Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Westlake Vinyls Company, LP
Geismar Site – VCM-E Plant
Geismar, Ascension Parish, Louisiana
Agency Interest Number: 1138
Activity Number: PER20070005
Proposed Permit Number: 1248-V3

I. APPLICANT

Company:
Westlake Vinyls Company, LP
PO Box 228
Geismar, Louisiana 70734-0228

Facility:
Geismar Site – VCM-E Plant
36045 Highway 30
Geismar, Ascension Parish, Louisiana

Approximate UTM coordinates are 667.46 kilometers East and 3358.39 kilometers North, Zone 15
SIC Code: 2869

II. FACILITY AND CURRENT PERMIT STATUS

The VCM-E (Vinyl Chloride Monomer via Ethylene) plant is actually made up of three separate operating units. Two of the units produce ethylene dichloride (EDC) and one produces vinyl chloride monomer (VCM). These units are referred to as the direct chlorination unit and the oxychlorination unit (to make EDC), and the vinyl chloride unit (for VCM).

In the EDC direct chlorination unit, ethylene and chlorine are reacted in the liquid phase to form crude ethylene dichloride. The crude EDC is mixed with recycled EDC from the vinyl chloride unit and is then processed in a portion of this unit referred to as the EDC purification section. The first part of the EDC purification section is concerned with water washing and neutralization of the crude EDC. Next the neutralized EDC is fractionally distilled to the first remove low boiling impurities plus water and then to remove high boiling impurities.

Presently in the oxychlorination unit, HCl, oxygen, and ethylene are combined to form EDC and water. The EDC produced in this unit is sent to the EDC purification section previously mentioned where it is neutralized and then purified by fractional distillation. The water produced in the oxychlorinated reaction is used as the washing agent for the water washing operation in the EDC purification section. The wash water is combined with the caustic soda solution from the EDC neutralization process. The combined aqueous stream is steam stripped and finally discharged through the biological wastewater treatment with downstream air stripping prior to discharge via an NPDES permitted outfall.

Purified, anhydrous EDC is either further processed to manufacture vinyl chloride or stored as a product for sale. The material that is further processed is thermally dehydrogenated (cracked) in the vinyl chloride unit to form hydrogen chloride (HCl) and VCM. About 50-60% of the EDC fed to the EDC cracking furnace is cracked. In the purification section of the vinyl chloride unit, the HCl is isolated and recycled to the oxychorination unit. The vinyl chloride product is purified and sent to storage.

Process Vents from the EDC and VCM-E units are sent to the incinerator for destruction of organic compounds. The gas from the incinerator is then sent through a quench scrubber and a caustic scrubber to remove HCl before the gas is released to the atmosphere. If the primary incinerator goes off line for any reason, the secondary incinerator will immediately go into service to prevent release of untreated process vents to the atmosphere.

Westlake Vinyls Company, LP – Geismar Site – VCM-E plant is a designated Part 70 source. One Part 70 permit has been issued to the operating units for the Plant. One Title V and one PSD permit associated with this project is currently under review:

Permit No.	Unit or Source	Date Issued
3057-V0	Chlor-Alkali Plant	07/03/2007
2874-V1	PVC Plant	09/11/2006
2699-V4	Utilities Plant	01/25/2008
2843-V0	EDC Marine Loading	01/01/2006
PSD-LA-535(M-2)	PSD Permit	05/29/2001
2872-V0	Biological Treatment Plant	07/26/2005
1248-V3	VCM-E Plant Major Modification	Under review
PSD-LA-734	Initial PSD Permit	Under review

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III. PROPOSED PROJECT/PERMIT INFORMATION

Application

A permit application was submitted on December 14, 2007 requesting a Part 70 operating permit for the Westlake Vinyls Company – Geismar Site - VCM-E Plant. Additional information dated April 10, 2008 was also submitted.

Project

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This modification is for the following changes for the VCM-E Plant:

1. Adding a new primary incinerator, EQT0126;

2. Replacing the existing secondary incinerator with the existing primary incinerator, EQT0127; and

3. Correction of specific requirements in the current permit.

The combined firing rate of the new primary incinerator with the existing primary incinerator will be increased to a total of 100 MMBtu/hr; whereas the combined firing rate is currently permitted at 67.7 MMBtu/hr. The new primary incinerator will use state-of-art technology including specially designed burner tips and will enhance the quality of products (VCM, HCl, and EDC) by ensuring continuous availability of an incinerator to control vent gas emissions.

The increase in NOx emissions related to the project triggers PSD and Non-Attainment New Source Review (NNSR).

Proposed Permit

Permit 1248-V3 will be a major modification to the Part 70 operating permit for the Geismar Site – VCM-E Plant. PSD-LA-734 will be the initial PSD permit for the Geismar Site – VCM-E Plant.

Permitted Air Emissions

Estimated emissions in tons per year are as follows:

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Pollutant	Before	After	Change
PM_{10}	71.83	71.77	-0.06
SO_2	0.37	0.36	-0.01
NO_X	53.23	140.05	+86.82
CO	54.72	84.91	+30.19
VOC *	56.78	58.33	+0.65

VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before	After	Change
Benzene	<0.01	<0.01	-
Bromoform	0.86	0.86	-
Carbon tetrachloride	1.20	1.20	-
Chlorobenzene	<0.01	<0.01	-
Chloroethane	0.55	0.55	-
Chloroform	13.26	13.06	-0.20
1,2-Dichloroethane	19.19	18.99	-0.20
1,2-Dichloroethylene	0.06	0.06	-
1,2-Dichloropropane	<0.01	<0.01	-
Ethyl benzene	<0.01	<0.01	-
Methyl Chloride (Chloromethane)	<0.01	<0.01	-
1,1,2,2-Tetrachloroethane	1.52	1.52	-
Tetrachloroethylene	<0.01	<0.01	-
1,1,2-Trichloroethane	0.85	0.85	-
Trichloroethylene	0.02	0.02	-
Toluene	0.02	0.02	-
Vinyl Chloride	9.81	9.63	-0.18
Total	47.34	46.76	-0.58

Other VOC (TPY): 11.19

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Non – VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before	After	Change
Chlorine	18.04	18.04	-
Dichloromethane	<0.01	<0.01	-
Hydrogen Chloride	10.99	10.99	-
Sulfuric Acid	<0.01	<0.01	-
Total	29.03	29.03	-

IV. REGULATORY ANALYSIS

The applicability of the appropriate regulations is straightforward and provided in the Specific Requirements section of the proposed permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are also provided in the Specific Requirements section of the proposed permit.

Applicability and Exemptions of Selected Subject Items

See section X and XI of the Title V permit.

Prevention of Significant Deterioration/Nonattainment Review

Estimated actual emission increases due to the project in tons per year are as follows:

Pollutant	Contemporaneous Increase	Project Increase	Net Change	PSD/ NNSR Threshold	NSR Review Required
PM_{10}	-	+ 0.92	+ 0.92	15 / NA	No
SO_2	-	+ 0.07	+ 0.07	40 / NA	No
NO_x	16.40	+ 99.80	+116.20	40 / 25	Yes
CO	-	+ 41.08	+ 41.08	100 / NA	No
VOC	-	+ 11.40	+ 11.40	NA / 25	No

Prevention of Significant Deterioration (PSD) review is required for this project, which results in a significant increase in emissions of a regulated pollutant.

PSD is part of the federal New Source Review (NSR) permitting program for pollutants. Westlake Vinyls Company, L.P. (WVC) VCM-E plant is categorized as one of the 28 sources listed in Section 169 of the Clean Air Act. VCM-E is a major source under PSD. As a major source, all proposed VCM-E attainment

pollutants emitted in amounts greater than or equal to the PSD significance levels are subject to PSD review. PSD review is required for NO_X.

The VCM-E Plant is located in Ascension parish, which is part of a nonattainment area for ozone. On June 15, 2005, the EPA revoked the 1-hour ozone ambient air quality standards and the Baton Rouge Nonattainment Area was reclassified as marginal for ozone precursors (NOx and VOC) under the new 8-hour ozone standard. However, on October 3, 2007, the EPA issued a memorandum summarizing the implications of a December 22, 2006 U.S. Court of Appeals for the District of Columbia Circuit decision (South Coast v. EPA). In effect, the court's decision restores applicability thresholds and emission offsets held for nonattainment area classifications under the 1-hour ozone standard. EPA stated that it intends to undertake rulemaking to conform to the court's decision.

In accordance with PSD regulations (LAC 33:III.509), the net emission increase is determined by summing all project-related emission increases plus any other creditable emission increases and/or decreases that are contemporaneous with the project construction and the date on which the emissions increase from the project occurs. If the net emission increase is greater than NO_X's PSD threshold of 40 tpy, then NO_X is considered to have a significant net emission increase and is subject to PSD review.

For NNSR, per LAC 33.III.504, the net emission increase will be determined by summing all project-related emission increases plus any other creditable emission increases and/or decreases "over a period including the calendar year of the proposed increase, up to the date on which the proposed increase will occur, and the preceeding four consecutive calendar years". If the net emission increase is greater than the NO_X's NNSR threshold of 25 tpy, then a significant net emission increase results and NO_X is subject to NNSR review. Based on permitting actions performed over the timeframes outlined above, the table below presents the creditable NO_X emission increases and decreases for this analysis.

Emission Source	Permitting Action and Emission Basis	Emissions (tpy)
Chlor-Alkali Steam Boiler (Chlor-Alkali Plant)	New Source; Potential to emit from 3/2007 air permit application and current air permit	19.71
Existing Secondary Incinerator (VCM-E Plant)	Removal of Source; Based on 4/2005 through 3/2007 natural gas data	-3.31
Creditable NO_X Emission Increases		**16.40**

The currently permitted allowable emissions for the Indeck Steam Boiler (Utilities Plant) and the Chlor-Alkali Steam Boiler (future Chlor-Alkali Plant) were used in the calculation of creditable NO_X emissions because both of these sources did not exist at the beginning of the PSD and NNSR contemporaneous timelines. For the

existing secondary incinerator at the VCM-E Plant, the NO_X emission decrease corresponding to its removal as part of this project was estimated based on the natural gas supplied to it during the 24-month consecutive period of April 2005 through March 2007.

Summing the NO_X project-related emission increase of 99.80 tpy and the creditable increase of 16.40 tpy results in a net NO_X emission increase of 116.20 tpy. Because this value is greater than its PSD and NNSR major modification threshold levels of 40 tpy and 25 tpy, respectively, NO_X is classified as having a significant net emission increase.

This NSR applicability analysis results in NO_X having both a significant emission increase and a significant net emission increase. Therefore, NO_X is subject to both PSD and NNSR review as part of this permitting action. Best Available Control Technology (BACT) is required for PSD projects. Since LAER is more stringent than BACT, the LAER analysis is used in place of the BACT analysis.

WVC has the NO_X emission reduction credits available in the Emission Reduction Credit bank to meet the offset requirements of LAC 33.504.M.3, the 99.8 ton NO_X project increase will be offset at a 1.3 to 1.0 ratio with 54.38 tons of Ozone Season NO_X credits and 75.36 tons of non-Ozone season NO_X credits.

BEST AVAILABLE CONTROL TECHNOLOGY

NO_X emissions are above PSD significance levels and must undergo PSD analyses. The selection of control technology was based on the BACT analysis using a "top down" approach and included consideration of control of toxic materials.

WVC will utilize good combustion practices and low NO_X burners (LNB) to control NO_X emissions to a degree equivalent to the Lowest Achievable Emission Rates (LAER) to fulfill BACT requirements of the PSD program.

Streamlined Equipment Leak Monitoring Program

Permittee shall comply with a streamlined equipment leaks monitoring program. Compliance with the streamlined program in accordance with this specific condition shall serve to comply with each of the fugitive emission monitoring programs being streamlined, as indicated in the following table. Noncompliance with the streamlined program in accordance with this specific condition may subject the permittee to enforcement action for one of the applicable fugitive emissions programs.

a. Streamlined program shall be applicable to the combined universe of components subject to any of the programs being streamlined. Any component type which does not require periodic monitoring under the overall most stringent program shall be monitored as required by the most

stringent program being streamlined and will not be exempted. The streamlined program will include any exemptions based on size or component available in any of the programs being streamlined.

b. Leak definitions and monitoring frequency shall be used based on the overall most stringent program. Percent leaker performance shall be calculated using the provisions of the overall most stringent program. Annual monitoring shall be defined as once every four quarters. Some allowance may be made in the first year on the streamlined program in order to allow for transition from existing monitoring schedules.

c. Permittee shall comply with recordkeeping and reporting requirements of the overall most stringent program. Semiannual reports shall be submitted on September 30 and March 31, to cover the periods from January 1 through June 30 and July 1 through December 31, respectively. The semiannual reports shall include any monitoring performed within the reporting period.

d. The streamlined program shall not be used to replace the continuous monitoring requirements of 40 CFR 61.65(b)(8)(i).

Unit or Plant Site	Programs Streamlined	Stream Applicability	Overall Most Stringent Program
VCM-E Plant	40 CFR 63 Subpart H	5% VOHAP	40 CFR 63 Subpart H
	LAC 33:III.2122	10% VOC	
	LAC 33:III.5109	TAP	

MACT Requirements

Emissions of toxic air pollutants (TAPs) from the complex are controlled using MACT, which includes a leak detection and repair (LDAR) program for fugitive components, flares, thermal oxidizers, and boilers.

Air Quality Analysis

Prevention of Significant Deterioration regulations require an analysis of existing air quality for those pollutants to be emitted in significant amounts from a proposed major modification. NO_X is the pollutant of concern in this case.

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

The PSD modeling consists of two separate phases, the PSD screening analysis (Significant Impact, Area of Impact, and Preconstruction Monitoring Analyses) and the full impact analysis (i.e., NAAQS and PSD Increment Analyses). The Significant Impact Analysis (SIA) determines the area of impact (AOI) associated with the facility emissions relative to the significant air quality levels. Once an AOI has been established, PSD Increment and NAAQS analyses are required to

demonstrate that air quality that air quality concentrations are maintained in accordance with LDEQ and PSD mandated levels.

Based on the results for year 2001 (worst-case), the maximum annual off-site NO_X concentration is projected to be 2.28 $\mu g/m^3$. This projected concentration is above the annual significance level for ambient NO_X concentration. Therefore, a full impacts analysis (i.e. NAAQS and PSD Increment modeling) is required. The AOI impact was determined to extend to approximately 0.9 km.

In addition to the project-related and contemporaneous NO_X emission sources, WVC NO_X emission sources not included in the PSD screening analysis and all major NO_X emission sources within the AOI plus 50 km were included in the subsequent NAAQS analysis. These sources were modeled at their maximum allowable emission rates.

Based on the results for year 2002 being the worst-case, the maximum annual off-site NO_X concentration is projected as 89.61 $\mu g/m^3$, which is below the NAAQS concentration threshold level of NO_X.

For the PSD Increment analysis, the same off-site sources were included in the models. However, with the exception of project related emission sources and proposed facility sources not yet built, the emission rates for the increment analysis are actual emission rates as opposed to maximum allowable emission rates. Based on the results for 200 through 2004, the maximum annual off-site NO_X concentration is projected to be 0.00 $\mu g/m^3$, which is below the PSD Increment threshold for NO_X.

In summary, the proposed project achieves compliance with all ambient air quality standards.

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to the Section VIII – General Condition XVII Activities of the proposed permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to the Section IX – Insignificant Activities of the proposed permit.

V. PERMIT SHIELD

No permit shield is requested in these permits.

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VI. PERIODIC MONITORING

See 'Specific Requirements' section of the permit.

VII. GLOSSARY

Carbon Monoxide (CO) – A colorless, odorless gas, which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) – The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Hydrogen Sulfide (H_2S) – A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the reaction of acids on metallic sulfides, and is an important chemical reagent.

New Source Review (NSR) – A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_X) – Compounds whose molecules consist of nitrogen and oxygen.

Organic Compound – Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit – Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: ≥10 tons per year of any toxic air pollutant; ≥25 tons of total toxic air pollutants; and ≥100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10} – Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) – The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

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Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO_2) – An oxide of sulfur.

Sulfuric Acid (H_2SO_4) – A highly corrosive, dense oily liquid. It is a regulated toxic air pollutant under LAC 33:III.Chapter 51.

Title V Permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) – Any organic compound, which participates in atmospheric photochemical reactions; that is, any organic compound other than those, which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.