



Mitchell E. Daniels, Jr.
Governor

Thomas W. Easterly
Commissioner

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
(800) 451-6027
www.IN.gov/idem

TO: Interested Parties / Applicant

DATE: April 27, 2007

RE: El Paso Production Company-Fore Production Facility / 083-24341-00048

FROM: Nisha Sizemore
Chief, Permits Branch
Office of Air Quality

Notice of Decision – Approval

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the enclosed matter. Pursuant to 326 IAC 2, this approval was effective immediately upon submittal of the application.

If you wish to challenge this decision, IC 4-21.5-3-7 requires that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, 100 North Senate Avenue, Government Center North, Room 1049, Indianapolis, IN 46204, **within eighteen (18) calendar days from the mailing of this notice**. The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

- (1) the date the document is delivered to the Office of Environmental Adjudication (OEA);
- (2) the date of the postmark on the envelope containing the document, if the document is mailed to OEA by U.S. mail; or
- (3) The date on which the document is deposited with a private carrier, as shown by receipt issued by the carrier, if the document is sent to the OEA by private carrier.

The petition must include facts demonstrating that you are either the applicant, a person aggrieved or adversely affected by the decision or otherwise entitled to review by law. Please identify the permit, decision, or other order for which you seek review by permit number, name of the applicant, location, date of this notice and all of the following:

- (1) the name and address of the person making the request;
- (2) the interest of the person making the request;
- (3) identification of any persons represented by the person making the request;
- (4) the reasons, with particularity, for the request;
- (5) the issues, with particularity, proposed for considerations at any hearing; and
- (6) identification of the terms and conditions which, in the judgment of the person making the request, would be appropriate in the case in question to satisfy the requirements of the law governing documents of the type issued by the Commissioner.

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178. Callers from within Indiana may call toll-free at 1-800-451-6027, ext. 3-0178.

Enclosures
FNPER-AM.dot 03/23/06



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We make Indiana a cleaner, healthier place to live.

Mitchell E. Daniels, Jr.

Governor

Thomas W. Easterly

Commissioner

100 North Senate Avenue
MC 61-53 IGCN 12003
Indianapolis, Indiana 46204-
2251

(317) 232-8603

(800) 451-6027

www.IN.gov/idem

Mr. Craig Bock
El Paso Production Company –
Fore Production Facility
1001 Louisiana Street
Houston, TX 77002-5089

April 27, 2007

Re: Exempt Construction and Operation Status,
083-24341-00048

Dear Mr. Bock:

The application from the El Paso Production Company – Fore Production Facility, received on February 21, 2007, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-1.1-3, it has been determined that the following natural gas processing plant, located at 1.0 Mile Northeast of Bicknell, off Highway 67, Bicknell, Indiana is classified as exempt from air pollution permit requirements:

- (a) One (1) Glycol Dehydration Process, constructed in 2005, and consisting of the following:
 - (1) One (1) Glycol Dehydration Unit Still, with a maximum capacity of 8.0 MMscf of natural gas per day. Emissions are exhausted through vent V-1.
 - (2) One (1) natural gas-fired reboiler, identified as H-1, with a maximum heat input capacity of 1.25 MMBtu/hour.
- (b) One (1) Amine Process, constructed in 2005, and consisting of the following:
 - (1) One (1) Amine Unit Still, with a maximum capacity of 8.0 MMscf of natural gas per day. Emissions are exhausted through vent V-2.
 - (2) One (1) natural gas-fired reboiler, identified as H-2, with a maximum heat input capacity of 3.6 MMBtu/hour.

The following conditions shall be applicable:

- (1) Pursuant to 326 IAC 5-1-2 (Opacity Limitations) except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following:
 - (a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
 - (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.
- (2) The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions).
- (3) Pursuant to 326 IAC 6-2-4 (Particulate Matter Emission Limitations for Sources of Indirect Heating), the PM emissions from reboilers H-1 and H-2 shall be each limited to 0.6 pounds per

- MMBtu heat input.
- (4) New Source Performance Standards for Onshore Natural Gas Processing: SO₂ Emissions [40 CFR 60.640-60.648, Subpart LLL] [326 IAC 12-1].

Pursuant to 40 CFR 60, Subpart LLL, the Permittee shall comply with the provisions of 40 CFR 60, Subpart LLL, which are incorporated by reference as 326 IAC 12 for the Amine Unit Still as specified below.

Subpart LLL—Standards of Performance for Onshore Natural Gas Processing: SO₂Emissions

Source: 50 FR 40160, Oct. 1, 1985, unless otherwise noted.

§ 60.640 Applicability and designation of affected facilities.

- (a) The provisions of this subpart are applicable to the following affected facilities that process natural gas: each sweetening unit, and each sweetening unit followed by a sulfur recovery unit.
- (b) Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H₂S) in the acid gas (expressed as sulfur) are required to comply with §60.647(c) but are not required to comply with §§60.642 through 60.646.
- (c) The provisions of this subpart are applicable to facilities located on land and include facilities located onshore which process natural gas produced from either onshore or offshore wells.
- (d) The provisions of this subpart apply to each affected facility identified in paragraph (a) of this section which commences construction or modification after January 20, 1984.

§ 60.641 Definitions.

All terms used in this subpart not defined below are given the meaning in the Act and in subpart A of this part.

Acid gas means a gas stream of hydrogen sulfide (H₂S) and carbon dioxide (CO₂) that has been separated from sour natural gas by a sweetening unit.

Natural gas means a naturally occurring mixture of hydrocarbon and nonhydrocarbon gases found in geologic formations beneath the earth's surface. The principal hydrocarbon constituent is methane.

Onshore means all facilities except those that are located in the territorial seas or on the outercontinental shelf.

Reduced sulfur compounds means H₂S, carbonyl sulfide (COS), and carbon disulfide (CS₂).

Sulfur production rate means the rate of liquid sulfur accumulation from the sulfur recovery unit.

Sulfur recovery unit means a process device that recovers element sulfur from acid gas.

Sweetening unit means a process device that separates the H₂S and CO₂ contents from the sour natural gas stream.

Total SO₂ equivalents means the sum of volumetric or mass concentrations of the sulfur compounds obtained by adding the quantity existing as SO₂ to the quantity of SO₂ that would be obtained if all reduced sulfur compounds were converted to SO₂ (ppmv or kg/dscm (lb/dscf)).

E The sulfur emission rate expressed as elemental sulfur, kilograms per hour (kg/hr) [pounds per hour (lb/hr)], rounded to one decimal place.

R The sulfur emission reduction efficiency achieved in percent, carried to one decimal place.

S The sulfur production rate, kilograms per hour (kg/hr) [pounds per hour (lb/hr)], rounded to one decimal place.

X The sulfur feed rate from the sweetening unit (i.e., the H₂S in the acid gas), expressed as sulfur, Mg/D(LT/D), rounded to one decimal place.

Y The sulfur content of the acid gas from the sweetening unit, expressed as mole percent H₂S (dry basis) rounded to one decimal place.

The minimum required sulfur dioxide (SO₂) emission reduction efficiency, expressed as percent carried to one decimal place. Z_i refers to the reduction efficiency required at the initial performance test. Z_c refers to the reduction efficiency required on a continuous basis after compliance with Z_i has been demonstrated.

[50 FR 40160, Oct. 1, 1985, as amended at 65 FR 61773, Oct. 17, 2000]

§ 60.647 Recordkeeping and reporting requirements.

(c) To certify that a facility is exempt from the control requirements of these standards, each owner or operator of a facility with a design capacity less than 2 LT/D of H₂S in the acid gas (expressed as sulfur) shall keep, for the life of the facility, an analysis demonstrating that the facility's design capacity is less than 2 LT/D of H₂S expressed as sulfur.

- (5) National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities [40 CFR 63.760-63.779] [IAC 20-30]

Pursuant to 40 CFR 63, Subpart HH, the Permittee shall comply with the provisions of 40 CFR 63, Subpart HH, which are incorporated by reference as 326 IAC 20-30 for the Glycol Dehydration Unit Still as specified below.

Subpart HH—National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities

Source: 64 FR 32628, June 17, 1999, unless otherwise noted.

§ 63.760 Applicability and designation of affected source.

(a) This subpart applies to the owners and operators of the emission points, specified in paragraph (b) of this section that are located at oil and natural gas production facilities that meet the specified criteria in paragraphs (a)(1) and either (a)(2) or (a)(3) of this section.

(1) Facilities that are major or area sources of hazardous air pollutants (HAP) as defined in §63.761. Emissions for major source determination purposes can be estimated using the maximum natural gas or hydrocarbon liquid throughput, as appropriate, calculated in paragraphs (a)(1)(i) through (iii) of this section. As an alternative to calculating the maximum natural gas or hydrocarbon liquid throughput, the owner or operator of a new or existing source may use the facility's design maximum natural gas or hydrocarbon liquid throughput to estimate the maximum potential emissions. Other means to determine the facility's major source status are allowed, provided the information is documented and recorded to the Administrator's satisfaction. A facility that is determined to be an area source, but subsequently increases its emissions or its potential to emit above the major source levels (without first obtaining and complying with other limitations that keep its potential to emit HAP below major source levels), and becomes a major source, must comply thereafter with all provisions of this subpart applicable to a major source starting on the applicable compliance date specified in paragraph (f) of this section. Nothing in this paragraph is intended to preclude a source from limiting its potential to emit through other appropriate mechanisms that may be available through the permitting authority.

(3) Facilities that process, upgrade, or store natural gas prior to the point at which natural gas enters the natural gas transmission and storage source category or is delivered to a final end user. For the purposes of this subpart, natural gas enters the natural gas transmission and storage source category after the natural gas processing plant, when present. If no natural gas processing plant is present, natural gas enters the natural gas transmission and storage source category after the point of custody transfer.

(b) The affected sources for major sources are listed in paragraph (b)(1) of this section and for area sources in paragraph (b)(2) of this section.

(2) For area sources, the affected source includes each triethylene glycol (TEG) dehydration unit located at a facility that meets the criteria specified in paragraph (a) of this section.

(f) The owner or operator of an affected major source shall achieve compliance with the provisions of this subpart by the dates specified in paragraphs (f)(1) and (f)(2) of this section. The owner or operator of an affected area source shall achieve compliance with the provisions of this subpart by the dates specified in paragraphs (f)(3) through (f)(6) of this section.

(3) The owner or operator of an affected area source, located in an Urban-1 county, as defined in §63.761, the construction or reconstruction of which commences before February 6, 1998, shall achieve compliance with the provisions of this subpart no later than the dates specified in paragraphs (f)(3)(i) or (ii) of this section, except as provided for in §63.6(i).

(i) If the affected area source is located within any UA plus offset and UC boundary, as defined in §63.761, the compliance date is January 4, 2010.

(ii) If the affected area source is not located within any UA plus offset and UC boundary, as defined in §63.761, the compliance date is January 5, 2009.

(4) The owner or operator of an affected area source, located in an Urban-1 county, as defined in §63.761, the construction or reconstruction of which commences on or after February 6, 1998, shall achieve compliance with the provisions of this subpart immediately upon initial startup or January 3, 2007, whichever date is later.

(5) The owner or operator of an affected area source that is not located in an Urban-1 county, as defined in §63.761, the construction or reconstruction of which commences before July 8, 2005, shall achieve compliance with the provisions of this subpart no later than the dates specified in paragraphs (f)(5)(i) or (ii) of this section, except as provided for in §3.6(i).

(i) If the affected area source is located within any UA plus offset and UC boundary, as defined in §63.761, the compliance date is January 4, 2010.

(ii) If the affected area source is not located within any UA plus offset and UC boundary, as defined in §63.761, the compliance date is January 5, 2009.

(6) The owner or operator of an affected area source that is not located in an Urban-1 county, as defined in §63.761, the construction or reconstruction of which commences on or after July 8, 2005, shall achieve compliance with the provisions of this subpart immediately upon initial startup or January 3, 2007, whichever date is later.

(h) An owner or operator of an affected source that is a major source or is located at a major source and is subject to the provisions of this subpart is also subject to 40 CFR part 70 or part 71 operating permit requirements. Unless otherwise required by law, the owner or operator of an area source subject to the provisions of this subpart is exempt from the permitting requirements established by 40 CFR part 70 or 40 CFR part 71.

[64 FR 32628, June 17, 1999, as amended at 66 FR 34550, June 29, 2001; 72 FR 36, Jan. 3, 2007]

§ 63.761 Definitions.

All terms used in this subpart shall have the meaning given them in the Clean Air Act (Act), subpart A of this part (General Provisions), and in this section. If the same term is defined in subpart A and in this section, it shall have the meaning given in this section for purposes of this subpart.

Alaskan North Slope means the approximately 180,000 square kilometer area (69,000 square mile area) extending from the Brooks Range to the Arctic Ocean.

Ancillary equipment means any of the following pieces of equipment: pumps, pressure relief devices, sampling connection systems, open-ended valves, or lines, valves, flanges, or other connectors.

API gravity means the weight per unit volume of hydrocarbon liquids as measured by a system recommended by the American Petroleum Institute (API) and is expressed in degrees.

Associated equipment, as used in this subpart and as referred to in section 112(n)(4) of the Act, means equipment associated with an oil or natural gas exploration or production well, and includes all equipment from the wellbore to the point of custody transfer, except glycol dehydration units and storage vessels with the potential for flash emissions.

Black oil means hydrocarbon (petroleum) liquid with an initial producing gas-to-oil ratio (GOR) less than 0.31 cubic meters per liter and an API gravity less than 40 degrees.

Boiler means an enclosed device using controlled flame combustion and having the primary purpose of recovering and exporting thermal energy in the form of steam or hot water. Boiler also means any industrial furnace as defined in 40 CFR 260.10.

Closed-vent system means a system that is not open to the atmosphere and is composed of piping, ductwork, connections, and if necessary, flow inducing devices that transport gas or vapor from an emission point to one or more control devices. If gas or vapor from regulated equipment is routed to a process (e.g., to a fuel gas system), the conveyance system shall not be considered a closed-vent system and is not subject to closed-vent system standards.

Combustion device means an individual unit of equipment, such as a flare, incinerator, process heater, or boiler, used for the combustion of organic HAP emissions.

Condensate means hydrocarbon liquid separated from natural gas that condenses due to changes in the temperature, pressure, or both, and remains liquid at standard conditions, as specified in §63.2.

Continuous recorder means a data recording device that either records an instantaneous data value at least once every hour or records hourly or more frequent block average values.

Control device means any equipment used for recovering or oxidizing HAP or volatile organic compound (VOC) vapors. Such equipment includes, but is not limited to, absorbers, carbon adsorbers, condensers, incinerators, flares, boilers, and process heaters. For the purposes of this subpart, if gas or vapor from regulated equipment is used, reused (i.e., injected into the flame zone of an enclosed combustion device), returned back to the process, or sold, then the recovery system used, including piping, connections, and flow inducing devices, is not considered to be a control device or closed-vent system.

Cover means a device which is placed on top of or over a material such that the entire surface area of the material is enclosed and sealed. A cover may have openings (such as access hatches, sampling ports, and gauge wells) if those openings are necessary for operation, inspection, maintenance, or repair of the unit on which the cover is installed, provided that each opening is closed and sealed when the opening is not in use. In addition, a cover may have one or more safety devices. Examples of a cover include, but are not limited to, a fixed-roof installed on a tank, an external floating roof installed on a tank, and a lid installed on a drum or other container.

Custody transfer means the transfer of hydrocarbon liquids or natural gas: after processing and/or treatment in the producing operations, or from storage vessels or automatic transfer facilities or other such equipment, including product loading racks, to pipelines or any other forms of transportation. For the purposes of this subpart, the point at which such liquids or natural gas enters a natural gas processing plant is a point of custody transfer.

Equipment leaks means emissions of HAP from ancillary equipment (as defined in this section) and compressors.

Facility means any grouping of equipment where hydrocarbon liquids are processed, upgraded (i.e., remove impurities or other constituents to meet contract specifications), or stored prior to the point of custody transfer; or where natural gas is processed, upgraded, or stored prior to entering the natural gas transmission and storage source category. For the purpose of a major source determination, facility (including a building, structure, or installation) means oil and natural gas production and processing equipment that is located within the boundaries of an individual surface site as defined in this section. Equipment that is part of a facility will typically be located within close proximity to other equipment located at the same facility. Pieces of production equipment or groupings of equipment located on different oil and gas leases, mineral fee tracts, lease tracts, subsurface or surface unit areas, surface fee tracts, surface lease tracts, or separate surface sites, whether or not connected by a road, waterway, power line or pipeline, shall not be considered part of the same facility. Examples of facilities in the oil and natural gas production source category include, but are not limited to, well sites, satellite tank batteries, central tank batteries, a compressor station that transports natural gas to a natural gas processing plant, and natural gas processing plants.

Field natural gas means natural gas extracted from a production well prior to entering the first stage of processing, such as dehydration.

Fixed-roof means a cover that is mounted on a storage vessel in a stationary manner and that does not move with fluctuations in liquid level.

Flame zone means the portion of the combustion chamber in a combustion device occupied by the flame envelope.

Flash tank. See the definition for gas-condensate-glycol (GCG) separator.

Flow indicator means a device which indicates whether gas flow is present in a line or whether the valve position would allow gas flow to be present in a line.

Gas-condensate-glycol (GCG) separator means a two- or three-phase separator through which the “rich” glycol stream of a glycol dehydration unit is passed to remove entrained gas and hydrocarbon liquid. The GCG separator is commonly referred to as a flash separator or flash tank.

Gas-to-oil ratio (GOR) means the number of standard cubic meters of gas produced per liter of crude oil or other hydrocarbon liquid.

Glycol dehydration unit means a device in which a liquid glycol (including, but not limited to, ethylene glycol, diethylene glycol, or triethylene glycol) absorbent directly contacts a natural gas stream and absorbs water in a contact tower or absorption column (absorber). The glycol contacts and absorbs water vapor and other gas stream constituents from the natural gas and becomes “rich” glycol. This glycol is then regenerated in the glycol dehydration unit reboiler. The “lean” glycol is then recycled.

Glycol dehydration unit baseline operations means operations representative of the glycol dehydration unit operations as of June 17, 1999. For the purposes of this subpart, for determining the percentage of overall HAP emission reduction attributable to process modifications, baseline operations shall be parameter values (including, but not limited to, glycol circulation rate or glycol-HAP absorbency) that represent actual long-term conditions (i.e., at least 1 year). Glycol dehydration units in operation for less than 1 year shall document that the parameter values represent

expected long-term operating conditions had process modifications not been made.

Glycol dehydration unit process vent means the glycol dehydration unit reboiler vent and the vent from the GCG separator (flash tank), if present.

Glycol dehydration unit reboiler vent means the vent through which exhaust from the reboiler of a glycol dehydration unit passes from the reboiler to the atmosphere or to a control device.

Hazardous air pollutants or *HAP* means the chemical compounds listed in section 112(b) of the Clean Air Act. All chemical compounds listed in section 112(b) of the Act need to be considered when making a major source determination. Only the HAP compounds listed in Table 1 of this subpart need to be considered when determining compliance.

Hydrocarbon liquid means any naturally occurring, unrefined petroleum liquid.

In VHAP service means that a piece of ancillary equipment or compressor either contains or contacts a fluid (liquid or gas) which has a total volatile HAP (VHAP) concentration equal to or greater than 10 percent by weight as determined according to the provisions of §63.772(a).

In wet gas service means that a piece of equipment contains or contacts the field gas before the extraction of natural gas liquids.

Incinerator means an enclosed combustion device that is used for destroying organic compounds. Auxiliary fuel may be used to heat waste gas to combustion temperatures. Any energy recovery section is not physically formed into one manufactured or assembled unit with the combustion section; rather, the energy recovery section is a separate section following the combustion section and the two are joined by ducts or connections carrying flue gas. The above energy recovery section limitation does not apply to an energy recovery section used solely to preheat the incoming vent stream or combustion air.

Initial producing GOR means the producing standard cubic meters of gas per liter at the time that the reservoir pressure is above the bubble point pressure (or dewpoint pressure for a gas).

Initial startup means the first time a new or reconstructed source begins production. For the purposes of this subpart, initial startup does not include subsequent startups (as defined in this section) of equipment, for example, following malfunctions or shutdowns.

Major source, as used in this subpart, shall have the same meaning as in §63.2, except that:

- (1) Emissions from any oil or gas exploration or production well (with its associated equipment, as defined in this section), and emissions from any pipeline compressor station or pump station shall not be aggregated with emissions from other similar units to determine whether such emission points or stations are major sources, even when emission points are in a contiguous area or under common control;
- (2) Emissions from processes, operations, or equipment that are not part of the same facility, as defined in this section, shall not be aggregated; and
- (3) For facilities that are production field facilities, only HAP emissions from glycol dehydration units and storage vessels with the potential for flash emissions shall be aggregated for a major source determination. For facilities that are not production field facilities, HAP emissions from all HAP emission units shall be aggregated for a major source determination.

Natural gas means a naturally occurring mixture of hydrocarbon and nonhydrocarbon gases found in geologic formations beneath the earth's surface. The principal hydrocarbon constituent is methane.

Natural gas liquids (NGL) means the liquid hydrocarbons, such as ethane, propane, butane, pentane, natural gasoline, and condensate that are extracted from field natural gas.

Natural gas processing plant (gas plant) means any processing site engaged in the extraction of natural gas liquids from field gas, or the fractionation of mixed NGL to natural gas products, or a combination of both.

No detectable emissions means no escape of HAP from a device or system to the atmosphere as determined by:

- (1) Instrument monitoring results in accordance with the requirements of §63.772(c); and
- (2) The absence of visible openings or defects in the device or system, such as rips, tears, or gaps.

Operating parameter value means a minimum or maximum value established for a control device or process parameter which, if achieved by itself or in combination with one or more other operating parameter values, indicates that an owner or operator has complied with an applicable operating parameter limitation, over the appropriate

averaging period as specified in §63.772(f) or (g).

Operating permit means a permit required by 40 CFR part 70 or part 71.

Organic monitoring device means an instrument used to indicate the concentration level of organic compounds exiting a control device based on a detection principle such as infra-red, photoionization, or thermal conductivity.

Primary fuel means the fuel that provides the principal heat input (i.e., more than 50 percent) to the device. To be considered primary, the fuel must be able to sustain operation without the addition of other fuels.

Process heater means an enclosed device using a controlled flame, the primary purpose of which is to transfer heat to a process fluid or process material that is not a fluid, or to a heat transfer material for use in a process (rather than for steam generation).

Produced water means water that is extracted from the earth from an oil or natural gas production well, or that is separated from crude oil, condensate, or natural gas after extraction.

Production field facilities means those facilities located prior to the point of custody transfer.

Production well means any hole drilled in the earth from which crude oil, condensate, or field natural gas is extracted.

Reciprocating compressor means a piece of equipment that increases the pressure of a process gas by positive displacement, employing linear movement of the drive shaft.

Safety device means a device that meets both of the following conditions: it is not used for planned or routine venting of liquids, gases, or fumes from the unit or equipment on which the device is installed; and it remains in a closed, sealed position at all times except when an unplanned event requires that the device open for the purpose of preventing physical damage or permanent deformation of the unit or equipment on which the device is installed in accordance with good engineering and safety practices for handling flammable, combustible, explosive, or other hazardous materials. Examples of unplanned events which may require a safety device to open include failure of an essential equipment component or a sudden power outage.

Shutdown means for purposes including, but not limited to, periodic maintenance, replacement of equipment, or repair, the cessation of operation of a glycol dehydration unit, or other affected source under this subpart, or equipment required or used solely to comply with this subpart.

Startup means the setting into operation of a glycol dehydration unit, or other affected equipment under this subpart, or equipment required or used to comply with this subpart. Startup includes initial startup and operation solely for the purpose of testing equipment.

Storage vessel means a tank or other vessel that is designed to contain an accumulation of crude oil, condensate, intermediate hydrocarbon liquids, or produced water and that is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic) that provide structural support.

Storage vessel with the potential for flash emissions means any storage vessel that contains a hydrocarbon liquid with a stock tank GOR equal to or greater than 0.31 cubic meters per liter and an API gravity equal to or greater than 40 degrees and an actual annual average hydrocarbon liquid throughput equal to or greater than 79,500 liters per day. Flash emissions occur when dissolved hydrocarbons in the fluid evolve from solution when the fluid pressure is reduced.

Surface site means any combination of one or more graded pad sites, gravel pad sites, foundations, platforms, or the immediate physical location upon which equipment is physically affixed.

Tank battery means a collection of equipment used to separate, treat, store, and transfer crude oil, condensate, natural gas, and produced water. A tank battery typically receives crude oil, condensate, natural gas, or some combination of these extracted products from several production wells for accumulation and separation prior to transmission to a natural gas plant or petroleum refinery. A tank battery may or may not include a glycol dehydration unit.

Temperature monitoring device means an instrument used to monitor temperature and having a minimum accuracy of ± 2 percent of the temperature being monitored expressed in $^{\circ}\text{C}$, or ± 2.5 $^{\circ}\text{C}$, whichever is greater. The temperature monitoring device may measure temperature in degrees Fahrenheit or degrees Celsius, or both.

Total organic compounds or *TOC*, as used in this subpart, means those compounds which can be measured according to the procedures of Method 18, 40 CFR part 60, appendix A.

UA plus offset and UC is defined as the area occupied by each urbanized area, each urban cluster that contains at least 10,000 people, and the area located two miles or less from each urbanized area boundary.

Urban-1 County is defined as a county that contains a part of a Metropolitan Statistical Area with a population greater than 250,000, based on the Office of Management and Budget's *Standards for defining Metropolitan and Micropolitan Statistical Areas* (December 27, 2000), and Census 2000 Data released by the U.S. Census Bureau.

Urbanized area refers to Census 2000 Urbanized Area, which is defined in the *Urban Area Criteria for Census 2000* (March 15, 2002). Essentially, an urbanized area consists of densely settled territory with a population of at least 50,000 people.

Urban cluster refers to a Census 2000 Urban Cluster, which is defined in the *Urban Area Criteria for Census 2000* (March 15, 2002). Essentially, an urban cluster consists of densely settled territory with at least 2,500 people but fewer than 50,000 people.

Volatile hazardous air pollutant concentration or *VHAP concentration* means the fraction by weight of all HAP contained in a material as determined in accordance with procedures specified in §63.772(a).

[64 FR 32628, June 17, 1999, as amended at 66 FR 34551, June 29, 2001; 72 FR 37, Jan. 3, 2007]

§ 63.762 Startups, shutdowns, and malfunctions.

(a) The provisions set forth in this subpart shall apply at all times except during startups or shutdowns, during malfunctions, and during periods of non-operation of the affected sources (or specific portion thereof) resulting in cessation of the emissions to which this subpart applies. However, during the startup, shutdown, malfunction, or period of non-operation of one portion of an affected source, all emission points which can comply with the specific provisions to which they are subject must do so during the startup, shutdown, malfunction, or period of non-operation.

(c) During startups, shutdowns, and malfunctions when the requirements of this subpart do not apply pursuant to paragraphs (a) and (b) of this section, the owner or operator shall implement, to the extent reasonably available, measures to prevent or minimize excess emissions to the maximum extent practical. For purposes of this paragraph, the term "excess emissions" means emissions in excess of those that would have occurred if there were no startup, shutdown, or malfunction, and the owner or operator complied with the relevant provisions of this subpart. The measures to be taken shall be identified in the applicable startup, shutdown, and malfunction plan, and may include, but are not limited to, air pollution control technologies, recovery technologies, work practices, pollution prevention, monitoring, and/or changes in the manner of operation of the source. Back-up control devices are not required, but may be used if available.

(e) Owners or operators are not required to prepare a startup, shutdown, and malfunction plan for any facility where all of the affected sources meet the exemption criteria specified in §63.764(e), or for any facility that is not located within a UA plus offset and UC boundary.

[64 FR 32628, June 17, 1999, as amended at 66 FR 34551, June 29, 2001; 72 FR 38, Jan. 3, 2007]

(e) *Exemptions.* (1) The owner or operator is exempt from the requirements of paragraph (c)(1) and (d) of this section if the criteria listed in paragraph (e)(1)(i) or (ii) of this section are met, except that the records of the determination of these criteria must be maintained as required in §63.774(d)(1).

(ii) The actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram per year, as determined by the procedures specified in §63.772(b)(2) of this subpart.

[64 FR 32628, June 17, 1999, as amended at 66 FR 34551, June 29, 2001; 72 FR 38, Jan. 3, 2007]

§ 63.772 Test methods, compliance procedures, and compliance demonstrations.

(b) *Determination of glycol dehydration unit flowrate or benzene emissions.* The procedures of this paragraph shall be used by an owner or operator to determine glycol dehydration unit natural gas flowrate or benzene emissions to meet the criteria for an exemption from control requirements under §63.764(e)(1).

(2) The determination of actual average benzene emissions from a glycol dehydration unit shall be made using the procedures of either paragraph (b)(2)(i) or (b)(2)(ii) of this section. Emissions shall be determined either uncontrolled, or with federally enforceable controls in place.

(i) The owner or operator shall determine actual average benzene emissions using the model GRI-GLYCalc™, Version 3.0 or higher, and the procedures presented in the associated GRI-GLYCalc™ Technical Reference Manual. Inputs to the model shall be representative of actual operating conditions of the glycol dehydration unit and may be determined using the procedures documented in the Gas Research Institute (GRI) report entitled "Atmospheric Rich/Lean Method for Determining Glycol Dehydrator Emissions" (GRI-95/0368.1); or

(ii) The owner or operator shall determine an average mass rate of benzene emissions in kilograms per hour through direct measurement using the methods in §63.772(a)(1)(i) or (ii), or an alternative method according to §63.7(f).

Annual emissions in kilograms per year shall be determined by multiplying the mass rate by the number of hours the unit is operated per year. This result shall be converted to megagrams per year.

§ 63.774 Recordkeeping requirements.

(a) The recordkeeping provisions of 40 CFR part 63, subpart A, that apply and those that do not apply to owners and operators of sources subject to this subpart are listed in Table 2 of this subpart.

(d)(1) An owner or operator of a glycol dehydration unit that meets the exemption criteria in §63.764(e)(1)(i) or §63.764(e)(1)(ii) shall maintain the records specified in paragraph (d)(1)(i) or paragraph (d)(1)(ii) of this section, as appropriate, for that glycol dehydration unit.

(ii) The actual average benzene emissions (in terms of benzene emissions per year) as determined in accordance with §63.772(b)(2).

[64 FR 32628, June 17, 1999, as amended at 66 FR 34554, June 29, 2001; 72 FR 39, Jan. 3, 2007]

§ 63.775 Reporting requirements.

(a) The reporting provisions of subpart A of this part, that apply and those that do not apply to owners and operators of sources subject to this subpart are listed in Table 2 of this subpart.

(8) An owner or operator of a TEG dehydration unit located at an area source that meets the criteria in §63.764(e)(1)(i) or §63.764(e)(1)(ii) is exempt from the reporting requirements for area sources in paragraphs (c)(1) through (7) of this section, for that unit.

§ 63.776 Implementation and enforcement.

(a) This subpart can be implemented and enforced by the U.S. EPA, or a delegated authority such as the applicable State, local, or Tribal agency. If the U.S. EPA Administrator has delegated authority to a State, local, or Tribal agency, then that agency, in addition to the U.S. EPA, has the authority to implement and enforce this subpart. Contact the applicable U.S. EPA Regional Office to find out if this subpart is delegated to a State, local, or Tribal agency.

(b) In delegating implementation and enforcement authority of this subpart to a State, local, or Tribal agency under subpart E of this part, the authorities contained in paragraph (c) of this section are retained by the Administrator of U.S. EPA and cannot be transferred to the State, local, or Tribal agency.

(c) The authorities that cannot be delegated to State, local, or Tribal agencies are as specified in paragraphs (c)(1) through (4) of this section.

(1) Approval of alternatives to the requirements in §§63.760, 63.764 through 63.766, 63.769, 63.771, and 63.777.

(2) Approval of major alternatives to test methods under §63.7(e)(2)(ii) and (f), as defined in §63.90, and as required in this subpart.

(3) Approval of major alternatives to monitoring under §63.8(f), as defined in §63.90, and as required in this subpart.

(4) Approval of major alternatives to recordkeeping and reporting under §63.10(f), as defined in §63.90, and as required in this subpart.

Table 2 to Subpart HH of Part 63.—Applicability of 40 CFR Part 63 General Provisions to Subpart HH

General provisions reference	Applicable to subpart HH	Explanation
§63.1(a)(1)	Yes.	
§63.1(a)(2)	Yes.	
§63.1(a)(3)	Yes.	
§63.1(a)(4)	Yes.	
§63.1(a)(5)	No	Section reserved.
§63.1(a)(6)	Yes.	

§63.1(a)(7) through (a)(9)	No	Section reserved.
§63.1(a)(10)	Yes.	
§63.1(a)(11)	Yes.	
§63.1(a)(12)	Yes.	
§63.1(b)(1)	No	Subpart HH specifies applicability.
§63.1(b)(2)	No	Section reserved.
§63.1(b)(3)	Yes.	
§63.1(c)(1)	No	Subpart HH specifies applicability.
§63.1(c)(2)	Yes.	Subpart HH exempts area sources from the requirement to obtain a title V permit unless otherwise required by law as specified in §63.760(h).
§63.1(c)(3) and (c)(4)	No	Section reserved.
§63.1(c)(5)	Yes.	
§63.1(d)	No	Section reserved.
§63.1(e)	Yes.	
§63.2	Yes.	Except definition of major source is unique for this source category and there are additional definitions in subpart HH.
§63.3(a) through (c)	Yes.	
§63.4(a)(1) through (a)(2)	Yes.	
§63.4(a)(3) through (a)(5)	No	Section reserved.
§63.4(b)	Yes.	
§63.4(c)	Yes.	
§63.5(a)(1)	Yes.	
§63.5(a)(2)	Yes.	
§63.5(b)(1)	Yes.	
§63.5(b)(2)	No	Section reserved.
§63.5(b)(3)	Yes.	
§63.5(b)(4)	Yes.	
§63.5(b)(5)	No	Section Reserved.
§63.5(b)(6)	Yes.	
§63.5(c)	No	Section reserved.
§63.5(d)(1)	Yes.	

§63.5(d)(2)	Yes.	
§63.5(d)(3)	Yes.	
§63.5(d)(4)	Yes.	
§63.5(e)	Yes.	
§63.5(f)(1)	Yes.	
§63.5(f)(2)	Yes.	
§63.6(a)	Yes.	
§63.6(b)(1)	Yes.	
§63.6(b)(2)	Yes.	
§63.6(b)(3)	Yes.	
§63.6(b)(4)	Yes.	
§63.6(b)(5)	Yes.	
§63.6(b)(6)	No	Section reserved.
§63.6(b)(7)	Yes.	
§63.6(c)(1)	Yes.	
§63.6(c)(2)	Yes.	
§63.6(c)(3) through (c)(4)	No	Section reserved.
§63.6(c)(5)	Yes.	
§63.6(d)	No	Section reserved.
§63.6(e)	Yes.	
§63.6(e)(1)(i)	No	Except as otherwise specified. Addressed in §63.762.
§63.6(e)(1)(ii)	Yes.	
§63.6(e)(1)(iii)	Yes.	
§63.6(e)(2)	No	Section reserved.
§63.6(e)(3)(i)	Yes.	Sources exempt under §63.764(e) and sources located outside UA plus offset and UC boundaries are not required to develop startup, shutdown, and malfunction plans as stated in §63.762(e).
§63.6(e)(3)(i)(A)	No	Except as otherwise specified. Addressed in §63.762(c).
§63.6(e)(3)(i)(B)	Yes.	
§63.6(e)(3)(i)(C)	Yes.	
§63.6(e)(3)(ii)	No	Section reserved.
§63.6(e)(3)(iii) through (3)(vi)	Yes.	

§63.6(e)(3)(vii)	Yes.	
§63.6(e)(3)(vii) (A)	Yes.	
§63.6(e)(3)(vii) (B)	Yes	Except that the plan must provide for operation in compliance with §63.762(c).
§63.6(e)(3)(viii) through (ix)	Yes.	
§63.6(f)(1)	Yes.	
§63.6(f)(2)	Yes.	
§63.6(f)(3)	Yes.	
§63.6(g)	Yes.	
§63.6(h)	No	Subpart HH does not contain opacity or visible emission standards.
§63.6(i)(1) through (i)(14)	Yes.	
§63.6(i)(15)	No	Section reserved.
§63.6(i)(16)	Yes.	
§63.6(j)	Yes.	
§63.7(a)(1)	Yes.	
§63.7(a)(2)	Yes	But the performance test results must be submitted within 180 days after the compliance date.
§63.7(a)(3)	Yes.	
§63.7(b)	Yes.	
§63.7(c)	Yes.	
§63.7(d)	Yes.	
§63.7(e)(1)	Yes.	
§63.7(e)(2)	Yes.	
§63.7(e)(3)	Yes.	
§63.7(e)(4)	Yes.	
§63.7(f)	Yes.	
§63.7(g)	Yes.	
§63.7(h)	Yes.	
§63.8(a)(1)	Yes.	
§63.8(a)(2)	Yes.	
§63.8(a)(3)	No	Section reserved.
§63.8(a)(4)	Yes.	

§63.8(b)(1)	Yes.	
§63.8(b)(2)	Yes.	
§63.8(b)(3)	Yes.	
§63.8(c)(1)	Yes.	
§63.8(c)(2)	Yes.	
§63.8(c)(3)	Yes.	
§63.8(c)(4)	Yes.	
§63.8(c)(4)(i)	No	Subpart HH does not require continuous opacity monitors.
§63.8(c)(4)(ii)	Yes.	
§63.8(c)(5) through (c)(8)	Yes.	
§63.8(d)	Yes.	
§63.8(e)	Yes	Subpart HH does not specifically require continuous emissions monitor performance evaluation, however, the Administrator can request that one be conducted.
§63.8(f)(1) through (f)(5)	Yes.	
§63.8(f)(6)	Yes.	
§63.8(g)	No	Subpart HH specifies continuous monitoring system data reduction requirements.
§63.9(a)	Yes.	
§63.9(b)(1)	Yes.	
§63.9(b)(2)	Yes	Existing sources are given 1 year (rather than 120 days) to submit this notification. Major and area sources that meet §63.764(e) do not have to submit initial notifications.
§63.9(b)(3)	No	Section reserved.
§63.9(b)(4)	Yes.	
§63.9(b)(5)	Yes.	
§63.9(c)	Yes.	
§63.9(d)	Yes.	
§63.9(e)	Yes.	
§63.9(f)	No	Subpart HH does not have opacity or visible emission standards.
§63.9(g)(1)	Yes.	
§63.9(g)(2)	No	Subpart HH does not have opacity or visible emission standards.
§63.9(g)(3)	Yes.	
§63.9(h)(1) through	Yes	Area sources located outside UA plus offset and UC boundaries are

(h)(3)		not required to submit notifications of compliance status.
§63.9(h)(4)	No	Section reserved.
§63.9(h)(5) through (h)(6)	Yes.	
§63.9(i)	Yes.	
§63.9(j)	Yes.	
§63.10(a)	Yes.	
§63.10(b)(1)	Yes.	§63.774(b)(1) requires sources to maintain the most recent 12 months of data on site and allows offsite storage for the remaining 4 years of data.
§63.10(b)(2)	Yes.	
§63.10(b)(3)	Yes	§63.774(b)(1) requires sources to maintain the most recent 12 months of data on site and allows offsite storage for the remaining 4 years of data.
§63.10(c)(1)	Yes.	
§63.10(c)(2) through (c)(4)	No	Sections reserved.
§63.10(c)(5) through (c)(8)	Yes.	
§63.10(c)(9)	No	Section reserved.
§63.10(c)(10) through(c)(15)	Yes.	
§63.10(d)(1)	Yes.	
§63.10(d)(2)	Yes	Area sources located outside UA plus offset and UC boundaries do not have to submit performance test reports.
§63.10(d)(3)	Yes.	
§63.10(d)(4)	Yes.	
§63.10(d)(5)(i)	Yes	Subpart HH requires major sources to submit a startup, shutdown, and malfunction report semi-annually. Area sources located within UA plus offset and UC boundaries are required to submit startup, shutdown, and malfunction reports annually. Area sources located outside UA plus offset and UC boundaries are not required to submit startup, shutdown, and malfunction reports.
§63.10(e)(1)	Yes	Area sources located outside UA plus offset and UC boundaries are not required to submit reports.
§63.10(e)(2)	Yes	Area sources located outside UA plus offset and UC boundaries are not required to submit reports.
§63.10(e)(3)(i)	Yes	Subpart HH requires major sources to submit Periodic Reports semi-annually. Area sources are required to submit Periodic Reports annually. Area sources located outside UA plus offset and UC boundaries are not required to submit reports.

		boundaries are not required to submit reports.
§63.10(e)(3)(i)(A)	Yes.	
§63.10(e)(3)(i)(B)	Yes.	
§63.10(e)(3)(i)(C)	No	Section reserved.
§63.10(e)(3)(ii) through (viii)	Yes.	
§63.10(f)	Yes.	
§63.11(a) and (b)	Yes.	
§63.12(a) through (c)	Yes.	
§63.13(a) through (c)	Yes.	
§63.14(a) and (b)	Yes.	
§63.15(a) and (b)	Yes	
§63.16	Yes.	

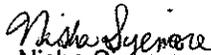
[64 FR 32628, June 17, 1999, as amended at 66 FR 34554, June 29, 2001; 71 FR 20457, Apr. 20, 2006; 72 FR 40, Jan. 3, 2007]

This existing source was issued a FESOP 083-21565-00048 on November 23, 2005. However, due to the removal of the 889 horsepower natural gas compressor, this source now qualifies for an exemption. IDEM, OAQ will revoke F083-21565-00048 upon issuance of this exemption.

An application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Quality (OAQ) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.

Pursuant to Contract No. A305-5-65, IDEM, OAQ has assigned the processing of this application to Eastern Research Group, Inc., (ERG). Therefore, questions should be directed to Amanda Baynham, ERG, 1600 Perimeter Park Drive, Morrisville, North Carolina 27560, or call (919) 386-1024 to speak directly to Ms. Baynham. Questions may also be directed to Duane Van Laningham at IDEM, OAQ, 100 North Senate Avenue, Indianapolis, Indiana, 46204-2251, or call (800) 451-6027, and ask for Duane Van Laningham or extension 3-6878, or dial (317) 233-6878.

Sincerely,


 Nisha Sizemore, Chief
 Permits Branch
 Office of Air Quality

ERG/AAB

cc: File - Knox County
 Knox County Health Department
 Northern Regional Office
 Air Compliance Section Inspector – Derrick Ohning
 Compliance Data Section
 Program Planning and Policy – Scott Delaney
 Billing, Licensing, and Training Section – Dan Stamatkin

**Indiana Department of Environmental Management
Office of Air Quality**

Technical Support Document (TSD) for an Exemption

Source Background and Description

Source Name:	El Paso Production Company – Fore Production Facility
Source Location:	1.0 Mile Northeast of Bicknell off Highway 67, Bicknell, Indiana 47512
County:	Knox
SIC Code:	1311
Exemption No.:	083-24341-00048
Permit Reviewer:	ERG/AAB

The Office of Air Quality (OAQ) has reviewed an application from the El Paso Production Company relating to the operation of a natural gas drying plant.

This source was issued a FESOP on February 23, 2005 and originally consisted of a 889 horsepower natural gas-fired compressor; a glycol dehydration process with 1.25 MMBtu/hour natural gas-fired boiler; and an amine process with a 3.6 MMBtu/hour natural gas-fired boiler. On February 21, 2007, El Paso Production Company (El Paso) submitted an application stating that the 889 hp compressor has been removed from this source. El Paso requested the FESOP be revoked and an exemption issued for this source.

Permitted Emission Units and Pollution Control Equipment

The source consists of the following permitted emission units and pollution control devices:

- (a) One (1) Glycol Dehydration Process, constructed in 2005, and consisting of the following:
 - (1) One (1) Glycol Dehydration Unit Still, with a maximum capacity of 8.0 MMscf of natural gas per day. Emissions are exhausted through vent V-1.
 - (2) One (1) natural gas-fired reboiler, identified as H-1, with a maximum heat input capacity of 1.25 MMBtu/hour.

- (b) One (1) Amine Process, constructed in 2005, and consisting of the following:
 - (1) One (1) Amine Unit Still, with a maximum capacity of 8.0 MMscf of natural gas per day. Emissions are exhausted through vent V-2.
 - (2) One (1) natural gas-fired reboiler, identified as H-2, with a maximum heat input capacity of 3.6 MMBtu/hour.

Unpermitted Emission Units and Pollution Control Equipment

There are no unpermitted emission units operating at this source during this review process.

Existing Approvals

The source has been operating under previous approvals including, but not limited to, the following:

- (a) FESOP 083-21565-00028, issued November 23, 2005; and
- (b) Minor Permit Revision 083-22718-00048, issued April 12, 2006.

All conditions from previous approvals were incorporated into the exemption letter except the following:

Condition D.1.1 – Carbon Monoxide and Nitrogen Oxides FESOP Limits [326 IAC 2-8].

- (a) CO emissions from the outlet of the NSCR-1 controlling the natural gas-fired compressor engine shall not exceed 22.19 pounds per hour.
- (b) NOx emissions from the outlet of the NSCR-1 controlling the natural gas-fired compressor shall not exceed 22.12 pounds per hour.

Compliance with these conditions is necessary to limit both CO and NOx emissions for the entire source to less than 100 tons per year. This renders the requirements of 326 IAC 2-7 (Part 70 Permit Program) not applicable.

Reason Not Incorporated: The 889HP Compressor has been removed from this source.

Enforcement Issue

There are no enforcement actions pending.

Recommendation

The staff recommends to the Commissioner that the operation be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

A complete application for the purposes of this review was received on February 21, 2007, with additional information received on March 28, 2007.

Emission Calculations

See Appendix A of this document for detailed emission calculations (Appendix A, pages 1 through 4).

Potential to Emit of the Source Before Controls

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U.S. EPA, the department, or the appropriate local air pollution control agency.”

Pollutant	Potential to Emit (tons/yr)
PM	1.37
PM-10	0.54
SO ₂	0.01
VOC	4.24
CO	1.78
NO _x	2.12
H ₂ S	4.59

HAPs	Potential to Emit (tons/yr)
Hexane	0.51
Other HAPs	Negligible
Total	0.51

- (a) The potential to emit (as defined in 326 IAC 2-1.1-1(16)) of all criteria pollutants is less than the levels listed in 326 IAC 2-1.103(e)(1). Therefore, the source is not subject to the provisions of 326 IAC 2-1.1-3. An exemption will be issued.
- (b) The potential to emit (as defined in 326 IAC 2-1.1-1(16)) of any single HAP is less than ten (10) tons per year and the potential to emit (as defined in 326 IAC 2-1.1-1(16)) of a combination of HAPs is less than twenty-five (25) tons per year. Therefore, the source is not subject to the provisions of 326 IAC 2-7.

County Attainment Status

The source is located in Knox County.

Pollutant	Status
PM-10	Attainment
PM 2.5	Attainment
SO ₂	Attainment
NO ₂	Attainment
8-hour Ozone	Attainment
CO	Attainment
Lead	Attainment

Note: Effective October 25, 2006, 326 IAC 1-4-1 has been revised revoking the one hour ozone standard in Indiana.

- (a) Knox County has been classified as attainment for PM2.5. U.S. EPA has not yet established the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 for PM 2.5 emissions. Therefore, until the U.S.EPA adopts specific provisions for PSD review for PM2.5 emissions, it has directed states to regulate PM10 emissions as surrogate for PM2.5 emissions.
- (b) Volatile organic compounds (VOC) and Nitrogen Oxides (NOx) are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for ozone. Therefore, VOC and NOx emissions are considered when evaluating the rule applicability relating to the ozone standards. Knox County has been designated as nonattainment for the 8-hour ozone standard. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for nonattainment new source review.

- (c) Knox County has been classified as attainment or unclassifiable in Indiana for PM₁₀, SO₂, NO₂, CO and Lead pollutant. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2. See the State Rule Applicability for the source section.
- (d) Fugitive Emissions
Since this type of operation is not one of the 28 listed source categories under 326 IAC 2-2 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD applicability.

Source Status

Existing Source PSD and Emission Offset Definition (emissions after controls, based on 8760 hours of operation per year at rated capacity and/or as otherwise limited):

Pollutant	Emissions (tons/yr)
PM	1.37
PM-10	0.54
SO ₂	0.01
VOC	4.24
CO	1.78
NO _x	2.12
H ₂ S	4.59
Single HAP	0.51
Combination HAPs	0.51

- (a) This existing source is not a major stationary source under PSD because no attainment regulated pollutant is emitted at a rate of 250 tons per year or greater and it is not in one of the 28 listed source categories.
- (b) These emissions were based on the calculations provided in Appendix A.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This existing source no longer subject to the Part 70 Permit requirements because the potential to emit (PTE) of:

- (a) each criteria pollutant is less than 100 tons per year,
- (b) a single hazardous air pollutant (HAP) is less than 10 tons per year, and
- (c) any combination of HAPs is less than 25 tons per year.

This status is based on the calculations provided in Appendix A.

Federal Rule Applicability

- (a) The New Source Performance Standards (NSPS) 40 CFR 60, Subparts D, Db, and Dc (326 IAC 12) are not included in this exemption because the boilers H-1 and H-2 have heat input capacities less than the applicability thresholds for these regulations.
- (b) The requirements of the New Source Performance Standard, 40 CFR 60, Subpart KKK - New Source Performance Standard for Equipment Leaks of VOC from Onshore Natural

Gas Processing Plants (326 IAC 12) are not included in this exemption. This NSPS applies only to emission units located at "natural gas processing plants", which are defined in the rule as "...any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products or both." No extraction or fractionation of natural gas liquids occurs at this location.

- (c) The requirements of the New Source Performance Standards for Onshore Natural Gas Processing: SO₂ Emissions (40 CFR 60.640-60.648, Subpart LLL) are applicable to this modification. This NSPS applies to facilities (called sweetening units) that separate H₂S and CO₂ from sour natural gas streams. Pursuant to 40 CFR 60.640(b), this source is exempt from the control requirements of this rule. Pursuant to 40 CFR 60.647(c), the Permittee shall keep, for the life of the facility, an analysis demonstrating that the facility's design capacity is less than 2 long tons per day (LT/D) of H₂S.

The Amine Unit Still is subject to the following portions of 40 CFR 60, Subpart LLL. Non applicable portions of the NSPS will not be included in the exemption.

- (1) 40 CFR 60.640(a), (b), (c), (d)
- (2) 40 CFR 60.641
- (3) 40 CFR 60.647(c)

The provisions of 40 CFR 60, Subpart A – General Provisions, which are incorporated as 326 IAC 12-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR 60, Subpart LLL.

- (d) The requirements of 40 CFR 63, Subpart HHH - National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities (326 IAC 20-31) are not included in the exemption because this source is not a major source of HAPs.
- (e) The requirements of 40 CFR 63, Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters (326 IAC 20-95) are not included in this exemption because this source is not a major source of HAPs.
- (f) The requirements of 40 CFR 63, Subpart HH - National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities (326 IAC 20-30) are applicable to the Glycol Dehydration Process because it consists of a triethylene glycol (TEG) dehydration unit at an area source of Hazardous Air Pollutants (HAPs).

The Glycol Dehydration Unit Still is subject to the following portions of 40 CFR 63, Subpart HH. Non applicable portions of the NESHAP will not be included in the exemption.

- (1) 40 CFR 63.760(a)(1) and (3), (b)(2), (f)(3) through (6), (h)
- (2) 40 CFR 63.761
- (3) 40 CFR 63.762(a), (c), (e)
- (4) 40 CFR 63.764(e)(ii)
- (5) 40 CFR 63.772(b)(2)(i) and (ii)
- (6) 40 CFR 63.774(a), (d)(1)(ii)
- (7) 40 CFR 63.775(a), (c)(8)
- (8) 40 CFR 63.776

The provisions of 40 CFR 63, Subpart A – General Provisions, which are incorporated as 326 IAC 20-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR 63, Subpart HH.

State Rule Applicability – Entire Source

326 IAC 2-2 (Prevention of Significant Deterioration (PSD))

This source was originally constructed in 2005, had a potential to emit of any regulated pollutant that was less than 250 tons per year, and is not in one of the twenty eight source categories listed in 326 IAC 2-2. Therefore, the construction of this source did not trigger PSD review.

The source was issued a minor permit revision (MPR 083-22718-00048, issued April 12, 2006. This permit revised some monitoring requirements and added PM emission limits for the boilers. Since no new emission units were added and no modifications were made to any existing emission units at this source, the provisions of 326 IAC 2-2 did not apply.

In 2007, the source removed the 889 HP compressor from this source. Since the PTE for all regulated pollutants is less than 250 tons per year, this source remains a minor source under PSD.

326 IAC 2-6 (Emission Reporting)

This source is located in Knox County, is not required to operate under a Part 70 Permit, and has potential lead emissions less than five (5) tons per year. Therefore, this source is only subject to 326 IAC 2-6-5 (Additional Information Requests).

326 IAC 5-1 (Opacity Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in the permit:

- (a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

326 IAC 2-4.1 (Major Sources of Hazardous Air Pollutants (HAP))

Although constructed after July 27, 1998, this source has the potential to emit less than 10 tons per year of a single HAP and less than 25 tons per year of a combination of HAPs. Therefore, 326 IAC 2-4.1 does not apply.

326 IAC 6-4 (Fugitive Dust Emissions)

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions).

326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)

This source was constructed after December 13, 1985. The only source of fugitive emissions for this source is from roads. The potential fugitive particulate emissions from roads are negligible. Therefore, 326 IAC 6-5 does not apply.

State Rule Applicability – Glycol Dehydration and Amine Processes

326 IAC 8-1-6 (New Facilities; General Reduction Requirements)

Although constructed after January 1, 1980, the potential VOC emissions from the glycol dehydration and amine processes are each less than 25 tons per year. Therefore, the provisions of 326 IAC 8-1-6 do not apply to these facilities.

326 IAC 6-3-2 (Particulate Emission Limits for Manufacturing Processes)

The glycol dehydration and amine processes are not sources of particulate emissions. Therefore, the provisions of 326 IAC 6-3-2 do not apply.

State Rule Applicability – Reboilers H-1 and H-2

326 IAC 6-2-4 (Particulate Emission Limitations for Sources of Indirect Heating)

Pursuant to 326 IAC 6-2-4 (Particulate Matter Emission Limitations for Sources of Indirect Heating), the PM emissions from the reboilers H-1 and H-2 shall be limited by the following equation:

$$Pt = \frac{1.09}{Q^{0.26}}$$

Where:

Pt = Pounds of particulate matter emitted per million Btu (lb/MMBtu) heat input.

Q = Total source maximum operating capacity rating in million Btu per hour heat input (4.85 MMBtu/hr)

$$Pt = 1.09 / (4.85)^{0.26} = 0.72 \text{ lb/MMBtu}$$

Or for Q less than 10 MMBtu/hour, Pt shall not exceed 0.6 lb/MMBtu.

Therefore, reboilers H-1 and H-2 shall be limited to 0.6 lb/MMBtu heat input. The following limitation has been included in the exemption:

Pursuant to 326 IAC 6-2-4 (Particulate Matter Emission Limitations for Sources of Indirect Heating), the PM emissions from reboilers H-1 and H-2 shall be each limited to 0.6 pounds per MMBtu heat input.

According to the emission calculated using AP-42 emission factors, the reboilers are able to comply with this emission limitation.

326 IAC 7-1.1-1 (Sulfur Dioxide Emission Limitations)

The potential emissions of sulfur dioxide from each reboiler is less than 25 tons per year and 10 pounds per hour. Therefore, the provisions of 326 IAC 7-1.1-1 do not apply.

Conclusion

The operation of this natural gas drying plant shall be subject to the conditions of this Exemption No.: 083-24341-00048.

**Appendix A: Emissions Calculations
Emissions Summary**

**Company Name: El Paso Production Company - Fore Production Facility
Address City IN Zip: 1.0 Mile Northeast of Bicknell off Hwy 67, Bicknell,
Permit Number: 083-24341
Plt ID: 083-00048
Reviewer: ERG/AAB
Date: March 26, 2007**

Emission Unit	Unrestricted PTE (tons/year)								
	PM	PM10	SO2	NOx	VOC	CO	H ₂ S	Total HAP	Hexane
Boilers	0.04	0.16	0.01	2.12	0.12	1.78	0	0.04	3.82E-02
Dehydration Unit*	0	0	0	0	4.01	0	0	0.47	0.47
Amine Unit**	0	0	0	0	0.11	0	4.59	0.001	0.001
Unpaved Roads	1.33	0.38	0	0	0	0	0	0	0
Totals	1.37	0.54	0.01	2.12	4.24	1.78	4.59	0.51	0.51

* - Emissions from the Dehydration Unit were calculated using GRI-GLYCalc, Version 4.0 (See Appendix B).

** - Emissions from the Amine Unit were calculated using AmineCalc, Version 1.0 (See Appendix B).

Appendix A: Emissions Calculations

Natural Gas Combustion

In One 1.25 MMBtu/hour Boiler and One 3.6 MMBtu/hour Boiler

Company Name: El Paso Production Company - Fore Production Facility
Address City IN Zip: 1.0 Mile Northeast of Bicknell off Hwy 67, Bicknell, Indiana 47512
Permit Number: 083-24341
PIt ID: 083-00048
Reviewer: ERG/AAB
Date: March 26, 2007

Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

4.9

42.5

Emission Factor in lb/MMCF	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0	5.5	84.0
				**see below		
Potential Emission in tons/yr	0.04	0.16	0.01	2.12	0.12	1.78

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.

**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

Methodology

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98)

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

Appendix A: Emissions Calculations
Natural Gas Combustion
In One 1.25 MMBtu/hour Boiler and One 3.6 MMBtu/hour Boiler
HAPs Emissions

Company Name: El Paso Production Company - Fore Production Facility
Address City IN Zip: 1.0 Mile Northeast of Bicknell off Hwy 67, Bicknell, Indiana 47512
Permit Number: 083-24341
Plt ID: 083-00048
Reviewer: ERG/AAB
Date: March 26, 2007

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene 2.1E-03	Dichlorobenzene 1.2E-03	Formaldehyde 7.5E-02	Hexane 1.8E+00	Toluene 3.4E-03
Potential Emission in tons/yr	4.46E-05	2.55E-05	1.59E-03	3.82E-02	7.22E-05

HAPs - Metals					
Emission Factor in lb/MMcf	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential Emission in tons/yr	1.06E-05	2.34E-05	2.97E-05	8.07E-06	4.46E-05

Methodology is the same as page 1.

Total HAP (tons/yr) = 0.04

The five highest organic and metal HAPs emission factors are provided above.
 Additional HAPs emission factors are available in AP-42, Chapter 1.4.

**Appendix A: Emission Calculations
Fugitive Emissions
From Unpaved Roads**

**Company Name: El Paso Production Company - Fore Production Facility
Address: 1.0 Mile Northeast of Bicknell off Hwy 67, Bicknell, Indiana 471
Permit Number: 083-24341
Permit No.: 083-00048
Reviewer: ERG/AAB
Date: March 26, 2007**

1. Emission Factors:

According to AP42, Chapter 13.2.2 - Unpaved Roads (11/06), the PM/PM10 emission factors for unpaved roads can be estimated from the following equation:

$$E = k \times (s/12)^a \times (w/3)^b$$

where:

E = emission factor (lb/vehicle mile traveled)
s = surface material silt content (%) = 8.5 % (AP-42, Table 13.2.2-1)
w = mean vehicle weight (tons) = 4.61 tons (see the calculations below)
k = empirical constant = 4.9 for PM and 1.5 for PM10
a = empirical constant = 0.7 for PM and 0.9 for PM10
b = empirical constant = 0.45

PM Emission Factor = $4.9 \times (6.0/12)^{0.7} \times (4.61/3)^{0.45}$ = **4.67 lbs/mile**

PM10 Emission Factor = $1.5 \times (6.0/12)^{0.9} \times (4.61/3)^{0.45}$ = **1.33 lbs/mile**

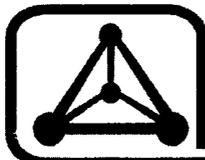
2. Potential to Emit (PTE) of PM/PM10 Before Control from Unpaved Roads:

Vehicle Type	Number of Units	Ave. Vehicle Weight (tons)	Vehicle Miles Traveled (VMT) (miles/day/unit)	Vehicle Miles Traveled (VMT) (miles/yr)	Traffic Component (%)	Component Vehicle Weight (tons)	PTE of PM (tons/yr)	PTE of PM10 (tons/yr)
Pickup Truck	1	3.50	1.50	548	95.8%	3.35	1.28	0.37
*18-Wheeler	1	30.0	1.00	24.0	4.20%	1.26	0.06	0.02
Total				572	100%	4.61	1.33	0.38

*The 18-Wheeler makes a total of one round trip per day, two days per month.

Methodology

Component Vehicle Weight (tons) = Ave. Vehicle Weight (tons) x Traffic Component (%)
(Note that the summation of the component vehicle weight equals the Mean Vehicle Weight.)
VMT(miles/yr) = VMT (miles/day/unit) x 365 days/yr x Number of Units
PTE of PM/PM10 (tons/yr) = VMT (miles/yr) x Emission Factor (lbs/mile) x 1 ton/ 2000 lbs



Lab #: 109032 Job #: 7991
 Sample Name: Fore CPF INLET Co. Lab#:
 Company: El Paso Exploration & Production
 Date Sampled: 1/12/2007
 Container: Cali-5-Bond Bag
 Field/Site Name: EL PASO Plainville
 Location:
 Formation/Depth:
 Sampling Point:
 Date Received: 1/15/2007 Date Reported: 2/06/2007

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	0.0030			
Helium -----	0.0069			
Hydrogen -----	0.0021			
Argon -----	0.0102			
Oxygen -----	0.133			
Nitrogen -----	1.06			
Carbon Dioxide -----	5.06			
Methane -----	90.76			
Ethane -----	2.80			
Ethylene -----	nd			
Propane -----	0.114			
Iso-butane -----	0.0237			
N-butane -----	0.0145			
Iso-pentane -----	0.0056			
N-pentane -----	0.0026			
Hexanes + -----	0.0051			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 975
 Specific gravity, calculated: 0.623

Remarks: H2S analyzed by 0 - 40ppm color detector tube.

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Fore Production Facility
 File Name: C:\Documents and Settings\Paul E. DeCiutiis\My Documents\AIR\El Paso
 Production\IN\Fore Production Facility\Mod to Registration 2-2007\Fore dehy 2-07.ddf
 Date: February 20, 2007

DESCRIPTION:

 Description: Production = 8.0 MMscfd
 Gas input from AmineCALC 1.0 Stream 7
 Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

 Temperature: 100.00 deg. F
 Pressure: 800.00 psig
 Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Nitrogen	1.1120
Methane	95.6250
Ethane	2.9430
Propane	0.1200
Isobutane	0.0250
n-Butane	0.0150
Isopentane	0.0060
n-Pentane	0.0030
Other Hexanes	0.0050

DRY GAS:

 Flow Rate: 8.0 MMSCF/day
 Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

 Glycol Type: TEG
 Water Content: 1.5 wt% H2O
 Flow Rate: 15.0 gpm

PUMP:

 Glycol Pump Type: Electric/Pneumatic

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Fore Production Facility
 File Name: C:\Documents and Settings\Paul E. DeCiutiis\My Documents\AIR\El Paso
 Production\IN\Fore Production Facility\Mod to Registration 2-2007\Fore dehy 2-07.ddf
 Date: February 20, 2007

DESCRIPTION:

Description: Production = 8.0 MMscfd
 Gas input from AmineCALC 1.0 Stream 7

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	22.6002	542.405	98.9889
Ethane	4.3242	103.780	18.9399
Propane	0.4146	9.950	1.8158
Isobutane	0.1614	3.873	0.7069
n-Butane	0.1268	3.042	0.5552
Isopentane	0.0643	1.542	0.2814
n-Pentane	0.0415	0.996	0.1817
Other Hexanes	0.1061	2.546	0.4647
Total Emissions	27.8389	668.134	121.9345
Total Hydrocarbon Emissions	27.8389	668.134	121.9345
Total VOC Emissions	0.9145	21.949	4.0057

EQUIPMENT REPORTS:

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages: 1.25
 Calculated Dry Gas Dew Point: 2.35 lbs. H2O/MMSCF

Temperature: 100.0 deg. F
 Pressure: 800.0 psig
 Dry Gas Flow Rate: 8.0000 MMSCF/day
 Glycol Losses with Dry Gas: 0.0718 lb/hr
 Wet Gas Water Content: Saturated
 Calculated Wet Gas Water Content: 68.50 lbs. H2O/MMSCF
 Calculated Lean Glycol Recirc. Ratio: 40.82 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
-----------	-------------------------	-----------------------

Water	3.42%	96.58%
Nitrogen	99.82%	0.18%
Methane	99.83%	0.17%
Ethane	99.45%	0.55%
Propane	99.11%	0.89%
Isobutane	98.74%	1.26%
n-Butane	98.35%	1.65%
Isopentane	98.32%	1.68%
n-Pentane	97.83%	2.17%
Other Hexanes	97.21%	2.79%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	85.13%	14.87%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.50%	99.50%
n-Pentane	0.50%	99.50%
Other Hexanes	1.00%	99.00%

STREAM REPORTS:

WET GAS STREAM

Temperature: 100.00 deg. F
 Pressure: 814.70 psia
 Flow Rate: 3.34e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.44e-001	2.29e+001
Nitrogen	1.11e+000	2.75e+002
Methane	9.56e+001	1.35e+004
Ethane	2.94e+000	7.80e+002
Propane	1.20e-001	4.66e+001
Isobutane	2.50e-002	1.28e+001
n-Butane	1.50e-002	7.68e+000
Isopentane	6.00e-003	3.82e+000
n-Pentane	3.00e-003	1.91e+000
Other Hexanes	5.00e-003	3.80e+000
Total Components	100.00	1.47e+004

DRY GAS STREAM

Temperature: 100.00 deg. F

Pressure: 814.70 psia
 Flow Rate: 3.33e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	4.95e-003	7.84e-001
Nitrogen	1.11e+000	2.74e+002
Methane	9.58e+001	1.35e+004
Ethane	2.94e+000	7.76e+002
Propane	1.19e-001	4.62e+001
Isobutane	2.48e-002	1.26e+001
n-Butane	1.48e-002	7.56e+000
Isopentane	5.92e-003	3.75e+000
n-Pentane	2.94e-003	1.87e+000
Other Hexanes	4.88e-003	3.69e+000
Total Components	100.00	1.46e+004

LEAN GLYCOL STREAM

Temperature: 100.00 deg. F
 Flow Rate: 1.50e+001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	8.32e+003
Water	1.50e+000	1.27e+002
Nitrogen	5.95e-013	5.02e-011
Methane	8.99e-018	7.59e-016
Ethane	2.42e-008	2.04e-006
Propane	2.00e-010	1.69e-008
Isobutane	5.73e-011	4.84e-009
n-Butane	3.72e-011	3.14e-009
Isopentane	3.82e-006	3.23e-004
n-Pentane	2.47e-006	2.09e-004
Other Hexanes	1.27e-005	1.07e-003
Total Components	100.00	8.45e+003

RICH GLYCOL STREAM

Temperature: 100.00 deg. F
 Pressure: 814.70 psia
 Flow Rate: 1.51e+001 gpm
 NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.79e+001	8.32e+003
Water	1.75e+000	1.49e+002
Nitrogen	5.96e-003	5.07e-001
Methane	2.66e-001	2.26e+001
Ethane	5.09e-002	4.32e+000
Propane	4.88e-003	4.15e-001
Isobutane	1.90e-003	1.61e-001
n-Butane	1.49e-003	1.27e-001
Isopentane	7.60e-004	6.46e-002
n-Pentane	4.91e-004	4.17e-002

Other Hexanes 1.26e-003 1.07e-001

 Total Components 100.00 8.50e+003

REGENERATOR OVERHEADS STREAM

 Temperature: 212.00 deg. F
 Pressure: 14.70 psia
 Flow Rate: 1.07e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
-----	-----	-----
Water	4.36e+001	2.21e+001
Nitrogen	6.42e-001	5.07e-001
Methane	5.00e+001	2.26e+001
Ethane	5.11e+000	4.32e+000
Propane	3.34e-001	4.15e-001
Isobutane	9.86e-002	1.61e-001
n-Butane	7.74e-002	1.27e-001
Isopentane	3.16e-002	6.43e-002
n-Pentane	2.04e-002	4.15e-002
Other Hexanes	4.37e-002	1.06e-001
-----	-----	-----
Total Components	100.00	5.05e+001

AMINECalc Input Data

Project Name: Fore Production Facility

Model: Gas Model
 Amine: DGA

Lean Amine Pressure: 800.000 [psia]
 Lean Amine Temperature: 100.000 [F]
 Lean Amine Flowrate: 200.000 [gal/min]
 Lean Amine Weight: 30.000 [%]
 H2S Loading: 0.000 [mol/mol]
 CO2 Loading: 0.001 [mol/mol]

Emission Control Efficiency 95.000
 Operating Hours/Day: 24 [hours/day]
 Operating Days/Year: 365 [days/year]

Gas Feed Pressure: 800.000 [psia]
 Gas Feed Temperature: 80.000 [F]
 Gas Feed Flowrate: 8.000 [MMSCFD]
 Number of Trays in Column: 20
 Flash Tank Pressure: 100.000 [psia]

H2S 0.00350 [%]
 CO2 5.06000 [%]
 DGA 0.00000 [%]
 H2O 0.00000 [%]
 N2 1.06000 [%]
 O2 0.00000 [%]
 C1 90.91000 [%]
 C2 2.80000 [%]
 C3 0.11400 [%]
 i-C4 0.02370 [%]
 n-C4 0.01450 [%]
 i-C5 0.00560 [%]
 n-C5 0.00260 [%]
 Hexanes 0.00510 [%]
 Heptanes 0.00000 [%]
 Octanes 0.00000 [%]
 Nonanes 0.00000 [%]
 C10+ 0.00000 [%]
 MeSH 0.00000 [%]
 EtSH 0.00000 [%]
 Benzene 0.00000 [%]
 Toluene 0.00000 [%]
 Ethylbenzene 0.00000 [%]
 Xylenes 0.00000 [%]
 n-C6 0.00000 [%]
 224Trimeth 0.00000 [%]

AMINECalc Stream Results

Stream 1		Gas Feed to Absorber	
Component	Mol Fraction	[lb/h]	[ton/yr]
H2S	0.000040	1.048	4.589
CO2	0.050600	1956.071	8567.445
DGA	0.000000	0.000	0.000
H2O	0.000000	0.000	0.000
N2	0.010600	260.828	1142.407
C1	0.909110	12810.910	56110.830
C2	0.028000	739.561	3239.224
C3	0.001140	44.157	193.403
i-C4	0.000240	12.100	52.997
n-C4	0.000150	7.403	32.424
i-C5	0.000060	3.549	15.545
n-C5	0.000030	1.648	7.217
Hexanes	0.000050	3.861	16.909
Total:	1.000000	15841.140	69382.990
Pressure	800.000	[psia]	
Temperature	80.000	[F]	

Stream 2		Rich Amine From Absorber	
Component	Mol Fraction	[lb/h]	[ton/yr]
H2S	0.000010	1.048	4.589
CO2	0.010300	1968.918	8623.714
DGA	0.067660	30914.320	135402.400
H2O	0.921030	72112.860	315849.000
N2	0.000010	0.654	2.863
C1	0.000960	67.130	294.022
C2	0.000030	4.087	17.901
C3	0.000000	0.205	0.897
i-C4	0.000000	0.003	0.013
n-C4	0.000000	0.002	0.008
i-C5	0.000000	0.001	0.006
n-C5	0.000000	0.001	0.002
Hexanes	0.000000	0.006	0.024
Total:	1.000000	105069.200	460195.400
Pressure	800.000	[psia]	
Temperature	116.431	[F]	

AMINECalc Stream Results

Stream 3 Flash Gas Vent Flow from Flash Tank

Component	----- Controlled -----		----- Uncontrolled -----	
	[lb/h]	[ton/yr]	[lb/h]	[ton/yr]
H2S	0.000	0.000	0.001	0.002
CO2	0.020	0.087	0.020	0.087
DGA	0.000	0.000	0.001	0.003
H2O	0.049	0.216	0.989	4.330
N2	0.031	0.133	0.611	2.674
C1	2.926	12.814	58.512	256.280
C2	0.177	0.775	3.536	15.489
C3	0.009	0.040	0.181	0.794
i-C4	0.000	0.001	0.003	0.013
n-C4	0.000	0.000	0.002	0.008
i-C5	0.000	0.000	0.001	0.006
n-C5	0.000	0.000	0.001	0.002
Hexanes	0.000	0.001	0.005	0.023
Total:	3.212	14.067	63.862	279.711
Pressure	100.000	[psia]		
Temperature	116.431	[F]		

Stream 4 Rich Amine Feed to Regenerator

Component	Mol Fraction	[lb/h]	[ton/yr]
H2S	0.000010	1.047	4.586
CO2	0.010300	1968.898	8623.627
DGA	0.067720	30914.320	135402.400
H2O	0.921840	72111.870	315844.600
N2	0.000000	0.043	0.188
C1	0.000120	8.618	37.745
C2	0.000000	0.550	2.411
C3	0.000000	0.024	0.104
i-C4	0.000000	0.000	0.000
n-C4	0.000000	0.000	0.000
i-C5	0.000000	0.000	0.000
n-C5	0.000000	0.000	0.000
Hexanes	0.000000	0.000	0.001
Total:	1.000000	105005.400	459915.700
Pressure	100.000	[psia]	
Temperature	116.431	[F]	

AMINECalc Stream Results

Stream 5 Acid Gas Flow from Regenerator

Component	----- Controlled -----		----- Uncontrolled -----	
	[lb/h]	[ton/yr]	[lb/h]	[ton/yr]
H2S	0.052	0.229	1.047	4.586
CO2	1955.958	8566.949	1955.958	8566.949
DGA	0.000	0.000	0.000	0.000
H2O	0.000	0.000	0.000	0.000
N2	0.002	0.010	0.043	0.188
C1	0.431	1.887	8.618	37.745
C2	0.028	0.120	0.550	2.411
C3	0.001	0.006	0.024	0.104
i-C4	0.000	0.000	0.000	0.000
n-C4	0.000	0.000	0.000	0.000
i-C5	0.000	0.000	0.000	0.000
n-C5	0.000	0.000	0.000	0.000
Hexanes	0.000	0.000	0.000	0.001
Total:	1956.472	8569.201	1966.240	8611.983
Pressure	N/A	[psia]		
Temperature	N/A	[F]		

Stream 6 Lean Amine from Regenerator

Component	Mol Fraction	[lb/h]	[ton/yr]
H2S	0.000000	0.000	0.000
CO2	0.000070	12.940	56.678
DGA	0.068420	30914.330	135402.500
H2O	0.931520	72133.450	315939.100
N2	0.000000	0.000	0.000
C1	0.000000	0.000	0.000
C2	0.000000	0.000	0.000
C3	0.000000	0.000	0.000
i-C4	0.000000	0.000	0.000
n-C4	0.000000	0.000	0.000
i-C5	0.000000	0.000	0.000
n-C5	0.000000	0.000	0.000
Hexanes	0.000000	0.000	0.000
Total:	1.000000	103060.700	451398.300
Pressure	800.000	[psia]	
Temperature	100.000	[F]	

AMINECalc Stream Results

Stream 7 Sweet Gas Flow from Absorber

Component	Mol Fraction	[lb/h]	[ton/yr]
H2S	0.000000	0.000	0.000
CO2	0.000000	0.093	0.409
DGA	0.000000	0.009	0.039
H2O	0.001380	20.584	90.159
N2	0.011180	260.175	1139.545
C1	0.956250	12743.780	55816.810
C2	0.029440	735.474	3221.323
C3	0.001200	43.952	192.507
i-C4	0.000250	12.097	52.984
n-C4	0.000150	7.401	32.416
i-C5	0.000060	3.548	15.539
n-C5	0.000030	1.647	7.215
Hexanes	0.000050	3.855	16.884
Total:	1.000000	13832.620	60585.830
Pressure	800.000	[psia]	
Temperature	100.009	[F]	