Statement of Basis
Draft Greenhouse Gas Prevention of Significant Deterioration Preconstruction Permit
For INVISTA S.à.r.l.
SIC 2869, NACIS 325199
Permit Number: PSD-TX-812-GHG

March 2013

This document serves as the statement of basis (SOB) for the above-referenced draft permit, as required by 40 CFR 124.7. This document sets forth the legal and factual basis for the draft permit conditions and provides references to the statutory or regulatory provisions, including provisions under 40 CFR 52.21, that would apply if the permit is finalized. This document is intended for use by all parties interested in the permit.

I. Executive Summary

On March 12, 2012, INVISTA submitted to EPA Region 6 a Prevention of Significant Deterioration (PSD) permit application for Greenhouse Gas (GHG) emissions for the West Powerhouse (WPH) boiler project at the Victoria Plant Site, in Victoria, Texas, an existing major stationary source of regulated New Source Review (NSR) pollutants. On May 29, 2012 EPA determined that the application submitted was incomplete per 40 CFR 124. INVISTA responded with additional information on July 18, 2012, September 14, 2012, and October 11, 2012 through March 4, 2013. The draft permit has been processed based on all the data provided by INVISTA. INVISTA also simultaneously submitted to the Texas Commission on Environmental Quality (TCEQ), an application to authorize the WPH project for emission increases of the non-GHG pollutants. The project includes the installation of Selective Non-Catalytic reduction (SNCR) on the WPH boilers to reduce NO_x emissions as a requirement of an EPA Consent Decree[1], as well as boiler tube refurbishment, process control and instrumentation modernization and air preheater repair to improve energy efficiency at the boilers. In addition, installation of low NO_x burners will further reduce NO_x emissions. The applicant indicates that the project will not constitute a major modification in the TCEQ permitting action, because the net emissions increases of regulated NSR pollutants other than GHG are not significant. Accordingly, EPA Region 6 anticipates the state agency will issue a minor new source review permit amendment to authorize the modification.

The WPH boilers are designed to maximize the steam production for the plant as well as meet the required Boiler and Industrial Furnaces (BIF), Resource Conservation Recovery Act (RCRA) and Clean Air Act (CAA) Maximum Achievable Control Technology (MACT), 40 CFR Part 63 Subpart EEE, destruction efficiency for the hazardous air pollutants (HAP) from the liquid waste streams that fuel these boilers. Natural gas will be supplemented as fuel to meet the plant's steam demand and also during startup of the boilers. After reviewing the application, EPA Region 6 has prepared the following Statement of Basis (SOB) in support of the draft air permit to authorize the WPH project at the INVISTA plant.

This SOB documents the information and analysis EPA used to support the decisions EPA made in drafting the air permit. It includes a description of the proposed facility, the applicable air permit

[1] Consent Decree was effective on July 28, 2009 between EPA and INVISTA , Case 1:09-cv-00244-GMS. The settlement is available at: http://epa.gov/compliance/resources/cases/civil/mm/invista.html

requirements, and an analysis demonstrating that the proposed permit conditions meet all applicable legal and regulatory requirements.

EPA Region 6 concludes that the INVISTA application is complete and provides the necessary information to demonstrate that the proposed project meets the applicable air permit regulations. EPA's conclusions rely upon information provided in the permit application, supplemental information EPA requested and provided by INVISTA and EPA's own technical analysis. EPA is making all this information available as part of the public record.

II. Applicant

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Contact: Mr. Paul B. Hughes
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III. Permitting Authority

On May 3, 2011, EPA published a federal implementation plan (FIP) that makes EPA Region 6 the PSD permitting authority for the pollutant GHG. 75 FR 25178 (promulgating 40 CFR § 52.2305). Texas still retains approval of its plan and PSD program for pollutants that were subject to regulation before January 2, 2011, i.e., regulated NSR pollutants other than GHG.

The GHG PSD Permitting Authority for the State of Texas is:

EPA, Region 6
1445 Ross Avenue
Dallas, TX 75202

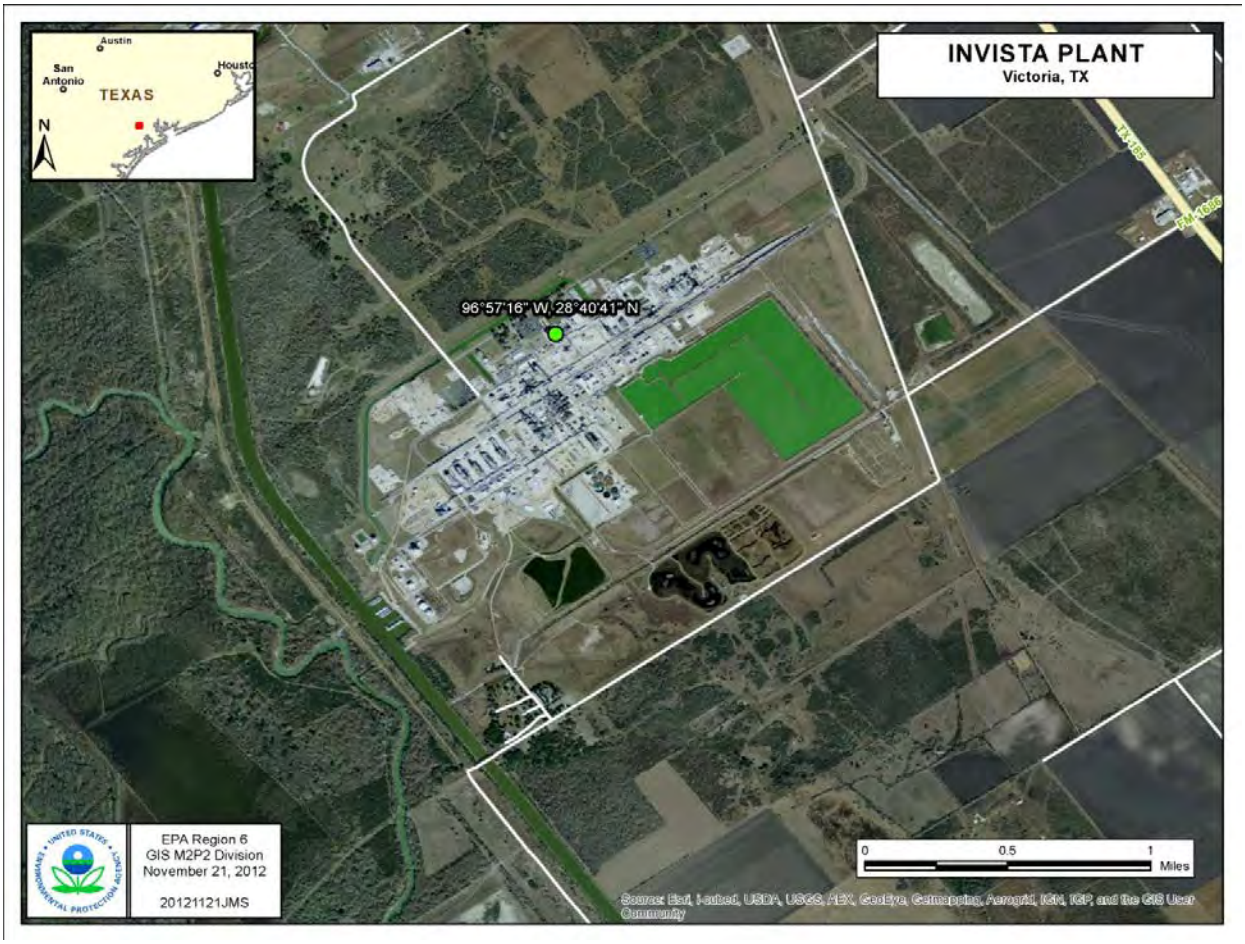
The EPA, Region 6 Permit Writer is:
Bonnie Braganza
Air Permitting Section (6PD-R)

IV. Facility Location

The INVISTA plant is located in Victoria County, Texas. This area is currently in attainment for all NAAQS pollutants. The area surrounding the plant is primarily agriculture. The nearest Class I area is Big Bend National Park (TX) at an approximate distance of 590 km from the site. The geographic coordinates for this facility are as follows:

Latitude: 28°40'41" North; Longitude: 96°57'17" West

Figure 1
Location of the INVISTA Plant



V. Applicability of Prevention of Significant Deterioration (PSD) Regulations

EPA concludes INVISTA's application is subject to PSD review for the pollutant GHG, because the project would lead to an emissions increase of GHG for a facility in excess of the emission thresholds described at 40 CFR § 52.21 (b)(49)(v). The facility is an existing major stationary source (as well as a source with a PTE that equals or exceeds 100,000 TPY CO_2e and 100/250TPY GHG mass basis), and the planned modification has a GHG emissions increase that equals or exceeds 75,000 TPY CO_2e (and 0 TPY GHG mass basis). INVISTA calculated a CO_2e emissions increase of 696,144 tpy (628,258 tpy on a mass basis) for the proposed project.

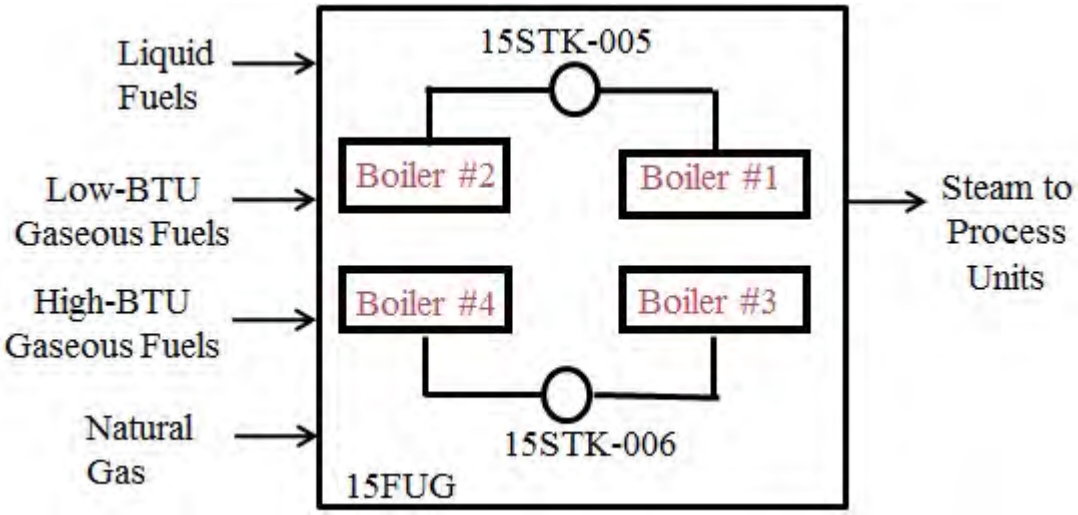
EPA Region 6 implements a GHG PSD FIP for Texas under the provisions of 40 CFR § 52.21 (except paragraph (a)(1)). See 40 CFR § 52.2305. EPA Region 6 applies the policies and practices reflected in the EPA document entitled "PSD and Title V Permitting Guidance for Greenhouse Gases" (March 2011; hereinafter "GHG Permitting Guidance"). Consistent with that guidance, we have not required the applicant to model or conduct ambient monitoring for GHG, and we have not required any assessment

of impacts of GHG in the context of the additional impacts analysis or Class I area provisions. Instead, EPA has determined that compliance with BACT is the best technique that can be employed at present to satisfy additional impacts analysis and Class I area requirements of the rules as they relate to GHG. The applicant submitted an analysis to meet the requirements of 40 CFR § 52.21(o), as it may otherwise apply to the project. EPA's PSD permitting action will only authorize emissions of GHG.

VI. Project and Process Description

INVISTA operates a nylon intermediates plant consisting of several process units that produce various liquid and gaseous waste streams subject to various regulatory requirements. The four boilers vent to two stacks and are used as a control device for these waste streams and therefore are subject to the RCRA, BIF, MACT for Hazardous Waste Combustion (40 CFR Part 63- Subpart EEE) and State SIP VOC vent control requirements. These waste streams are fuel for the boilers and supplemented with natural gas as needed to produce the steam requirements for the plant. The boilers are tangentially fired, "Combustion Engineering Model VU-60" water-tube boilers. These boilers are designed specifically for the various fuels and have different burners for liquid waste, gaseous waste and natural gas combustion. Additionally, the boilers will be retrofitted with SNCR for NO_x control per the requirements of the Consent Decree[1] as well as low NO_x burners. The boilers produce steam that is utilized throughout the plant. The WPH utilizes the heat from the plant's waste streams which in part, meet the plant steam requirements. The configuration of the WPH is in Figure 2.

Figure 2
Victoria Plant West Powerhouse
Existing Boiler Configuration



Except for the supplemental natural gas, the fuels fired in the boilers are generated by four separate process units (ADN, Adipic Acid, C12 and AOP-Nitric Acid). The process unit production rates determine the quantity and heat content of the waste fuel streams as well as the steam demand for these units. The quantities and composition of these waste streams vary significantly on a short term basis and therefore monitoring of Btu levels or flow rates of these fuels to each boiler for demonstrating compliance with GHG emission limits is not feasible. The combination of fuels combusted in any given boiler at any given time is based on fuel availability, boiler availability, fuel compatibility and steam

demand. The fuel shift is done so that to the extent feasible, each boiler operates at the normal operating range to maximize energy efficiency.

As indicated in the INVISTA's application[2] the project will be conducted in phases over a period of approximately four years commencing in 2013 and will meet the consent decree requirements to be completed on or before December 2016.

The proposed GHG PSD permit, if finalized, will allow INVISTA to:

1) Install technologies such as SNCR and low NO_x burners at the WPH;

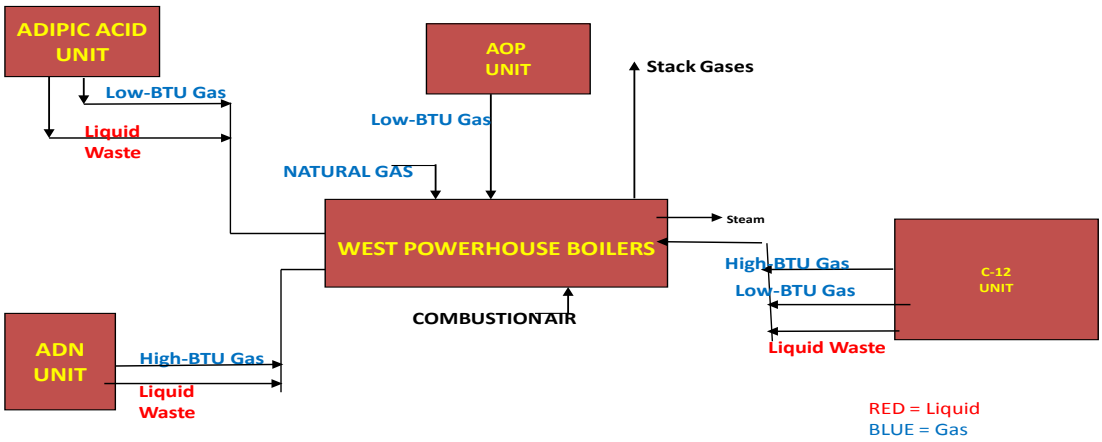
2) Modify the existing WPH boilers, including retubing, operational flexibility, and efficiency improvements, and boiler control modernization; and

3) Make associated modifications to fuel system piping.

It is estimated that these projects will have up to a 3% efficiency increase that will reduce the net energy consumption in the plant. The start-up and shutdown emissions have been considered in computing the total GHG emission increases. The permit, upon final issuance, will apply to all operating conditions including normal operations, maintenance, start-up, and shutdown for the WPH project.

Figure 3

WEST POWERHOUSE BOILER FUELS



[2] INVISTA S.a r.l. Victoria Site *I* West Powerhouse GHG Permit application dated March 12, 2012, Section 1.3

VII. GHG Emissions

The four existing boilers combust several different fuels that originate from various process units at the Victoria plant site, as shown in Figure 3. GHG emissions are generated from the boiler as a result of combustion and are primarily (~ 99.98%) CO_2, with some emissions of methane (CH_4) and nitrous oxide (N_2O) emissions. Changes to the fuel piping will result in fugitive emission increases. Estimated methane fugitive emissions are 0.28% of the total CO_2e from the boilers. Fugitive components will be monitored using the TCEQ 28 VHP LDAR program. INVISTA calculated the projected actual emissions based on the worst case scenarios based on past fuel flow rates and Btu content. Installation of SNCR as required by the Consent Decree will also increase GHG emissions. Some N_2O is formed as a result of the SNCR and is included in the calculations based on the EPA's Air Pollution Control Technology Fact Sheet for SNCR (EPA-452/F-03-031)which assumes that at most 10% of the NO_x reduced in urea based SNCR will be converted to N_2O. Also with the SNCR urea system, the calculations assume that 100% of the carbon in the urea is being converted to CO_2. These calculations are based on the design urea injection rates.

In calculating the baseline GHG emission rates for the boilers, actual annual fuel rates were used during the baseline period which is September 2009 through August 2011. The project emission increase did include all GHG emission sources and is estimated to be 696,144 tpy CO_2e , based on the average carbon factor of the fuels combusted in the boilers as indicated in Table 1. The total GHG emissions from the four boilers are estimated to be 1,371,711 tpy. INVISTA will install CO_2 CEMS in the duct of each boiler (Figure 4).

Table 1- Estimated Carbon Content in Boiler Fuels

Boiler ID (FIN)	EPN	Fuel Category	Average Carbon /lb of fuel
15BLR001 15BLR002 15BLR003 15 BLR 004	15STK-005 15STK-006	Liquid Waste	0.62
		Low BTU Gas	0.039
		High BTU Gas	0.26
		Natural Gas	0.73

VIII. BACT Considerations and Emission Limits

The majority of the GHG emissions associated with the project are from the operations of the four boilers. EPA reviewed available GHG PSD permitting precedents for industrial hazardous waste boilers including the RACT/BACT/LAER Clearinghouse as well as the EPA White Paper for industrial boilers[3]. As of this date, there have been no GHG permits issued for boilers fueled with hazardous waste. EPA further reviewed surrogate (other combustion sources) permits, but concluded that these permits could not be used to determine BACT as they are not applicable to the unique combustion of liquids and gases used in these boilers. Table 2 lists EPA combustion factors for various types of fuels, which were considered for determining an appropriate output BACT limit for liquid and gaseous streams combusted at the WPH.

[3] Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Industrial, Commercial, and Institutional Boilers.- October 2010 available at: http://www.epa.gov/nsr/ghgdocs/iciboilers.pdf

Table 2
BACT Comparisons of Fuels for Industrial Boilers

Fuel	Factor* [kg CO_2/MMBtu)	Estimated Emissions (lbs. CO_2/ 1,000 lbs. of Steam)**
Municipal Solid Waste	90.70	289
Residual Fuel Oil No.6	75.10	240
Distillate Fuel Oil No.2	73.96	236
Other oil > 400°F	76.22	243
INVISTA's proposed BACT Limit	N/A	235
Weighted U.S. Average Natural Gas	53.02	169

*Factors are from 40 CFR Part 98, Subpart C, and Table C-1.
**Estimated CO_2 emissions per 1,000 lbs of 550 psig steam based on 76% boiler efficiency for all fuels except for natural gas which is based on 83% boiler efficiency.

INVISTA calculated the BACT limit based on the steam production and past efficiencies of the boilers that combust the various fuel streams. The average estimated combined efficiency for the operation of all four boilers is76%[4] utilizing the mixture of the waste stream fuels. The design boiler efficiency based on combusting natural gas only, is 83%.

Boiler Steam Production Units ((15BLR001-15BLR004) and EPN 15 STK-005, 15 STK-006))

INVISTA's permit application discussed and identified several control options in the 5 step BACT analyses. In its BACT analyses, INVISTA reviewed the RACT/BACT/LAER Clearinghouse, other GHG permits for combustion units, and several EPA and Department of Energy documents that are referred to in separate sections of this SOB.

Step 1 – Identification of Available Control Technologies:

1. Clean Fuels such as natural gas.

   INVISTA's permit application explained that the option of utilizing only "clean fuels" such as natural gas would change the fundamental process and design for these hazardous waste boilers. The fundamental design and operation of the boilers is to utilize the heat in the waste streams and meet certain specific effluent hazardous regulatory requirements. The boilers produce the steam utilized in the plant and when necessary INVISTA supplements the waste fuel with clean pipeline natural gas. Not utilizing the waste streams as fuel would require hazardous waste to be disposed of in conventional incinerators that would create the same quantity of GHG without the beneficial use of energy from combustion. Additionally, the purpose of this project is to meet the requirements of the Consent Decree without changing the fundamental purpose of the operation of these boilers that are being used to produce steam for the plant. Therefore this option was eliminated based primarily

[4] Supplemental information dated September 14, 2012 to Bonnie Braganza of EPA

on the fact that BACT, in most cases, should not be applied to regulate the applicant's purpose or objective for the proposed facility.

2. Design Energy Efficiency Measures such as:

   - the replacement and upgrade of the burners,
   - the use of an economizer,
   - air preheater,
   - insulation of the boiler and heat surfaces,
   - energy capture from boiler blowdown and condensate return system,
   - reduction of slagging and fouling of heat transfer surfaces and,
   - Design of boiler tubes for creating gaseous turbulent flow within the firetubes.

3. Operational Energy Efficiency Measures such as monitoring and performing regular maintenance of boilers and air preheaters, advanced burner management and advanced burner management and instrumentation/process controls.

4. Carbon Capture and Sequestration

Step 2 – Elimination of Technically Infeasible Alternatives

1. Clean Fuels:

   The fundamental design and operation of the WPH is to utilize the heat of combustion of the waste streams, meet certain specific effluent hazardous regulatory requirements, and produce steam for the plant. Therefore this option was eliminated based primarily on the fact that BACT, in most cases, should not be applied to regulate the applicant's purpose or objective for the proposed facility.

2. Design and Operational Energy Efficiency Measures:

   The design of boilers that can improve energy efficiency identified in INVISTA's application includes the use of turbulent flow in the tubes and the use of an economizer as well as design considerations listed in the table below. INVISTA's application[5] indicates that the design to create turbulent flow in the tubes was eliminated since the WPH boilers are water tube boilers. Also, instead of an economizer, the WPH utilizes staged exchangers that preheat boiler feedwater with steam. In addition, INVISTA operates an air preheater that utilizes the heat from the hot stack effluent gases to preheat the combustion air to the boilers thereby reducing the need of fuel which would otherwise be required to preheat the ambient air to combustion temperatures.

   INVISTA is implementing all the Design Efficiency Measures set forth in EPA's White Paper[3] as identified in Step 1 of the BACT analysis and described in the Table 3 and Table 4 below.

[5] INVISTA's application to Jeff Robinson of EPA dated March 12, 2012 and supplemental information dated July 12, 2012 and September 14, 2012 to Bonnie Braganza of EPA.

Table 3
Design Energy Efficiency

Replace and Upgrade Burners	Burners are being upgraded to low NO_x burners. This may increase GHG emissions, but reduction of NO_x is required by the Consent Decree that is the driver for this project.
Air preheater	The current air preheater will be repaired for full functionality and the seals will be replaced to limit air leakage. Improvements will be made to allow for more effective cleaning to maintain effective heat transfer.
Insulation	Insulation will be replaced to meet safety standards and to reduce heat loss. Firebox insulation will be replaced with mineral wool based fiberboard that meets ASTM standards with an "R" value of 12.
Blowdown and condensate return system energy capture	Already implemented and will continue for this project.
Boiler tube refurbishment	The boilers will be retubed to replace plugged tubes and cleaned to restore the tubes to their design heat transfer capability.
Reduction of slagging and fouling of the heat transfer surfaces	New automated soot blowers will be installed for cleaning the heat transfer surfaces.

Table 4
Operational Energy Efficiency Measures

These consist of maintenance of the boiler and air preheater and instrumentation with process controls. All options identified in Step 1 are considered technically feasible.

Boiler tuning	Boiler burners and combustion system will be tuned upon start-up to optimize the CO and O_2 levels to meet the Boiler and Industrial Furnace regulatory requirements and also optimize energy efficiency (Less excess air)
Instrumentation controls	The WPH instrumentation is being modernized to allow for process control to minimize energy consumption by automatic adjustment to minimize excess O_2 and still meet all the regulatory requirements for complete combustion of HAP and waste components.
Reduce Air Leakages	Regular maintenance of the air preheaters. Boiler firebox is periodically monitored to minimize leakage and heat loss.
Reduce Steam Trap Leaks	This is already part of INVISTA's steam trap program to detect and repair steam trap leaks that avoids unnecessary energy losses.

3. Carbon Capture and Sequestration (CCS)

Carbon Capture and Sequestration (CCS) is an available add-on control technology that should be evaluated as BACT[6] for the boilers.

Step 3 – Ranking of Remaining Technologies Based on Effectiveness

INVISTA has estimated that if CCS was determined to be technically feasible the capture of CO_2 would be approximately 90%.

The design and operational energy efficiency measures stated above are considered effective as a group of work practice and engineering design standards. INVISTA has operated the boilers since 1965 and has stated the design boiler efficiencies are approximately 83% based on combustion of natural gas only. However, when combusting the variety of different fuels from the waste streams, this efficiency is lower.

Step 4 – Evaluation of Control Technologies in Order of Most Effective to Least Effective

INVISTA believes that the design and operational energy efficiency measures stated above are feasible but specific efficiency improvements for each measure cannot be specifically quantified and has referenced EPA guidance[3] for the potential ranges of efficiency improvement related to each measure.

INVISTA asserts that Carbon Capture is not appropriate for its operation because the methods of amine scrubbing, O_2/CO_2 recycle and membrane transfer would require additional energy for preparation of the streams prior to the potential use of CO_2 and this additional energy use would have a negative environmental impact. This conclusion is supported by the Interagency Task Force on Carbon Capture and Storage Report [7].

The Task Force report summarized the status of CCS and listed difficulties associated with implementing the technology for individual sources such INVISTA.

(1) A high volume of gas would have to be treated due to the low CO_2 concentration in the exhaust stream (approximately three to ten percent by volume in the WPH boiler exhaust);
(2) The boiler exhaust gas is at a low pressure (additional pressure would be required to process the exhaust in the CO_2 capture system);
(3) Contaminants in the exhaust gas, including oxides of nitrogen, particulate matter, and sulfur dioxide, that could degrade the materials used to capture the CO_2; and
(4) The captured CO_2 would have to be compressed to the high CO_2 pipeline pressure.

[6] Pg 36 of the PSD and title V permitting guidance for Greenhouse gases http://www.epa.gov/nsr/ghgdocs/ghgpermittingguidance.pdf Based on the information provided by INVISTA and reviewed by EPA for this BACT analysis, while there are some portions of CCS that may be technically infeasible for this project, EPA has determined that overall Carbon Capture and Storage (CCS) technology is technologically feasible at this source.

[7] See *Report of the Interagency Task Force on Carbon Capture and Storage* available at: http://www.epa.gov/climatechange/policy/ccs_task_force.html

As to CCS, in determining the technical and environmental impacts for carbon capture, INVISTA evaluated the use of an amine scrubbing system that would capture the CO_2 from the stack gas. The amine tower design and energy used to provide the amine scrubbing agent as well as the steam that would be required to recycle the amine would create substantial criteria and GHG pollutants. Accordingly, this technology would be environmentally counterproductive, and is rejected. Another alternative would be to use pure O_2 instead of air in the boilers and recycle the stack gas to concentrate the CO_2 and limit combustion temperatures. This is not technically feasible for these boilers since these boilers require compliance with 99.99% destruction efficiency under RCRA BIF and MACT EEE standards. The third technology evaluated was the membrane contactor that uses a membrane and solvent that has a high selectivity for CO_2. This technology has not been demonstrated for process waste stream boilers due to the constituents of these streams. The above technologies therefore are not technically or environmentally feasible

However, assuming a carbon capture system were technically feasible, INVISTA analyzed transportation issues associated with CCS in the Victoria, Texas area. There is no long term storage facilities located near the INVISTA Victoria Site and the nearest CO_2 pipeline is the Denbury Green Pipeline which is located more than 100 miles from the INVISTA site. Additionally assuming that CCS was technically feasible and cost effective, there still are logistical issues such as obtaining the right of way (ROW) for the pipeline and obtaining contracts from a third party for storage and transportation of the CO_2 that are unknown at this time.

INVISTA's analysis for CCS also provided the basis for eliminating the technology in step 4 of the BACT process as a viable control option based on cost. INVISTA utilized an existing document[8] prepared by the U.S. Department of Energy National Energy Technology Laboratory (NETL) for the capital and annualized cost estimates for its facilities. It is estimated that only 90% of the CO_2 emissions could be captured. The cost estimate is based on the total projected actual emissions which are 1,371,711 tpy. The total capital cost of carbon capture is between $219- $301 million, and the cost for the pipeline is estimated at $75 million. This is approximately four times the capital cost of the WPH project. The annualized costs provided by INVISTA varied significantly due to the uncertainties in capture, storage and transport and an average cost was approximately $57 to 134 million, which is about 150% the capital cost of the WPH project.

EPA Region 6 reviewed INVISTA's CCS cost estimate and believes it adequately approximates the cost of a CCS control for this project and demonstrates those costs are prohibitive in relation to the overall cost of the proposed project, and thus CCS has been eliminated as BACT for this project.

Step 5 – Selection of BACT for Boilers

The BACT design and operational energy efficiency measures for the boilers are in Tables 3 and 4 above. Based on data in Table 2 provided by INVISTA, the variability of the fuel to the boiler from past operations in the plant, and EPA research on the operations and BACT emission limits of various hazardous boilers, the BACT output limit of 235 lbs CO_2 per thousand pounds of 550 psig steam 12-month rolling average) is appropriate. The lower BACT limits in Table 2 are based on operations

[8] Aboudheir, A. and G. Mcintyre, "Industrial Design and Optimization of C02 Capture, Dehydration. and Compression Facilities".

utilizing the fuels listed in the table without much variability in the BTU or type of fuels. The WPH has both variability in the type of fuel and BTU content that reduces the efficiency of the boilers, and even with the process control modernization on the boilers, the efficiency of the boiler is reduced. In addition, the requirement to meet 99.99% destruction efficiency for hazardous waste feeds requires additional residence time and higher combustion zone temperatures which results in a lower efficiency when compared to traditional steam generating boilers. This BACT limit takes into consideration all the operational and design energy efficiency improvements indicated above. Additionally INVISTA also proposes a 12- month rolling CO_2e limit of 1,371,711 tpy after all four boilers are in operation.
In order to demonstrate continuous compliance with the BACT GHG and annual GHG emission limit, conditions to record fuel rates and type have been included in the permit for the boilers. INVISTA will meet the BACT limit during the operations for each modified boiler or modified boiler combinations, until the WPH project is completed in December 2016.

BACT Process Fugitives (EPN 15FUG)

Hydrocarbon emissions from leaking pipe components (process fugitives) associated with the proposed project include methane, a GHG. The additional methane emissions from process fugitives have been conservatively estimated to be 959 TPY of CO_2e and are approximately 0.06% of the total CO_2 emissions from the WPH. INVISTA has conservatively included all the fugitive components in the fuel lines even though many of them already exist. Even under this conservative approach to the fugitive components, the GHG emissions from fugitive components have a negligible contribution in comparison to the total GHG emissions from combustion.

Step 1 – Identification of Potential Control Technologies

Control of fugitive emissions from piping is considered under these following criteria:

1. Leak detection concentration (For refineries the EPA requirement is 10,000ppmv but for chemical and more toxic hydrocarbon emissions is as low as 500ppmv).
2. Monitoring Frequency- quarterly, monthly, or weekly audio-visual inspections
3. Type of fugitive equipment- valves, flanges, relief valves etc.
   Requirements for repair- Directed maintenance program that fixes the leak when found and the component is remonitored. A non-directed maintenance does not require the use of a gas analyzer during repair or maintenance of a leaking component.
   Since INVISTA will also be obtaining a State NSR permit amendment, for clarity on permitting terminology, the TCEQ programs are being referenced. TCEQ has incorporated the EPA fugitive emission program for various categories such as chemical plants, refineries, oil and gas production etc. for control of VOC and has more stringent programs. These are categorized from most stringent to least: 28 LAER; 28 MID; 28 VHP (MACT); 28 RCT and 28M (40 CFR 60). The most stringent program is the 28 LAER directed LDAR program which is applicable to ozone non- attainment area.

Step 2 – Elimination of Technically Infeasible Alternatives

All the TCEQ LDAR programs are a technically feasible option for controlling process fugitive methane emissions.

Step 3 – Ranking of Remaining Technologies Based on Effectiveness.

1. The 28 LAER-LDAR program is the most effective program and is used for plants in non-attainment areas especially for the highly reactive volatile organic emissions (VOC) and for control of ozone formation. All fugitive components are monitored at the 500 ppmv detection levels. Methane is not a highly reactive ozone forming VOC. 28 MID program is similar to the 28 LAER program but implemented primarily for listed toxic organic and inorganic components such as chlorine and hydrogen sulfide gases. Methane is not a toxic gas.
2. 28 VHP program is the EPA MACT requirement for the hazardous air pollutants. Pumps are monitored at the 2000 ppmv levels. Valves are monitored at the 500 ppmv levels. This is an effective program for methane.
3. 28 RCT program is a TCEQ program where the leak detection levels are at 10,000ppmv for all fugitive components except for valves at 500 ppmv.
4. 28M is the least stringent program equivalent to EPA's requirements in 40 CFR 60 for some plants and is similar to the 28 RCT program for leak detection levels but includes valves at 10,000ppmv.

Step 4 – Evaluation of Control Technologies in Order of Most Effective to Least Effective

Referring to the Step 3, 28 LAER, is eliminated because INVISTA is in an attainment area and methane emissions are not a highly reactive VOC. Also 28 MID, is for primarily toxic VOC and methane is not a listed toxic pollutant. 28 VHP is the program currently implemented by INVISTA and is considered to provide similar controls for fugitive emissions as the 28 LAER and 28 MID since there will be relatively fewer fugitive components. This project is designed to accommodate the low NO_x burners and SNCR NO_x control technology and therefore the project modification on the fuel system will result in few additional fugitive components. There will be no pumps and compressors installed in this project that would be subject to the lower detection levels in the 28 LAER or 28 MID program. Therefore changing the existing fugitive monitoring program for thousands of existing fugitive component would be operationally and logistically impractical. INVISTA currently uses TCEQ's 28VHP, LDAR program to minimize process fugitive VOC emissions at the WPH, and this program has also been proposed for the additional fugitive VOC emissions associated with the project. Additionally the program requires the weekly audio and visual inspection of connectors to identify and correct fugitive leaks.

Step 5 – Selection of BACT

INVISTA will implement TCEQ's 28VHP[9] LDAR program for VOC BACT purposes, which will also effectively minimize methane emissions. Therefore, the proposed VOC LDAR program satisfies BACT requirements when monitoring for methane. However, since numeric limits for application of the LDAR are not practically enforceable since they are emission factors based on some estimated leaks, such limits will not be included in the permit. Rather, these limits will be enforced as a work practice standards.

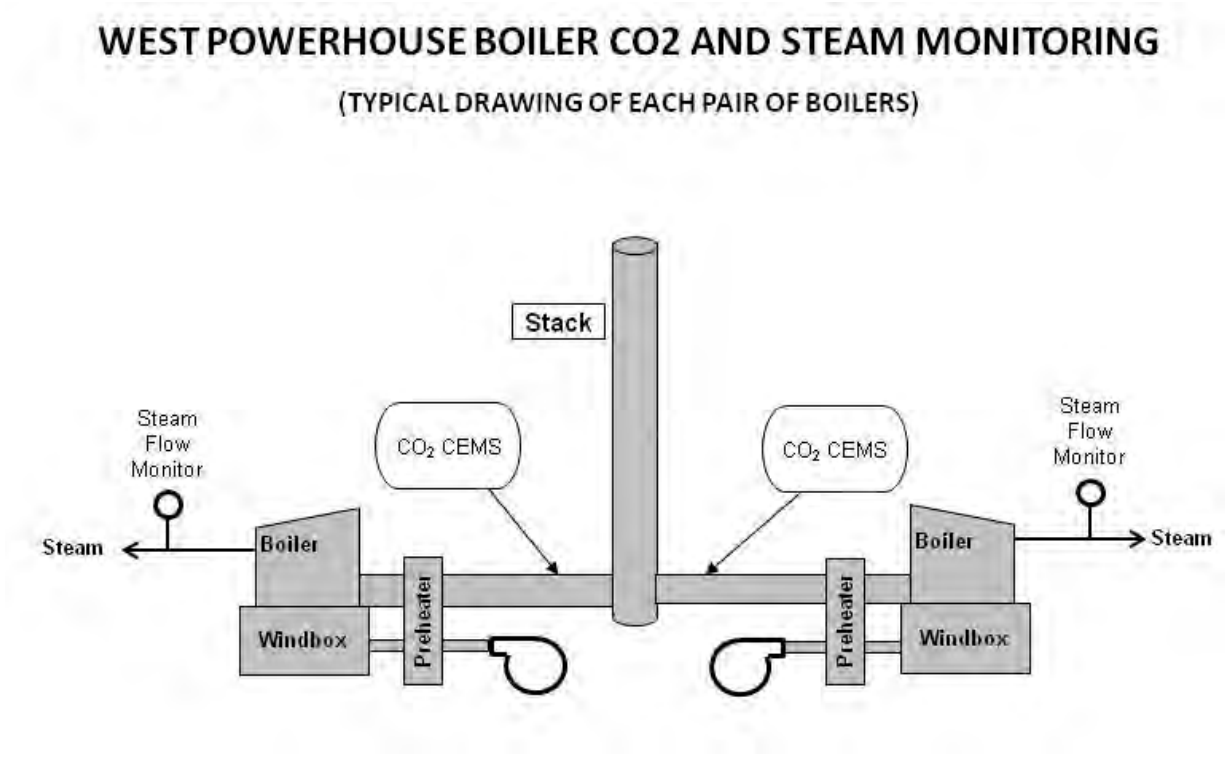
[9] The boilerplate special conditions for the TCEQ 28 VHP LDAR program can be found at http://www.tceq.state.tx.us/assets/public/permitting/air/Guidance/NewSourceReview/bpc_rev28laer.pdf. These conditions are included in the TCEQ issued NSR permit.

IX. Monitoring and Recordkeeping

INVISTA proposes to utilize a continuous emissions monitoring system (CEMS) to monitor the CO_2 in each duct and will also monitor the stack flow rates. This is illustrated in Figure 4. The annual CO_2 emissions will be calculated as a 12-month rolling average in tpy. This system will be fully operational at the conclusion of the project in 2016

The CO_2 CEMS will be operated as in 40 CFR 60 Appendix B, Specification 3 and meet the quality assurance procedures of 40 CFR 60, Appendix F. The steam flow rates will be continuously monitored from each boiler. A data acquisition handling system (DAHS) will be used to measure and record the CO_2 to demonstrate compliance with the annual and BACT permit limit of 235 lbs GHG/thousand (M) pounds (LBS) of 550PSIG steam. Figure 4 below indicates the location of the WPH CEMS.

Figure 4



CO_2 emissions (pounds emitted) shall be calculated monthly in the DAHS based on the CO_2 CEMS and stack gas flows from the combined WPH boilers. Steam (pounds of 550 psig steam) produced from the combined WPH boilers shall be calculated monthly by summing the steam quantity from each boiler as determined by EPA approved flow monitors for each WPH boiler.

$$BACT\ Limit = \frac{\sum(monthly\ CO2\ lbs\ from\ each\ WPH\ boiler\ duct/stack)}{\sum(monthly\ Mlbs\ of\ 550\ psig\ Steam\ output\ from\ each\ WPH\ boiler)}$$

Until project completion for all four boilers in December 2016, INVISTA will comply with the BACT limit for each modified boiler or combination of boilers after the initial tests. The initial compliance tests have been specified after each boiler is modified in Section VI of the permit.

X. Endangered Species Act

Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA) (16 U.S.C. 1536) and its implementing regulations at 50 CFR Part 402, EPA is required to insure that any action authorized, funded, or carried out by EPA is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species or result in the destruction or adverse modification of such species' designated critical habitat.

To meet the requirements of Section 7, EPA is relying on a Biological Assessment (BA) prepared by INVISTA and its consultant, Weston Solutions, Inc. ("Weston").

A draft BA has identified five (5) species listed as federally endangered or threatened in Victoria County, Texas:

Federally Listed Species for Cameron County by the U.S. Fish and Wildlife Service (USFWS) and the Texas Parks and Wildlife Department (TPWD)	**Scientific Name**
Birds	
Attwater's Prairie-Chicken	*Tympanuchus cupido attwateri*
Whooping Crane	*Grus americana*
Interior Least Tern	*Sterna antillarum athalassos*
Mammals	
Louisiana Black Bear	*Ursus americanus luteolus*
Red Wolf	*Canis rufus*

EPA adopts the data and analysis contained in the BA and concludes that issuance of the proposed permit to INVISTA for the installation of nitrogen oxide (NO_x) controls and modification to existing boilers and fuel system piping will have no effect on the Attwater's prairie-chicken, interior least tern, Louisiana black bear, or the red wolf as there are no records of occurrence, no designated critical habitat, nor potential suitable habitat for any of these species within the action area.

However, for the whooping crane, because the proposed project is approximately 10 miles north of critical habitat and located within the migratory path, EPA determines that this project may affect, but is not likely to adversely affect the whooping crane. Information in the BA indicates that there is no known or potential habitat for the cranes within the action area. However, because the use of certain construction equipment poses a possible but unlikely risk of bird strikes, EPA engaged in informal consultation with the USFWS's Southwest Region, Corpus Christi, Texas Ecological Services Field Office. Following discussions with INVISTA and USFWS staff, INVISTA has committed to implement measures that include marking any construction equipment taller than 50 feet with lighting/flags and retracting construction equipment (e.g., construction cranes) at night or when not in use at the plant site. EPA determines that the implementation of these USFWS recommended measures and practices are sufficient to reduce the possibility of strikes to a level that reduces these potential effects to insignificant or discountable. EPA has requested concurrence on its determination from the USFWS's Corpus Christi Field Office.

In addition to the listed species, three (3) candidate species, Sprague's pipit (*Anthus spragueii)*, golden orb (*Quadrula aurea*), and Texas pimpleback (*Quadrula petrina*), are considered in the BA. There are

no records of occurrence, no designated critical habitat, nor potential suitable habitat for any of these species within the action area.

Any interested party is welcome to bring particular concerns or information to our attention regarding this project's potential effect on listed species. The final draft biological assessment can be found at EPA's Region 6 Air Permits website at http://yosemite.epa.gov/r6/Apermit.nsf/AirP.

XI. Magnuson-Stevens Act

Pursuant to Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations at 50 CFR part 600, EPA is required to consult with NOAA's National Marine Fisheries Service on proposed actions that may adversely affect essential fish habitat (EFH). The facility is adjacent to tidally influenced portions of the Victoria Barge Canal which empties into San Antonio Bay system. These tidally influenced portions have been identified as potential habitats of postlarval, juvenile, subadult or adult red drum (*Sciaenops ocellatus*), white shrimp (*Penaeus setiferus*), brown shrimp (*Penaeus aztecus*), pink shrimp (*Penaeus duorarum*), royal red shrimp (*Pleoticus robustus*) and forty-three species of reef fish which include triggerfishes, jacks, wrasses, snappers, tilefishes, and groupers. The EFH information was obtained from the NMFS's website (http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html).

EPA concludes that the proposed PSD permit for the installation of nitrogen oxide (NO_x) controls and modification to existing boilers and fuel system piping within the existing facility property will have no adverse impacts on listed marine and fish habitats. Information provided in the Biological Assessment was used to support this determination. There are no proposed direct construction impacts or indirect project impacts within or directly adjacent to the Victoria Barge Canal (VBC). Further, air modeling indicates that pollutant0 levels will be below *de minimums* levels over the water. The site storm water system will remain the same as it exists today; where contact storm water is routed to the wastewater treatment plant and non-contact storm water is routed via storm water outfalls to the Victoria Barge Canal. All wastewater that will be generated as a result of the project and contact storm water will be sent directly to INVISTA's existing wastewater treatment plant that discharges into the Guadalupe River. The Guadalupe River is a freshwater river which is not considered EFH and does not connect with the VBC.

XII. National Historic Preservation Act (NHPA)

Section 106 of the NHPA requires EPA to consider the effects of this permit action on properties eligible for inclusion in the National Register of Historic Places. To make this determination, EPA relied on a cultural resource report prepared by AmaTerra Environmental, Inc. ("AmaTerra") submitted on December 12, 2012.

AmaTerra conducted a cultural resource review within a 3-kilometer area of potential effect (APE) extending from the construction site. This review included a search of the Texas Historical Commission's online Texas Archaeological Site Atlas (TASA). The cultural resources report, indicates the presence of eight archaeological sites within the 3-kilometer radius of the proposed construction site, five sites are potentially eligible for listing in the National Register. Of these five sites, four sites have Prehistoric or Native American significance with two of the sites containing burial remains. The closest site is roughly 1200 meters (4000 feet) from the site of construction. Following initial consultation with the State Historic Preservation Officer (SHPO), THC staff requested additional field investigations

within the construction footprint. On February 12, 2013, INVISTA and AmaTerra conducted that additional field assessment that included 11 shovel tests and concluded that no archaeological resources were identified. Since no cultural materials of historic or prehistoric age were identified within the project area, Ama Terra determined no further archaeological work is needed within the project area. AmaTerra provided a summary of the additional field work as a supplement to the cultural resources report. On January 25, 2013, EPA sent to Indian tribes identified by the Texas Historical Commission as having historical interests in Texas to inquire if any of the tribes have historical interest in the particular location of the project and to inquire whether any of the tribes wished to consult with EPA in the Section 106 process. Three tribes, Tonkawa Tribe of Oklahoma, Yselta del sur Pueblo and the United Keetoowah Band of Cherokee Indians in Oklahoma, expressed interest in the area and requested notification should construction activities inadvertently unearth any human remains, funerary objects, artifacts or other evidence of historical or cultural significance and that construction should cease at that time.

EPA Region 6 determines that while there are cultural materials of historic or prehistoric age identified within the 1-mile radius of the project area, issuance of the permit to INVISTA will not affect properties on or potentially eligible for listing on the National Register. Additionally, no historic properties are located within the APE and that a potential for the location of archaeological resources is low within the construction footprint itself.

EPA will provide a copy of the complete report to the State Historic Preservation Officer for final consultation and concurrence with EPA's determination.

Issuance of this permit will not be finalized until all obligations under Section 106 of the NHPA have been met and approved by the EPA with concurrence from the SHPO. Any interested party is welcome to bring particular concerns or information to our attention regarding this project's potential effect on historic properties. A copy of the report may be found at http://yosemite.epa.gov/r6/Apermit.nsf/AirP.

XIII. Environmental Justice (EJ)

Executive Order (EO) 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Based on this Executive Order, the EPA's Environmental Appeals Board (EAB) has held that environmental justice issues must be considered in connection with the issuance of federal Prevention of Significant Deterioration (PSD) permits issued by EPA Regional Offices. *See, e.g., In re Prairie State Generating Company,* 13 E.A.D. 1, 123 (EAB 2006); *In re Knauf Fiber Glass, Gmbh,* 8 E.A.D. 121, 174-75 (EAB 1999*) ("Knauf I").*This permitting action, if finalized, only authorizes emissions of GHG and does not select environmental controls for any other pollutants. Climate change modeling and evaluations of risks and impacts is typically conducted for changes in emissions orders of magnitude larger than the emissions from individual projects that might be analyzed in PSD permit reviews. Quantifying the exact impacts attributable to a specific GHG source obtaining a permit in specific places and points would not be possible[10]. Thus, we conclude it would not be meaningful to evaluate impacts of GHG emissions on a local community in the context of a single permit. Accordingly, we have determined an environmental justice analysis is not necessary for the permitting record.

[10] Pg 48 of PSD and title V permitting guidance for Greenhouse gases http://www.epa.gov/nsr/ghgdocs/ghgpermittingguidance.pdf

XIV. Conclusion and Proposed Action

Based on the information supplied by INVISTA, our review of the analyses in the GHG PSD Permit Application, and our independent evaluation of the information contained in our Administrative Record, it is our determination that the proposed project would employ BACT for GHG under the terms contained in the draft permit. Therefore, EPA is proposing to issue INVISTA a PSD permit for GHG for the WPH boiler project, subject to the PSD permit conditions specified therein. This permit is subject to review and comments. A final decision on issuance of the permit will be made by EPA after considering comments received during the public comment period.