PM_{10}	NO_X	CO
EQT0015	P-1 - Scrubber A	650 MM lbs/yr	lb/hr tons/yr	4.76 20.87		
EQT0025	P-2 - Scrubber B	650 MM lbs/yr	lb/hr tons/yr	4.76 20.87		
EQT0032	P-3 - Delivery Silo A	650 MM lbs/yr	lb/hr	0.4		
EQT0033	P-4 - Delivery Silo B	650 MM lbs/yr	lb/hr	0.4		
EQT0034	P-5 - Delivery Silo C	650 MM lbs/yr	lb/hr	0.4		
EQT0035	P-6 - Delivery Silo D	650 MM lbs/yr	lb/hr	0.4		
EQT0036	P-7 - Delivery Silo E	650 MM lbs/yr	lb/hr	0.4		
EQT0037	P-8 - Delivery Silo F	650 MM lbs/yr	lb/hr	0.4		
EQT0038	P-9 - H/C Cleaning Silo	1 MM lbs/yr	lb/hr tons/yr	0.05 0.17		
ARE0001	Road - Fugitive Dust (Paved Roads)	N/A	lb/hr tons/yr	0.22 0.98		
EQT0167	U-7A - South Tank Yard Fire Water Pump	1.069	lb/hr	0.92	13.02	2.81
EQT0186	U-7B - South Tank Yard Fire Water Pump	1.069	lb/hr	0.92	13.02	2.81
EQT0187	U-7C - South Tank Yard Fire Water Pump	1.069	lb/hr	0.92	13.02	2.81
EQT0168	U-8A - North Tank Yard Fire Water Pump	1.126	lb/hr	0.97	13.70	2.95
EQT0188	U-8B - North Tank Yard Fire Water Pump	1.126	lb/hr	0.97	13.70	2.95
EQT0189	U-8C - North Tank Yard Fire Water Pump	1.126	lb/hr	0.97	13.70	2.95
EQT0169	U-9 - Ship Dock Emergency Pump	1.146	lb/hr tons/yr	0.99 0.02	13.95 0.27	3.01 0.06
EQT0170	U-10 - Utility Emergency Generator	1.744	lb/hr tons/yr	0.48 0.01	16.44 0.21	3.77 0.05

SPECIFIC CONDITIONS

Shintech Louisiana LLC - Plaquemine PVC Plant
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EQT	Description	Capacity MM BTU/hr	Maximum Permitted Emission Rates			
				PM/PM_{10}	NO_X	CO
EQT0171	C-6A - C/A Emergency Generator	4.352	lb/hr	1.20	41.02	9.40
EQT0190	C-6B - C/A Emergency Generator	2.05	lb/hr	0.56	19.32	4.43
EQT0174	M-16A - VCM Unit Emergency Generator	3.537	lb/hr	0.97	33.34	7.64
EQT0191	M-16B - VCM Unit Emergency Generator	1.118	lb/hr	0.97	13.61	2.93
EQT0192	M-16C - VCM Unit Emergency Generator	0.458	lb/hr	0.40	5.58	1.20
EQT0193	M-16D - VCM Unit Emergency Generator	0.458	lb/hr	0.40	5.58	1.20
EQT0194	M-16E - VCM Unit Emergency Generator	0.458	lb/hr	0.40	5.58	1.20
EQT0178	P-28A - PVC Emergency Combustion Equipment	1.375	lb/hr	1.19	16.74	3.62
EQT0195	P-28B - PVC Emergency Combustion Equipment	0.866	lb/hr	0.75	10.54	2.28
EQT0196	P-28C - PVC Emergency Combustion Equipment	0.458	lb/hr	0.40	5.58	1.21
EQT0197	P-28D - PVC Emergency Combustion Equipment	2.05	lb/hr	0.56	19.32	4.43
EQT0175	P-25 - IB Loading Hopper	460 ft^3/min	lb/hr tons/yr	0.05 0.01		
EQT0176	P-26 - IC Loading Hopper	460 ft^3/min	lb/hr tons/yr	0.05 0.01		
EQT0177	P-27 - IFS Loading Hopper	1000 ft^3/min	lb/hr tons/yr	0.11 0.02		

LOUISIANA AIR EMISSION PERMIT
GENERAL CONDITIONS

I. This permit is issued on the basis of the emissions reported in the application for approval of emissions and in no way guarantees that the design scheme presented will be capable of controlling the emissions to the type and quantities stated. Failure to install, properly operate and/or maintain all proposed control measures and/or equipment as specified in the application and supplemental information shall be considered a violation of the permit and LAC 33:III.501. If the emissions are determined to be greater than those allowed by the permit (e.g. during the shakedown period for new or modified equipment) or if proposed control measures and/or equipment are not installed or do not perform according to design efficiency, an application to modify the permit must be submitted. All terms and conditions of this permit shall remain in effect unless and until revised by the permitting authority.

II. The permittee is subject to all applicable provisions of the Louisiana Air Quality Regulations. Violation of the terms and conditions of the permit constitutes a violation of these regulations.

III. The Emission Rates for Criteria Pollutants, Emission Rates for TAP/HAP & Other Pollutants, and Specific Requirements sections or, where included, Emission Inventory Questionnaire sheets establish the emission limitations and are a part of the permit. Any operating limitations are noted in the Specific Requirements or, where included, Tables 2 and 3 of the permit. The synopsis is based on the application and Emission Inventory Questionnaire dated February 29, 2008, along with supplemental information dated May 28, 2008.

IV. This permit shall become invalid, for the sources not constructed, if:

A. Construction is not commenced, or binding agreements or contractual obligations to undertake a program of construction of the project are not entered into, within two (2) years (18 months for PSD permits) after issuance of this permit, or;

B. If construction is discontinued for a period of two (2) years (18 months for PSD permits) or more.

The administrative authority may extend this time period upon a satisfactory showing that an extension is justified.

This provision does not apply to the time period between construction of the approved phases of a phased construction project. However, each phase must commence construction within two (2) years (18 months for PSD permits) of its projected and approved commencement date.

V. The permittee shall submit semiannual reports of progress outlining the status of construction, noting any design changes, modifications or alterations in the construction schedule which have or may have an effect on the emission rates or ambient air quality levels. These reports shall continue to be submitted until such time as construction is certified as being complete. Furthermore, for any significant change in the design, prior approval shall be obtained from the Office of Environmental Services, Air Permits Division.

VI. The permittee shall notify the Department of Environmental Quality, Office of Environmental

Services, Air Permits Division within ten (10) calendar days from the date that construction is certified as complete and the estimated date of start-up of operation. The appropriate Regional Office shall also be so notified within the same time frame.

VII. Any emissions testing performed for purposes of demonstrating compliance with the limitations set forth in paragraph III shall be conducted in accordance with the methods described in the Specific Conditions and, where included, Tables 1, 2, 3, 4, and 5 of this permit. Any deviation from or modification of the methods used for testing shall have prior approval from the Office of Environmental Assessment, Air Quality Assessment Division.

VIII. The emission testing described in paragraph VII above, or established in the specific conditions of this permit, shall be conducted within sixty (60) days after achieving normal production rate or after the end of the shakedown period, but in no event later than 180 days after initial start-up (or restart-up after modification). The Office of Environmental Assessment, Air Quality Assessment Division shall be notified at least (30) days prior to testing and shall be given the opportunity to conduct a pretest meeting and observe the emission testing. The test results shall be submitted to the Air Quality Assessment Division within sixty (60) days after the complete testing. As required by LAC 33:III.913, the permittee shall provide necessary sampling ports in stacks or ducts and such other safe and proper sampling and testing facilities for proper determination of the emission limits.

IX. The permittee shall, within 180 days after start-up and shakedown of each project or unit, report to the Office of Environmental Compliance, Enforcement Division any significant difference in operating emission rates as compared to those limitations specified in paragraph III. This report shall also include, but not be limited to, malfunctions and upsets. A permit modification shall be submitted, if necessary, as required in Condition I.

X. The permittee shall retain records of all information resulting from monitoring activities and information indicating operating parameters as specified in the specific conditions of this permit for a minimum of at least five (5) years.

XI. If for any reason the permittee does not comply with, or will not be able to comply with, the emission limitations specified in this permit, the permittee shall provide the Office of Environmental Compliance, Enforcement Division with a written report as specified below.

A. A written report shall be submitted within 7 days of any emission in excess of permit requirements by an amount greater than the Reportable Quantity established for that pollutant in LAC 33.I.Chapter 39.

B. A written report shall be submitted within 7 days of the initial occurrence of any emission in excess of permit requirements, regardless of the amount, where such emission occurs over a period of seven days or longer.

C. A written report shall be submitted quarterly to address all emission limitation exceedances not included in paragraphs A or B above. The schedule for submittal of quarterly reports

shall be no later than the dates specified below for any emission limitation exceedances occurring during the corresponding specified calendar quarter:

1. Report by June 30 to cover January through March
2. Report by September 30 to cover April through June
3. Report by December 31 to cover July through September
4. Report by March 31 to cover October through December

D. Each report submitted in accordance with this condition shall contain the following information:

1. Description of noncomplying emission(s);
2. Cause of noncompliance;
3. Anticipated time the noncompliance is expected to continue, or if corrected, the duration of the period of noncompliance;
4. Steps taken by the permittee to reduce and eliminate the noncomplying emissions; and
5. Steps taken by the permittee to prevent recurrences of the noncomplying emissions.

E. Any written report submitted in advance of the timeframes specified above, in accordance with an applicable regulation, may serve to meet the reporting requirements of this condition provided all information specified above is included. For Part 70 sources, reports submitted in accordance with Part 70 General Condition R shall serve to meet the requirements of this condition provided all specified information is included. Reporting under this condition does not relieve the permittee from the reporting requirements of any applicable regulation, including LAC 33.I.Chapter 39, LAC 33.III.Chapter 9, and LAC 33.III.5107.

XII. Permittee shall allow the authorized officers and employees of the Department of Environmental Quality, at all reasonable times and upon presentation of identification, to:

A. Enter upon the permittee's premises where regulated facilities are located, regulated activities are conducted or where records required under this permit are kept;

B. Have access to and copy any records that are required to be kept under the terms and conditions of this permit, the Louisiana Air Quality Regulations, or the Act;

C. Inspect any facilities, equipment (including monitoring methods and an operation and maintenance inspection), or operations regulated under this permit; and

D. Sample or monitor, for the purpose of assuring compliance with this permit or as otherwise authorized by the Act or regulations adopted thereunder, any substances or parameters at any location.

XIII. If samples are taken under Section XII.D. above, the officer or employee obtaining such samples shall give the owner, operator or agent in charge a receipt describing the sample obtained. If

requested prior to leaving the premises, a portion of each sample equal in volume or weight to the portion retained shall be given to the owner, operator or agent in charge. If an analysis is made of such samples, a copy of the analysis shall be furnished promptly to the owner, operator or agency in charge.

XIV. The permittee shall allow authorized officers and employees of the Department of Environmental Quality, upon presentation of identification, to enter upon the permittee's premises to investigate potential or alleged violations of the Act or the rules and regulations adopted thereunder. In such investigations, the permittee shall be notified at the time entrance is requested of the nature of the suspected violation. Inspections under this subsection shall be limited to the aspects of alleged violations. However, this shall not in any way preclude prosecution of all violations found.

XV. The permittee shall comply with the reporting requirements specified under LAC 33:III.919 as well as notification requirements specified under LAC 33:III.927.

XVI. In the event of any change in ownership of the source described in this permit, the permittee and the succeeding owner shall notify the Office of Environmental Services in accordance with LAC 33:I.Chapter 19.Facility Name and Ownership/Operator Changes Process.

XVII. Very small emissions to the air resulting from routine operations, that are predictable, expected, periodic, and quantifiable and that are submitted by the permitted facility and approved by the Air Permits Division are considered authorized discharges. Approved activities are noted in the General Condition XVII Activities List of this permit. To be approved as an authorized discharge, these very small releases must:

1. Generally be less than 5 TPY
2. Be less than the minimum emission rate (MER)
3. Be scheduled daily, weekly, monthly, etc., or
4. Be necessary prior to plant startup or after shutdown [line or compressor pressuring/depressuring for example]

These releases are not included in the permit totals because they are small and will have an insignificant impact on air quality. This general condition does not authorize the maintenance of a nuisance, or a danger to public health and safety. The permitted facility must comply with all applicable requirements, including release reporting under LAC 33:I.3901.

XVIII. Provisions of the permit may be appealed to the secretary in writing pursuant to La. R.S. 30:2024(A) within 30 days from notice of the permit action. A request may be made to the secretary to suspend those provisions of the permit specifically appealed. The permit remains in effect to the extent that the secretary or assistant secretary does not elect to suspend the appealed provisions as requested or, at his discretion, other permit provisions as well. Construction cannot proceed, except as specifically approved by the secretary or assistant secretary, until a final decision has been rendered on the appeal. A request for hearing must be sent to the Office of the Secretary. A request for hearing must be sent to the following:

Attention: Office of the Secretary, Legal Services Division

LOUISIANA AIR EMISSION PERMIT
GENERAL CONDITIONS

La. Dept. of Environmental Quality
Post Office Box 4302
Baton Rouge, Louisiana 70821-4302

XIX. For Part 70 sources, certain Part 70 general conditions may duplicate or conflict with state general conditions. To the extent that any Part 70 conditions conflict with state general conditions, then the Part 70 general conditions control. To the extent that any Part 70 general conditions duplicate any state general conditions, then such state and Part 70 provisions will be enforced as if there is only one condition rather than two conditions.

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TABLE I: BACT COST SUMMARY

Shintech Louisiana LLC - Plaquemine PVC Plant
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Shintech Louisiana LLC
Plaquemine, Iberville Parish, Louisiana
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TABLE V: BACT COST SUMMARY

Control Alternatives		Availability/ Feasibility	Negative Impacts (a)	Control Efficiency	Emissions Reduction (TPY)	Annualized Cost ($)	Cost Effectiveness ($/Ton)	Notes
	(NA)							

Notes: a) Negative impacts: 1) economic, 2) environmental, 3) energy, 4) safety
b) Technically infeasible, economic analysis was not performed

TABLE II: AIR QUALITY ANALYSIS SUMMARY

Shintech Louisiana LLC - Plaquemine PVC Plant
Agency Interest No.: 126578
Shintech Louisiana LLC
Plaquemine, Iberville Parish, Louisiana
PSD-LA-709 (M-1)

Table VI:

Pollutant	Averaging Period	Preliminary Screening Concentration ($\mu g/m^3$)	Level of Significant Impact ($\mu g/m^3$)	Significant Monitoring Concentration ($\mu g/m^3$)	Background ($\mu g/m^3$)	Maximum Modeled Concentration ($\mu g/m^3$)	Modeled + Background Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Modeled PSD Increment Consumption ($\mu g/m^3$)	Allowable Class II PSD Increment ($\mu g/m^3$)
PM_{10}	24-hour	3.72	5	10	NR	NR	NR	150	NR	30
NO_X	Annual	0.75	1	14	NR	NR	NR	100	NR	25
CO	1-hour	226.95	2000	-	NR	NR	NR	40,000	NR	-
	8-hour	105.01	500	575	NR	NR	NR	10,000	NR	-

NR = Not required.