STATE OF NEBRASKA

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Governor

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PREVENTION OF SIGNIFICANT DETERIORATION (PSD)
CONSTRUCTION PERMIT

PERMIT TO CONSTRUCT AN
AIR CONTAMINANT SOURCE
IS HEREBY ISSUED TO:

Abengoa Bioenergy Corporation
1414 Road O
York, NE 68467

FOR THE SPECIFIC CONSTRUCTION OF:

An Ethanol Manufacturing Facility

TO BE LOCATED AT:

1414 Road O
York, York County, Nebraska.

Pursuant to Chapter 14 of the Nebraska Air Quality Regulations, the public has been notified by prominent advertisement of this proposed construction of an air contaminant source and the thirty (30) day period allowed for comments has elapsed. This Construction Permit (CP) supercedes the Construction Permit issued to High Plains Corporation on July 11, 2001. High Plains Corporation changed its name to Abengoa Bioenergy Corporation on April 15, 2003. This CP addresses modifications due to Prevention of Deterioration (PSD) requirements for the existing equipment. This CP also addresses increases of the production of anhydrous ethanol from 50 million gallons per year to 100 million gallons per year, including a small ethanol pilot plant (research) producing approximately 1 million gallons per year.

The equipment covered by this permit includes the following:

Stack ID #	Equipment description
F2	Corn grain receiving pits #1 & #2, four 80,000-bushel capacity storage bins (Bins #1-#4), one 20,000-bushel capacity day bin (Day Bin #1), associated elevators, conveyors, cleaners, and hammermills controlled by cyclone and baghouse (in series).
F5	Corn grain receiving pits #3 & #4, two 80,000-bushel capacity storage bins (Bins #5-#6), one 20,000-bushel capacity day bin (Day Bin #2), and associated elevators, conveyors, cleaners, and hammermills
F9	Milo/corn grain receiving pit #4, one 80,000-bushel capacity storage bin (Bin #8 for milo), and associated elevators, conveyors, cleaners, and hammermills controlled by cyclone and baghouse (in series)
F6	The R&D pilot plant grain handling and milling equipment, consisting of one 2,000-bushel capacity storage bin- Bin #7, one hammermill and associated elevators, conveyors, and cleaners controlled by cyclone and baghouse (in series) – F6.

	Six hammermills will be used interchangeably for the grain handling and millings lines controlled by Baghouses F2, F5 and F9. The grain receiving pits are partially enclosed and use a "choked flow" receiving system. The solids collected in the cyclones/baghouses are returned to the process downstream of the hammermills. The cleanings solids are collected in a storage bin, then transported off-site. The grain receiving operations consist of unloading of grain by truck at one of five grain receiving pits, which has a total design rate of 1,120 tons/hr.
F1/F4/F7/F8 combined	Fermentation operations at the main plant consist of 3 yeast propagator tanks, a slurry tank, a beer well and 10 fermentation tanks. The yeast propagator tanks, the slurry tank, and the beer well are controlled by Vent Scrubber F4. Fermentation tanks #1-#4 are controlled by Vent Scrubber F4 and CO_2 Scrubber F1. Fermentation tanks #5-10 are controlled by Vent Scrubber F7 and CO_2 Scrubber F8. The fermentation and distillation equipment from the pilot plant will be controlled by Vent Scrubber F4.
F3	Distillation operations at the main plant consist of degasser, beer column, rectifier, auxiliary column, molecular sieves, whole stillage tank, centrifuges, centrate tank, thin stillage tank, and 2 evaporative systems. The distillation operations will be controlled by a new distillation scrubber (F3).
Stack 1	The DDGS dryers, thermal oxidizers, DDGS cooling cyclones and boilers are routed to a single stack (Stack #1). The thermal oxidizers with heat recovery steam generator systems (TO/HRSG system) control emissions from the drying operations to produce dried distillers grain solubles (DDGS). DDGS dryers #1, #2, and #3, and associated DDGS cooling cyclone are controlled by thermal oxidizer #1. DDGS dryers #4 and #5 and associated cooling cyclone are controlled by thermal oxidizer #2. Each DDGS dryer has a burner design rate of 45 MMBtu/hr. Each thermal oxidizer has a burner design rate of 200 MMBtu/hr, and equipped with a heat recovery steam generator system. Each DDGS dryer grouping (#1/2/3 and #4/5) has one DDGS cooling cyclone. Each DDGS cooling cyclone is controlled by a baghouse, with the exhaust from the baghouse routed back to the associated DDGS dryer grouping. Boiler B1consists of one boiler design-rated at 160 MMBTU/hr, manufactured by Combustion Engineering in 1986, then relocated and constructed at York in 1994. Boiler B2 consists of one boiler design-rated at 150 MMBTU/hr, manufactured by National Dynamics and constructed in 1995.
Storage Tanks	The storage tanks consist of the following internal floating-roof vertical aboveground tanks: Tank T-800: 1,000,000 gallons capacity, for fuel grade ethanol; Tank T-801: 526,000 gallons capacity, for intermediate product (ethanol); Tank T-802: 526,000 gallons capacity, for fuel grade ethanol; Tank T-807: 39,500 gallons capacity, for denaturant (natural gasoline); and The storage tanks consist of the following fixed-roof, vertical aboveground tanks and controlled by a vapor recovery system with a flare: Tank T-803: 39,500 gallons capacity, for 200 proof ethanol; Tank T-804: 39,500 gallons capacity, for 200 proof ethanol; Tank T-805: 39,500 gallons capacity, for 190 proof ethanol; Tank T-806: 39,500 gallons capacity, for 190 proof ethanol; Tank T-808: 9,950 gallons capacity, for low proof ethanol; Tank T-1501A: 23,000 gallons capacity, for 194 proof ethanol; Tank T-1501B: 23,000 gallons capacity, for 194 proof ethanol; Tank T-1501C: 23,000 gallons capacity, for 194 proof ethanol;

	Tank T-1501D: 4,600 gallons capacity, for intermediate ethanol; A 4,240 gallons capacity, horizontal aboveground storage tank (Tank T-830), for corrosion inhibitor (was special denaturant/product), controlled by a vapor recovery system and flare; and A 550 gallons capacity, aboveground storage tank (fire pump tank) for diesel fuel; and A 110 gallons capacity, aboveground storage tank (generator tank) for diesel fuel.
	Loadout (truck and rail) of liquid product (denatured ethanol) shall be controlled by a vapor recovery system with a flare.
	Fugitive Dust from haul roads.
	Equipment Leaks
T1	Cooling Tower #1
T2	Cooling Tower #2
T3	Cooling Tower #3
M3	The methanator operation consists of wastewater treatment tanks, a methanator (which removes VOC from the wastewater), and a flare design-rated at 4.8 MMBtu/hr. Methane can be also combusted in DDGS dryer #2.
	The emergency equipment includes one 900 hp, diesel fired, emergency electric generator and a fire water-pump engine for emergencies.

Compliance with this permit shall not be a defense to any enforcement action for violation of an ambient air quality standard.

This permit is issued with the following conditions:

General Conditions

I. This permit is not transferable to another source or location. (Title 129, Chapter 17)

II. Holding of this permit does not relieve the owner/operator of the source from the responsibility to comply with all applicable portions of the Nebraska Air Quality Regulations and any other requirements under local, State, or Federal law. (Title 129, Chapter 41)

III. Any applicant who fails to submit any relevant facts or who has submitted incorrect information in a permit application shall, upon becoming aware of such failure or incorrect submittal, promptly submit such supplementary facts or corrected information. If the source wishes to make changes at the facility that will result in change(s) to values, specifications, and/or locations of emission points that were indicated in the permit application (or other supplemental information provided by the applicant and reviewed by the Department in issuance of this permit), the source must receive approval from the Department before the change(s) can be made. In addition, any modification which may result in an adverse change to the air quality impacts predicted by atmospheric dispersion modeling (such as changes in stack parameters or increases in emission rates, potential emissions, or actual emissions) shall have prior approval from the Department. The source shall provide all necessary information to verify that there are no substantive changes affecting the basis upon which this permit was issued. Information may include, but not be limited to, additional engineering, and modeling and ambient air quality studies. (Title 129, Chapter 17, Section 006, 007, & 008)

IV. Approval to construct, reconstruct and/or modify the source will become invalid if a continuous program of construction is not commenced within 18 months after the date of issuance of the construction permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable period of time. (Title 129, Chapter 17, Section 12)

V. The owner/operator of the source shall provide a notification to the Department of the anticipated date of initial startup, postmarked not more than 60 days nor less than 30 days prior to such date, and of the actual date of initial startup, postmarked within 15 days after such date, of each independently operable emission unit, process, or group of equipment or emission units. (Title 129, Chapter 17, Section 012 & Chapter 18, Section 001.01)

VI. The permittee shall allow the Department, EPA or an authorized representative, upon presentation of credentials to (Title 129, Chapter 8, Section 012.02):

(A) Enter upon the permittee's premises at reasonable times where a source subject to this permit is located, emissions-related activity is conducted or records are kept, for the purpose of ensuring compliance with the permit or applicable requirements;

(B) Have access to and copy, at reasonable times, any records, for the purpose of ensuring compliance with the permit or applicable requirements;

(C) Inspect at reasonable times any facilities, pollution control equipment, including monitoring and air pollution control equipment, practices, or operations, for the purpose of ensuring compliance with the permit or applicable requirements;

(D) Sample or monitor at reasonable times substances or parameters for the purpose of ensuring compliance with the permit or applicable requirements.

VII. Applicable regulations: Title 129 - Nebraska Air Quality Regulations as amended November 24, 2003.

VIII. This permit may contain abbreviations and symbols of units of measure, which are defined in 40 CFR Part 60.3. Other abbreviations may include, but are not limited to, the following: Best Available Control Technology (BACT), Code of Federal Regulations (CFR), Compilation of Air Pollutant Emission Factors, Volume I, Stationary Point and Area Sources (AP-42), Carbon Monoxide (CO), Construction Permit (CP), Continuous Emissions Monitor (CEM), Dried Distillers Grain with Solubles (DDGS), Hazardous Air Pollutant (HAP), Leak Detection and Repair (LDAR), Maximum Achievable Control Technology (MACT), million standard cubic feet (MMscf), million British Thermal Units per hour (MMBtu/hr), National Ambient Air Quality Standards (NAAQS), New Source Performance Standards (NSPS), Nitrogen Oxides (NOx), Particulate Matter (PM), Particulate Matter less than or equal to 10 micrometers (PM_{10}), parts per million (ppm), Prevention of Significant Deterioration (PSD), Sulfur Dioxide (SO_2), Total Reduced Sulfur (TRS), Volatile Organic Compounds (VOC), Wet Distillers Grain with Solubles (WDGS).

IX. Open fires are prohibited except as allowed by Title 129, Chapter 30.

X. The source shall not cause or permit fugitive particulate matter to become airborne in such quantities and concentrations that it remains visible in the ambient air beyond the property line. (Title 129, Chapter 32)

XI. Application for review of plans or advice furnished by the Director will not relieve the source of legal compliance with any provision of these regulations, or prevent the Director from enforcing or implementing any provision of these regulations. (Title 129, Chapter 37)

XII. If and when the Director declares an air pollution episode as defined in Title 129, Chapter 38, Sections 003.01B, 003.01C, or 003.01D, the source shall immediately take all required actions listed in Title 129, App. I until the Director declares the air pollution episode terminated.

Specific Conditions

XIII. Specific terms and conditions of this permit:

(A) Opacity of visible emissions shall not equal or exceed 20%, as evaluated by an EPA approved method in Appendix A of 40 CFR 60 in accordance with Title 129, Chapter 20, Section 005.

(B) Particulate matter emissions from each process unit shall not exceed limits as specified in Title 129, Chapter 20, Section 001 (Table 20-1). Compliance with this condition may be demonstrated through compliance with Conditions XIII.(E)(2)(d), (G)(5)(a) and (b), (K)(2), (K)(3), and (K)(4).

(C) Particulate matter emissions from fuel combustion shall not exceed limits as specified in Title 129, Chapter 20, Section 003. Compliance with this condition may be demonstrated through compliance with Conditions XIII.(G)(2), (G)(5)(a) and (b), and (M)(2).

(D) Emissions of sulfur oxides shall not exceed 2.5 lbs/MMBtu, maximum 2-hour average. (Title 129, Chapter 24). Compliance with this condition may be demonstrated through compliance with Conditions XIII.(G)(2) and XIII.(M)(2).

(E) The following conditions apply to: GRAIN HANDLING AND MILLING

(1) The grain receiving pits shall have a “choked flow” system, aspirated to a baghouse and located inside a building to capture particulate matter emissions. (Title 129, Chapter 19)

(2) PM and PM_{10} from all grain handling and milling operations shall be controlled by at least one of the four baghouse dust collector systems (identified as F2, F5, F6 and F9). Each of baghouses F2, F5 and F9 is in series with a cyclone, which is located prior to the baghouse in the air stream. (Title 129, Chapters 4, 19, and 34)

(a) The baghouse dust collector systems shall be operated whenever the associated equipment is in operation, including when the grain is received, elevated, conveyed into and out of the grain

storage bins and the day bin, moved by associated conveyors and transfer point, and processed through the hammermill(s).

(b) Each of the baghouse dust collector systems (cyclones and baghouse) shall be properly installed, operated and maintained. Manufacturer's instructions shall be kept on site and readily available to Department representatives.

(c) Each of the baghouses shall be equipped with an operational pressure drop instrumentation and shall be installed, calibrated, operated and properly maintained according to manufacturer's recommendations. The pressure drop readings shall be recorded at a minimum of once per day.

(d) The PM and PM_{10} emissions from the grain handling and milling baghouses shall not exceed the following hourly limits, based on a 3-hour average or other averaging time established by the performance test method. (Title 129, Chapters 4 and 19)

(i) Baghouse F2: 1.46 pounds per hour;

(ii) Baghouse F5: 1.46 pounds per hour;

(iii) Baghouse F6 (R&D Pilot Plant): 0.43 pounds per hour;

(iv) Baghouse F9: 1.46 pounds per hour.

(e) PM and PM_{10} emissions from baghouses F2, F5, F6, and F9 shall not exceed 0.01 gr/dsf. (Title 129, Chapter 19)

(f) In order to demonstrate compliance with Conditions XIII.(E)(2)(d), the source shall conduct a performance test for PM and PM_{10} on each of the new baghouses (F5, F6 and F9), while operating at full capacity within 60 days after reaching the maximum capacity but not more than 180 days after the start-up of operations. The performance test shall be conducted in accordance with Condition XIII.(Q). (Title 129, Chapter 34)

(g) Routine observations (at least once each day the baghouse dust collectors are in operation) shall be conducted to determine whether there are visible emissions from the stack, leaks, noise, atypical operating parameter readings (including pressure differential readings), or other indications, which may necessitate corrective action. Corrective action shall be taken immediately if necessary.

(h) Collected waste material from the fabric dust collectors shall be handled, transported, and stored in a manner that ensures compliance with Condition X.

(F) The following conditions apply to: FERMENTATION & DISTILLATION OPERATIONS

(1) Vent Scrubbers F4 & F7, CO_2 Scrubbers F1 & F8, and Distillation Scrubber F3 shall not exceed 74.20 lbs/hr VOC, combined. This emission rate is based on a 3-hour average or other averaging time established by the performance test method. (Title 129, Chapters 19)

(2) Scrubbers F1, F3, F4, F7, and F8 shall each maintain 98% control efficiency for VOC and for HAPs. (Title 129s, Chapter 19 and 27)

(3) All fermentation and distillation operations shall be controlled by a scrubber.

(4) In order to demonstrate compliance with Conditions XIII.(F)(1), and (F)(2), the source shall conduct a performance test for VOC and HAPs on each of the scrubbers (F1, F3, F4, F7, and F8) and determine control efficiency of each of the scrubbers. The performance test for scrubbers F1 and F4 shall be conducted within 180 days after the high efficiency packing has been installed. The performance test for scrubbers F3, F7 and F8 shall be conducted while operating at full capacity within 60 days after reaching the maximum capacity but not more than 180 days after the start-up of operations. The performance test shall be conducted in accordance with Condition XIII.(Q) and shall include speciation and quantification of the HAP composition of the emissions from the scrubbers. VOC emissions shall be expressed as weight of VOC. (Title 129, Chapter 34)

(5) Operation of each of the scrubbers shall be in accordance with the following requirements: (Title 129, Chapters 19 and 27)

(a) The scrubbers shall be operated at all times when the associated emission units are in operation.

(b) The scrubbers shall be properly installed, operated and maintained. Manufacturer's specifications, if available, shall be kept on site and readily available to Department representatives.

(c) The scrubbers shall be inspected daily to determine whether there are visible emissions, leaks, noise, atypical operating parameters, or other indications which may necessitate corrective action. Corrective action shall be taken immediately if necessary.

(6) The owner or operator shall develop ranges of operating parameters for the fermentation and distillation operations and the scrubbers (including, but not limited to, temperature, fresh water circulation rate, and pH). The range of operating parameters indicative of normal operation shall be established from data obtained during the performance testing and/or from other basis such as historical operating parameter trends, manufacturer's specifications, and engineering judgment. The owner or

operator shall submit the proposed ranges of operating parameters as part of the operating permit application for this facility.

(7) The actual operating parameters (including, but not limited to, temperature, fresh water circulation rate, and pH) for the fermentation and distillation operations and the scrubbers shall be determined and documented on a daily basis. (Title 129, Chapters 19 and 27)

(G) The following conditions apply to: DDGS DRYING OPERATIONS/THERMAL OXIDIZERS/BOILERS

(1) The thermal oxidizer with heat recovery steam generator systems (TO/HRSG system) control emissions from the DDGS drying operations. DDGS dryers #1, #2, and #3 and associated DDGS cooling cyclone/baghouse are controlled by thermal oxidizer #1. DDGS dryers #4 and #5 and associated cooling cyclone/baghouse are controlled by thermal oxidizer #2. All five DDGS dryers and both thermal oxidizers are routed to a single stack (Stack #1).

(2) Only natural gas shall be burned as fuel in the boilers, thermal oxidizers and DDGS dryers #1, #3, #4, and #5. Natural gas and methane from the biomethanator shall be burned as fuel in the DDGS dryer #2. (Title 129, Chapter 4 and 19)

(3) Dryers #4 and #5 and their associated DDGS cooling cyclone shall be controlled by a thermal oxidizer.

(4) Each boiler, dryer, and thermal oxidizer shall be equipped with a low NO_x burners with flue gas recirculation. (Title 129, Chapter 19)

(5) Total Emissions from the TO/HRSG systems' stack (Stack 1) shall be limited to following hourly limits. The emission limits, except for NO_x, are based on a 3-hour average or other averaging time established by the performance test method. (Title 129, Chapters 4 and 19)

(a) 15.12 pounds per hour PM

(b) 15.12 pounds per hour PM_{10}

(c) 0.04 pounds per MMBtu NO_x, based on rolling 30-day average

(d) 40.91 pounds per hour CO

(e) 45.53 pounds per hour VOC

(6) Each thermal oxidizer (#1 and #2) shall maintain at least 98% control efficiency for VOC, HAPs, PM and PM_{10} (including condensables). The control efficiency for PM and PM10 includes the control efficiency from the DDGS cooling cyclone and baghouse associated with each thermal oxidizer. (Title 129, Chapter 19 and 27)

(7) Each thermal oxidizer (#1 and #2) shall maintain at least 90% control efficiency or shall not exceed 100 ppmv for CO in outlet concentration. (Title 129, Chapter 19)

(8) The boilers shall not exceed 0.084 lbs/MMBtu of CO. (Title 129, Chapter 19)

(9) In order to demonstrate compliance with Conditions XIII.(G)(5) through (G)(8), the source shall conduct a performance test for PM, PM_{10} (including condensable particulate matter), NO_x, CO, VOC and HAPs on the TO/HRSG systems' stack and determine emission rates and control efficiency of each thermal oxidizer, while operating at full capacity. The stack will be tested not more than 180 days after the start-up of thermal oxidizer for the existing equipment. The stack will be tested within 60 days after reaching the maximum capacity but not more than 180 days after the start-up of operations for the new equipment (ie. DDGS dryers #4, and/or #5 and associated thermal oxidizer). The performance test shall be conducted in accordance with Condition XIII.(Q) and shall include speciation and quantification of the hazardous air pollutant composition of the emissions from the TO/HRSG systems' stack. VOC emissions shall be expressed as weight of VOC. (Title 129, Chapter 34)

(10) Operation of the thermal oxidizer shall be in accordance with the following requirements: (Title 129, Chapters 4, 19 and 27)

(a) The thermal oxidizer shall be operated at all times when the associated emission units are in operation.

(b) The operating temperatures of the thermal oxidizer shall be maintained equal to or greater than 1,400 °F based on a one-hour average.

(c) The thermal oxidizer shall be equipped with a thermocouple or equivalent device capable of continuously monitoring the temperature. The thermocouple shall be calibrated on an as-needed basis but at least annually according to manufacturer's instructions.

(d) The thermal oxidizer shall be inspected daily during operation, to determine whether there are visible emissions, leaks, noise, atypical operating parameter, or other indications which may necessitate corrective action. Corrective action shall be taken immediately if necessary.

(11) The thermal oxidizers with the heat recovery steam generators and both boilers are subject to the requirements of Title 129, Chapter 18, New Source Performance Standards (NSPS), Section 001.22, Industrial-Commercial-Institutional Steam Generating Units –Subpart Db and Subpart A in its entirety. The following conditions are intended to clarify the primary requirements of Subpart Db: (40 CFR 60.40b)

(a) Performance and compliance testing shall be conducted in accordance with Title 129, Chapter 18, NSPS, Section 001.01 General Provisions, and as required by 40 CFR 60.46b(e).

(b) The permittee shall install, calibrate, maintain, and operate a continuous emission monitoring system (CEM) in accordance with Subpart Db for the TO/HRSG systems and boilers for measuring the NO_x emissions.

(c) The Requirements for Performance Specifications found in 40 CFR 60 Appendix B shall be followed for the continuous emission monitoring systems required under the Condition XIII.(G)(11)(b).

(d) Quality Assurance for the continuous emissions monitoring system required under the Condition XIII.(G)(11)(b) shall be conducted according to the requirements of 40 CFR 60 Appendix F. The report of the Relative Accuracy Test Audit required by the 40 CFR 60 Appendix F or a similar procedure shall be submitted to the Department within 45 days of completion of the test.

(e) The source shall record and maintain records of the amount of each fuel combusted during each day for each unit unless EPA Region VII approves an alternative recordkeeping frequency. (40 CFR 60.48b(d))

(f) The source shall submit notification of the date of construction, anticipated startup, and actual startup, as provided by Title 40 CFR 60.7. (40 CFR 60.49b(a))

(12) The boilers, DDGS dryers and the associated TO/HRSG systems shall be properly installed, operated, and maintained. Manufacturer's instructions shall be kept on site and readily available to Department representatives. (Title 129, Chapters 19 and 27)

(13) The owner or operator shall develop ranges of operating parameters (including, but are not limited to, operating temperatures). The range of operating parameters indicative of normal operation shall be established from data obtained during the performance testing and/or from other basis such as historical operating parameter trends, manufacturer's specifications, and engineering judgment. The owner or operator shall submit the proposed ranges of operating parameters as part of the operating permit application for this facility.

(14) The actual operating parameters range (including, but not limited to, operating temperatures) for the TO/HRSG, DDGS dryers and boilers shall be determined and documented on a daily basis.

(15) The source shall conduct a performance test for VOC, HAPs and liquid content of the wet cake (WDGS) to quantify the estimated emissions of

VOC and HAPs from the wet cake storage pile, in accordance with Condition XIII.(Q).

(H) The following conditions apply to: STORAGE TANKS

(1) Tanks T-1502 (200,000 gallons capacity, for beverage grade ethanol, fixed-roof tank) and T-831 (2670 gallons capacity, for specially denatured alcohol (scale tank), fixed-roof tank) shall be permanently disconnected from the production lines.

(2) The requirements from Title 129, Chapter 18, Section 001.62 – Volatile Organic Liquid Storage Vessels (including petroleum storage vessels) – Subpart Kb, apply to the following storage tanks: T800-T808, T-830, and T-1501A-T-1501D.

(a) The tanks T-800, T-801, T-802, and T-807 shall each be equipped with an internal floating roof, in accordance with the specifications in 40 CFR 60.112b(a)(1).

(b) The tanks shall each be visibly inspected and repaired in accordance with testing and procedures per 40 CFR 60.113b(a).

(c) The owner or operator of the affected tanks shall report and keep records as described in 40 CFR 60.115b – Reporting and recordkeeping requirements and in 40 CFR 60.116b – Monitoring of operations.

(3) Tanks T803-T806, T-808, T-830, and T-1501A-T-1501D shall each be controlled by a vapor recovery system with a flare, and tanks T-800, T-801, T-802, and T-807 shall each be equipped with an internal floatingroof. (Title 129, Chapters 19 and 27).

(4) The flare for the vapor recovery system shall have a flame present when Tanks T803-T806, T-808, T-830 and T-1501A-T-1501D are in use (including when liquid is being loaded in or out of the tanks). The facility must install an appropriate safety device or monitoring system to ensure that tanks cannot be used unless the captured emissions are adequately controlled. The installed safety device or monitoring system must be calibrated and operated in accordance with manufacturer's instructions. The facility shall maintain appropriate documentation at the site, such as flare specifications on the installed safety device or flame monitoring, to demonstrate compliance. (Title 129, Chapter 19)

(5) In order to demonstrate compliance with the Title 129, Chapter 27, Section 002 (HAP), the source shall test the manufactured anhydrous ethanol for HAP content to quantify the HAP emissions from the storage tanks, equipment leaks, and loading rack. The performance test shall be in accordance with Condition XIII.(Q).

(I) The following conditions apply to: LIQUID PRODUCT LOADING

(1) Liquid product shall use submerged loading when transferring liquid (denatured ethanol or denaturant) from the storage tanks to tanker railcar or tanker truck. (Title 129, Chapters 19 and 27)

(2) Loadout to non-dedicated transportation tanks (truck and rail) shall not exceed 10,000,000 gallons of denatured ethanol per any period of twelve (12) consecutive calendar months.

(3) Loadout (truck and rail) of liquid product (denatured ethanol) or denaturant shall be controlled by a vapor recovery system with a flare. (Title 129, Chapters 19 and 27)

(a) The vapor recovery system shall be properly designed, installed, operated and maintained. The vapor recovery system shall have a minimum capture/control efficiency of 95%. Manufacturer's specifications shall be kept on site and readily available to Department representatives.

(b) When loadout of liquid product is occurring, a flame shall be present at the flare. The facility must install an appropriate safety device or monitoring system to ensure that loadout cannot occur unless the captured emissions are adequately controlled. The installed safety device or monitoring system must be calibrated and operated in accordance with manufacturer's instructions. The facility shall maintain appropriate documentation at the site, such as flare specifications on the installed safety device or flame monitoring, to demonstrate compliance.

(J) The following conditions apply to: FUGITIVE EMISSIONS

(1) The requirements from Title 129, Nebraska Air Quality Regulations, Chapter 18, Section 001.14 – Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry – Subpart VV, apply in its entirety to all affected equipment used in the ethanol production processes. (40CFR60.480)

(a) Compliance with NSPS, Subpart VV shall be demonstrated for all equipment within 180 days of initial startup. (40 CFR 60.482-1)

(b) Test methods and procedures shall be consistent with the requirements found in 40 CFR 60.485. The methods include:

(i) Method 21 shall be used to determine the presence of leaking sources. (40 CFR 60.485(b)(1))

(ii) Method 21 shall be used to determine the background level. (40 CFR 60.485(c)(2))

(iii) Procedures that conform to the general methods in ASTM E-260, E-168, E-169 (incorporated by reference

– see § 60.17) shall be used to determine the percent VOC content in the process fluid that is contained in or contacts a piece of equipment. (40 CFR 60.485(d)(1))

(iv) Standard reference texts or ASTM D-2879 (incorporated by reference – see § 60.17) shall be used to determine the vapor pressure of the components in the liquid in the light liquid service. (40 CFR 60.485(e)(1))

(c) The owner or operator shall report and keep records as described in 40 CFR 60.487 – Reporting requirements and in 40 CFR 60.486 – Recordkeeping requirements. Each owner or operator shall submit semiannual reports to the Department beginning six months after the initial startup date.

(d) Equipment under this subpart is defined as each pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, valve, and flange or other connector in VOC service and any devices or systems required by this subpart. (40 CFR 60.481)

(e) Emissions will be controlled by the Leak Detection and Repair Program as defined in 40 CFR 60.482-1 through 60.482-10.

(2) The haul roads shall be paved. The paved haul roads shall have the following conditions:

(a) The haul roads emissions shall not exceed 22.66 lbs/day PM_{10} for the haul roads combined, and 0.60 lbs/day PM_{10} for the entrance haul road segment (first 100 feet). (Title 129, Chapters 4 & 19)

PM_{10} emissions for the haul roads combined shall be calculated each day using the following equation:

$$\text{Lbs } PM_{10}/\text{day} = (\text{Lbs/VMT})*(\text{VMT/day}) = (0.36)*(\text{trucks/day})* (sL/2)^{0.65}$$

where,
VMT = vehicle mile traveled
sL = road surface silt loading (g/m^2)
trucks/day = total incoming and outgoing number of trucks per day

PM_{10} emissions for the entrance haul road segment shall be calculated each day using the following equation:

$$\text{Lbs } PM_{10}/\text{day} = (\text{Lbs/VMT})*(\text{VMT/day}) = (0.0095)*(\text{trucks/day})* (sL/2)^{0.65}$$

where,
VMT = vehicle mile traveled
sL = road surface silt loading (g/m^2)

trucks/day = total incoming and outgoing number of trucks per day

(b) Compliance with the emission limitation in Condition XIII.(J)(2)(a) shall be demonstrated by a silt loading performance test conducted in accordance with Condition XIII.(Q) at least once per quarter. (Title 129, Chapter 34)

(c) A fugitive dust control plan shall be submitted to the Department. The facility shall conduct fugitive dust control activities with the same activity type and same frequency that was tested under Condition XIII.(J)(2)(b) and specified in the fugitive dust control plan.

(d) The fugitive dust control activities identified in the fugitive dust control plan, per Condition XIII.(J)(2)(c), shall be implemented within 180 days of issuance of this permit.

(K) The following conditions apply to: COOLING TOWER

(1) The three cooling towers shall be properly designed, installed, operated and maintained. Manufacturer's specifications shall be kept on site and readily available to Department representatives. (Title 129, Chapters 4 and 19)

(2) A mist eliminator shall be properly designed, installed, operated and maintained on each cooling tower. The drift loss shall not exceed 0.005 percent. Verification of drift loss will be by manufacturer's guarantee. Manufacturer's drift loss guarantee shall be kept on site and readily available to Department representatives, upon request. (Title 129, Chapters 4 and 19)

(3) The total dissolved solids concentration (TDS) in the cooling water shall not exceed 3600 ppm for any single sampling event and shall not exceed an average of 2400 ppm for any period of twelve (12) consecutive calendar months. A TDS sample will be collected and tested at a minimum of once per calendar month. (Title 129, Chapters 4 and 19)

(4) The circulation rate for Cooling Tower #1 shall not exceed 1,020,000 gallons per hour. The circulation rate for Cooling Tower #2 shall not exceed 900,000 gallons per hour. The circulation rate for Cooling Tower #3 shall not exceed 2,400,000 gallons per hour. (Title 129, Chapter 4 and 19)

(L) The following conditions apply to: METHANATOR OPERATION

(1) Methane shall be collected by the methanator and only combusted in the flare or the DDGS dryer #2. Methane shall not be vented to the atmosphere. (Title 129, Chapters 19 and 27)

(2) The wastewater treatment tanks, methanator and the flare shall be properly designed, installed, operated and maintained. Manufacturer's specifications shall be kept on site and readily available to Department representatives.

(3) The facility must install an appropriate safety device or monitoring system to ensure that methanator off-gases are adequately controlled. The installed safety device or monitoring system must be calibrated and operated in accordance with manufacturer's instructions. The facility must maintain appropriate documentation at the site, such as flare specifications on the installed safety device or flame monitoring, to demonstrate compliance.

(M) The following conditions apply to: EMERGENCY EQUIPMENT

(1) The emergency fire water-pump engine and emergency generator shall not exceed 500 operating hours each per any period twelve (12) consecutive calendar months. (Title 129, Chapter 4 and 19)

(2) Only diesel fuel (No. 1 and No. 2) and biodiesel (diesel fuel and ethanol mixture) are permitted to be combusted in the emergency equipment. (Title 129, Chapters 4 and19)

(3) The emergency fire water-pump engine and emergency generator shall be equipped with an non-resettable hour meter to record the operating hours to determine compliance with Condition XIII.(M)(1). The hour meter shall be installed and calibrated in accordance with manufacturer's instructions.

(N) The following conditions apply to the verification of NAAQS modeling analysis: (Title 129, Chapter 4)

(1) Stack heights shall not be less than the following heights above ground level:

(a) Boiler/thermal oxidizer stack (Stack 1) shall not be less than 150 feet.

(b) Grain handling baghouse F2 shall not be less than 95 feet.

(c) Grain handling baghouse F5 shall not be less than 95 feet.

(d) Grain handling baghouse F6 shall not be less than 20 feet.

(e) Grain handling baghouse F9 shall not be less than 95 feet.

(2) A six-foot high chain-link fence or equivalent shall be installed and maintained with "No Trespassing" signs posted at a minimum interval of every 200 feet and at every opening in the fence. The signs must be visible and easily read during daylight hours from a distance of 125 feet. All gates must be monitored, e.g., equipped with cameras, have guards

that have an unobstructed view of the opening, or equivalent. The source shall submit documentation on how they will monitor gates when not in use.

(3) Re-modeling to demonstrate NAAQS compliance may be required if the results of the performance test in accordance with Condition XIII.(Q) show exceedance of the emissions limits established in this permit.

(O) The control equipment shall be installed and operational by the following dates: (Title 129, Chapter 19)

(1) June 11, 2004: Vent Scrubber F4 and CO_2 Scrubber F1 high efficiency packing;

(2) July 20, 2004: Flare and associated vapor recovery system upgrades for the storage tanks and the loading rack;

(3) August 24, 2004: NO_x burners on the DDGS Dryers #1, #2, and #3, and Boilers B1 and B2; and

(4) August 30, 2005: Thermal oxidizer #1.

(P) The production of the following products shall be limited until the specified control equipment has been installed and operational in accordance with Condition XIII.(O):

(1) Anhydrous ethanol shall be limited to 54 million gallons/year, until Vent Scrubber F4 and CO_2 Scrubber F1 has been modified.

(2) Dried distillers grain with solubles (DDGS) shall be limited to 115,000 tons/year, until Thermal oxidizer #1 controlling DDGS Dryers #1-#3 has been installed.

(Q) The performance tests required in the permit must be completed and submitted to the Department as follows: (Title 129, Chapter 34, Section 001)

(1) Testing methods shall be from 40 CFR 60 Appendix A, or other method approved by the NDEQ.

(2) An emission testing protocol shall be submitted to the Department at least 45 days prior to testing. (Title 129, Chapter 34, Section 002 & 008)

(3) The owner or operator of a source shall provide the Department 30 days notice prior to testing to afford the Department an opportunity to have an observer present. (Title 129, Chapter 34, Section 003)

(4) A written report of the performance tests shall be submitted to the Department within 60 days after reaching maximum capacity but not later than 180 days after the start-up of operations. (Title 129, Chapter 34, Section 007)

(5) The written results, including methods used, data, and results of such tests shall be forwarded to the Department within 45 days of completion of the tests. (Title 129, Chapter 34, Section 002.07)

(R) Any non-compliance with the terms and conditions of this permit shall be reported to the Department as soon as it is discovered. A written statement shall be submitted within 15 days after discovery of non-compliance, which will include information as required by Title 129, Chapter 35, Section 002.

(S) The following conditions apply to: MONITORING AND RELATED RECORDKEEPING AND REPORTING REQUIREMENTS

Records of all limits, measurements, results, inspections, and observations listed in Conditions XIII.(A) through XIII.(R), as required to ensure compliance with this permit shall be maintained. Whenever the record involves a quantity, a running total for any period of twelve (12) consecutive calendar months must be maintained. The production or consumption shall be totaled and recorded daily if it is possible to exceed the consecutive twelve-month limit during the calendar month. Monthly and 12 consecutive calendar month calculations and records shall be completed no later than the 15th day of each calendar month and shall include all information through the previous calendar month. Records shall be kept on-site for a minimum of five years. These records shall be clear and readily accessible to Department representatives and shall include the following:

(1) Inspection and maintenance records for each baghouse (F2, F5, F6, and F9) to show compliance with Condition XIII.(E)(2), shall include the following:

(a) Records documenting when routine observations were conducted with a description, including operating parameters (e.g., pressure differential readings) and any atypical observations. The records shall include the operating ranges for each operating parameter.

(b) Records documenting when routine maintenance and preventive actions were conducted with a description of the maintenance and/or preventive action conducted.

(c) Filter replacement records including filter position, type, and date of filter installation.

(d) Records documenting equipment failures, malfunctions, or other variations, including time of occurrence, remedial action taken, and when corrections were made.

(2) Inspection and maintenance records for the fermentation and distillation equipment and the scrubbers, to show compliance with Conditions XIII.(F)(5) and XIII.(F)(7), shall include the following:

(a) Records documenting when routine observations were conducted with a description, including operating parameters (e.g., aeration rate, temperature, fresh water circulation rate, pH, pressure

differential, and air flow rate) and any atypical observations. The records shall include the operating ranges for each operating parameter.

(b) Records documenting when routine maintenance and preventive actions were conducted with a description of the maintenance and/or preventive action conducted.

(c) Records documenting equipment failures, malfunctions, or other variations, including time of occurrence, remedial action taken, and when corrections were made.

(3) Inspection and maintenance records for the TO/HRSG systems, boilers and associated drying equipment, to show compliance with Condition XIII.(G)(10), (G)(12), and (G)(14), shall include the following:

(a) Records for the temperature of the thermal oxidizer shall include hourly temperature readings while the DDGS dryers are in operation compiled at least monthly by the 15th of each month for the previous month, as well as the raw data from the thermocouple recordings. These records are to demonstrate compliance with Condition XIII.(G)(10)(b).

(b) Daily records documenting actual operating parameters of the thermal oxidizers and the DDGS dryers. These records are to demonstrate compliance with Condition XIII.(G)(14).

(c) Records documenting when routine observations were conducted with a description, including operating parameters (e.g., temperature) and any atypical observations. The records shall include the operating ranges for each operating parameter.

(d) Records documenting when routine maintenance and preventive actions were conducted with a description of the maintenance and/or preventive action conducted.

(e) Records documenting equipment failures, malfunctions, or other variations, including time of occurrence, remedial action taken, and when corrections were made.

(4) As designated in Title 129, Chapter 18, Section 001.22, New Source Performance Standards (NSPS), Industrial – Commercial – Institutional Steam Generating units – Subpart Db, Reporting and Recordkeeping Requirements {40 CFR 60.49b} {Condition XIII.(G)(11)}.

(5) As designated in Title 129, Chapter 18, Section 001.62, New Source Performance Standards (NSPS), Volatile Organic Liquid Storage Vessels (including petroleum storage vessels) – Subpart Kb, Reporting and Recordkeeping Requirements. (40CFR60.115b){Condition XIII.(H)(2)}

(6) Inspection and maintenance record for the vapor recovery system and flare for the fixed roof storage tanks and liquid product loadout facility, to show compliance with Conditions XIII.(H)(4) and XIII.(I)(3), shall include the following:

(a) Records documenting when routine observations were conducted with a description, including any atypical observations.

(b) Records documenting when routine maintenance and preventive actions were conducted with a description of the maintenance and/or preventive action conducted.

(c) Records documenting equipment failures, malfunctions, or other variations, including time of occurrence, remedial action taken, and when corrections were made.

(d) Records demonstrating the installed safety device or monitoring system was calibrated and operated in accordance with manufacturer's instructions.

(7) Records documenting the amount of denatured ethanol that is shipped by non-dedicated transportation tanks. This condition demonstrates compliance with Condition XIII.(I)(2).

(8) As designated in Title 129, Chapter 18, Section 001.62, New Source Performance Standards (NSPS), Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry – Subpart VV, Recordkeeping Requirements. (40 CFR 60.486) {Condition XIII.(J)(1)}

(9) Records documenting the daily emissions from the haul roads combined and the entrance haul road. These records shall include amount of truck traffic on the haul roads on a daily basis, current silt loading test results, and vehicle miles traveled. {Condition XIII.(J)(2)(a) and (b)}

(10) Records documenting the fugitive dust control efforts for the haul roads, including the silt loading test results. {Condition XIII.(J)(2)(c)}

(11) Inspection and maintenance record for the cooling towers, to show compliance with Conditions XIII.(K)(1) and (K)(2), shall include the following:

(a) Records documenting when routine observations were conducted with a description, including any atypical observations.

(b) Records documenting when routine maintenance and preventive actions were conducted with a description of the maintenance and/or preventive action conducted.

(c) Records documenting equipment failures, malfunctions, or other variations, including time of occurrence, remedial action taken, and when corrections were made.

(12) Total dissolved solids (TDS) concentration in cooling water for each tower for each calendar month and for each period of twelve (12) consecutive calendar months. (Condition XIII.(K)(3))

(13) Records documenting the amount of cooling water circulated in each tower for each calendar month and for each period of twelve (12) consecutive calendar months. (Condition XIII.(K)(4))

(14) Inspection and maintenance record for the methanator operation, including the wastewater treatment tanks, methanator, and the flare, to show compliance with Conditions XIII.(L)(2) and XIII.(L)(3), shall include the following:

(a) Records documenting when routine observations were conducted with a description, including any atypical observations.

(b) Records documenting when routine maintenance and preventive actions were conducted with a description of the maintenance and/or preventive action conducted.

(c) Records documenting equipment failures, malfunctions, or other variations, including time of occurrence, remedial action taken, and when corrections were made.

(d) Records demonstrating the installed safety device or monitoring system was calibrated in accordance with manufacturer's instructions.

(e) Records demonstrating the installed safety device or monitoring system was operated in accordance with manufacturer's instructions, when the methane is routed to the flare.

(15) Hours of operation for the emergency fire water-pump engine for each calendar month and for each period of twelve (12) consecutive calendar months, per Condition XIII.(M)(1).

(16) Hours of operation for the emergency generator for each calendar month and for each period of twelve (12) consecutive calendar months, per Condition XIII.(M)(1).

(17) Fuel receipts for the diesel and biodiesel fuel from the supplier to show compliance with Condition XIII.(M)(2).

(18) A site survey or similar documentation demonstrating compliance with the stack height limitations per Condition XIII.(N)(1) and the fencing requirements per Condition XIII.(N)(2).

(19) Notification of start-up of operation of control equipment additions and/or upgrades to existing process equipment to demonstrate compliance with Condition XIII.(O).

(20) Production amounts of anhydrous ethanol and DDGS for each calendar month and for each period of twelve (12) consecutive calendar months, per Condition XIII.(P). The production amount for each product will be recorded until the control equipment associated with each product has demonstrated compliance with Condition XIII.(O).

(21) Copies of all notifications, reports, and test results submitted to the Department.

(22) Manufacturer's design, installation, operation, and maintenance specifications documents for all permitted equipment, if available.

Pursuant to a Delegation Memorandum dated May 3, 2000, and signed by the Director, the undersigned hereby executes this document on behalf of the Director.

01/21/2004

Date

Shelley Kaderly, Air Administrator
Air Quality Division

FACT SHEET

Abengoa Bioenergy Corporation
1414 Road O
York, York County, NE 68467

January 21, 2004

DESCRIPTION OF THE FACILITY OR ACTIVITY:

This facility is an anhydrous ethanol production plant. This Prevention of Significant Deterioration (PSD) Construction Permit (CP) supercedes the Construction Permit issued to High Plains Corporation on July 11, 2001. High Plains Corporation changed its name to Abengoa Bioenergy Corporation on April 15, 2003.

This facility was issued an initial construction permit on October 28, 1993, which relocated the facility from Louisiana. A modification to the construction permit was issued on October 10, 1997, which changed conditions to reflect "as-built" conditions at the facility and to add industrial grade ethanol production (and upgrade/additions to related equipment and activities). A second modification of the construction permit was issued July 11, 2001, to increase production of anhydrous ethanol production from 42,2800,000 gallons/year to 50,000,000 gallons/year, and to add/replace in accordance with the expansion.

This PSD construction permit addresses PSD regulations and the proposed increase in the production of anhydrous ethanol from 50 million gallons per year to 100 million gallons per year. The PSD-Best Available Control Technology (BACT) changes are due to a Notice of Violation (NOV) issued on December 4, 2002, which was issued due to stack test results from a September 2002 stack testing of the DDGS dryers (#2 & #3), CO2 scrubber and Vent Scrubber. The proposed modification also includes a small research and development (R&D) ethanol pilot plant (initially funded in part by a Department of Energy –DOE- grant), which will be used to develop techniques and procedures to increase the ethanol yield (gallons of ethanol/bushel of grain). The application for the R&D pilot plant project was received November 28, 2002, but due to the NOV issue the R&D pilot plant project application could not be processed until the existing plant came into compliance. The PSD permit incorporates the NOV compliance issues, the R&D pilot plant (about 1 million gallon increase in anhydrous ethanol) and an additional planned expansion of the plant. The PSD construction permit application was received April 1, 2003, and corrections were submitted June 2003.

This modification (application received April/June 2003) includes the following:

Increase anhydrous ethanol production from 50 million gallons/year to 100 million gallons/year;
Increase denatured ethanol production from 52.5 million gallons/year to 105 million gallons/year;
Increase grain (corn/milo) receiving from 560,000 tons/yr to 1,200,000 tons/yr;
Increase dried distillers grain with solubles (DDGS) from 115,000 tons/yr to 400,000 tons/yr;

Removed from permit:
-Throughput limitations for grain receiving, natural gas combusted in boilers and DDGS dryers, methane combusted in DDGS Dryer #2/Methanator, and storage tanks chemicals (ethanol, denaturant);
-Production limitations for anhydrous ethanol, DDGS, and WDGS (Wetcake);

-Storage tanks (previously permitted but not installed), including the following fixed-roof, vertical aboveground tanks:

Tank T-810: 200,000 gallons for storage of intermediate ethanol;
Tank T-832: 39,500 gallons capacity, for specially denatured alcohol;
Tank T-833: 39,500 gallons capacity, for specially denatured alcohol;
Tank T-834: 39,500 gallons capacity, for specially denatured alcohol;
Tank T-835: 39,500 gallons capacity, for specially denatured alcohol;
Tank T-836: 39,500 gallons capacity, for specially denatured alcohol;
Tank T-837: 39,500 gallons capacity, for specially denatured alcohol;
Tank T-840: 10,000 gallons capacity, for toluene;
Tank T-841: 10,000 gallons capacity, for methanol;
Tank T-842: 10,000 gallons capacity, for ethyl acetate; and
Tank T-1503: 200,000 gallons capacity, for beverage grade ethanol.

-Tank T-838: 4,240 gallons capacity horizontal aboveground storage tank for low proof ethanol because it was not installed;

-Tank T-1502: 200,000 gallons capacity, for beverage grade ethanol, removed from service, but will remain on site. (It was constructed, but does not have emissions controls required under NSPS, Subpart Kb.) The permit now requires that this tank is permanently disconnected from the process line.

Addition of 2 grain receiving and storage systems (1 for corn and 1 for alternative grain-milo): including 2 "choke flow" receiving systems, 3 storage bins (2 for corn & 1 for milo), elevators, 3 hammermills, and 2 baghouses;

Addition of R&D pilot plant, including: 1 grain receiving pit using a "choke flow"system, 1 storage bin, 1 baghouse, fermentation and distillation equipment;

Addition of 6 fermentation tanks and two associated scrubbers (Vent Scrubber F7 and CO_2 scrubber F8);

Addition of a new slurry tank and new liquefaction tank;

Addition of 3 distillation columns;

Addition of new distillation scrubber (F3);

Upgrade existing scrubbers by installing high efficient packing material in each scrubber (F4 & F1);

Updated emission factors for fermentation/distillation scrubbers, and DDGS dryers based on September 2002 and January 2003 stack tests;

Upgraded existing DDGS Dryer #1 from 28.2 MMBtu/hr to 45 MMBtu/hr burner design rate;

Upgraded existing DDGS Dryers #2 and 3 each from 21.3 MMBtu/hr to 45 MMBtu/hr burner design rate;

Boilers B1 & B2 and DDGS Dryers #1, #2 and 3 will each have low NO_x burners installed;

Addition of 2 new DDGS Dryers (#4 & #5);

Addition of 2 thermal oxidizers (#1 and #2) to control DDGS Dryers emissions;

Add vapor recovery system with flare to 11 fixed-roof storage tanks;

Added components (light liquid valves and pumps, and gas valves) for the new equipment;

Added 3rd cooling tower;

Decrease NO_x limitation on boilers and DDGS dryers from 0.1 lbs/MMBtu to 0.04 lbs/MMBtu;

Removal of second-stage distillation system and associated scrubber (shut down as of January 2002);

Change Tank T-801 from storing intermediate product (ethanol) to denatured ethanol storage;

Increase the TDS concentration limits of cooling tower water from 2200 ppm to 3600 ppm for any single sampling event, and from 1200 ppm to 2400 ppm average for any period of twelve consecutive calendar months;
Increased methanator flare design rate from 3.2 MMBtu/hr to 4.8 MMBtu/hr;
Increased emergency equipment hourly operating limitation from 52 hrs/yr to 500 hrs/yr per unit;
Added limitations (stack height, haul roads) to demonstrate NAAQS (Title 129, Chapter 4) compliance;
Applied NSPS (Title 129, Chapter 18) requirements to applicable equipment;
Applied PSD-BACT (Title 129, Chapter 19) requirements to the entire facility;
Applied BACT (Title 129, Chapters 27) to HAP sources.

TYPE AND QUANTITY OF AIR CONTAMINANT EMISSIONS ANTICIPATED:

Acronyms and abbreviations used in this permit and fact sheet are:

AP-42	Compilation of Air Pollutant Emission Factors, Volume I, Stationary Point and Area Sources
ASC	Arsenic Compounds
BACT	Best Available Control Technology
BEC	Beryllium Compounds
CAS #	Chemical Abstract Service Number
CDC	Cadmium Compounds
CEM	Continuous Emissions Monitor
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COC	Cobalt Compounds
CP	Construction Permit
CRC	Chromium Compounds
DDGS	Dried Distillers Grain with Solubles
DOE	Department of Energy
gal	Gallons
gr/dscf	Grains per dry standard cubic feet of air flow
HAP	Hazardous Air Pollutant
HGC	Mercury Compounds
hp	horsepower
hr	Hour
kg	Kilograms
lbs	Pounds
LDAR	Leak Detection and Repair
MACT	Maximum Achievable Control Technology
MCPU	Miscellaneous organic chemical manufacturing process units
MMscf	Million standard cubic feet
MMBtu	Million British Thermal Units
MNC	Manganese Compounds
NAAQS	National Ambient Air Quality Standards
NDEQ	Nebraska Department of Environmental Quality
NESHAP	National Emission Standards for Hazardous Air Pollutants
NIC	Nickel Compounds
NOV	Notice of Violation
NO_x	Nitrogen Oxides

NSPS	New Source Performance Standards
PM	Particulate Matter
PM_{10}	Particulate Matter less than or equal to 10 micrometers
POM	Polyorganic Matter (a HAP)
ppmv	parts per million by volume
PSD	Prevention of Significant Deterioration
PTE	Potential to emit
R&D	Research and development
SEC	Selenium Compounds
SO_2	Sulfur Dioxide
SOx	Sulfur Oxides (includes SO_2)
TDS	Total dissolved solids
TO	Thermal oxidizer
TO/HRGS	Thermal oxidizer with a heat recovery steam generator
TRS	Total Reduced Sulfur
VMT	Vehicle miles traveled
VOC	Volatile Organic Compounds
WDGS	Wet Distillers Grain with Solubles
yr	Year

GRAIN HANDLING AND MILLING {Condition XIII.(E)}

The grain receiving operations consists of unloading of grain by truck at one of five grain receiving pits (3 for corn, 1 for milo, and 1 for R&D pilot plant). Grain is initially received by truck, and loaded to one of the grain dump pits. All 5 pits can be operated at the same time. From the dump pits, grain discharges to the elevator legs, which convey the grain to a cleaner. Grain exits the cleaner and is directed to one of the eight storage bins (80,000 bushel capacity each). Cleanings are collected in a separate bin. Grain is transferred from the storage bins using a metering conveyor into an 8,000-bushels per hour elevator leg and conveyed to one of the day-bins (20,000 bushel capacity each). From the day-bin, grain is gravity-fed into one of six hammermills for crushing and further processing. Ground grain is moved from the hammermill by a drag conveyor to the wet processing area.

The main grain receiving, handling, and milling operations are controlled by 3 control systems, each consisting of a cyclone and baghouse in series (F2, F5, and F9). Baghouse F2 controls corn grain receiving pits #1 & #2, four 80,000-bushel capacity storage bins (Bins #1-#4), one 20,000-bushel capacity day bin (Day Bin #1), associated elevators, conveyors, cleaners, and hammermills. Baghouse F5 controls corn grain receiving pits #3 & #4, two 80,000-bushel capacity storage bins (Bins #5-#6), one 20,000-bushel capacity day bin (Day Bin #2), and associated elevators, conveyors, cleaners, and hammermills. Baghouse F9 controls milo/corn grain receiving pit #4, one 80,000-bushel capacity storage bin (Bin #8), and associated elevators, conveyors, cleaners, and hammermills. Receiving pits #1-4 are partially enclosed. Six hammermills will be used interchangeably for the grain handling and millings lines controlled by Baghouses F2, F5 and F9. Baghouse F6 controls the R&D pilot plant grain handling and milling equipment, consisting of one 2,000-bushel capacity storage bin- Bin #7, one hammermill and associated elevators, conveyors, and cleaners. The solids collected in the baghouses are returned to the process downstream of the hammermill. The cleanings solids are collected in a storage bin, then transported off-site.

The grain receiving area includes capture of particulates. The grain truck enters the canopy or enclosure surrounding the receiving area. The grain is dropped from the bottom of the truck into

a receiving pit to a "choke flow" system, which is attached to a conveyor system. The receiving pit has a slight negative pressure, which will pull air from around the truck into the bin area and to a baghouse.

All of the non-fugitive emissions from the grain handling and milling will be emitted from the baghouse dust collectors. The emissions are estimated based on the baghouse outlet grain loading (gr/scf – based on available facility information as provided in the application) for particulate matter (PM/ PM_{10}) and airflow (acfm – based on design information). Performance tests will be required to verify the emission rates reported on the application.

The following are the calculations for the grain handling and milling emission rates:

Baghouse F2 (existing grain area)	0.01 gr/dscf	17,000 acfm
Baghouse F5 (new corn area)	0.01 gr/dscf	17,000 acfm
Baghouse F9 (new milo area)	0.01 gr/dscf	17,000 acfm
Baghouse F6 (new pilot plant)	0.01 gr/dscf	5,000 acfm

Potential To Emit calculations for PM & PM_{10}
PTE = (gr/dscf)(lbs/7000 grains)(acfm)(60 min/hr)(8,760 hrs/yr)/(2000 lbs/ton)

Baghouse F2	= (0.01)(1/7,000)(17,000)(60)	= 1.46 lbs/hr
	= (0.01)(1/7,000)(17,000)(60)(8,760)/2000	= 6.38 tons/yr
Baghouse F5	= (0.01)(1/7,000)(17,000)(60)	= 1.46 lbs/hr
	= (0.01)(1/7,000)(17,000)(60)(8,760)/2000	= 6.38 tons/yr
Baghouse F9	= (0.01)(1/7,000)(17,000)(60)	= 1.46 lbs/hr
	= (0.01)(1/7,000)(17,000)(60)(8,760)/2000	= 6.38 tons/yr
Baghouse F6	= (0.01)(1/7,000)(5,000)(60)	= 0.43 lbs/hr
	= (0.01)(1/7,000)(5,000)(60)(8,760)/2000	= 1.88 tons/yr

Fugitive emissions from the grain receiving area are the emissions, which are not controlled by the building and the "choked flow" system. The doors for the building will generally be open during the receiving process. The emissions are estimated by using emission factors from AP-42, Chapter 9.9.1 – Grain Elevators and Processes (4/03), Table 9.9.1-1. The facility submitted a vendor (Brock Grain and Feed Systems) claim of 96% control efficiency for the "choked flow" system. The facility is claiming 95% control efficiency for the combination of partial enclosure and "choked flow" system, which is a conservative efficiency. The following are the calculations for the grain receiving fugitive emission rates:

Grain received	1,200,000 tons/yr
Emission factor	0.035 lbs PM/ton
	0.0078 lbs PM_{10}/ton
Control efficiency	95%

Potential To Emit calculations for fugitive PM & PM_{10}

PM	= (1,200,000 tons/yr grain)(0.035 lbs PM/ton)(1-0.95)/(2000 lbs/ton)
	= 1.05 tons/yr PM
PM_{10}	= (1,200,000 tons/yr grain)(0.0078 lbs PM_{10}/ton)(1-0.95)/(2000 lbs/ton)
	= 0.23 tons/yr PM_{10}

Total emissions from the grain handling/milling operations:

22.07 tons/yr PM
21.25 tons/yr PM_{10}

Grain handling/milling's maximum throughputs/capacity are calculated as follows:

Weight of corn = 56 lbs/bushel

Maximum capacity = (bushels/hr)(56 lbs/bushel)/2000 = tons/hr grain handled
Elevator legs = (5 legs)(8,000 bu/hr per leg)(56)/2000 = 1,120 tons/hr grain handled

Storage bins = (8 bins)(80,000 bu/bin) +(2 bins)(20,000 bu/bin)
= 680,000 bushels storage capacity

FERMENTATION & DISTILLATION OPERATIONS {Condition XIII.(F)}

Fermentation operations at the main plant consist of 3 yeast propagator tanks, a slurry tank, a beer well and 10 fermentation tanks. The yeast propagator tanks, the slurry tank, and the beer well are controlled by Vent Scrubber F4. Fermentation tanks #1-#4 are controlled by Vent Scrubber F4 and CO_2 Scrubber F1. Fermentation tanks #5-10 are controlled by Vent Scrubber F7 and CO_2 Scrubber F8.

Distillation operations at the main plant consist of degasser, beer column, rectifier, auxiliary column, molecular sieves, whole stillage tank, centrifuges, centrate tank, thin stillage tank, and 2 evaporative systems. The distillation operations will be controlled by a new distillation scrubber (F3).

The fermentation and distillation equipment from the pilot plant will be controlled by Vent Scrubber F4. The specific fermentation/distillation equipment in the pilot plant is confidential. The ethanol and WDGS produced in the pilot plant will be added to the main plant's process after distillation.

All of the fermentation and distillation equipment combined will produce 100,000,000 gallons of anhydrous ethanol from biomass a year.

The scrubbers (F1, F3, F4, F7, and F8) have emissions of volatile organic compounds (VOC) and hazardous air pollutants (HAP). The hazardous air pollutants reported by the facility are acetaldehyde, formaldehyde, and methanol. The controlled emission factors from the Vent scrubbers and the CO_2 scrubbers are based upon January 2003 stack testing data at this facility. The HAP emission rates are based upon September 2002 stack testing data at this facility. The emission factors were submitted by the facility. The January 2003 testing was conducted using unapproved testing methods and the testing report was not submitted to the NDEQ. The January 2003 testing is used only for uncontrolled emission estimates of VOC because the September 2002 testing did not test for uncontrolled emission rates. The September 2002 testing demonstrated controlled emission rates, based on existing efficiencies of the scrubbers. The September 2002 testing results will be used to estimate proportion of hazardous air pollutant emissions in the VOC emissions. Performance tests will be performed to verify the emission rates reported on the application, as well as the speciation of all of the individual HAPs.

The emissions are based on combined emission rates of the Vent scrubber(s) and the CO_2 scrubber(s), because the fermentation/distillation emissions were controlled together in scrubbers

F1 & F4, but the new modification will have the distillation emissions routed to a separate scrubber (F3). The potential emissions are calculated as follows:

January 2003 scrubber test results on inlet to scrubbers F1 and F4.
Inlet = Uncontrolled Emissions

Table F-1: January 2003 scrubber test results			
	Test 1	Test 2	Test 3
CO_2 scrubber (F1)	224.57 lbs/hr	169.66 lbs/hr	219.68 lbs/hr
Vent scrubber (F4)	110.18 lbs/hr	105.79 lbs/hr	133.52 lbs/hr
Total scrubber emissions	334.75 lbs/hr	275.45 lbs/hr	353.20 lbs/hr

Maximum uncontrolled VOC emissions 353.20 lbs/hr (from January 2003 test)
Molecular weight adjustment factor 1.9
(This adjustment factor is to adjust the results from a carbon basis to a VOC mass basis.)

Adjusted uncontrolled VOC emissions = (353.20 lbs/hr)(1.9) = 671.08 lbs/hr

The January 2003 testing had a raw materials (grain) usage of 45,700 bushels per day from a 3-days prior grind. The facility currently produces 2.7 gallons of anhydrous ethanol per bushel of grain.

(45,700 bushels)/(24 hours) = 1,904.17 bu/hr
(1,904.17 bu/hr)(2.7 gal/bu) = 5,141.26 gal/hr

The VOC uncontrolled emission factors (based on January 2003 testing) are summarized in Table H-2 and calculated below:

Lbs VOC/bu grain = (uncontrolled emissions lbs/hr VOC)/(1,904.17 bu/hr)
Lbs VOC/gal ethanol = (uncontrolled emissions lbs/hr VOC)/(5,141.26 gal/hr)

Table F-2: VOC Uncontrolled Emission Factors based on January 2003 testing		
	Lbs VOC/bu grain	Lbs VOC/gal ethanol produced
Fermentation/Distillation	0.35	0.13

The VOC and HAP emission factors will change when future stack tests are performed on the scrubbers. The most recent stack tests will be used for future emission calculations, including separate emission factors for fermentation and distillation operations. The emission factors for the fermentation operations will be a combination of emissions from scrubbers F1, F4, F7, and F8 since the production flow can vary over time between the fermentation tanks (1-10) and air flows can be routed between the Vent and CO_2 scrubbers for each grouping of fermentation tanks.

The HAPs emission factors are calculated based on the September 2002 stack test and are shown in Table F-3. The most recent stack test(s) will be used for future emission calculations.

Table F-3: September 2002 Stack Test Results				
Pollutant	CO_2 Scrubber F1 outlet (lbs/hr)	Vent Scrubber F4 outlet (lbs/hr)	Total (lbs/hr)	Fraction (HAP/VOC)
VOC	57.5	44.8	102.3	
Acetaldehyde	0.55	0.50	1.05	0.0103
Acrolein	0.08	0.06	0.14	0.0014
Formaldehyde	0.02	0.02	0.04	0.00039
Methanol	0.08	0.06	0.14	0.0014

The emission calculation results are in Table F-4 and the formulas are as follows:

Scrubber control efficiency: 98%
(per PSD-BACT requirement for VOC and per Title 129, Chapter 27 BACT requirement for HAPs)

Annual throughput: 100,000,000 gal/yr

HAP Uncontrolled Emission Factor
= (Uncontrolled VOC emission factor lbs/gal)(HAP fraction) = lbs/gal

Controlled Emission Factor
= (Uncontrolled emission factor lbs/gal)(1-0.98) = lbs/gal

Controlled Hourly Emissions
= (Annual throughput gal/yr)(Controlled emission factor lbs/gal)/(8,760 hrs/yr) = lbs/hr

Controlled Annual Emissions
= (Annual throughput gal/yr)(Controlled emission factor lbs/gal)/(2,000 lbs/ton) = tons/yr

TABLE F-4: Fermentation/Distillation Emission Summary					
	HAP Fraction (HAP/VOC)	Uncontrolled Emission Factor (lbs/gal)	Controlled Emission Factor (lbs/gal)	Potential Controlled Hourly Emissions (lbs/hour)	Potential Controlled Annual Emissions (tons/yr)
VOC		0.13	2.60E-03	29.68	130.00
Acetaldehyde	0.0103	1.34E-03	2.68E-05	0.31	1.34
Acrolein	0.0014	1.82E-04	3.64E-06	0.04	0.18
Formaldehyde	0.00039	5.07E-05	1.01E-06	0.01	0.05
Methanol	0.0014	1.82E-04	3.64E-06	0.04	0.18
Total HAP				0.40	1.75

DDGS DRYING OPERATIONS/THERMAL OXIDIZERS/BOILERS {Condition XIII.(G)}

The dried distillers grain with solubles (DDGS) drying operations with thermal oxidizers and the boilers are grouped together as a single point source because they are vented through a single common stack (Stack 1). The equipment for this point source consist of five 45 MMBtu/hr DDGS dryers which are controlled by two 200 MMBtu/hr thermal oxidizers with heat recovery steam generator systems (TO/HRSG system), two DDGS cooling cyclone which are each controlled by a baghouse, and two boilers (B1 & B2). Each DDGS dryer grouping (#1/2/3 and #4/5) has one DDGS cooling cyclone and one thermal oxidizer. Each DDGS cooling cyclone is controlled by a baghouse, with the exhaust from the baghouse routed back to the associated DDGS dryer grouping. The solids collected in the cyclones and baghouse are sold as DDGS. Boiler B1consists of one boiler design-rated at 160 MMBTU/hr, manufactured by Combustion Engineering in 1986, then relocated and constructed at York in 1994. Boiler B2 consists of one boiler design-rated at 150 MMBTU/hr, manufactured by National Dynamics and constructed in 1995. The heat recovery steam generators and the boilers will provide steam for use in the fermentation/distillation operations.

The dryers have process emissions, which include particulate matter (PM & PM_{10}), carbon monoxide (CO), volatile organic compounds (VOC), and hazardous air pollutant (HAP) emissions. The uncontrolled emission factors for PM, PM_{10}, CO, VOC, and HAPs are based on a September 2002 stack tests on Dryers #1 -#3. The controlled emission factors for PM, PM_{10}, CO and VOC include emissions from natural gas/methane combustion in the dryers and thermal oxidizers, and emissions emitted from the DDGS cooling cyclones/baghouses. The process emission factors are the estimated emissions from the dryers, which are emitted from the TO/HRSG system stack (1). The potential emissions are calculated as follows:

September 2002 (highest test result for each pollutant for the combination of Dryers #1-#3) (These emission rates are uncontrolled – no thermal oxidizer was installed at time of testing.)

Maximum CO emission rate = 31.4 lbs/hr for 10.946 tons/hr DDGS produced
= 2.87 lbs CO/ton DDGS produced
Maximum PM/PM_{10} emission rate = 61.36 lbs/hr for 10.946 tons/hr DDGS produced
= 5.61 lbs PM/ton DDGS produced
= 5.61 lbs PM_{10}/ton DDGS produced
Maximum VOC emission rate = 204.5 lbs/hr for 10.657 tons/hr DDGS produced
= 19.19 lbs VOC/ton DDGS produced

Emission rate of acetaldehyde = 0.75 lbs/ton (0.0389 fraction of VOC)
Emission rate of acrolein = 0.0098 lbs/ton (0.00051 fraction of VOC)
Emission rate of formaldehyde = 0.34 lbs/ton (0.0178 fraction of VOC)
Emission rate of methanol = 0.18 lbs/ton (0.0096 fraction of VOC)

DDGS annual production 400,000 tons

Thermal oxidizers' control efficiency per PSD-BACT requirements and per Title 129, Chapter 27 BACT requirement for HAPs:

CO = 90 % or a maximum of 100 ppmv CO emission rate
PM = 98%
PM_{10} = 98%

VOC = 98%
HAPs = 98% (most HAPs are VOCs also)

CO Controlled Emission Calculations

Hourly limit based on 90% control

(2.87 lbs/ton)(90% control efficiency)(400,000 tons DDGS/yr)/(8760 hrs/yr)
= 13.24 lbs/hr CO

Hourly limit based on 100 ppmv

Assumes flow rate of dryers #4 & 5 will equal the flow rate of dryers #2 &3
Flow rate = 2*(6571 dscfm + 10791 dscfm) = 34724 dscfm
Molecular weight of CO = 28 lb/lb-mole
Conversion factor from AP-42: ppmv * (molecular weight/(385.1 x 10^6)) = lbs/cf

$$(100\,ppmv)\left(\frac{28}{385.1x10^6}\right)\left(\frac{34724 dscf}{\min}\right)\left(\frac{60\min}{hr}\right)=\left(\frac{15.15 lbs}{hr}\right)$$

Annual emission rate based on 100 ppmv (worst case of hourly limit)

(15.15 lbs/hr)(8760 hrs/yr)/(2000 lbs/ton) = 66.36 tons/yr CO

Emission rate per ton of DDGS produced based on 100 ppmv

(66.36 tons/yr CO)(2000 lbs/ton)/(400,000 tons/yr DDGS)
= 0.33 lbs CO/ton DDGS

Controlled Emission Factor

Emission Factor = (uncontrolled emission factors lbs/ton)(1-(control efficiency/100)

Controlled Hourly Potential to Emit

PTE = (annual production rate)(emission factor)/(8760 hrs/year)

Controlled Annual Potential to Emit

PTE = (annual production rate)(emission factor)/(2,000 lbs/ton)

TABLE G-1: DDGS Dryers - Process Emissions

	Uncontrolled Emission Factor (lbs/ton)	Control Efficiency of TO (%)	Controlled Emission Factor (lbs/ton)	Potential Controlled Hourly Emissions (lbs/hour)	Potential Controlled Annual Emissions (tons/yr)
CO	2.87	100 ppmv	0.33	15.15	66.36
PM_{10}	5.61	98	0.11	5.02	22
PM	5.61	98	0.11	5.02	22
VOC	19.19	98	0.38	17.35	76
Acetaldehyde	0.75	98	0.015	0.68	3
Acrolein	0.0098	98	0.0002	0.009	0.04
Formaldehyde	0.34	98	0.007	0.32	1.4
Methanol	0.18	98	0.0036	0.16	0.72
Total HAP				1.17	5.16

Performance tests will be performed to verify the emission rates (for PM, PM_{10}, CO, VOC, and HAPs) and the required control efficiencies.

The DDGS dryers/thermal oxidizers/boilers also have emissions from the combustion of natural gas and methane from the methanator. The methane combustion emissions are calculated under the flare for the methanator. The methane can be burned in DDGS dryer #2 to offset natural gas combustion. The maximum potential emissions are calculated assuming the dryers/thermal oxidizers/boilers burn natural gas 100% of the time, and the flare burns all of the methane produced. The potential emissions from the natural gas combustion are calculated as follows:

Heat content of natural gas 1,011 MMBtu/MMscf

Design rate of each dryer 45 MMBtu/hr
Total design rate of 5 dryers 225 MMBtu/hr

Design rate of each thermal oxidizer 200 MMBtu/hr
Total design rate of 2 thermal oxidizers 400 MMBtu/hr

Boiler #1: Maximum design rate: 160 MMBtu/hr
Boiler #2: Maximum design rate: 150 MMBtu/hr
Total boiler maximum design rate: 310 MMBtu/hr

Total Maximum design rate: 225 + 400 + 310 = 935 MMBtu/hr

Operating hours: 8,760 hours/yr

Emission factors are from AP-42, Tables 1.4-1, 1.4-2,and 1.4-3, (7/1998), except NOx, which is based on PSD-BACT limit of 0.04 lbs/MMBtu. PM, PM_{10}, CO, and VOC emissions from the dryers and thermal oxidizers are included in the DDGS dryer's process emissions calculations.

Natural gas throughput = (design rate)(operating hours)/(heat content)
= (935 MMBtu/hr)(8760 hrs/yr)/(1011 MMBtu/MMscf)
= 8101.48 MMscf/yr

= (935 MMBtu/hr)/(1011 MMBtu/MMscf)
= 0.92 MMscf/hr

Emission calculations for the fuel combustion in the dryers, thermal oxidizers and boilers are as follows:

NO_x emissions = (935 MMBtu/hr)(0.04 lbs/MMBtu) = 37.40 lbs/hr
= (935 MMBtu/hr)(0.04 lbs/MMBtu)(8,760 hrs/yr)/(2,000 lbs/ton)
= 163.81 tons/yr

Calculated emissions = (natural gas throughput)(emission factor)/(2,000 lbs/ton)
= (8,101.48 MMscf/yr)(lbs pollutant/MMscf)/(2,000 lbs/ton)
= tons pollutant/yr

TABLE G-2: Stack 1 Natural Gas Combustion Emissions			
Pollutant	Emission Factor (lbs/MMscf)	Potential Hourly Emissions (lbs/hour)	Potential Annual Emissions (tons/yr)
Sulfur Dioxide (SO_2)	0.6	0.55	2.43
Formaldehyde (50000)	0.075	6.94E-02	0.30
Hexane (110543)	1.8	1.66	7.29
Lead	0.0005	4.62E-04	2.03E-03
Benzene (71432)	0.0021	1.94E-03	8.51E-03
Dichlorobenzene (106467)	0.0012	1.11E-03	4.86E-03
Napthalene (91203)	0.00061	5.64E-04	2.47E-03
Toluene (108883)	0.0034	3.14E-03	1.38E-02
Polyorganic matter (POM)	0.0000882	8.16E-05	3.57E-04
Arsenic Compounds (ASC)	0.0002	1.85E-04	8.10E-04
Beryllium Compounds (BEC)	0.000012	1.11E-05	4.86E-05
Cadmium Compounds (CDC)	0.0011	1.02E-03	4.46E-03
Chromium Compounds (CRC)	0.0014	1.29E-03	5.67E-03
Cobalt Compounds (COC)	0.000084	7.77E-05	3.40E-04
Manganese Compounds (MNC)	0.00038	3.51E-04	1.54E-03
Mercury Compounds (HGC)	0.00026	2.40E-04	1.05E-03
Nickel Compounds (NIC)	0.0021	1.94E-03	8.51E-03
Selenium Compounds (SEC)	0.000024	2.22E-05	9.72E-05
Total HAPs		1.75	7.65

The emissions of CO, PM, PM_{10}, and VOC emissions from the boilers are not included in the DDGS dryer's process emissions calculations, therefore these pollutants are calculated below for the boilers. Emission factors are from AP-42, Tables 1.4-1 and 1.4-2, (7/1998),

Heat content of natural gas: 1,011 MMBtu/MMscf
Design rate of boilers: 310 MMBtu/hr
Operating hours: 8,760 hrs/yr

Natural gas throughput = (design rate)(operating hours)/(heat content)
= (310 MMBtu/hr)(8,760 hrs/yr)/(1,011 MMBtu/MMscf)
= 2,686.05 MMscf/yr

= (310 MMBtu/hr)/(1,011 MMBtu/MMscf)
= 0.31 MMscf/hr

The boilers' other pollutants potential emissions are calculated in Table G-3:

TABLE G-3: Boilers - Natural Gas Combustion Emissions (pollutants not included in DDGS dryers' process emissions)			
	Emission Factor (lbs/MMscf)	Potential Hourly Emissions (lbs/hour)	Potential Annual Emissions (tons/yr)
Carbon Monoxide (CO)	84	25.76	112.81
Particulate Matter (PM)	7.6	2.33	10.21
Particulate Matter less than 10 microns (PM_{10})	7.6	2.33	10.21
Volatile Organic Compounds (VOC)	5.5	1.69	7.39

Table G-4 presents the total emissions from the TO/HRSG systems' stack, including process emissions from the DDGS dryers, and the combustion emissions from the DDGS dryers, thermal oxidizers, and boilers.

TABLE G-4: Total Emissions from TO/HRSG Stack		
Pollutant	Potential Hourly Emissions (lbs/hour)	Potential Annual Emissions (tons/yr)
Carbon Monoxide (CO)	40.91	179.17
Particulate Matter (PM)	7.35	32.21
Particulate Matter less than 10 microns (PM_{10})	7.35	32.21
Oxides of Nitrogen (NO_x)	37.40	163.81
Sulfur Dioxide (SO_2)	0.55	2.42
Volatile Organic Compounds (VOC)	19.04	83.39
Acetaldehyde (75070)	0.68	3.00
Acrolein (107058)	0.01	4.00E-02
Benzene (71432)	1.93E-03	8.46E-03
Dichlorobenzene (106467)	1.10E-03	4.84E-03
Formaldehyde (50000)	0.39	1.70
Hexane (110543)	1.66	7.25
Methanol (67561)	0.16	0.72
Napthalene (91203)	5.61E-04	2.46E-03
Toluene (108883)	3.13E-03	1.37E-02
Polyorganic matter (POM)	8.11E-05	3.55E-04
Metal HAP (includes ASC, BEC, CDC, CRC, COC, Lead, MNC, HGC, NIC, SEC)	5.58E-03	2.44E-02
Total HAPs	2.91	12.77

STORAGE TANKS {Condition XIII.(H)}

This facility has 14 production storage tanks. The facility has two additional small storage tanks containing the diesel fuel for the emergency equipment. The production tanks will hold raw material (denaturants) and final products (various grades of ethanol, denatured alcohol). The exact capacity, chemical content, company's identification, and type of each tank are listed below.

Internal floating-roof vertical aboveground tanks:

Tank T-800: 1,000,000 gallons capacity, for fuel grade ethanol;
Tank T-801: 526,000 gallons capacity, for intermediate product (ethanol);
Tank T-802: 526,000 gallons capacity, for fuel grade ethanol;
Tank T-807: 39,500 gallons capacity, for denaturant (natural gasoline); and
Fixed-roof, vertical aboveground tanks controlled by a vapor recovery system with flare :

Tank T-803: 39,500 gallons capacity, for 200 proof ethanol;
Tank T-804: 39,500 gallons capacity, for 200 proof ethanol;
Tank T-805: 39,500 gallons capacity, for 190 proof ethanol;
Tank T-806: 39,500 gallons capacity, for 190 proof ethanol;
Tank T-808: 9,950 gallons capacity, for low proof ethanol;
Tank T-1501A: 23,000 gallons capacity, for 194 proof ethanol;
Tank T-1501B: 23,000 gallons capacity, for 194 proof ethanol;
Tank T-1501C: 23,000 gallons capacity, for 194 proof ethanol;
Tank T-1501D: 4,600 gallons capacity, for intermediate ethanol; and

A 4,240 gallons capacity, horizontal aboveground storage tank (Tank T-830), for corrosion inhibitor (was special denaturant/product), controlled by a vapor recovery system with flare; and

A 550 gallons capacity, aboveground storage tank (fire pump tank) for diesel fuel; and

A 110 gallons capacity, aboveground storage tank (generator tank) for diesel fuel.

The facility had an additional 14 storage tanks listed on their 2001 permit. These tanks have not been installed and will not be installed in the future. The facility has requested that these tanks are removed from the permit. The tanks in question are Tank T-838: 4,240 gallons capacity horizontal aboveground storage tank for low proof ethanol; and the following fixed-roof, vertical aboveground tanks:

Tank T-810: 200,000 gallons capacity, for intermediate ethanol;
Tank T-831: 2670 gallons capacity, for specially denatured alcohol (scale tank);
Tank T-832: 39,500 gallons capacity, for specially denatured alcohol;
Tank T-833: 39,500 gallons capacity, for specially denatured alcohol;
Tank T-834: 39,500 gallons capacity, for specially denatured alcohol;
Tank T-835: 39,500 gallons capacity, for specially denatured alcohol;
Tank T-836: 39,500 gallons capacity, for specially denatured alcohol;
Tank T-837: 39,500 gallons capacity, for specially denatured alcohol;
Tank T-840: 10,000 gallons capacity, for toluene;
Tank T-841: 10,000 gallons capacity, for methanol;
Tank T-842: 10,000 gallons capacity, for ethyl acetate;
Tank T-1502: 200,000 gallons capacity, for beverage grade ethanol; and
Tank T-1503: 200,000 gallons capacity, for beverage grade ethanol.

Tanks T-1502 (200,000 gallons capacity, for beverage grade ethanol, fixed-roof tank) and T-831 (2670 gallons capacity, for specially denatured alcohol (scale tank), fixed-roof tank) shall be permanently disconnected from the production lines. These tanks were taken out of service after they were constructed and in operation. If the facility wants to use these tanks in the future, the facility will have to install control equipment (floating-roof or vapor recovery system) that will comply with NSPS, Subpart Kb and PSD-BACT and will need to apply for a permit modification.

Tanks T-800, T-801, T-802, and T-807 are subject to NSPS, Subpart Kb, due to size and product. They are required to install control equipment, because Tanks T-800, T-801, and T-802 have a capacity greater than 151 m^3 (40,000 gallons) and a maximum true vapor pressure greater than 5.2 kPa (0.75 psia) but less than 76.6 kPa (11.1 psia); and Tank T-807 has a capacity greater than 75 m^3 (20,000 gallons) but less than 151 m^3 (40,000 gallons) and a maximum true vapor pressure greater than 27.6 kPa (4.0 psia) but less than 76.6 kPa (11.1 psia) {40 CFR 60.112b(a)}. The control equipment that was installed in the tanks is an internal floating roof. This NSPS subpart addresses the specific control equipment required for each type of tank and the reporting & recordkeeping requirements.

The emissions for each of the storage tanks were calculated using TANKS 4.0, using the maximum throughput for each tank. The denaturant used at this facility is gasoline. The estimated VOC emissions are shown in Table H-1 and the estimated HAP emissions are in Table H-2.

Table H-1: Storage Tanks VOC Emission Summary

Tank	Throughput (Mmgal/yr)	VOC (lbs/yr)	Add-On Control Efficiency (%)	Controlled VOC (lbs/yr)
T-800 (denatured ethanol)	100	743.41		743.41
T-801 (denatured ethanol)	60	674.55		674.55
T-802 (denatured ethanol)	60	674.55		674.55
T-803 (ethanol)	70	7,308.79	95	365.44
T-804 (ethanol)	70	7,308.79	95	365.44
T-805 (ethanol)	70	7,308.79	95	365.44
T-806 (ethanol)	70	7,308.79	95	365.44
T-807 (denaturant)	7.5	2,257.62		2257.62
T-808 (ethanol)	10	1,109.14	95	55.46
T-830 (special product/ethanol)	10	1,154.49	95	57.72
T-1501A (ethanol)	35	4,190.14	95	209.51
T-1501B (ethanol)	35	4,190.14	95	209.51
T-1501C (ethanol)	35	4,190.14	95	209.51
T-1501D (ethanol)	10	1,122.39	95	56.12
Fire pump tank (diesel)	2,400 gal/yr	0.13		0.13
Generator tank (diesel)	2,400 gal/yr	0.08		0.08

In the ethanol, acetyldehyde and methanol are present at 200 ppm. Additionally, the denaturant HAP emissions include hexane, toluene, benzene, xylenes, cumene, ethylbenzene, and carbon disulfide. The HAP emissions are calculated as follows:

HAP emissions = (VOC emissions)(Percent of VOC emissions)
= (1750.76 lbs/yr VOC)(0.0002 of acetaldehyde in denatured ethanol)
= 0.35 lbs/yr acetaldehyde from denatured ethanol tanks

TABLE H-2: Storage Tanks HAP Emission Summary

Tank	VOC Emissions (lbs/yr)	Hazardous Air Pollutant	HAP Percent of VOC	HAP Emissions (lbs/yr)
Denatured ethanol tanks *	2092.51 (1750.76 from ethanol, 341.72 from denaturant)	Acetaldehyde	0.0002	0.35
		Benzene	0.0025	0.85
		Carbon disulfide	0.00002	0.0068
		Cumene	0.0001	0.034
		Ethyl Benzene	0.00005	0.017
		n-Hexane	0.05	17.09
		Methanol	0.0002	0.35
		Toluene	0.005	1.71
		Xylenes	0.0005	0.17
Ethanol tanks	2,259.59	Acetaldehyde	0.0002	0.45
		Methanol	0.0002	0.45
Denaturant tank	2,257.62	Benzene	0.0025	5.64
		Carbon disulfide	0.00002	0.045
		Cumene	0.0001	0.23
		Ethyl Benzene	0.00005	0.11
		n-Hexane	0.05	112.88
		Toluene	0.005	11.29
		Xylenes	0.0005	1.13
Diesel tanks	0.21	Insignificant HAP emissions		

* The HAP fractions for the denatured ethanol tanks are based on each chemical in the mixture. Acetaldehyde and methanol are based on the ethanol component, and all other HAPs are based on the gasoline component. The VOC breakdown (between ethanol and denaturant) is from the TANKS reports.

TABLE H-3: Storage Tanks Emission Summary		
Pollutant (CAS #)	Controlled Emissions (lbs/yr)	Controlled Emissions (tons/yr)
VOC	6,609.93	3.3
Acetaldehyde (75070)	0.80	4.00E-04
Benzene (71432)	6.49	3.20E-03
Carbon disulfide (75150)	0.0518	2.60E-05
Cumene (98828)	0.264	1.30E-04
Ethyl Benzene (100414)	0.127	6.40E-05
n-Hexane (110543)	129.97	6.50E-02
Methanol (67561)	0.80	4.00E-04
Toluene (108883)	13.00	6.50E-03
Xylenes (1330207)	1.30	6.50E-04
Total HAPs	152.81	7.64E-02

LIQUID PRODUCT LOADOUT {Condition XIII.(I}

Liquid product loading consists of submerged loading of various grades of denatured ethanol into tanker trucks and tanker rail cars, and denaturant into tanker trucks for resale. The facility is required to install a vapor recovery system with a flare on both the truck and railcar loadouts. The vapor recovery system is being installed because the VOCs are subject to PSD-BACT and the HAP emissions are subject to the BACT requirements of Title 129, Chapter 17 for HAPs.

Truck Emissions – Non-Dedicated Tank
Assumes previous load in tanker truck was unleaded gasoline. The emission calculations would be the same for non-dedicated tanks for railcars, but the majority of non-dedicated transportation tanks will be tanker trucks.

The gasoline vapors are assumed to be displaced by the ethanol, for worst-case assumption. Vapor pressure and molar mass based on T807, TANKs output data for RVP10 gasoline. The VOC emission factor equation is from AP-42, Section 5.2.2 (January 1995) - Loading Losses.

HAP emission factors are a percentage of the VOC emission factor, based on the composition of the RVP10 gasoline. The HAP composition and emission factors are shown in Table I-1. Methyl tert-butyl ether (MTBE) in the gasoline emissions are to decreased in the future, due to MBTE being phased out as an oxygenate in the gasoline. The MTBE will eventually be replaced by ethanol in gasoline. The emissions calculated assume worst-case HAP emissions from gasoline displacement.

The estimated emissions from the truck loadout for 12,500,000 gal/yr (10,000,000 gal/yr of denatured ethanol and 2,500,000 gal/yr of denaturant in direct resales) are shown in Table I-2.

VOC Emission Factor Equation: 12.46*S*P*M/T

where: S = 1.0 Saturation factor (submerge loading; vapor balance service)
P = 4.4758 Vapor pressure (psia)
M = 66 Molar mass (lb/lb-mole)
T = 530 Product temperature (deg R)
95% Capture/control efficiency of vapor recovery system with flare

VOC Emission factor = (12.46)(1.0)(4.4758)(66)/(530) = 6.94 lbs/1,000 gal loaded uncontrolled
VOC Emission factor = (6.94 lbs/1,000 gal)(1-0.95) = 0.35 lbs/1,000 gal loaded controlled

VOC Uncontrolled Emissions = (6.94 lbs/1000 gal)(12,500,000 gal/yr)
= 86,750 lbs/yr VOC uncontrolled
= 43.38 tons/yr VOC uncontrolled

VOC Controlled Emissions = (0.35 lbs/1000 gal)(12,500,000 gal/yr)
= 4,375 lbs/yr VOC controlled
= 2.19 tons/yr VOC controlled

HAP Controlled Emission factors = (VOC lbs/gal controlled)(HAP content%)
HAP Controlled Emissions = (VOC lbs/yr controlled)(HAP content%)

TABLE I-1: HAP Emission Factors for Truck Loadout

Pollutant	HAP Content	HAP Controlled Emission Factor
Benzene	2.45 %	0.0086 lbs/1000 gal
Cumene	1.00 %	0.0035 lbs/1000 gal
Ethyl benzene	2.00 %	0.0070 lbs/1000 gal
Methyl tert-butyl ether	7.50 %	0.0263 lbs/1000 gal
Toluene	15.00 %	0.0525 lbs/1000 gal
Xylenes	12.00 %	0.0420 lbs/1000 gal

TABLE I-2: Controlled Emissions from Truck Loading

Pollutant	Emissions (lbs/yr)	Emissions (tons/yr)
VOC	4,375.00 lbs/yr	2.19 tons/yr
Benzene	107.5 lbs/yr	0.054 tons/yr
Cumene	43.75 lbs/yr	0.022 tons/yr
Ethyl benzene	87.50 lbs/yr	0.044 tons/yr
Methyl tert-butyl ether	328.75 lbs/yr	0.16 tons/yr
Toluene	656.25 lbs/yr	0.33 tons/yr
Xylenes	525.00 lbs/yr	0.26 tons/yr
Total HAPs	1748.75 lbs/yr	0.87 tons/yr

Railcar Emissions – Dedicated Tank

Assumes previous load in the railcar tank was denatured ethanol.
Denaturant is gasoline.
The displaced vapors are assumed to be in the same proportion as the composition of the denatured ethanol, for worst-case assumption: 95% anhydrous ethanol and 5% denaturant.
Vapor pressure and molar mass based on TANKs output data for denatured ethanol.

VOC emission factor equation is from AP-42, Section 5.2.2 (January 1995)- Loading Losses.
HAP emission factors are a percentage of the VOC emission factor, based on the composition of the denatured ethanol storage tanks. The HAP composition and emission factors are shown in Table I-3.
The estimated emissions from the railcar loadout for 95,000,000 gallons/year of denatured ethanol are shown in Table I-4.

VOC Emission factor Equation: 12.46*S*P*M/T

where:	S = 0.6	Saturation factor (submerge loading; dedicated normal service)
	P = 0.6086	Vapor pressure (psia)
	M = 49.83	Molar mass (lb/lb-mole)
	T = 530	Product temperature (deg R)
	95%	Capture/control efficiency of vapor recovery system with flare

VOC Emission factor = (12.46)(0.6)(0.6086)(49.83)/(530) = 0.43 lbs/1,000 gal loaded uncontrolled
VOC Emission factor = (0.4278 lbs/1000 gal)(1-0.95) = 0.022 lbs/1,000 gal loaded controlled

VOC Uncontrolled Emissions = (0.43 lbs/1000 gal)(95,000,000 gal/yr)
= 40,850.00 lbs/yr VOC uncontrolled
= 20.43 tons/yr VOC uncontrolled

VOC Controlled Emissions = (0.0214 lbs/1000 gal)(95,000,000 gal/yr)
= 2,090.00 lbs/yr VOC controlled
= 1.05 tons/yr VOC controlled

HAP emissions are a percentage of the VOC emissions based on the proportion of anhydrous ethanol (95%) and denaturant (5%) in the denatured ethanol.

HAP emissions = (VOC lbs/yr)(proportion %)(HAP content %)

TABLE I-3: HAP Emission Factors for Rail Loadout				
Pollutant	Proportion	HAP Content	HAP Emission Factor	
Acetaldehyde	95 %	0.02 %	4.18E-06	lbs/1000 gal
Benzene	5 %	0.25 %	2.75E-06	lbs/1000 gal
Carbon disulfide	5 %	0.002 %	2.00E-08	lbs/1000 gal
Cumene	5 %	0.01 %	1.10E-07	lbs/1000 gal
Ethyl benzene	5 %	0.005 %	6.00E-08	lbs/1000 gal
n-Hexane	5 %	5 %	5.50E-05	lbs/1000 gal
Methanol	95 %	0.02 %	4.18E-06	lbs/1000 gal
Toluene	5 %	0.5 %	5.50E-06	lbs/1000 gal
Xylenes	5 %	0.05 %	5.50E-07	lbs/1000 gal

TABLE I-4: Emissions from Railcar Loading		
Pollutant	Emissions (lbs/yr)	Emissions (tons/yr)
VOC	2,090.00 lbs/yr	1.05 tons/yr
Acetaldehyde	0.40 lbs/yr	1.99E-04 tons/yr
Benzene	0.26 lbs/yr	1.31E-04 tons/yr
Carbon disulfide	0.00 lbs/yr	1.00E-06 tons/yr
Cumene	0.01 lbs/yr	5.00E-06 tons/yr
Ethyl benzene	0.01 lbs/yr	3.00E-06 tons/yr
n-Hexane	5.23 lbs/yr	2.61E-03 tons/yr
Methanol	0.40 lbs/yr	1.99E-04 tons/yr
Toluene	0.52 lbs/yr	2.61E-04 tons/yr
Xylenes	0.05 lbs/yr	2.60E-05 tons/yr
Total HAPs	6.87 lbs/yr	3.44E-03 tons/yr

The loadout flare has additional pollutants associated with the combustion of the VOC. The VOC emissions are included in the loadout emissions (Table I-5).

Design rate of flare 1.0 MMBtu/hr
Methane AP-42 emission factors came from AP-42, Section 13.5 (9/1991), Table 13.5-1.
PTE operating hours 8760 hrs/yr

Hourly Emissions = (Emission factor lbs/MMBtu)(1.0 MMBtu/hr)
Annual Emissions = (Emission factor lbs/MMBtu)(1.0 MMBtu/hr)(8760 hrs/yr)/(2000 lbs/ton)

TABLE I-5: Truck Loadout Flare Emission Summary			
Pollutant	Emission Factor (lbs/MMBtu)	Hourly Emissions (lbs/hr)	Annual Emissions (tons/yr)
CO	0.37	0.37	1.62
NO_x	0.068	0.068	0.30

The summary of emissions from the liquid product loadout is shown in Table I-6.

TABLE I-6: Liquid Product Loadout Emissions				
Pollutant	Truck Controlled Emissions (tons/yr)	Railcar Controlled Emissions (tons/yr)	Loadout Flare Emissions (tons/yr)	Total Loadout Emissions (tons/yr)
VOC	2.19	1.05		3.24
CO			1.62	1.62
NO_x			0.30	0.3
Acetaldehyde		1.99E-04		1.99E-04
Benzene	0.054	1.31E-04		5.41E-02
Carbon disulfide		1.00E-06		1.00E-06
Cumene	0.022	5.00E-06		2.20E-02
Ethyl benzene	0.044	3.00E-06		4.40E-02
n-Hexane		2.61E-03		2.61E-03
Methanol		1.99E-04		1.99E-04
Methyl tert-butyl ether	0.16	2.61E-04		0.16
Toluene	0.33	2.60E-05		0.33
Xylenes	0.26	3.44E-03		0.26
Total HAPs	0.87	6.88E-03		0.88

FUGITIVE EMISSIONS {Condition XIII.(J)}

The fugitive emissions consist of fugitive VOC emissions from equipment leaks and fugitive dust (PM/ PM_{10}) emissions from the haul roads.

(1) Equipment leaks are leaks from valves and pumps in light service, gas valves, control valves, flanges, transmitters, and manholes. The company will perform Leak Detection and Repair (LDAR) Program in accordance with NSPS, Subpart VV. {40 CFR 60.480 through 60.489}. Emissions are calculated from *Protocol for Leak Emission Estimates*, EPA-453/R-95-017, November 1995. Emissions are calculated as follows:

VOC(lbs/hr) = (# of components)(emission factor kg/hr/source)(2.21 lbs/kg)
VOC uncontrolled (tons/yr) = (VOC in lbs/hr)(8760 hrs/year)/(2000 lbs/ton)
VOC controlled (tons/yr) = (VOC uncontrolled in tons/yr)(1-{% value/100})

TABLE J-1: Equipment Leaks Emission Summary						
Type of Component	# of Components	Leaking Emission Factor (kg/hr/source)	VOC (lbs/hr)	VOC uncontrolled (tons/yr)	LDAR Control efficiency %	VOC controlled (tons/yr)
Light liquid valves	775	0.00403	6.90	30.22	84	4.84
Light liquid pumps	40	0.0199	1.76	7.71	69	2.39
Gas valves	450	0.00597	5.94	26.02	87	3.38
TOTAL EMISSIONS			14.60	63.95		10.61

The equipment leaks will be assumed to be anhydrous ethanol process lines for determination of HAP emissions. In the anhydrous ethanol, acetyldehyde and methanol are present at 200 ppm. The HAP emissions are calculated as follows:

HAP emissions = (VOC emissions)(Percent of VOC emissions)
Acetaldehyde = (10.61 tons/yr VOC)(0.0002 of acetaldehyde) = 0.0021 tons/yr
Methanol = (10.6064 tons/yr VOC)(0.0002 of methanol) = 0.0021 tons/yr

(2) Fugitive emissions from the DDGS storage, handling, and loadout area are the emissions, which are not controlled by the enclosure. The doors for the enclosure will generally be open. The emissions are estimated by using emission factors from AP-42, Chapter 9.9.1 – Grain Elevators and Processes (4/03), Table 9.9.1-2, Animal Feed Mills. The following are the calculations for the DDGS fugitive emission rates:

DDGS loadout 400,000 tons/yr

Emission factor 0.0033 lbs PM/ton
0.0008 lbs PM_{10}/ton

Potential To Emit calculations for fugitive PM & PM_{10}
PM = (400,000 tons/yr DDGS)(0.0033 lbs PM/ton)/(2000 lbs/ton) = 0.66 tons/yr PM
= (400,000 tons/yr DDGS)(0.0033 lbs PM/ton)/(8760 hrs/yr) = 0.15 lbs/hr PM
PM_{10} = (400,000 tons/yr DDGS)(0.0008 lbs PM_{10}/ton)/(2000 lbs/ton) = 0.16 tons/yr PM_{10}
= (400,000 tons/yr DDGS)(0.0008 lbs PM_{10}/ton)/(8760 hrs/yr) = 0.04 tons/yr PM_{10}

(3) Haul roads emissions consists of truck traffic on the paved roads as part of the receiving of raw materials (denaturant, grain) or shipping of final products (ethanol, WDGS, DDGS) and denaturant. To determine emissions, the following information for each material transported is obtained:

Annual production or usage (tons or gals)
Capacity of truck used in transport (tons or gals)
Plant roads: Empty truck travel (feet per trip)
Full truck travel (feet per trip)

Calculations:
Estimated annual truck trips = (Annual production)(1-(% by rail/100))/(truck capacity)
Vehicle miles traveled EMPTY = (Empty feet/trip)(1 mile/5280 feet)(# of trips)
Vehicle miles traveled FULL = (Full feet/trip)(1 mile/5280 feet)(# of trips)

The EMPTY vehicle miles traveled are totaled for all materials. The FULL vehicle miles traveled are total for all materials. The percentage of EMPTY and FULL vehicles miles traveled out of total vehicle miles traveled is determined.

TABLE J-2: Haul Road Mileage Summary

	Annual Throughput	% by Rail	Capacity of Truck	Estimated # of Trips	EMPTY Ft/trip	FULL Ft/trip	EMPTY Miles	FULL Miles
Denatured ethanol	105,000,000 gal	90	7,800 gal	1,346.15	2,413.00	1,789.97	615.20	456.36
Denaturant	5,250,000 gal	50	7,800 gal	336.54	1,789.97	2,413.00	114.09	153.80
Denaturant Resold	2,500,000 gal	0	7,800 gal	320.51	2413.0	1,789.97	146.48	108.66
DDGS	400,000 tons	50	25 tons	8,000.00	1,864.64	1,026.99	2,825.21	1,556.05
Grain	1,200,000 tons	0	25 tons	48,000.00	1,026.99	1,864.64	9,336.27	16,951.27
Misc. Supplies	30,000 tons	0	25 tons	1,200.00	2,101.49	2,101.49	477.61	477.61
Total							13,514.86	19,703.75

Total Miles: 13,514.86 miles EMPTY 40.68% percent of total miles are EMPTY trucks
19,703.75 miles FULL 59.32% percent of total miles are FULL trucks
33,218.61 Total Miles

Empty truck is estimated to weigh 15 tons (for both liquids and solids).
Full Truck is estimated to weigh 40 tons (for both liquids and solids).

Weighted Average (W) = (40.68%*15) + (59.32%*40) = 29.83 tons

Emission factors for paved haul roads are calculated using the following equations from AP-42, Section 13.2.1 (10/2002).

$$\text{Lbs/VMT} = k\,(sL/2)^{0.65}\,(W/3)^{1.5}$$

Particle size multiplier	k	0.082 dimensionless for PM
Particle size multiplier	k	0.016 dimensionless for PM_{10}
Road surface silt loading	sL	0.4 g/m^2 (from Table 13.2.1-3 –normal)
Weighted average vehicle weight	W	tons (calculated above)

$$\text{Lbs PM/VMT} = 0.082\,(0.4/2)^{0.65}\,(29.83/3)^{1.5}$$
$$= 0.903$$
$$\text{Lbs } PM_{10}\text{/VMT} = 0.016\,(0.4/2)^{0.65}\,(29.83/3)^{1.5}$$
$$= 0.176$$

Total Vehicle Emissions = (Total VMT)(lbs/VMT)
PM = (33,218.61 VMT/year)(0.903 lbs/miles)
= 29,996.40 lbs/year PM uncontrolled
= 15.00 tons/year PM uncontrolled

PM_{10} = (33,218.61 miles/year)(0.176 lbs/miles)
= 5,846.48 lbs/year PM_{10}
= 2.92 tons/year PM_{10} uncontrolled

The emission limitations of 22.66 lbs/day PM_{10} for the haul roads combined (3768 feet), and 0.60 lbs/day PM_{10} for the entrance haul road segment (first 100 feet) are based on emissions reported by Abengoa in the NAAQS modeling. This limitation is calculated as follows:

Average vehicle weight: 29.83 tons

Lbs PM_{10}/VMT= $0.016\ (sL/2)^{0.65}\ (29.83/3)^{1.5}$

= $0.50167*(sL/2)^{0.65}$

Daily pounds of PM_{10} per day for the haul roads combined are calculated as:

Lbs PM_{10}/day = (Lbs/VMT)*(VMT/day)

= $[0.50167*(sL/2)^{0.65}]*[\ (3768/5280)*(\text{trucks/day})]$

= $(0.36)*(\text{trucks/day})*\ (sL/2)^{0.65}$

The value for trucks/day includes both incoming and outgoing traffic.

Abengoa's modeling assumed 22.66 pounds PM_{10} are emitted per day for all haul roads combined. Therefore, the lbs/day cannot exceed 22.66 lbs/day. The equation becomes:

22.66 PM_{10}/day $\geq (0.36)*(\text{trucks/day})\ *(sL/2)^{0.65}$

According to the modeling, the entrance haul road segment is the critical haul road traffic area. Abengoa assumed in the modeling that it is approximately 100 feet in length (0.018939 miles). Vehicle miles traveled per day is then calculated as VMT/day = 0.018939*(trucks/day).

Daily pounds of PM_{10} per day for the first 100 feet of haul road are calculated as:

Lbs PM_{10}/day = (Lbs/VMT)*(VMT/day)

= $[0.50167*(sL/2)^{0.65}]*[\ 0.018939*(\text{trucks/day})]$

= $(0.0095)*(\text{trucks/day})*(sL/2)^{0.65}$

Abengoa's modeling assumed 0.6 pounds PM_{10} are emitted per day on the entrance haul road segment. Therefore, the lbs/day cannot exceed 0.6 lbs/day. The equation becomes:

0.6 PM_{10}/day $\geq (0.0095)*(\text{trucks/day})\ *(sL/2)^{0.65}$

Based on the NAAQS limitation and an operating rate of 365 days per year, the potential PM_{10} emissions from haul roads are calculated as follows:

PM_{10} = (22.66 lbs/day)*(365 days/yr)

= 8,270.9 lbs/yr PM_{10}

= 4.14 tons/yr PM_{10}

The potential PM emissions from haul roads are calculated based on the ratio of particle size multiplier for PM and PM_{10} and the potential emissions of PM_{10} as follows:

PM = (0.082/0.016)*(4.14.tons/yr)

= 21.22 tons/yr PM

Table J-3 is the summary of emissions from this condition (including fugitive equipment leaks and fugitive dust from material handling and haul roads).

TABLE J-3: Fugitive Emission Summary	
Pollutant	PTE (tons/year)
PM	21.88
PM_{10}	4.30
VOC	10.61
Acetaldehyde	0.0021
Methanol	0.0021

COOLING TOWERS {Condition XIII.(K)}

The facility will have three (3) cooling towers. The total dissolved solids concentration (TDS) in the cooling water will be limited to 3,600 ppm for any single sampling event and will be limited to an average of 2,400 ppm for any period of twelve (12) consecutive calendar months. The drift loss will be limited to 0.005 percent per PSD-BACT requirements, due to the operation of a mist eliminator on each of the cooling towers.

Circulation rates for each of the cooling towers is:

Cooling Tower #1: 1,020,000 gal/hr
Cooling Tower #2: 900,000 gal/hr
Cooling Tower #3: 2,400,000 gal/hr

The estimated particulate (PM & PM_{10}) emissions are as follows (from AP-42, Section 13.4-2):

Water density = 8.34 lbs/gal
PM/ PM_{10}
= (2,400 lbs TDS/1,000,000 lbs water)(8.34 lbs/gal water)(1000 gal/1 Mgal)(0.005/100 drift loss)
PM/ PM_{10} = 0.0010 lbs/Mgal

Potential annual throughput= (hourly throughput gal/hr)(8760 hrs/yr)(1 Mgal/1000 gal)
Annual Emissions = (Emission factor lbs/Mgal)(throughput Mgal/yr)/(2000 lbs/ton)
Hourly Emissions = (Emission factor lbs/Mgal)(throughput gal/hr)(1 Mgal/1000 gal)

TABLE K-1: Cooling Tower Emission Calculation Summary				
	Hourly Throughput (gal/hr)	Hourly PM/PM_{10} Emissions (lbs/hr)	Potential Annual Throughput (Mgal/yr)	Potential Annual PM/PM_{10} Emissions (tons/yr)
Cooling Tower #1	1,020,000	1.02	8,935,200	4.47
Cooling Tower #2	900,000	0.90	7,884,000	3.94
Cooling Tower #3	2,400,000	2.40	21,024,000	10.51

TABLE K-2: Cooling Tower Emission Summary	
Pollutant	PTE (tons/year)
PM	18.92
PM_{10}	18.92

This modification has an increase in the TDS concentration from the 2001 permit limits (2200 ppm for single event, 1200 ppm annual average) due to the increased usage of water. The higher water demand requires the facility to obtain additional water resources which has a lower water quality (higher TDS concentration) that the existing water that is used.

METHANATOR OPERATION {Condition XIII.(L)}

This operation removes VOC from wastewater, converts the VOC into methane, then combusts methane in the flare. The methane produced is also burned in the DDGS Dryer #2. Since the wastewater treatment tanks are enclosed, no significant fugitive VOC emissions exists. The methanator is an anaerobic digester that removes organics contained in process wastewater and produces a fuel gas (mostly methane). The methanator provides for at least an 80% (and up to 95%) reduction in total wastewater loading, and discharges into a lagoon for polish treatment and solids separations. The wastewater contains little sulfur containing compounds, therefore, the digestor cannot produce SO_x or total reduced sulfur (TRS) in the off-gas. Emissions of PM, PM_{10}, and SO_x are negligible due to the composition of the methane (off-gas).

The estimated emissions are as follows:

Heat content of methane 850 MMBtu/MMscf
Design rate of flare 4.8 MMBtu/hr
Methane AP-42 emission factors came from AP-42 (9/91, reformatted 1/95), Section 13.5, Table 13.5-1.
Operating hours 8,760 hrs/yr

Hourly Emissions = (lbs/MMBtu)(4.8 MMbtu/hr) = lbs/hr
Annual Emissions = (lbs/MMBtu)(4.8 MMBtu/hr)(8,760 hrs/yr)/(2,000 lbs/ton) = tons/yr

Table L-1: Methanator Flare Emission Summary			
Pollutant	Emission Factor (lbs/MMBtu)	Hourly PTE (lbs/hr)	Annual PTE (tons/yr)
CO	0.37	1.78	7.78
NO_x	0.068	0.03	1.43
VOC	0.14	0.67	2.94

EMERGENCY EQUIPMENT {Condition XIII.(M)}

The emergency equipment consists of a 900 hp diesel-fired electric generator and a 340 hp diesel-fired engine for the emergency fire water-pump. The emergency equipment limited to the expected number of operating hours during non-emergency periods (maintenance and testing). Therefore, the limitation on the engine is required to restrict the plant from operating the unit

continuously (8760 hrs/year). The 500 hrs/yr limitation is the PSD-BACT operational limitation for the emergency equipment.

The estimated emissions are as follows:

Design rate of generator 900 hp
Emission factors from AP-42, Chapter 3.4 (10/96), Tables 3.4-1 and 3.4-3.
Operating hours (limit) 500 hrs/yr
Sulfur Content of Diesel fuel (S) 0.05 %

Hourly Emissions = (emission factor lbs/hp-hr)(900 hp) = lbs/hr
Annual Emissions = (emission factor lbs/hp-hr)(900 hp)(500 hrs/yr)/(2000 lbs/ton)

1 hp= 7000 Btu/hr = 0.007 MMBtu/hr
(900 hp)((0.007 MMBtu/hr)/hp) = 6.3 MMBtu/hr
HAPs Hourly Emissions = (emission factor lbs/MMBtu)(6.3 MMBtu/hr)
HAPs Annual Emissions
= (emission factor lbs/MMBtu)(6.3 MMBtu/hr)(500 hrs/yr)/(2000 lbs/ton)

Table M-1: Electric Generator Emission Summary

Pollutant	Emission Factor (lbs/hp-hr)	Hourly Emissions (lbs/hr)	Annual Emissions (tons/yr)
PM	0.0007	0.63	0.16
PM10	0.0007	0.63	0.16
SO_2	0.000405	0.36	0.09
NO_x	0.024	21.60	5.40
CO	0.0055	4.95	1.24
VOC	0.000705	0.63	0.16
	(lbs/MMBtu)		
Acetaldehyde (75070)	2.52E-05	1.59E-04	3.97E-05
Acrolein (107028)	7.88E-06	4.96E-05	1.24E-05
Benzene (71432)	7.76E-04	4.89E-03	1.22E-03
Formaldehyde (50000)	7.89E-05	4.97E-04	1.24E-04
Toluene (108883)	2.81E-04	1.77E-03	4.43E-04
Xylenes (1330207)	1.93E-04	1.22E-03	3.04E-04
Total HAPs		8.59E-03	2.14E-03

Design rate of fire pump engine 340 hp
Emission factors from AP-42, Chapter 3.3 (10/96), Tables 3.3-1 and 3.3-2.
Operating hours (limit) 500 hrs/yr

Hourly Emissions = (emission factor lbs/hp-hr)(340 hp) = lbs/hr
Annual Emissions = (emission factor lbs/hp-hr)(340 hp)(500 hrs/yr)/(2000 lbs/ton)

1 hp= 7000 Btu/hr = 0.007 MMBtu/hr
(340 hp)((0.007 MMBtu/hr)/hp) = 2.38 MMBtu/hr

HAPs Hourly Emissions = (emission factor lbs/MMBtu)(2.38 MMBtu/hr)
HAPs Annual Emissions
= (emission factor lbs/MMBtu)(2.38 MMBtu/hr)(500 hrs/yr)/(2000 lbs/ton)

Table M-2: Fire Pump Engine Emission Summary

Pollutant	Emission Factor (lbs/hp-hr)	Hourly Emissions (lbs/hr)	Annual Emissions (tons/yr)
PM	0.0022	0.75	0.19
PM_{10}	0.0022	0.75	0.19
SO_2	0.00205	0.70	0.17
NO_x	0.031	10.54	2.64
CO	0.00668	2.27	0.57
VOC	0.00247	0.84	0.21
	(lbs/MMBtu)		
Acetaldehyde (75070)	7.67E-04	1.83E-03	4.56E-04
Acrolein (107028)	9.25E-05	2.20E-04	5.50E-05
Benzene (71432)	9.33E-04	2.22E-03	5.55E-04
1,3-Butadiene (106990)	3.91E-05	9.31E-05	2.33E-05
Formaldehyde (50000)	1.18E-03	2.81E-03	7.02E-04
Napthalene (91203)	8.48E-05	2.02E-04	5.05E-05
Polycyclic Organic Matter (POM)	8.32E-05	1.98E-04	4.95E-05
Toluene (108883)	4.09E-04	9.73E-04	2.43E-04
Xylenes (1330207)	2.85E-04	6.78E-04	1.70E-04
Total HAPs		9.22E-03	2.30E-03

The company has requested the alternative of bio-diesel (10% ethanol, and 90% diesel) to be used in the emergency equipment. After researching the subject, bio-diesel is an excepted alternative fuel to diesel by the US Department of Energy to reduce air emissions from mobile sources. The specific percentages of ethanol to diesel was left out of the permit, because if it is later determined that the equipment can handle combusting a higher percentage of ethanol in the fuel, then the company can be allowed to use a higher ethanol content. Ethanol combustion emits less pollution than diesel combustion. The emission estimate shows 100% diesel combustion.

Equipment/Process Emission Summary							
	PM	PM_{10}	SO_x	NOx	CO	VOC	HAPs
Grain Handling/Milling	22.07	21.25					
Fermentation/Distillation						130.00	1.75
TO/HRSG Stack 1	32.21	32.21	2.42	163.81	179.17	83.39	12.77
Storage Tanks						3.3	7.64E-02
Loading Rack				1.62	0.30	3.24	8.77E-01
Fugitive Emissions	21.88	4.3				10.61	4.24E-03
Cooling Towers	18.92	18.92					
Methanator flare				1.43	7.78	2.94	
Emergency equipment	0.35	0.35	0.26	8.04	1.81	0.37	4.45E-03
Total Emissions:	95.43	77.03	2.68	174.90	189.06	233.85	15.48

Facility-Wide 2003 PTE Controlled (Permitted) Emissions			
Regulated Pollutant	2003 PTE Controlled Emissions (tons/year)	2001 Permitted PTE (tons/year)	Emission Change (tons/year)
Particulate Matter (PM)	95.43	53.95	41.48
Particulate Matter smaller than or equal to 10 microns (PM_{10})	77.03	53.95	23.08
Sulfur Dioxide (SO_2)	2.68	0.77	1.91
Oxides of Nitrogen (NO_x)	174.90	109.38	65.52
Carbon Monoxide (CO)	189.06	94.31	94.75
Volatile Organic Compounds (VOC)	233.85	125.69	108.16
Hazardous Air Pollutants (HAP):			
Acetaldehyde (75070)	4.34		4.34
Acrolein (107028)	0.22		0.22
Formaldehyde (50000)	1.75		1.75
Hexane (110543)	7.32		7.32
Methanol (67561)	0.90	0.36	0.54
Methyl tert-butyl ether (1634044)	0.16		0.16
Toluene (108883)	0.35	0.13	0.22
Xylenes (1330207)	0.26		0.26
Miscellaneous HAPs*	0.098		0.098
Total HAPs	15.48	0.49	14.99

*Miscellaneous HAPs are HAPs that are emitted at a rate less than 0.10 tons per year individually, including benzene, 1,3 butadiene, carbon disulfide, cumene, dicholorobenzene, ethyl benzene, naphthalene, polycyclic organic matter, arsenic compounds, beryllium compounds, cadium compounds, chromium compounds, cobalt compounds, lead compounds, manganese compounds, mercury compounds, nickel compounds, and selenium compounds,

APPLICABLE REQUIREMENTS AND VARIANCES OR ALTERNATIVES TO REQUIRED STANDARDS:

Prevention of Significant Deterioration (PSD)

The facility was permitted in 2001 for a minor PSD modification (125 tons/yr VOC facility wide, with less than 40 tons/yr increase in emissions), which was below the PSD applicability thresholds. During the September 2002 performance to confirm the PSD limitations, the emissions of PM, PM_{10} and VOC exceeded the hourly emissions limitations for the DDGS dryers, vent scrubber and CO_2 scrubber. This permit limit exceedances trigger PSDmajor source thresholds and subject the existing facility to PSD review. Additionally, CO and VOC were measured as being emitted from the DDGS dryers, which was previously not reported.

Pollutant	2001 Permitted Limit	Sept. 2002 test results
DDGS Dryers (total)		
PM	5.3 lbs/hr	61.36 lbs/hr (268.76 tons/yr)
PM10	5.3 lbs/hr	61.36 lbs/hr (268.76 tons/yr)
VOC	not permitted	204.5 lbs/hr (895.71 tons/yr)
CO	not permitted	31.4 lbs/hr (137.53 tons/yr)
Vent/CO2 Scrubber		
VOC	12.79 lbs/hr	117.34 lbs/hr (513.95 tons/yr)

A PSD review is required for VOC, CO, PM, PM_{10}, and NO_x emissions. In accordance with Title 129, Chapter 19, PSD review consists of the following:

1. Determination of Best Available Control Technology (BACT);
2. Determination of air quality monitoring requirements;
3. Analysis of compliance with National Ambient Air Quality Standards (NAAQS);
4. Evaluation of PSD increment consumption;
5. Evaluation of source related impacts on growth, soils, vegetation, and visibility;
6. Evaluation of Class I area impacts.

BACT Analysis

BACT is an emission limitation based on the maximum degree of reduction of each pollutant subject to PSD requirements that is determined to be achievable on a case-by-case basis. The Department conducts BACT analyses in accordance with the *"Top-Down" Best Available Control Technology Guidance Document* outlined in the 1990 draft USEPA *New Source Review Workshop Manual*, as follows:

1. Identify all potentially available control options;
2. Eliminate technically infeasible control options;
3. Rank remaining control technologies by control effectiveness;
4. Evaluate the most effective controls and document the results; and
5. Select BACT.

BACT analyses take into account the energy, environmental, and economic impacts on the source. These reductions may be determined through the application of available control techniques, process design, and/or operational limitations.

The BACT determination is based on the following information:

1. The permit application (and revisions) submitted by Abengoa Bioenergy;
2. Information from vendors/suppliers;
3. The EPA RACT/BACT/LAER (RBLC) Clearinghouse.

PSD BACT Equipment Activities/Limitations	
Point Emission Source	PSD-BACT activities/limitations/equipment
Grain Handling and Milling	4 Baghouse(s) with hourly limitations equivalent to 0.01 gr/dscf for PM/PM_{10} per baghouse
Grain Receiving – Fugitive dust	Partial enclosure of receiving pit, and receiving pit using a "choke feed" system and aspirated to a baghouse. (95% control efficiency combined for PM/PM_{10}).
Fermentation and Distillation	5 scrubbers with 98% control efficiency for VOC each
DDGS Dryers- Fuel combustion	0.04 lbs/MMBtu of NO_x emissions (low NO_x burners), Limit fuel to natural gas (all dryers) and methane (Dryer #2). Good combustion practice.
Thermal Oxidizer – Fuel combustion	0.04 lbs/MMBtu of NO_x emissions (low NO_x burners), Limit fuel to natural gas. Good combustion practice.
DDGS Dryers – process emissions	2 thermal oxidizers with limits of: 98% control efficiency for VOC; 98% control efficiency for PM/PM_{10}; 90% control efficiency or 100 ppmv for CO.
Steam Boilers	0.04 lbs/MMBtu of NOx emissions (low NO_x burners), 0.084 lbs/MMBtu of CO emissions (good combustion practice), Limit fuel to natural gas.
Storage tanks	Internal floating in 4 tanks (existing); Vapor recovery system with flare to control VOC emissions from fixed roof production tanks; Emergency equipment diesel tanks don't require BACT due to limited throughput (hourly limitation on emergency equipment).
Liquid Product Loadout	Vapor recovery system with flare to control VOC emissions from truck and railcar loadout; Submerge filling of tanker cars; Limit amount of liquid product loaded into non-dedicated tanks.
DDGS Loadout	Partial enclosure.
Equipment Leaks	LDAR program per NSPS, Subpart VV to control VOC emissions.
Plant Roads	lbs/day limitation for PM and PM_{10} Paved haul roads; Fugitive dust control (cleaning).
Cooling Towers	Limit TDS concentration; Limit amount of water circulated in each cooling tower; Mist eliminators with a 0.005% drift loss on each cooling tower.

Wastewater Treatment	Methanator removes VOC from wastewater to be combusted in DDGS Dryer #2 or a flare.
Emergency Equipment	Limitation on operating hours to 500 hours/yr.

The BACT analysis is summarized below:

1. Grain Handling and Milling: The BACT for grain handling and milling is for all operations including storage bins, elevators, hammermills, and associated conveyors and transfer points to be enclosed and routed to a baghouse with a 0.01 gr/dscf or less emission rate for PM and PM_{10}. This is top BACT technology. The facility had reviewed the use of a baghouse, wet scrubber, and a cyclone with an emission rate of 0.01 to 0.02 gr/dscf.

2. Grain Receiving – Fugitive Dust: The BACT for grain receiving pits is to have the pits partial enclosed, with a "choked feed" system and aspirated to a baghouse. The partial enclosure means that the receiving pits are in a building but the doors are open. Because the number of trucks that are being received, the doors are left open. If the doors were closed during the unloading of the trucks, the additional control of emissions would be minimal (about 1 ton/yr of PM) and would cause delays in the receiving of the grain.

3. Fermentation and Distillation Operations: The BACT for fermentation and distillation operations is to have wet scrubbers with a control efficiency of 98%. The facility had reviewed a thermal oxidizer and a wet scrubber with 95% control efficiency for VOC. The thermal oxidizer was determined to be not feasible because the exhaust streams from the fermentation and distillation operations had high CO_2 concentrations, which would interfere with proper combustion. Also, the thermal oxidizers destroy the VOC it controls, while the scrubbers allow for product (ethanol) recovery. In a letter submitted November 3, 2003, Abengoa proposed a 95% control efficiency of existing two scrubbers, and 98% control efficiency for the three new scrubbers. There was insufficient justification why the existing scrubbers cannot be operated with 98% control efficiency. The NDEQ determined that 98% control efficiency of all five scrubbers would be the PSD-BACT.

4. Fuel Combustion for DDGS dryers, thermal oxidizers, and boilers: The fuel burning equipment will use low NO_x burners with flue gas recirculation to achieve 0.04 lbs/MMBtu for NO_x. Abengoa reviewed SCONOx and selective non-catalytic reduction (SNCR) and determined they were not technically feasible. They also reviewed selective catalytic reduction (SCR) but determined it was not cost effective. The SCR can have catalyst fouling that may be affected by the particulate matter emissions from the DDGS Dryers' process emissions. The units will also use good combustion practices to limit CO emissions to 0.084 lbs/MMBtu. Abengoa reviewed catalytic oxidation for control of CO emissions, but determined it was not cost effective to control emissions. The fuel will be limited to natural gas and methane (from methanator). This fuel type limitation will restrict SO_2 emissions, because if #2 diesel fuel (with 0.5% sulfur content) the potential emissions would be 2092 tons/yr of SO_2 instead of 2.42 tons/yr SO_2 for natural gas combustion.

5. DDGS Dryers – process emissions: NDEQ has required a minimum control of a thermal oxidizer with 98% control efficiency for VOC, PM, PM_{10} and 90% control efficiency or 100 ppmv for CO. The facility has reviewed a thermal oxidizer and a wet scrubber with a control efficiency of 95% for VOC, PM, PM_{10}. The thermal oxidizer (95% control

efficiency minimum) is standard BACT per Title 129, Chapter 27 for HAPs, for ethanol plants with DDGS dryers (even those with emissions below PSD or MACT levels). Abengoa stated that their vendors would not guarantee any control efficiency above 95%. In the vendor quotations submitted by Abengoa, three vendors guaranteed 95% control efficiency and one vendor guaranteed 99% control efficiency. In one of the 95% control efficiency guarantee vendor document, the vendor referenced four other facilities where they guaranteed and achieved 98+% control efficiency. The thermal oxidizers can be designed to achieve a minimum of 98% control efficiency and the costs are similar to the 95% control efficiency thermal oxidizers. Therefore, the BACT for the DDGS Dryers is thermal oxidizers 98% control efficiency. Additionally, the DDGS cooling process uses a cyclone and a baghouse to control the particulate matter load in the exhaust stream. The exhaust stream from the DDGS cooling process is routed through the DDGS dryers after the cyclone/baghouse control the emissions.

6. Storage tanks: The BACT (VOC) for storage tanks is generally a floating roof or a vapor recovery system with a flare. Tanks T-800, T-801, T-802, and T-807 were installed with floating roofs when they were constructed because they are subject to the NSPS. Tanks T-803 to T-806, T-808, T-830, and T-1501(A-D) were installed with fixed roofs because they were not subject to the NSPS. These tanks will be vented and controlled by a vapor recovery system with a flare. The storage tanks for diesel fuel will not have controls added because the throughput and emissions from these tanks are very small and the added control would not be cost effective.

7. Liquid Product Loadout: Submerged loading of liquid product (denatured ethanol or denaturant) reduces the amount of VOC emitted, and the facility was already required to use submerged loading. A vapor recovery system with flare will be added to the truck and railcar loading rack to provide 95+% control efficiency. The vapor recovery system with flare can be the same system that is used on the storage tanks. The vapor recovery system is the top BACT technology. The facility calculated based on a limited amount of denatured ethanol being loaded into non-dedicated tanks (mainly trucks). A limit of the denatured ethanol loaded into non-dedicated tanks was added to the permit. Non-dedicated tanks emit more than dedicated tanks because it is assumed that the previous liquid in the non-dedicated tank was gasoline, which evaporates more readily than ethanol and contains more HAPs than ethanol. The company expects to ship most of its liquid product by railcar, which is generally a dedicated tank for ethanol.

8. DDGS Loadout: The BACT (for PM/PM_{10}) for the DDGS loadout is that the DDGS is stored and loaded in a building. The doors of the building can be open during the loading of the DDGS. The DDGS still contains moisture, which will prevent fugitive dust from occurring in large quantities. A baghouse for this operation would not be cost effective.

9. Equipment Leaks: The BACT (for VOC) for equipment leaks is conduct a Leak Detection and Repair Program as defined in 40 CFR 60.482-1 through 60.482-10 (NSPS, Subpart VV). Any other control method would cost prohibitive.

10. Haul Roads: The haul roads are already paved and they must remain paved. The roads must be cleaned and maintain and the roads are limited to an lbs/day of PM_{10} limitation as the BACT (for PM/PM_{10}). The lbs/day limitation is to show compliance with the 24-hour and annual NAAQS standards for PM_{10}. The haul road cleaning and maintenance will limit visible emissions and off-site transport of the fugitive dust.

11. Cooling Towers: The BACT (PM/PM_{10}) for the cooling towers is to limit the amount of total dissolved solids (TDS) in the cooling water, the amount of cooling water circulated through the towers, and the drift loss limited to a maximum of 0.005% . The permitted concentration increased from the 2001 permit, from 2200 ppm to 3600 ppm for any single sampling event and from 1200 ppm to 2400 ppm for any twelve consecutive months. The increase in TDS concentration is due increased of the amount of circulated water, because will water of lower quantity. The facility may have to treat the water to meet these limits. Lower limits of TDS would not be cost effective due to the cost for treating the water. The circulation rate limitations require the cooling towers to be operated according to the permit application. The cooling towers are equipment with mist eliminators, which have drift loss of 0.005%. A lower percent drift loss would not be cost effective. Therefore, a 0.005% drift loss mist eliminator is considered BACT.

12. Wastewater Treatment: The VOC in the wastewater is treated in the methanator. The methane (off-gas) from the methanator is combusted in a DDGS dryer or it is flared. The combustion of the wastewater off-gas is considered BACT. Other controls of the wastewater off-gas are not cost effective because of the low volume of uncontrolled emissions.

13. Emergency Equipment: The facility has chosen an operational limitation on these units for BACT. The 500 hours/yr limitation is the EPA standard limitation for defining emergency equipment. The emergency equipment should not exceed 500 hours/yr during the normal operation of the plant: testing of equipment and short term electrical outages. Other limitations are not cost effective.

Air Quality Impact Analysis

The source is required by 40 CFR 52.21(k) to demonstrate that emissions from a new source will not cause or contribute to violation of NAAQS or any maximum allowable increase over the baseline concentration in any area.

Air quality impact analyses were submitted for the proposed increases in PM_{10}, NO_x, SO_2, and CO emissions in the facility.

Air Quality Monitoring Requirements

The modeling analysis adequately demonstrates that the project's impacts are below the pre-application monitoring thresholds for NO_2, SO_2, and CO.

Results from the modeling analysis indicate that the project's impacts exceed the pre-application monitoring threshold for PM_{10}. However, representative background monitoring data for PM_{10} are available. The last full year of PM_{10} monitoring in Lincoln was conducted in 1997. The highest values were recorded in 1996. The second highest 24-hour impact recorded in Lincoln in 1996 was 63 micrograms per cubic meter and 28 micrograms per cubic meter for the annual average.

Abengoa did not add background concentrations for the PM_{10} NAAQS analyses. NDEQ added 60 and 25 to Abengoa's 24-hour and annual NAAQS impacts respectively, taken from Hastings 1996 data. The total impacts were well below the NAAQS. Even if Lincoln PM_{10} 1996 data were used, the impacts would still be well below the NAAQS. Therefore, NDEQ has determined that the Lincoln data can be used to waive pre-application monitoring requirements for PM_{10}.

National Ambient Air Quality Standards (NAAQS) and Increment Consumption

The results of the significant impact level (SIL) analysis are summarized below.

Significant Impact Levels Comparison

Pollutant	Averaging Period	Modeled Concentration (ug/m^3)	SIL (ug/m^3)
CO	1-hr	35	2,000
	8-hr	22	500
SO_2	Annual	<1	1.0
	24-hr	<1	5.0
	3-hr	<1	25.0
PM_{10}	Annual	**3**	1.0
	24-hr	**25**	5.0
NO_2	Annual	<1	1.0

The results of the preliminary modeling analysis indicate that the operation of the facility will not cause a significant impact in the surrounding area for CO, SO_2 and NO_2. However, PM_{10} concentrations exceed the *Significance Levels* and are considered to have a significant impact on the local air quality. Therefore, PM_{10} was further evaluated in the refined modeling analysis. The purpose of the refined modeling analysis was to demonstrate that the proposed facility would not cause or contribute to violations of applicable NAAQS or PSD Increments for PM_{10}. The Nebraska and National AAQS and PSD increments are identical.

NAAQS for PM_{10}

Results of the PM_{10} NAAQS modeling analysis, as shown below, indicate that the model-predicted maximum concentration is below the allowable PM_{10} NAAQS for both 24-hour and annual average period.

PM-10 24-hour NAAQS Compliance Demonstration				
Meteorology (Year)	Source Contribution (ug/m^3)	Background Concentration (ug/m^3)	Total Concentration (ug/m^3)	Exceeds Standard, 150 ug/m^3? (Yes/No)
5-year *	22	60	82	No

* 5-year meteorology includes 1985, 1986, 1989, 1990, and 1991

PM-10 Annual NAAQS Compliance Demonstration				
Meteorology (Year)	Source Contribution (ug/m^3)	Background Concentration (ug/m^3)	Total Concentration (ug/m^3)	Exceeds Standard, 50 ug/m^3? (Yes/No)
1985	3	25	28	No
1986	3	25	28	No
1989	3	25	28	No
1990	3	25	28	No
1991	3	25	28	No

PSD Increment for PM_{10}

Results of the PM_{10} PSD modeling analysis, as shown below, indicate that the model-predicted maximum increment consumption is below the allowable PM_{10} increment for both 24-hour and annual average period.

PM-10 24-Hour PSD Increment Compliance Demonstration			
Meteorology (Year)	Source Contribution (ug/m^3)	Increment Consumed (ug/m^3)	Exceeds Increment, 30 ug/m^3? (Yes/No)
1985	22	22	No
1986	19	19	No
1989	21	21	No
1990	20	20	No
1991	25	25	No

PM-10 Annual PSD Increment Compliance Demonstration			
Meteorology (Year)	Source Contribution (ug/m^3)	Increment Consumed (ug/m^3)	Exceeds Increment, 17 ug/m^3? (Yes/No)
1985	3	3	No
1986	3	3	No
1989	3	3	No
1990	3	3	No
1991	3	3	No

Growth Analysis, and Soils and Vegetation Impacts

PSD analysis includes consideration of emissions from general commercial, residential and other growth associated with the new employees required for the construction and operation of the modified facility. Associated growth includes new industries locating in the area to support or further process the additional production capacity. The ethanol plant, which has a small operating staff, and the construction activities for the ethanol plant improvements will cause very little associated growth. The ethanol plant is located outside of the City of York. Overall, the impact of associated growth on local air quality has been minimal.

Based on the modeling analysis, the impact of the ethanol plant emissions on soil and vegetation is expected to be negligible. Ambient concentrations below the secondary NAAQS are generally considered to be protective of soil and vegetation.

Class I Area Impacts

The source is not expected to impact any Class I areas. The nearest Class I area is Badlands National Park approximately 250 miles away.

New Source Performance Standards (NSPS), Title 129, Chapter 18

Subpart Db: The two steam generating boilers and the two thermal oxidizers are subject to this subpart. Fuel usage records and a CEM on Stack 1 are the requirements. The CEMs are to confirm the emissions are below 0.1 lbs NOx/MMBtu per the NSPS; also, confirms the 0.04 lbs NOx/MMBtu per the PSD-BACT requirements. The equipment is not subject to the standards for SOx or PM because of the limitations on the fuel types (no oil, wood, or coal).

Subpart DD: This subpart does not apply to the grain handling operations, since the permanent storage capacity is less than the requirements for grain terminal elevators (2.5 million bushels) or for grain storage elevators (1 million bushels). The permanent storage capacity for the grain handling operations at this plant is 680,000 bushels.

Subpart NNN: This subpart no longer applies to the distillation operation, per EPA's January 24, 2000, letter. This letter stated that Subpart NNN does not apply to ethanol derived from biomass. Subpart NNN applies to synthetic (chemical reaction of petroleum refining products) processes to produce organic chemicals (including ethanol).

Subpart RRR: This subpart no longer applies to the fermentation tanks, per EPA's January 24, 2000, letter. This letter stated that Subpart RRR does not apply to ethanol derived from biomass. Subpart RRR applies to synthetic (chemical reaction of petroleum refining products) processes to produce organic chemicals (including ethanol).

Subpart VV: This subpart applies to the VOC equipment leaks associated with a Synthetic Organic Chemical Manufacturing Industry. This subpart is associated with subpart NNN & RRR, but NNN & RRR are based on how the chemical is produced (biomass versus synthetic), while VV is based on the chemicals produced. Since new organic chemicals are synthesized (process doesn't matter), then all of the associated equipment leaks are subject to this subpart. Associated equipment includes light liquid valves, light liquid pumps, and gas valves (may include other connectors).

Subpart Kb: This subpart applies to some of the production storage tanks (tanks are specified in permit). This subpart does not apply to 8 tanks because the tanks are less than the 40 cubic meter (10,567 gal) capacity size {40 CFR 60.110b(a)}.

Process Weight Rate (Title 129, Chapter 20, Section <u>001</u>)

Each of the permitted emission rate limitations ensures the process weight rate limitations will not be exceeded. The following formulas were used to determine compliance: for process weight rates up to 60,000 lbs/hr, $E= 4.10\ p^{0.67}$, and for process weight rates in excess of 60,000 lbs/hr, $E= 55.0\ p^{0.11}-40$, where E = rate of emissions in lbs/hr and p = process weight rate in tons/hr.

For the grain handling/milling baghouses (F2, F5, F9, and F6):

P = 1120 tons/hr grain processed (combined)

$E = 55.0(1120)^{0.11}-40 = 79.06$ lbs/hr PM emission rate combined allowed per Title 129, Chapter 20

F2 = 1.46 lbs/hr PM emission rate limitation in permit

F5 = 1.46 lbs/hr PM emission rate limitation in permit

F9 = 1.46 lbs/hr PM emission rate limitation in permit

F6 = 0.43 lbs/hr PM emission rate limitation in permit

(based on gr/dscf and acfm for each baghouse, 7000 gr/lb, 60 minutes/hr)

For the grain receiving fugitive dust operations:

P = (1,200,000 tons/yr grain received)/(8760 hrs/yr)

= 136.99 tons/hr grain received = 273,973.60 lbs/hr

$E = 4.10(136.99)^{0.67} = 110.76$ lbs/hr PM emission rate allowed per Title 129, Chapter 20

Grain receiving pits = 1.05 tons/yr PM = 0.24 lbs/hr PM emission rate (combination of all pits)

For the TO/HRSG system (Stack 1):

P = (400,000 tons DDGS/yr)(2.5 tons WDGS/1 ton DDGS)/(8760 hrs/yr)
= 114.16 tons/hr WDGS entering dryers (combined) = 228,310.50 lbs/hr
$E = 4.1(114.16)^{0.67}$ = 98.02 lbs/hr PM emission rate allowed per Title 129, Chapter 20
Stack 1 = 15.12 lbs/hr PM emission rate limitation in permit

For the DDGS storage, handling and loadout operations:
P = (400,000 tons/yr DDGS)/(8760 hrs/yr)
= 45.66 tons/hr DDGS handled = 91,324.20 lbs/hr
$E = 4.10(45.66)^{0.67}$ = 53.05 lbs/hr PM emission rate allowed per Title 129, Chapter 20
DDGS loadout = 0.15 lbs/hr PM emission rate

For the cooling tower #1:
P = (1,020,000 gal/hr)(8.34 lbs/gal) = 8,506,800 lbs/hr = 4,253.40 tons/hr
$E = 55.0(4,253.40)^{0.11}$-40 = 97.89 lbs/hr PM emission rate allowed per Title 129, Chapter 20
Tower #1 = 1.02 lbs/hr PM emission rate limitation in permit
(based on TDS concentration, drift loss, and gals/hr)

For the cooling tower #2:
P = (900,000 gal/hr)(8.34 lbs/gal) = 7,506,000 lbs/hr = 3,753 tons/hr
$E = 55.0(3753)^{0.11}$-40 = 96.00 lbs/hr PM emission rate allowed per Title 129, Chapter 20
Tower #2 = 0.90 lbs/hr PM emission rate limitation in permit
(based on TDS concentration, drift loss, and gals/hr)

For the cooling tower #3:
P = (2,400,000 gal/hr)(8.34 lbs/gal) = 20,016,000 lbs/hr = 10,008 tons/hr
$E = 55.0(10,008)^{0.11}$-40 = 111.50 lbs/hr PM emission rate allowed per Title 129, Chapter 20
Tower #3 = 2.40 lbs/hr PM emission rate limitation in permit
(based on TDS concentration, drift loss, and gals/hr)

Particulate Emissions from Combustion Sources (Title 129, Chapter 20, Sections 002 and 003)

This facility is in compliance with this regulation because the fuels that combusted at this facility are natural gas, diesel fuel, and methane. The allowable emission rates per Title 129, Chapter 20, Section 002 and 003 are shown below. The particulate emissions in the DDGS dryers/thermal oxidizers natural gas combustion emissions are included in the process weight rate emission calculations.

$A = 1.026/I^{0.233}$, where A = allowable emission rate in lb/MMBtu,
and I = total heat input in MMBtu/hr.

Boilers (grouped through a single stack):
A= $1.026/(150+160)^{0.233}$ = 0.27 lbs PM/MMBtu allowable
Actual: (7.6 lbs PM/MMscf)(MMscf/1,011 MMBtu) = 0.0075 lbs PM/MMBtu actual

Emergency Generator (900 hp):
Design rate: (900 hp)((7,000 Btu/hr)/hp)(1 MMBtu/1,000,000 Btu) = 6.3 MMBtu/hr
A= 0.60 lbs PM/MMBtu allowable per Chapter 20,Section 002

Emission factor: 0.0007 lbs/hp-hr
Actuals: (0.0007 lbs/hp-hr)(hp/(7,000 Btu/hr)(1,000,000 Btu/MMBtu) = 0.1 lbs PM/MMBtu

Fire Pump Engine (340 hp):
Design rate: (340 hp)((7,000 Btu/hr)/hp)(1 MMBtu/1,000,000 Btu) = 2.38 MMBtu/hr
A= 0.60 lbs PM/MMBtu allowable per Chapter 20,Section 002
Emission factor: 0.0022 lbs/hp-hr
Actuals: (0.0022 lbs/hp-hr)(hp/(7,000 Btu/hr)(1,000,000 Btu/MMBtu) = 0.31 lbs PM/MMBtu

Sulfur Compounds Emissions (Title 129, Chapter 24)

This facility is in compliance with this regulation because the fuels that combusted at this facility are natural gas, diesel fuel, and methane. The regulation limits sulfur compound emissions from fossil fuel burning to less than 2.5 lbs/MMBtu. The actual emission rates per the application are shown below:

Boilers/DDGS dryers/Thermal oxidizers (same stack)
Boilers: 0.1840 lbs SO_x/hr and 310 MMBtu/hr total design rate
DDGS dryers: 0.1335 lbs SO_x/hr and 225 MMBtu/hr total design rate
Thermal oxidizers: 0.2374 lbs SO_x/hr and 400 MMBtu/hr total design rate

Total SO_x rate: 0.1840 + 0.1335 + 0.2374 = 0.5549 lbs SO_x/hr
Total design rate: 310 + 225 + 400 = 935 MMBtu/hr
(0.5549 lbs SO_x/hr)/(935MMBtu/hr) = 0.00059 lbs/MMBtu SO_x actual

Emergency generator: ((0.000405 lbs/hp-hr)/(7000 Btu/hp-hr))(1,000,000 Btu/MMBtu) = 0.058 lbs/MMBtu SO_x

Fire pump engine: ((0.00205 lbs/hp-hr)/(7000 Btu/hp-hr))(1,000,000 Btu/MMBtu) = 0.29 lbs/MMBtu SO_x

Best Available Control Technology (Title 129, Chapter 27, Section 002)

This facility is subject to Best Available Control Technology (BACT) since potential individual HAP emissions exceed 2.5 tons/year and combined HAP emissions exceed 10 tons/year. BACT equipment and activities include the following:

Process	BACT equipment/activities
Fermentation/Distillation	Scrubbers: 98% control efficiency
DDGS drying	Thermal oxidizers: 98% control efficiency
Storage Tanks	Internal floating roof, Vapor recovery system with flare for fixed roof tanks (except diesel tanks)
Loading of Liquid Product	Submerge filling, Vapor recovery system with flare, Limit usage of non-dedicated transportation tanks.
Biomethanator (waste water treatment)	Flare and/or fuel for DDGS dryer #2
Fuel combustion	Limitation of fuel type for DDGS dryers,

	thermal oxidizers, and boilers; Operational limitation on emergency equipment

The BACT analysis for HAPs is the same for the PSD-BACT for VOC emissions, since the majority of the HAPs are VOC HAPs. The fuel type limitations for fuel combustion in the DDGS dryers, thermal oxidizers, and boilers limit the potential amount of HAPs, because if these units would emit 27 tons/yr of total HAPs when combusting #2 diesel fuel, while they would emit 7.6 tons/yr when combusting natural gas (based on 935 MMBtu/hr total design rate).

The potential uncontrolled emissions for this facility exceed 10 tons/year of individual HAP and 25 tons/year of combined HAPs. Per the September 2002 performance test, this facility emitted more than 29.7 tons/yr of acetaldehyde, 3.1 tons/yr of acrolein, 4.2 tons/yr of methanol, 12.5 tons/yr of formaldehyde, and 49.5 tons/yr of total HAPs. This test data was only for 2 scrubbers (operating at about 93% efficiency per January 2003 test) and 3 dryers (no controls). This facility proposes upgrades and addition of control equipment to the existing equipment in response to the emission exceedances in the September 2002 test and for PSD-BACT. Once the control equipment is in operation, the actual emissions will be less than 10 tons/year of individual HAP and 25 tons/year of combined HAPs for the entire facility. As the new process equipment start-up operation, they must have the applicable control device in operation. When the plant is fully operational and controlled, and the expansion has started operations, the HAP emissions should be about 4.34 tons/yr acetaldehyde, 7.32 tons/yr hexane, and 15.5 tons/yr total HAPs. A facility-wide emission limit is not in the permit at this time, because currently they are over the 10/25 tons/yr thresholds (dryers are uncontrolled) but once the control equipment have started operations they will be below the 10/25 thresholds. The control equipment will have to be in operation by August 2005, per Condition XIII.(O), which is per schedule of construction from Abengoa.

Maximum Achievable Control Technology (Title 129, Chapter 27, Section 003)

This facility is not subject to Maximum Achievable Control Technology (MACT) because the controlled emissions for the new construction/modification are less than 10 tons/year of individual HAP and 25 tons/year of combined HAPs. The control equipment required under BACT (Title 129, Chapter 27, Section 002) will control emissions of HAPs below the MACT levels.

National Emission Standards for Hazardous Air Pollutants (NESHAP, 40 CFR 63)

Subpart F – National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry: This subpart applies to manufacturing facilities which produce a hazardous air pollutant as the primary chemical {§63.100(b)(1)}, and use the chemical as a reactant or manufacture the chemical as a product or co-product {§63.100(b)(2)}, and are located at a plant site that is a major source (≥10 tons/year of individual HAP or ≥ 25 tons/year of combined HAPs). This plant produces ethanol, which contains acetaldehyde and methanol, as well as the HAPs in the denaturant. This facility is not subject to this subpart because the primary product is ethanol (which is not on the HAP list in this subpart).

Subpart G – National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater: This subpart applies to the same manufacturing facilities as Subpart

F, but only for all of the process vents, storage vessels, transfer racks and wastewater streams. Since this plant is not subject to Subpart F, it is also not subject to Subpart G.

Subpart H – National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Equipment Leaks: This subpart applies to the same manufacturing facilities as Subpart F, but only for the following equipment: pumps, compressors, agitators, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, instrumentation systems, and control devices or closed vent systems that are intended in operate in organic hazardous air pollutant service 300 hours or more during the calendar year. Since this plant is not subject to Subpart F, it is also not subject to Subpart H.

Subpart Q – National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers: This subpart applies to industrial process cooling towers that are operated with chromium-based water treatment chemicals and are located at major facilities for HAPs (≥10 tons/year of individual HAP or ≥ 25 tons/year of combined HAPs). This facility is not subject to this subpart because no chromium-based water treatment chemicals were reported to be used for the cooling towers.

Subpart EEEE – National Emission Standards for Hazardous Air Pollutants for Organic Liquids Distribution (non-gasoline): This subpart was proposed April 2, 2002 (Federal Register, Vol. 67, No. 63, pages 15674 to 15706). This subpart has not been promulgated at the time of issuance of this permit. This subpart applies to major HAP facilities (≥10 tons/year of individual HAP or ≥ 25 tons/year of combined HAPs), which have organic liquids distribution. The organic liquids distribution operation must have 7.29 million gallons per year or more either into or out of the operation to be subject to this subpart. Organic liquids are all crude oils other than black oil, and those liquids or liquid mixtures, except gasoline, that contain a total of 5 percent by weight or more of the organic HAP listed in the subpart (including acetaldehyde, methanol, benzene, carbon disulfide, cumene, ethyl benzene, hexane, toluene, xylenes). Fuels used on-site (such as fuels used for fleet refueling) are exempt from this subpart. This facility may be subject to this subpart because the facility is above the major source thresholds. An analysis will need to be conducted on the organic liquid distribution operations and facility-wide HAP emissions to determine if this subpart is applicable, when this subpart is promulgated.

Subpart FFFF – National Emission Standards for Hazardous Air Pollutants for Miscellaneous Organic Chemical Manufacturing: This subpart was promulgated on November 10, 2003 (Federal Register, Vol. 68, No. 217, pages 63852 to 63911). This subpart applies to major HAP facilities (≥10 tons/year of individual HAP or ≥ 25 tons/year of combined HAPs), which own or operate miscellaneous organic chemical manufacturing process units (MCPU). An MCPU includes equipment necessary to operate a miscellaneous organic chemical manufacturing process, as defined in §63.2550 (process includes reaction, recovery, separation, purification, or other activity, operation, manufacture, or treatment which are used to produce a product of isolated intermediate), that produce an organic chemical(s) in the specified SIC (includes SIC 2869), and it processes, uses, or produces HAP. An analysis will need to be conducted on the miscellaneous organic chemical manufacturing units and operations and facility-wide HAP emissions to determine if this subpart is applicable. This facility will need to comply with this NESHAP by November 10, 2006, if it is subject. Many of the MPCUs are also subject to NSPS requirements. NESHAP, Subpart FFFF can be shown compliance for specific MCPU if the MCPU is in compliance with the respective NSPS (i.e. Subparts Kb, VV) per 40 CFR 63.2535.

Permit conditions specific to the proposed permit are discussed as follows:

XIII.(A) This facility is subject to opacity limitation per Title 129, Chapter 20, Section 005.

XIII.(B) This facility is subject to PM Process Weight limitations per Title 129, Chapter 20, Section 001. The emission limits for the grain handling/milling baghouses, thermal oxidizers, and cooling towers will demonstrate compliance with this requirement.

XIII.(C) This facility is subject to the PM limitations on the fuel combustion per Title 129, Chapter 20, Sections 002 & 003. The emission and fuel type limits for the thermal oxidizers, DDGS dryers, boilers, and emergency generators will demonstrate compliance with this requirement.

XIII.(D) This facility is subject to the SO_2 limitation on fuel combustion per Title 129, Chapter 24. The fuel type limits for the thermal oxidizers, DDGS dryers, boilers, and emergency generators will demonstrate compliance with this requirement.

XIII.(E) Conditions for grain handling and milling operations

(1) This condition requires the receiving pits to be partially enclosed and have "choked feed" system per the PSD-BACT. This condition limits the fugitive dust emissions from the receiving of grain. The building provides only a partial enclosure, because the doors of building are allowed to remain open while grain is being dropped into the receiving pits.

(2) Conditions related to the baghouses, including emission limits and stack testing. Baghouse F2 is not required to conduct a new performance test in response to this modification because it has already passed a performance test and it will not be changing operations.

XIII.(F) Conditions for the fermentation and distillation operation

(1) VOC limitation on fermentation and distillation operations (combined for 5 scrubbers). This limit is based on stack test provided by the facility and a 98% control efficiency.

(2) Scrubbers must meet 98% control efficiency to comply with the PSD-BACT and Title 129, Chapter 27, State BACT for HAPs.

(3) Any of the new (or existing) fermentation and distillation equipment, which is installed, cannot be operated without being controlled by a scrubber. For example, if fermentators #5 were installed, it could be used only when it was controlled by a scrubber.

(4) Performance test for scrubbers (Title 129, Chapter 34).

(5) Maintenance/inspection of scrubbers. This condition is to ensure that the equipment is operating correctly and should be operating at the same emission rate and efficiency as it did during the performance test.

(6) The facility needs to develop a range of operating parameters for the scrubbers so that the operators and inspectors can identify if the equipment is operating incorrectly.

(7) The actual operating parameters have to be documented so that an inspector can ensure that the company has been operating the equipment consistently and efficiently.

XIII.(G) Conditions for the DDGS drying operations/thermal oxidizers/boilers

(1) This limits the equipment that is controlled by each thermal oxidizer and identifies that all the DDGS drying operations, thermal oxidizers, and boilers are exhausted through the same stack.

(2) This condition limits the fuel types that are combusted in the dryers, thermal oxidizers and boilers.

(3) Dryers #4 and #5 and their associated equipment, which is installed, cannot be operated without being controlled by a thermal oxidizer. For example, if Dryer #4 were installed, it could be used only when it was controlled by a thermal oxidizer.

(4) The dryers, thermal oxidizers, and boilers are required to have low NO_x burners with flue gas recirculation to comply with PSD-BACT for NO_x.

(5) Emission limits (lbs/hr and lbs/MMBtu) for the thermal oxidizer stack. The NO_x limitation (0.04 lbs/MMBtu) is PSD-BACT. The emission limits for PM, PM_{10}, CO, and VOC include the PSD-BACT control efficiency calculated in the emissions (based on current test data). The CO emission limits are based on both boilers operating at maximum capacity and the thermal oxidizers operating below 100 ppmv and with the current stack air flow rate of the existing dryers. Because of the variability of the emissions from the thermal oxidizers (increase air flow rates, higher initial concentrations than expected, and CO emissions controlled by more than 90% but still over 100 ppmv), the lb/hr limitations will require the facility to emit at or below the rate

(6) that was identified in the construction permit application.

(7) Minimum control efficiency of 98 % for VOC, HAPs, PM, and PM_{10} which is PSD-BACT limitations and Title 129, Chapter 27, State BACT for HAPs. The HAP limitation is the same as VOC limitation because the majority of the HAPs are also VOC. The control efficiency includes the control efficiency of the cooling cyclone and baghouse. For example, the PM/PM_{10} emissions from DDGS dryers #1-3 will be controlled by 98% from the combination of DDGS cooling cyclone/baghouse and thermal oxidizer #1.

(8) Limit CO to 90% control efficiency or 100 ppmv from each of the thermal oxidizers, which is a PSD-BACT limitation.

(9) The boilers are limited to 0.084 lbs/MMBtu CO. This limitation is a PSD-BACT limitation. The facility should be able to meet this limitation with good combustion practices.

(10) Performance test requirements. A specific test method is not identified, because the testing methodology may change by the time both thermal oxidizers and all of the new equipment is operational. This allows the Department to require the most appropriate testing method, which the Department can discuss with Abengoa when (or prior to) the testing protocol submittal.

(11) Operational requirements for the thermal oxidizers. This condition is to ensure that the thermal oxidizer is working consistently and efficiently, and is still operating under the conditions it was tested under (which ensures the emission rates are still accurate).

(12) NSPS, Subpart Db – the thermal oxidizers with heat recovery steam generators and the boilers are subject to Db when the combustion design rate exceeds 100 MMBtu/hr. This equipment is required to have a CEM. Since there is one stack for all four units, then one CEM may be used by the company.

(13) Maintenance and installation of equipment, which is ensure the equipment is working consistently and efficiency.

(14) The facility needs to develop a range of operating parameters so that the operators and inspectors can identify if the equipment is operating incorrectly.

(15) The actual operating parameters have to be documented so that an inspector can ensure that the company has been operating the equipment consistently and efficiently.

(16) Requires performance testing of the WDGS if the facility starts to sell WDGS as a product, to accurately determine the plants emissions. Other ethanol plants have determined there are some emissions of VOC while the WDGS is in a storage pile, but has not been loaded into the trucks or railcars. The VOC emissions are occurring as the outer layer of the stockpile dries.

XIII.(H) Conditions for the Storage tanks

(1) Requires two existing tanks to be permanently disconnected from the process line. Per Abengoa's May 2003 submittal (letter), Tanks T-831 and T-1502 are "Installed, Out-of-Service".

(2) NSPS, Subpart Kb requirements and identifies which tanks apply.

(3) PSD-BACT for the fixed roof storage tanks is a vapor recovery system with a flare. The floating roof tanks are already considered PSD-BACT.

(4) The flare must be operating to control emissions from the storage tanks, therefore documentation must be maintained to demonstrate compliance with control of emissions.

(5) Testing of the composition of the anhydrous ethanol will identify the emissions from the storage tanks, equipment leaks and the loadout racks.

XIII.(I) Conditions for Liquid Product Loadout

(1) Submerged filling limits that amount VOC that volatilizes during loadout. This is a PSD-BACT requirement.

(2) The loadout of denatured ethanol to non-dedicated tankers is limited to 10,000,000 gallons per year. The non-dedication tankers are usually trucks but they may be rail. The condition is a PSD-BACT requirement. The facility expects the majority of their product to be shipped by dedicated railcars.

(3) PSD-BACT is a vapor recovery system with a flare to control the emissions from the truck and rail car loading rack.

XIII.(J) Conditions for Fugitive Emissions

(1) VOC Equipment Leaks, NSPS, Subpart VV. This condition is PSD-BACT.

(2) Fugitive dust from haul roads – off-site transport. Limitations on the haul road are to meet the NAAQS for PM_{10} and for PSD-BACT.

XIII.(K) Conditions for Cooling Towers.

(1) Maintenance/inspection for cooling towers.

(2) Mist eliminator requirement for PSD-BACT.

(3) Total dissolved solids concentration (TDS) limitations for the cooling water. This limitation is for PSD-BACT and NAAQS requirements.

(4) Circulation limitations on the cooling towers, which require the facility to maintain the circulation rates the same as the permit application.

XIII.(L) Conditions for Methanator operation

(1) Describe what units can burn the methane produced in the methanator. The methane must be combusted. This condition is a PSD-BACT requirement.

(2) Proper installation and maintenance is required.

(3) A safety device is required to make sure the methane is combusted and is not vent through a flare that is not operating.

XIII.(M) Conditions for Emergency Equipment

(1) Limitation of operating hours. This limitation is PSD-BACT requirement.

(2) Limit type of fuel used in equipment.

(3) Requires an hour meter to show compliance with Condition XIII.(M)(1).

XIII.(N) NAAQS Conditions

(1) Stack height requirements.

(2) Fencing requirements. The fencing and security plan was submitted November 5, 2003. The requirements are from the facility's fencing and security plan. The fence should already be in place. This condition is required because the facility claimed the fence line in defining ambient air during the NAAQS modeling.

(3) Remodeling may be required if testing or configuration of the facility is different than application and permit.

XIII.(O) This condition is to specify a schedule for completion of addition or upgrade of control equipment for existing process equipment. This condition is to ensure the modifications are installed in a timely matter on the existing equipment to meet PSD requirements.

XIII.(P) This condition is to specify production limitations on the existing equipment. The production limitations are in place until the control equipment of the specified process equipment has been installed/modified and is operational.

XIII.(Q) Stack testing requirements per Title 129, Chapter 34. The test methods are not specified, because a few of the tests for some of the emission units may be changed in the future. The facility must submit a protocol for the testing. If there is a change is testing procedures, the NDEQ will notified the facility at the time the protocol is submitted and reviewed.

XIII.(R) Any non-compliance issues shall be reported to the Department within 15 days per Title 129, Chapter 35.

XIII.(S) Conditions for Monitoring and Recordkeeping and Reporting Requirements.

STATUTORY OR REGULATORY PROVISIONS ON WHICH PERMIT REQUIREMENTS ARE BASED:

Applicable regulations: Title 129 - Nebraska Air Quality Regulations as amended November 24, 2003.

PROCEDURES FOR FINAL DETERMINATION WITH RESPECT TO THE PROPOSED CONSTRUCTION PERMIT:

The public notice, as required under NAQR Chapter 14, shall be published on November 29, 2003. Persons or groups shall have 30 days from that issuance of public notice (December 29, 2003) to provide the NDEQ with any written comments concerning the proposed permit action and/or to request a public hearing, in accordance with NAQR Chapter 14. If a public hearing is granted by the Director, there will be a notice of that meeting published at least 30 days prior to the hearing. Persons having comments or requesting a public hearing may contact:

W. Clark Smith-Permitting Section Supervisor
Air Quality Division
Nebraska Department of Environmental Quality
PO Box 98922
Lincoln, Nebraska 68509-8922

If no public hearing is requested, the permit may be granted at the close of the 30-day comment period. If a public hearing is requested, the Director of the NDEQ may choose to extend the date on which the permit is to be granted until after that public hearing has been held. During the 30-day comment period, persons requiring further information should contact:

Stephenie Moyer
Air Quality Division-Permitting Section
Nebraska Department of Environmental Quality
PO Box 98922
Lincoln, Nebraska 68509-8922

Telephone inquiries may be made at:

(402) 471-2189

TDD users please call 711 and ask the relay operator to call us at (402) 471-2186.

January 21, 2004

RE: NOTICE OF DECISION
Abengoa Bioenergy Corporation
1414 County Rd O
York, NE 68467-8236
(NDEQ Facility # 59094)

To Whom It May Concern:

The Department has considered all comments received and has made a final decision to modify and issue the Construction Permit for the above referenced facility. This Permit approves the modification of the existing ethanol facility to include Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) and the expansion of the facility to accommodate a Research and Development (R&D) pilot plant and increase anhydrous ethanol production. This Permit is in accordance with regulations contained in Title 129 - Air Quality Regulations.

The decision regarding issuance of this Construction Permit may be appealed under Neb. Rev. Stat. 81-1509. This appeal shall be done in accordance with the Administrative Procedure Act, Neb. Rev. Stat. Section 84-901 to 84-920 and Title 115 - Rules of Practice and Procedure.

In preparing this summary, the Department reviewed all comments made during the public comment period from November 29, 2003 to December 29, 2003 and listed all comments in the attached Responsiveness Summary. The Responsiveness Summary consists of four sections:

Comment #: The comment is summarized.

Response and Rationale: Department's response to the comment raised and the rationale.

Changes: Any changes to the Permit and/or Fact Sheet are addressed.

Applicable Regulations/Statutes: This is a listing of regulations/statutes pertinent to the comment.

The Department appreciates the time and the conscientious efforts of all that have commented. If you have any questions, please contact Stephenie Moyer or me at (402) 471-2189.

Sincerely,

Shelley Kaderly, Air Administrator
Air Quality Division

Enclosure

RESPONSE TO PUBLIC COMMENTS SUMMARY
On the Issuance of a PSD Construction Permit for
Abengoa Bioenergy Corporation in York (Facility #59094)

Background Information:

Abengoa Bioenergy Corporation submitted a PSD Construction Permit application on April 1, 2003**.** The corrections were submitted June 2003. This permit approves the modification of the existing ethanol facility to include Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) in response to a December 2002 Notice of Violation and the expansion of the facility. The expansion of the facility includes a Research and Development (R&D) pilot plant, and new equipment and modification of some of the existing equipment to increase anhydrous ethanol production from 50,000,000 to 100,000,000.

Two comment letters were received during the public notice period. The first letter was from the Environmental Protection Agency, Region VII, signed by Donald Toensing, Chief of the Air Permitting and Compliance Branch, which was received on December 24, 2003. The second letter was from Abengoa Bioenergy Corporation, signed by Brian Pasbrig, Operations Manager at the York Facility, which was received on December 29, 2003. The following are NDEQ's responses to the comments received during the public comment period:

COMMENT #1:

EPA Comment #1: "Since the permit requires controls on existing equipment it specifies when the controls must be installed and operational by in Condition XIII.(O). Our concern is that Abengoa may be able to increase their production over their current permit limits of:

- 50 million gallons/year of anhydrous ethanol;
- 52.5 million gallons/year of denatured ethanol;
- 560,000 tons/year of grain receiving; and
- 115,000 tons/year of dried distillers grain with solubles (DDGS)

using their existing equipment before the controls required by the permit are installed. Besides the dates in the draft permit, we recommend the permit require Abengoa to install the controls before increasing their production."

RESPONSE AND RATIONALE:

The facility has requested the production of the anhydrous ethanol should be increased to 58 million gallons/year, per a January 6, 2004 meeting with NDEQ. This increase is due to the facility is currently producing 52 to 53 million gallons of anhydrous ethanol. After discussions between EPA, NDEQ, and Abengoa, it was determined to allow an increase in production to 54 million gallons/year. This value was determined because it allows less than a 40 tons/year increase in VOC emissions due to increase in production to 54 million gallons/yr, based on current emission rates (except assuming a 90% control efficiency of the fermentation/distillation scrubbers), increase in the amount of denatured used (5% of denatured ethanol), and no change in other equipment or throughput of the solids (grain, DDGS, WDGS).

The throughput limitation for the denatured ethanol will not be added to the permit because the throughput will be limited by the amount of anhydrous ethanol produced.

The throughput limitation for the grain receiving will not be limited because the baghouses for the existing grain receiving pits are already in compliance with the requirements of this permit and the amount of anhydrous ethanol increase is due mainly to the increase in production efficiency (gallons per bushel).

The production limitation for DDGS was added to the permit. The facility had accepted this limitation. The DDGS dryers were the units with the high emissions that were uncontrolled. The facility will be able to increase production rates after the thermal oxidizer has been installed.

CHANGES:

The following changes were made:

- In the permit, a condition (now Condition XIII.(P)) was added with the production limitations for the anhydrous ethanol and DDGS;
- In the permit, a condition (now Condition XIII.(S)(20)) was added to require recordkeeping to demonstrate compliance with Condition XIII.(P);
- In the permit, subsequent conditions were renumbered as appropriate;
- In the fact sheet, a condition (now Condition XIII.(P)) was added to page 26 and the subsequent conditions were renumbered as appropriate.

APPLICABLE REGULATIONS:

Title 129, Chapter 19

COMMENT #2:

EPA's Comment #2: "Based on the information provided in the Fact Sheet, we support your Best Available Control Technology (BACT) decision on the DDGS Dryers for volatile organic compounds and particulate matter."

RESPONSE AND RATIONALE:

No response required.

CHANGES:

No change required.

APPLICABLE REGULATIONS:

Title 129, Chapter 19

COMMENT #3:

EPA's Comment #3: "There is a minor typo in Condition XIII.(F)(7). It appears that "basis" has been omitted from the end of the last sentence."

RESPONSE AND RATIONALE:

Agreed with EPA's comment.

RESPONSE TO PUBLIC COMMENTS SUMMARY
On the Issuance of a PSD Construction Permit for
Abengoa Bioenergy Corporation in York (Facility #59094)

CHANGES:

Added "basis" to the end of Condition XIII.(F)(7). Added language to fact sheet (on page 44) about Conditions XIII.(F)(6) & (7).

APPLICABLE REGULATIONS:

Title 129, Chapters 19 and 27.

COMMENT #4:

Abengoa's Comment #1: "On page 1 "The R&D pilot plant grain handling and milling facility" is mentioned. It should be Grain handling, Milling and partial biomass conversion facility. Page 1 also mentions 80,000 bushel storage bin for R&D pilot plant. It should be 2000 bushels."

RESPONSE AND RATIONALE:

The name change from "DOE pilot plant" to "R&D pilot plant" more accurately describes the future use of the pilot plant. "Grain handling, milling and partial biomass conversion facility" is not used because it could describe the whole ethanol plant instead of only the smaller research pilot plant. Typographical changes only for the storage bin storage size. The April 2003 application for this permit stated that the bin had an 80,000-bushel storage capacity.

CHANGES:

In the permit and fact sheet, "DOE pilot plant" was changed to "R&D pilot plant" and references for the R&D pilot plant's storage bin (Bin #7) was changed from "80,000-bushel" to "2,000-bushel" storage capacity.

APPLICABLE REGULATIONS:

Title 129, Chapters 17 and 19

COMMENT #5:

Abengoa's Comment #2: "Condition XIII.(E)(2)(e) – There are a few small typographical errors on this condition: "F19" should be changed to "F9".

RESPONSE AND RATIONALE:

Typographical change only.

CHANGES:

Corrected Condition XIII.(E)(2)(e) by changing "F19" to "F9".

RESPONSE TO PUBLIC COMMENTS SUMMARY
On the Issuance of a PSD Construction Permit for
Abengoa Bioenergy Corporation in York (Facility #59094)

APPLICABLE REGULATIONS:

Title 129, Chapter 19

COMMENT #6:

Abengoa's Comment #3: "Condition XIII.(F)(2) – This is a redundant condition and we request that it be removed. 98% control efficiency is used in all of the fact sheet calculations which are reflected in Condition XIII.(F)(1) already which can remain as written. Abengoa agrees to the requirement in Condition XIII.(F)((4) that states that initial tests will completed to determine control efficiency, but the actual compliance should be limited to Condition XIII.(F)(1)."

RESPONSE AND RATIONALE:

Condition XIII.(F)(2) is the PSD-BACT limitation for VOC emissions and the BACT limitation (per Title 129, Chapter 27) for the HAP emissions for each scrubber controlling the fermentation and distillation operations. Therefore, Condition XIII.(F)(2) cannot be removed. Neither of the two tests (September 2002 and January 2003) on the two existing scrubbers included both uncontrolled and controlled emission results, therefore actual control efficiency could not be determined. The lbs/hr limitation in Condition XIII.(F)(1) provide an upper emission rate limit for a combination of all five scrubbers.

CHANGES:

No change required.

APPLICABLE REGULATIONS:

Title 129, Chapters 19 and 27

COMMENT #7:

Abengoa's Comment #4: "Condition XIII.(G)(5)(a) & (b) – The Fact Sheet is based on 98% reduction from the uncontrolled emissions. We believe the thermal oxidizer is not a PM/PM10 control device based on the following a) the condition needs to be consistent with the rest of the ethanol industry. b). The requirement needs to match with the language in the consent decree and c). None of the vendors has guaranteed the PM/PM10 destruction. However, some PM control is reflected in the fact that the oxidizer also controls VOCs, which are believed to be a significant contributor to the condensable fraction of the PM-10 emissions. However, even if the VOC removal at the oxidizer is 98%, the overall PM/PM-10 removal would be less than 98% because not all PM/PM-10 is part of the condensable fraction. We suggest that hourly lb/hr emissions limit be the enforceable factor for all emissions and PM/PM-10 is recomputed. Also the allowable PM and PM-10 lb/hr values do not match data presented in the Fact Sheet."

RESPONSE AND RATIONALE:

The PM/PM_{10} emissions from the dryers are controlled in a combination of cooling cyclone/baghouse and thermal oxidizer. The thermal oxidizer by itself will not control 98% of the PM/PM_{10} emissions from the

dryers. The cooling cyclone/baghouse will remove the larger particulate load, which will be sold as DDGS, while the thermal oxidizer will remove the remaining particulate matter in the air stream (including condesables). The VOC and HAP emissions are not expected to be controlled by the DDGS cooling cyclone/baghouse.

CHANGES:

Condition XIII.(G)(5)(b) was modified in the permit and fact sheet to include the language about the cooling cyclone/baghouse.

APPLICABLE REGULATIONS:

Title 129, Chapters 19 and 27

COMMENT #8:

Abengoa's Comment #5: "Condition XIII.(G)(5)(d) – The hourly CO emission limit needs to be consistent with the proposed BACT limit. The CO limit appears to be derived based on 90% emissions control, whereas the BACT limit is 90% control or to a level of 100 ppmdv. In this case, the 100 ppmdv limit is applicable, because the uncontrolled emissions level is approximately 373.39 ppmdv and less than 90% control is required to achieve the desired outlet concentration level (100ppmdv). We suggest the hourly lb/hr value for CO should be based on the 100 ppmdv outlet concentration and not 90% control.

RESPONSE AND RATIONALE:

The fact sheet should have calculated the lb/hr rates based on both the 90% control efficiency and 100 ppmdv. The fact sheet was corrected to show calculations for both controlled emission rates for CO. The highest controlled emission rate was used to determine the lbs/hr emission limitation and the annual emission rate. The requirement to maintain at least 90% control efficiency or shall not exceed 100 ppmv for CO in outlet concentration doesn't mean the company has to achieve both limitations, only to meet one of the limitations. This PSD-BACT determination was based on the fact that it would be difficult to achieve 90% control efficiency for concentrations less than 100 ppmv of CO, and it would difficult to control more than 90% CO from the thermal oxidizer, even with the final concentration greater than 100 ppmv. The overall emissions from the stack will be limited by the lbs/hr limit per Condition XIII.(G)(5)(d), which is based on both boilers operating at maximum capacity and the thermal oxidizers operating below 100 ppmv and with the current stack air flow rate of the existing dryers.

CHANGES:

Calculations for both controlled emission rates for CO were added to the fact sheet. Also in the fact sheet, the annual and hourly emission rates for CO was updated in Tables G-1 and G-4, and in facility wide tables on page 29. Condition XIII.(G)(5)(d) – hourly CO emission limit (lbs/hr) was updated in the permit.

APPLICABLE REGULATIONS:

Title 129, Chapter 19

COMMENT #9:

Abengoa's Comment #6: "Conditions XIII.(F)(5)(d) and (e) – The lists of operating parameters do not match in these two conditions. We suggest that condition (e) be changed to match condition (d). We suggest the following for condition (e): ….(including, but not limited to, fresh water circulation rate, pH, and temperature)…."

RESPONSE AND RATIONALE:

The public notice version of the permit has Condition XIII.(F)(5)(d) and (e) as Conditions XIII.(F)(6) and (7). The listing of operating parameters is a reasonable request.

CHANGES:

Corrected Conditions XIII.(F)(6) and (7) to show the parameters listed above.

APPLICABLE REGULATIONS:

Title 129, Chapter 19 and 27

COMMENT #10:

Abengoa's Comment #7: "Condition XIII.(F)(5)(e) – This condition requires that Abengoa maintain certain data related to the performance of the scrubbers, but does not specify the use of the data for permit compliance purposes. For example, if the measured value for any parameter is outside of the operating range specified under (d) of this Condition, the permit should specify what corrective measures are needed and an appropriate timeline for implementation of such measures. It is recommended that the permit allow Abengoa sufficient time to implement corrective measures to bring equipment operation back into the appropriate operating range prior to the excursion being deemed a permit violation. Such an approach is also consistent with EPA recommendations on parametric monitoring for Title V operating permit sources such as Abengoa/York. It is suggested that this time limit be set as at least 5 days in case the malfunction is traced to a part not in stock that must be ordered from off-site."

RESPONSE AND RATIONALE:

A timeline is not listed in the permit because the time to fix a malfunction depends on the type of malfunction and if the part (if required) is readily available or has to be ordered. The NDEQ expects the malfunction to fixed immediately if the part is on site or can be adjusted easily. If the malfunction can't be fixed immediately (i.e. if a part has to be ordered), then the NDEQ expects the facility to order the part immediately and make corrections as soon as possible. It is expected that spare parts will be on site for the parts of the equipment that fail or need replacement more frequently (i.e. seals, valves).

CHANGES:

No change required.

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Abengoa Bioenergy Corporation in York (Facility #59094)

APPLICABLE REGULATIONS:

Title 129, Chapter 19 and 27

COMMENT #11:

Abengoa's Comment #8: Condition XIII.(G)(8) – CO emissions at the stack is already limited on a lb/hr basis and a separate lb/MMBtu limit for the boiler contribution to these emissions appears to be unnecessary. The permit requires CO testing at the stack, which will measure the combined emissions from the oxidizer and boiler, but will not provide separate boiler emissions data. Since there will be no testing or other monitoring specific to this emissions limit, this condition becomes redundant."

RESPONSE AND RATIONALE:

The boilers have a lb/MMBtu limitation for CO because that is the PSD-BACT determination for the boilers. The boilers have already been tested and are in compliance with this rate. Testing will not be required for the boilers due to this modification. The lbs/hr emission rate provides an overall emission rate limitation for this stack, which includes emissions from the DDGS dryers and TO/HRSGs. The lbs/hr emission rate is based on the PSD-BACT limitations for each piece of equipment that is vented through this stack. The facility should be able to meet the lbs/hr limitation for CO because it is expected that one of the boilers will become backup as soon as one of the TO/HRSGs is operational. The boilers contribute the highest proportion to the CO lb/hr limitation (25.76 lbs/hr from boilers, 40.91 lbs/hr from stack).

CHANGES:

No change required.

APPLICABLE REGULATIONS:

Title 129, Chapter 19

COMMENT #12:

Abengoa's Comment #9: "Condition XIII.(G)(9) – A typographical error should be corrected in that DDGS dryer #3 is not a new unit subject to emissions testing."

RESPONSE AND RATIONALE:

Agreed with Abengoa's comment.

CHANGES:

Removed "#3" from the listing of new DDGS dryers in Condition XIII.(G)(9).

APPLICABLE REGULATIONS:

Title 129, Chapters 19 and 34

COMMENT #13:

Abengoa's Comment #10: "Condition XIII.(G)(14) - This condition requires that Abengoa maintain certain data related to the performance of the oxidizers, but does not specify the use of the data for permit compliance purposes. For example, if the measured value for any parameter is outside of the operating range specified under (13) of this Condition, the permit should specify what corrective measures are needed and an appropriate timeline for implementation of such measures. It is recommended that the permit allow Abengoa sufficient time to implement corrective measures to bring equipment operation back into the appropriate operating range prior to the excursion being deemed a permit violation. Such an approach is also consistent with EPA recommendations on parametric monitoring for Title V operating permit sources such as Abengoa/York. It is recommended that this time limit be set as at least 5 days in case the malfunction is traced to a part not in stock that must be ordered from off-site."

RESPONSE AND RATIONALE:

Same as Comment #10 above.

CHANGES:

No change required.

APPLICABLE REGULATIONS:

Title 129, Chapters 19 and 27

COMMENT #14:

Abengoa's Comment #11: "Condition XIII.(G)(15) – We are unaware of any available test method to satisfy this condition. We request that the NDEQ provide appropriate testing methods."

RESPONSE AND RATIONALE:

The testing is a material balance test to determine VOC and HAPs emissions from the WDGS storage piles due to evaporation. NDEQ will send Abengoa testing methods proposed by other ethanol plants. Abengoa may propose additional testing methodology. The testing methods proposed may be from other standard testing methods, such as NIOSH or ASTM.

CHANGES:

No change.

APPLICABLE REGULATIONS:

Title 129, Chapter 34

COMMENT #15:

Abengoa's Comment #12: "Condition XIII.(J)(2) – Under paragraph (c), Abengoa will prepare a fugitive dust control plan, but at the same time, the permit specifies the control measures in the plan. Abengoa should be able to implement any feasible measure or combination of measures that meets the overall emission control requirements, with or without use of road sweeping."

RESPONSE AND RATIONALE:

The facility will have to submit the fugitive dust control plan. The permit will allow flexibility in the fugitive dust control activities, with the removal of the specific road sweeping condition. It is expected that road sweeping will be part of the current plan, but the facility will the option to change control activities in the future due to new technologies, chemicals, or activities which may be developed in the future. The specific control activities in the plan may be incorporated in the operating permit for this facility.

CHANGES:

Condition XIII.(J)(2)(c), removed "The dust control activities shall include, but not limited to, road sweeping."

APPLICABLE REGULATIONS:

Title 129, Chapters 4 and 19

COMMENT #16:

Abengoa's Comment #13: "Condition XIII.(O) – Under paragraph (2), it is suggested that the "John Z" be deleted as it is a specific manufacturer. Finally, it is recommended that a paragraph (5) be added establishing a timeline for implementation of the fugitive dust control measures."

RESPONSE AND RATIONALE:

The specific model of flare is not necessary. After discussion between the NDEQ and Abengoa on January 6, 2004, it was determined that the fugitive dust controls shall be implemented within 180 days after issuance of this permit. The facility should already have most, if not all, fugitive dust controls already in operation due to previous permits.

CHANGES:

In Condition XIII.(O)(2), removed "John Z" from condition. A condition was added under Condition XIII.(J)(2) stating the implementation has to be within 180 days of issuance of permit.

APPLICABLE REGULATIONS:

Title 129, Chapter 19

COMMENT #17:

Abengoa's Comment #14: "Condition XIII.(P)(6) – It is recommended that this condition be changed to read: "the permittee may be required by NDEQ to retest the emissions unit." This would allow NDEQ flexibility in requiring new tests when the situation warrants. There may be circumstances where additional testing for minor changes in operating conditions is not needed."

RESPONSE AND RATIONALE:

This condition was removed from the permit prior to public notice. The NDEQ may require new testing per Title 129, Chapter 34, even it is not specified in the permit.

CHANGES:

None.

APPLICABLE REGULATIONS:

Title 129, Chapter 34

COMMENT #18:

Abengoa's Comment #15: "Condition XIII.(S)(11): We propose documenting the quarterly silt load testing should qualify for the types of fugitive dust control records that are required. Daily records are requested. That will turn into tremendous data collection task."

RESPONSE AND RATIONALE:

The correct condition in question is Conditions XIII.(S)(9) and (10). The daily records are to demonstrate compliance with Condition XIII.(J)(2)(a) which has a daily PM_{10} limitation. Since the silt loading is tested on a quarterly basis, the NDEQ requires Abengoa to document what controls are used to limit daily emissions, including road sweeping and watering.

CHANGES:

No change.

APPLICABLE REGULATIONS:

Title 129, Chapter 4

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Questions regarding this summary may be directed to:

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