AIR QUALITY PERMIT

Issued To:	EOG Resources, Inc. Irigoin 15-23H Battery P.O. Box 250 Big Piney, WY 83113	Permit: #3311-00 Application Complete: 02/17/04 Preliminary Determination Issued: 03/26/04 Department's Decision Issued: 04/27/04 Permit Final: 05/13/04 AFS: #083-0024

An air quality permit, with conditions, is hereby granted to EOG Resources, Inc (EOG), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and the Administrative Rules of Montana (ARM) 17.8.740, *et seq*., as amended, for the following:

SECTION I: Permitted Facilities

A. Permitted Equipment

Permit #3311-00 is issued to EOG for the operation of an oil and gas production tank battery. The battery is known as the Irigoin 15-23H Battery. A complete list of the permitted equipment is contained in Section I.A of the permit analysis.

B. Plant Location

The battery is located in Section 23, Township 25 North, Range 53 East, in Richland County, Montana. The battery's office is located at 1540 Belco Drive, in Big Piney, Wyoming.

SECTION II. Conditions and Limitations

A. Emission Control Requirements

1. EOG's Irigoin 15-23H Battery shall be limited to 255,500-barrels (bbls) of oil production during any rolling 12-month time period (ARM 17.8.749).

2. EOG shall control volatile organic compound (VOC) emissions from the heater treater and the production tanks by routing the emissions to a flare or by routing the emissions to a pipeline (ARM 17.8.752).

3. EOG shall control VOC emissions from truck loading operations by utilizing submerged loading to transfer the oil from the production tanks to the tanker trucks or by routing the emissions to a pipeline (ARM 17.8.752).

4. Emissions from the 85-Horsepower (Hp) Waukesha Pumping Unit Engine shall be controlled with a non-selective catalytic reduction (NSCR) unit (ARM 17.8.752).

5. Emissions from the 85-Hp Waukesha Pumping Unit Engine shall not exceed the following (ARM 17.8.749):

Oxides of nitrogen (NO_x)	0.23 lb/hr
Carbon monoxide (CO)	0.32 lb/hr

6. EOG shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6-consecutive minutes (ARM 17.8.304).

7. EOG shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

8. EOG shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.7 (ARM 17.8.749).

B. Inspection and Repair Requirements

1. Each calendar month, all fugitive piping components (valves, flanges, pump seals, open-ended lines) shall be inspected for leaks. For purposes of this requirement, detection methods incorporating sight, sound, or smell are acceptable (ARM 17.8.105 and ARM 17.8.749).

2. EOG shall (ARM 17.8.105 and ARM 17.8.749):

   a. Make a first attempt at repair for any leak not later than 5 calendar days after the leak is detected; and

   b. Repair any leak as soon as practicable, but no later than 15 calendar days after it is detected, except as provided in Section II.B.3.

3. Delay of repair of equipment for which a leak has been detected will be allowed if repair is technically infeasible without a source shutdown. Such equipment shall be repaired before the end of the first source shutdown after detection of the leak (ARM 17.8.749).

C. Operational Reporting Requirements

1. EOG shall supply the Department of Environmental Quality (Department) with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis and sources identified in Section I.A of the permit analysis.

   Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. EOG shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745, that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit. The notice must be

submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).

3. EOG shall document, by month, the oil production of the facility. By the 25th day of each month, EOG shall total the oil production of the facility during the previous 12 months to verify compliance with the limitation in Section II.A.1. A written report of the compliance verification shall be submitted along with annual emission inventory (ARM 17.8.749).

D. Recordkeeping Requirements

1. A record of each monthly leak inspection required by Section II.B.1 of this permit shall be kept on file with EOG. Inspection records shall include, at a minimum, the following information (ARM 17.8.749):

   a. Date of inspection;

   b. Findings (may indicate no leaks discovered or location, nature, and severity of each leak);

   c. Leak determination method;

   d. Corrective action (date each leak repaired and reasons for any repair interval in excess of 15 calendar days); and

   e. Inspector's name and signature.

2. All records compiled in accordance with this permit must be maintained by EOG as a permanent business record for at least 5 years following the date of the measurement, must be available for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

E. Testing Requirements

1. The Department may require testing (ARM 17.8.105).

2. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

SECTION III: General Conditions

A. Inspection – EOG shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if EOG fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving EOG of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The Department's decision on the application is not final unless 15 days have elapsed and there is no request for a hearing under this section. The filing of a request for a hearing postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by EOG may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

Permit Analysis
EOG Resources, Inc.
Irigoin 15-23H Tank Battery
Permit #3311-00

I. Introduction/Process Description

EOG Resources, Inc. (EOG) proposed to construct and operate an oil and gas tank battery located in Section 23, Township 25 North, Range 53 East, in Richland County, Montana. The battery is known as the Irigoin 15-23H Battery. The facility is designed for a maximum storage capacity of 1200 barrels (bbls). The wells that supply the battery are currently producing at 171-bbls per day. Because oil wells have a steady decline in production upon completion of the well, emission estimates and production limits that were contained in the preliminary determination (PD) for Permit #3311-00 were based on the rate that the wells were producing, or 171 bbls per day. However, EOG submitted comments on the PD and requested that the emission estimates and production limits be based on 700 bbls per day. An increased production rate would allow EOG greater operational flexibility by allowing EOG to eventually route additional wells to the facility while maintaining compliance with the Administrative Rules of Montana (ARM). The new emission estimates and production limits contained in Permit #3311-00 are based on 700 bbls per day, which is the expected production rate of any wells that would be drilled within the oil field.

A. Permitted Equipment

The facility consists of the following equipment:

Source I.D.	Description	Year Manufactured	Year Installed
OT-1	Connor 400- bbl Production Oil Tank	2003	Planned for 2004
OT-2	Connor 400- bbl Production Oil Tank	2003	Planned for 2004
OT-3	Connor 400- bbl Production Oil Tank	2003	Planned for 2004
OT-4	Connor 400- bbl Produced Water Tank	2003	Planned for 2004
F-1	Tank Vapor Combustor	N/A	Planned for 2004
TL	Truck Loading	N/A	N/A
F-2	Sivalis Treater Gas Flare	2003	Planned for 2004
HTB	Heater Treater Burner	2003	Planned for 2004
PUE	85-Hp Waukesha Pumping Unit Engine	N/A	Planned for 2004

B. Source Description

Crude oil from nearby wells is received through tubing from the wells and the natural gas from the wells is received through the casing. The oil and gas commingles at the surface within the flow line. The oil and gas is sent to the heater treater, which separates oil, gas, and water. From the heater treater, the water is sent to the 400-bbl "produced water" tank, the gas is sent to a flare, and the oil is sent to the 3 production oil tanks, which are all interconnected using sealed thief hatches. All of the oil tanks vent through one common vent. The gas vapors from the production oil tanks are vented to a continuous combustion device. The water from the produced water tank is transported by truck to an appropriate disposal site and the oil from the production oil tanks is transported by truck to sales destinations. The pumping unit engine will be utilized to drive the pumping unit that will be installed once the well stops flowing on its own.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the ARM and are available, upon request, from the Department of Environmental Quality (Department). Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   EOG shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

EOG must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, EOG shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.316 Incinerators. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any incinerator, particulate matter in excess of 0.10 grains per standard cubic feet (gr/dscf) of dry flue gas, adjusted to 12% carbon dioxide (CO_2) and calculated as if no auxiliary fuel had been used. Also, no person shall cause or authorize to be discharged into the outdoor atmosphere from any incinerator, emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes. This rule does not apply to the flares at the EOG facility because EOG has applied for and received an air quality permit in accordance with ARM 17.8.748 and MCA 75-2-215.

6. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.

7. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.

8. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR 60, Standards of Performance for New Stationary Sources (NSPS).

   40 CFR 60, Subpart K – Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978, does not apply because the facility was constructed after May 19, 1978. In addition, this subpart does not apply to storage vessels of less than 40,000 bbls and none of the tanks at the facility have a capacity greater than 40,000 bbls. Further, this subpart does not apply to storage vessels for petroleum or condensate stored, processed, or treated at production facilities prior to custody transfer.

40 CFR 60 Subpart Ka – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after May 18, 1978, and prior to July 23, 1984, does not apply because the tanks were constructed after July 23, 1984. In addition, each petroleum liquid storage vessel with a capacity of less than 420,000 gallons used for petroleum or condensate stored, processed, or treated prior to custody transfer is exempt from the requirements of this subpart.

40 CFR 60, Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984, is not applicable to any of the tanks at the facility because this subpart does not apply to vessels with a design capacity less than or equal to 1,589,874 cubic meters (m^3) used for petroleum or condensate stored, processed, or treated prior to custody transfer. The design capacity of the entire facility is 190.81 m^3.

9. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. The source, as defined and applied in 40 CFR 63, shall comply with the requirements of 40 CFR 63, as applicable:

   40 CFR 63, Subpart HH - National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities. Owners or operators of oil and natural gas production facilities, as defined and applied in 40 CFR Part 63, shall comply with the applicable provisions of 40 CFR Part 63, Subpart HH. In order for an oil and natural gas production facility to be subject to 40 CFR Part 63, Subpart HH requirements, certain criteria must be met. First, the facility must be a major source of Hazardous Air Pollutants (HAP) as determined according to paragraphs (a)(1)(i) through (a)(1)(iii) of 40 CFR 63, Subpart HH. Second, a facility that is determined to be major for HAPs must also either process, upgrade, or store hydrocarbon liquids prior to the point of custody transfer, or 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. Third, the facility must also contain an affected source as specified in paragraphs (b)(1) through (b)(4) of 40 CFR Part 63, Subpart HH. Finally, if the first three criteria are met, and the exemptions contained in paragraphs (e)(1) and (e)(2) of 40 CFR Part 63, Subpart HH do not apply, the facility is subject to the applicable provisions of 40 CFR Part 63, Subpart HH. Based on the information submitted by EOG, the Irigoin 15-23H Battery is not subject to the provisions of 40 CFR Part 63, Subpart HH because the facility is not a major source of HAPs.

D. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. EOG submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 When Permit Required--Exclusions. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

E. ARM 17.8, Subchapter 7 – Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit alteration to construct, alter or use any air contaminant sources that have the Potential to Emit (PTE) greater than 25 tons per year of any pollutant. The EOG facility has a PTE grater than 25 tons per year of oxides of nitrogen (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC); therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration or use of a source. EOG submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. EOG submitted an affidavit of publication of public notice for the February 18, 2004, issue of the *Sidney Herald*, a newspaper of general circulation in the Town of Sidney in Richland County, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that Best Available Control Technology (BACT) shall be utilized. The BACT analysis is discussed in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving EOG of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

F. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source since this facility is not a listed source and the facility's PTE is below 250 tons per year of any pollutant (excluding fugitive emissions).

G. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:

   a. PTE > 100 tons/year of any pollutant;

   b. PTE > 10 tons/year of any one HAP, PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

   c. PTE > 70 tons/year of particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #3311-00 for EOG, the following conclusions were made:

   a. The facility's PTE is less than 100 tons/year for any pollutant.

   b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year for all HAPs.

   c. This source is not located in a serious PM_{10} nonattainment area.

   d. This facility is not subject to any current NSPS.

   e. This facility is not subject to any current NESHAP standards.

   f. This source is not a Title IV affected source, nor a solid waste combustion unit.

   g. This source is not an EPA designated Title V source.

   Based on these facts, the Department determined that EOG will be a minor source of emissions as defined under Title V.

H. Montana Code Annotated (MCA) 75-2-103, Definitions provides, in part, as follows:

1. "Incinerator" means any single or multiple-chambered combustion device that burns combustible material, alone or with a supplemental fuel or catalytic combustion assistance, primarily for the purpose of removal, destruction, disposal, or volume reduction of all or any portion of the input material.

2. "Solid waste" means all putrescible and nonputrescible solid, semisolid, liquid, or gaseous wastes, including, but not limited to...air pollution control facilities...

I. MCA 75-2-215, Solid or hazardous waste incineration - additional permit requirements:

1. MCA 75-2-215 requires air quality permits for all new commercial solid waste incinerators; therefore, EOG must obtain an air quality permit.

2. MCA 75-2-215 requires the applicant to provide, to the Department's satisfaction, a characterization and estimate of emissions and ambient concentrations of air pollutants, including HAPs from the incineration of solid waste. The Department determined that the information submitted in Permit Application #3311-00 is sufficient to fulfill this requirement.

3. MCA 75-2-215 requires that the Department reach a determination that the projected emissions and ambient concentrations constitute a negligible risk to public health, safety, and welfare. The Department completed a health risk assessment based on an emissions inventory and ambient air quality modeling for EOG's proposal. Based on the results of the emission inventory, modeling, and the health risk assessment, the Department determined that EOG's proposal complies with this requirement.

4. MCA 75-2-215 requires the application of pollution control equipment or procedures that meet or exceed BACT. The Department determined that the proposed incinerator constitutes BACT.

III. BACT Determination

A BACT determination is required for each new or altered source. EOG shall install on the new or altered source the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized.

VOC is the pollutant emitted in greatest quantity from the EOG facility, as well as from typical oil and gas field processing operations. The majority of VOC emissions from oil and gas field processing operations are typically generated from the production tanks and truck loading operations. However, the highest VOC contributors at the EOG facility include the heater treater gas flare (4,181 ton/year), the production tanks (61.81 ton/year), and truck loading (7.62 ton/year). The heater treater gas flare has been proposed to control emissions from the heater treater, which separates oil, gas, and water received from the wells. EOG indicated that they intend to eventually install a pipeline to transport the "saleable gas" to a gas plant for processing, negating the VOC emissions. The tank vapor flare has been proposed to control VOC emissions from the production tanks and submerged loading has been proposed to control VOC emissions from truck loading until a pipeline is completed to transport the "saleable gas" to a gas plant for processing, negating the VOC emissions.

A. <u>Heater Treater Burner/Production Tanks</u>

Available control techniques to reduce VOC emissions from equipment (such as the heater treater and the production tanks at EOG) at oil and natural gas field processing operations include flares, incinerators, vapor recovery, internal floating roofs, carbon adsorption, and scrubbers. All of the previously mentioned VOC control technologies have very similar control efficiencies, between 98 and 99% depending on the design of the system. Flares are typically used as the control method for reducing VOC emissions from oil and gas field processing operations. However, in many instances, oil and gas field processing operations install VOC control equipment that typically exceeds BACT requirements because the VOC emissions are actually generated by reducing "saleable gas" or product that can be sent to a gas processing plant via pipeline, thereby generating revenue for the company.

EOG proposed to control VOC emissions from the heater treater with a flare and to control VOC emissions from the production storage tanks with a vapor combustor (flare). Because all of the control technologies have a maximum control efficiency of 98-99%, the Department concurs with EOG's BACT proposal and determined that a flare constitutes BACT for VOC emissions from the heater treater burner and the production tanks. Because EOG indicated that they intend to eventually install a pipeline to transport the saleable gas to a gas plant, the BACT

requirement contained in Section II.A.2 of Permit #3311-00 includes the option of routing the emissions from the heater treater and the production storage tanks to a pipeline to prevent EOG from the need to submit a permit application to change control equipment that will nearly negate VOC emissions from the facility. Vapor recovery to a pipeline is not typically considered BACT for crude oil field production facilities and the cost per ton of pollutant controlled would be above industry norm.

B. Truck Loading

Available control techniques to reduce VOC emissions from truck loading operations at oil and natural gas field processing operations include flares, incinerators, carbon adsorption, scrubbers, vapor recovery, vapor balance system, and submerged loading. The control efficiency's of the above mentioned control technologies vary from 58-99%. However, due to the relatively small amount of emissions (7.62 ton/year), any add-on control (such as flares or incinerators, carbon adsorption, scrubbers, vapor recovery, and vapor balance systems) would be considered cost prohibitive. Therefore, EOG proposed to utilize submerged loading to minimize VOC emissions from truck loading operations. Because the relatively small amount of emissions would make other add on control technology cost prohibitive, the Department concurs with EOG's proposal and determined that utilizing submerged loading constitutes BACT for emissions from truck loading operations. Because EOG indicated that they intend to eventually install a pipeline to transport the saleable gas to a gas plant, the BACT requirement contained in Section II.A.3 of Permit #3311-00 includes the option of routing the emissions from truck loading operations to a pipeline to prevent EOG from the need to submit a permit application to change control equipment that will nearly negate VOC emissions from the facility. Vapor recovery to a pipeline is not typically considered BACT for crude oil field production facilities and the cost per ton of pollutant controlled would be above industry norm.

C. 85-Horsepower Waukesha Pumping Unit Engine

Emissions from the 85-Horsepower (Hp) Waukesha Pumping Unit Engine include particulate matter (PM), NO_x, carbon monoxide (CO), and VOC. The following discussion addresses options for controlling these pollutants.

1. NO_x Emissions

Available control techniques to reduce NO_x emissions from rich-burn natural gas-fired engines include Selective Catalytic Reduction (SCR) units, prestratisfied charge combustion (PCC) (i.e. lean-burn retrofit), non-selective catalytic reduction (NSCR) units in conjunction with air to fuel ratio (AFR) controllers (NSCR/AFR), NSCR units, and AFR controllers. Due to the relatively small amount of NO_x emissions (9.02 ton/year), SCR and PCC would be considered cost prohibitive. Therefore, the Department determined that SCR and PCC would not constitute BACT for NO_x emissions from the 85-Hp Waukesha Pumping Unit Engine.

NSCR/AFR, NSCR, and AFR are all viable options for controlling NO_x emissions from the 85-Hp Waukesha Pumping Unit Engine. Recent BACT determinations for 85-Hp natural gas fired engines limit NO_x emissions to a lb/hr limit (0.37 lb/hr) equivalent to 2.0 g/hp-hr. AFR would not be capable of achieving 0.37 lb/hr; therefore, the Department determined that the use of an AFR controller to achieve the BACT emission level of 0.37 lb/hr does not constitute BACT for the 85-Hp Waukesha Pumping Unit Engine.

NSCR/AFR would be capable of achieving 0.37 lb/hr; however, the environmental benefit that would be attained by the additional control efficiency achieved by an AFR controller in conjunction with an NSCR unit would be insignificant; thereby, the cost per ton of

pollutant reduced would be prohibitive. Therefore, the Department determined that the use of NSCR/AFR to achieve the BACT emission level of 0.37 lb/hr does not constitute BACT for the 85-Hp Waukesha Pumping Unit Engine.

EOG proposed to use an NSCR unit to control NO_x emissions from the 85-Hp Waukesha Pumping Unit Engine. An NSCR unit is capable of achieving 0.37 lb/hr; therefore, the Department concurs with EOG's proposal and determined that utilizing an NSCR unit to achieve an emission limit of 0.37 lb/hr constitutes BACT for NO_x emissions from the 85-Hp Waukesha Pumping Unit Engine. However, EOG's application proposed a controlled NO_x emission level of 0.23 lb/hr. Therefore, because the controlled NO_x emission level in the application exceeded recently permitted BACT emission levels for similar sources, the 0.23 lb/hr emission level was included in the permit under the authority of ARM 17.8.749.

2. CO Emissions

Available control techniques to reduce CO emissions from rich-burn natural gas-fired engines include oxidation catalysts, NSCR, and AFR. Due to the relatively small amount of CO (9.02 ton/year) emissions, an oxidation catalyst would be considered cost prohibitive. Therefore, the Department determined that an oxidation catalyst would not constitute BACT for CO emissions from the 85-Hp Waukesha Pumping Unit Engine.

NSCR/AFR, NSCR, and AFR are all viable options for controlling CO emissions from the 85-Hp Waukesha Pumping Unit Engine. Recent BACT determinations for 85-Hp natural gas fired engines limit CO emissions to a lb/hr limit (0.37 lb/hr) equivalent to 2.0 g/hp-hr. An AFR controller, alone, would not be capable of achieving 0.37 lb/hr; therefore, the Department determined that the use of an AFR controller to achieve the BACT emission level of 0.37 lb/hr does not constitute BACT for the 85-Hp Waukesha Pumping Unit Engine.

NSCR/AFR would be capable of achieving 0.37 lb/hr; however, the environmental benefit that would be attained by the additional control efficiency achieved by an AFR controller in conjunction with an NSCR unit would be insignificant; thereby, the cost per ton of pollutant reduced would be prohibitive. Therefore, the Department determined that the use of NSCR/AFR to achieve the BACT emission level of 0.37 lb/hr does not constitute BACT for the 85-Hp Waukesha Pumping Unit Engine.

EOG proposed to use an NSCR unit to control CO emissions from the 85-Hp Waukesha Pumping Unit Engine. An NSCR unit is capable of achieving 0.37 lb/hr; therefore, the Department concurs with EOG's proposal and determined that utilizing an NSCR unit to achieve an emission limit of 0.37 lb/hr constitutes BACT for CO emissions from the 85-Hp Waukesha Pumping Unit Engine. However, EOG's application proposed a controlled CO emission level of 0.32 lb/hr. Therefore, because the controlled CO emission level in the application exceeded recently permitted BACT emission levels for similar sources, the 0.32 lb/hr emission level was included in the permit under the authority of ARM 17.8.749.

3. PM and VOC Emissions

Due to the extremely small amounts of PM (0.04 ton/year) and VOC (1.23 ton/year) emissions, any add on controls would be cost prohibitive. Therefore, the Department determined that no additional control (utilizing good combustion practices) constitutes BACT for PM and VOC emissions from the 85- Hp Waukesha Pumping Unit Engine. No additional controls would minimize PM and VOC emissions by utilizing proper combustion practices in the 85- Hp Waukesha Pumping Unit Engine.

The control options selected as part of this review have controls and control costs that are comparable to other recently permitted similar sources. The control options that were selected are capable of achieving the appropriate emission standards.

IV. Emission Inventory

		Tons/year						
Source I.D.#	**Source**	**PM**	**NO_x**	**CO**	**VOC**	**SO_x**	**HAPs**	**H_2S**
OT-1 OT-2 OT-3	400-bbl Production Oil Tanks (Commingled)	--------	--------	--------	1.41	--------	0.06	0.00
F-1	Tank Vapor Combustor (Flare)	--------	0.31	0.61	--------	--------	--------	0.00
HTB	Heater Treater Burner	0.01	0.13	0.13	0.00	0.00	--------	--------
F-2	Heater Treater Gas Flare	--------	26.28	52.52	83.62	--------	0.33	0.00
TL	Truck Loading	--------	--------	--------	7.62	--------	--------	--------
FE	Fugitive Emissions-Piping	--------	--------	--------	1.78	--------	--------	--------
PUE	85-Hp Pumping Unit Engine	0.04	1.01	1.40	1.23	0.00	--------	--------
Totals		0.05	27.73	54.66	95.66	0.00	0.39	0.00

*The facility is designed for a maximum capacity of 1200-barrels. The wells that supply the battery is currently producing at 171-bbl per day. However, emission estimates are based on the rate that new wells within the oil field are expected to produce upon completion of the new wells, or 700-bbls per day.

(3) 400-bbl and (3) 500-bbl Commingled Production Oil Tanks (OT-1, OT-2, OT-3, OT-4, OT-5, and OT-6)

Tank Emissions include all vapor losses (standing, working, and flashing from all tanks combined-tanks are commingled)

Permit Limitation:	700 bbl/day	(Maximum Capacity of Wells)
Vapor Gas Volume (vpg):	6000.0 Scf/day or 250.0 Scf/hr	(Worst case from facilities within the same oil field)
VOC Weight Fraction:	0.7030	(Worst case from facilities within the same oil field)
HAP Weight Fraction:	0.0300	(Worst case from facilities within the same oil field)
H_2S Weight Fraction:	0.0000	(Worst case from facilities within the same oil field)
Molecular Weight:	34.7799 lb/lb-mole	(Company Gas Stream Analysis)
Control Efficiency:	98%	(Tank Vapor Combustor)

VOC Emissions:

Calculations: 250.0 Scf/hr * 1/379 Scf/lb-mole * 34.7799 lb/lb/mole * 0.7030 VOC fraction = 16.13 lb/hr
16.13 lb/hr * 8760 hr/yr * 0.0005 ton/lb * (1.0-0.98) = 1.41 ton/yr

HAP Emissions:

Calculations: 250.0 Scf/hr 1/379 Scf/lb-mole * 34.7799 lb/lb-mole * 0.0300 HAP fraction = 0.69 lb/hr
0.69 lb/ton* 8760 hr/yr * 0.0005 ton/lb* (1.0-0.98) = 0.06 ton/yr

H_2S Emissions

0.00 ton/yr (Worst case from facilities within the same oil field)

Tank Vapor Combustor (F-1)

Fuel Gas Heating Value:	2015 Btu/Scf	(Company Information)
Fuel Gas Usage:	250 Scf/hr	(Worst case from facilities within the same oil field)
Pilot Gas Heating Value:	1647 Btu/Scf	(Company Information)
Pilot Gas Usage:	1 Scf/hr	(Company Information)

<u>Flare</u>

NO_x Emissions

Emission Factor: 0.1380 lb/MMScf (Chemical Manufacturers Association (CMA), Flare Study)
Calculations: 250 Scf/hr * 2015 Btu/Scf * 0.1380 lb/MMBtu = 0.07 lb/hr
0.07 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.31 ton/yr

CO Emissions

Emission Factor: 0.2755 lb/MMScf (CMA Flare Study)

Calculations: 250.0 Scf/hr * 2015 Btu/Scf * 0.2755 lb/MMBtu = 0.14 lb/hr
0.14 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.61 ton/yr

Pilot

NO_x Emissions

Emission Factor: 0.1380 lb/MMBtu (CMA Flare Study)

Calculations: 1 Scf/hr * 1647 Btu/Scf * 0.1380 lb/MMBtu = 0.0002 lb/hr
0.0002 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.00 ton/yr

CO Emissions

Emission Factor: 0.2755 lb/MMBtu (CMA Flare Study)

Calculations: 1 Scf/hr * 1647 Btu/Scf * 0.2755 lb/MMBtu = 0.0005 lb/hr
0.0005 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.00 ton/yr

Flare Total

NO_x Emissions

Calculations: 0.31 ton/yr + 0.00 ton/year = 0.31 ton/yr

CO Emissions

Calculations: 0.61 ton/yr + 0.00 ton/year = 0.61 ton/yr

Heater Treater Burner

Fuel Heating Value: 1647 MMBtu/MMScf (Company Information)
Fuel Consumption: 0.50 MMBtu/hr (Maximum Rated Design Capacity)

PM Emissions (PM emissions include PM_{10} and $PM_{2.5}$):

Emission Factor: 7.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)

Calculations: 7.6 lb/MMScf * 1 MMScf/1647 MMBtu * 0.50 MMBtu/hr = 0.0023 lb/hr
0.0023 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.01 ton/yr

NO_x Emissions:

Emission Factor: 100 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)

Calculations: 100 lb/MMScf * 1 MMScf/1647 MMBtu * 0.50 MMBtu/hr = 0.03 lb/hr
0.03 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.13 ton/yr

CO Emissions:

Emission Factor: 84 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)

Calculations: 84 lb/MMScf * 1 MMScf/1647 MMBtu * 0.50 MMBtu/hr = 0.03 lb/hr
0.03 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.13 ton/yr

VOC Emissions:

Emission Factor: 5.5 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)

Calculations: 5.5 lb/MMScf * 1 MMScf/1647 MMBtu * 0.50 MMBtu/hr = 0.001 lb/hr
0.001 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.00 ton/yr

SO_2 Emissions:

Emission Factor: 0.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)

Calculations: 0.6 lb/MMScf * 1 MMScf/1647 MMBtu * 0.50 MMBtu/hr = 0.0002 lb/hr
0.0002 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.00 ton/yr

Heater Treater Gas Flare

Fuel Gas Heating Value: 1647 Btu/Scf
Fuel Gas Usage: 26417 Scf/hr
Control Efficiency: 98%

NO_x Emissions
Emission Factor: 0.1380 lb/MMScf (CMA Flare Study)
Calculations: 26417 Scf/hr * 1647 Btu/Scf * 0.1380 lb/MMBtu = 6.00 lb/hr
6.00 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 26.28 ton/yr

CO Emissions
Emission Factor: 0.2755 lb/MMScf (CMA Flare Study)
Calculations: 26417 Scf/hr * 1647 Btu/Scf * 0.2755 lb/MMBtu = 11.99 lb/hr
11.99 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 52.52 ton/yr

VOC Emissions
Calculations 26417 Scf/hr * 1/379 Scf/lb-mole * 27.87 MW (lb/lb-mole) * 0.4914 VOC fraction = 954.59 lb/hr
954.59 lb/hr* 8760 hr/yr * 0.0005 ton/lb* (1.0-0.98) = 83.62 ton/yr

HAP Emissions
Calculations 26417 Scf/hr * 1/379 Scf/lb-mole * 27.87 MW (lb/lb-mole) * 0.001959 VOC fraction = 3.810 lb/hr
3.8 lb/hr* 8760 hr/yr * 0.0005 ton/lb* (1.0-0.98) = 0.33 ton/yr

Truck Loading (TL)

VOC Emissions

Production = 700 bbl/day * 42 gal/bbl * 1 day/24 hr = 1225.00 gal/hr (maximum capacity of wells)

L_L = 12.46 * SPM/T (AP-42, Chapter 5, equation 1, page 5.2-4, 1/95)

Where:

L_L = loading loss, lb/10^3 gallons of liquid loaded
S = Saturation Factor from Table 5.2-1 = 0.60
P = true vapor pressure of liquid loaded (psia) from Table 7.1-2 = 2.3
M = molecular weight of vapors (lb/lb/mole) = 42
T = temperature of bulk liquid loaded in ºR (ºF + 460) = 510

L_L = 12.46 * 0.60 * 2.3 * 42 / 510 = 1.42 lb/1000 gal
L_L = 1.42 lb/1000 gal * 1225.00 gal/hr * 8760 hr/yr * 0.0005 ton/lb = 7.62 ton/yr

Fugitive Emissions – Piping (12-FE)

VOC Emissions

Emission Factors from: Equipment Leak Factor for Oil and Gas Production Operations; American Petroleum Institute; TNRCC Memorandum 1/3/96

<u>Oil & Gas</u>

VOC Weight Fraction: 0.4914 (Company Estimate)

Valves: 66 valves (Company Information)
Emission Factor: 0.00992 lb/hr - valve
Calculation: 66 valves * 0.00992 lb/hr-valve * 0.4914 * 8760 hr/yr * 0.0005 ton/lb = 1.41 ton/yr

Relief Valves: 6 relief valves (Company Information)
Emission Factor: 0.01940 lb/hr – relief valve
Calculation: 6 relief valves * 0.01940 lb/hr – relief valve * 0.4914 = 0.06
0.06 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.25 ton/yr

Flanges: 36 flanges (Company Information)
Emission Factor: 0.00086 lb/hr - flange
Calculation: 36 flanges * 0.00086 lb/hr-flange * 0.4914 * 8760 hr/yr * 0.0005 ton/lb = 0.07 ton/yr

Pump Seals: 4 pump seals (Company Information)
Emission Factor: 0.00529 lb/hr – pump seal
Calculation: 4 pump seals * 0.00529 lb/hr-pump seal * 0.4914 * 8760 hr/yr * 0.0005 ton/lb = 0.05 ton/yr

Total fugitive emissions – piping = 1.41 ton/yr + 0.25 ton/yr+ 0.07 ton/yr + 0.05 ton/yr = 1.78 ton/yr

85-Hp Waukesha Pumping Unit Engine

Fuel Heating Value: 1647 MMBtu/MMScf (Company Information)
Fuel Usage: 0.00054 MMScf/hr (Company Information)

PM Emissions (PM emissions include PM_{10} and $PM_{2.5}$):

Emission Factor: 0.00991 lb/MMBtu * 1647 MMBtu/MMScf * 0.00054 MMScf/hr = 0.01 lb/hr
Calculations: 0.01 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.04 ton/yr

NO_x Emissions:

Emission Factor: 1.23 g/hp-hr (Company Information)
Calculations: 1.23 g/hp-hr * 0.002205 lb/g * * 85 hp = 0.23 lb/hr
0.23 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 1.01 ton/yr

CO Emissions:

Emission Factor: 1.71 g/hp-hr (Company Information)
Calculations: 1.71 g/hp-hr * 0.002205 lb/g * 85 hp = 0.37 lb/hr
0.37 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 1.40 ton/yr

VOC Emissions:

Emission Factor: 1.5 g/hp-hr* 0.002205 lb/g * 85 hp = 0.32 lb/hr
0.32 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 1.23 ton/yr

SO_2 Emissions:

Emission Factor: 0.000588 lb/MMBtu * 1647 MMBtu/MMScf * 0.00054 MMScf/hr = 0.0005 lb/hr
Calculations: 0.0005 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.00 ton/yr

V. Existing Air Quality

The EOG facility is located in eastern Montana in a sparsely populated area with generally very good ventilation throughout the year. The legal description of the facility is Section 23, Township 25 North, Range 53 East, in Richland County, Montana. Richland County is unclassifiable/attainment for the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants.

VI. Ambient Air Impact Analysis

The Department conducted Screen View air dispersion modeling, an EPA-approved screening model, using the maximum inputs obtained from EOG's permit application and PD comment letter of April 7, 2004, and an emission rate of 6.34E-03 grams per second, which is the sum of all the HAP emissions from the proposed flares. The individual one-hour results for each pollutant were then calculated by multiplying the modeled impact of 5.88E-03 $\mu g/m^3$ by the percentage of each individual HAP making up the total of the HAP emissions. The maximum 1-hour concentrations were then converted to an annual average and used in the risk assessment. The results are contained in Section VII, Health Risk Assessment, of this permit analysis. A complete copy of the HAP emission inventory that was calculated for the flares to conduct the health risk assessment and a complete copy of the Screen 3 Model is on file with the Department.

SCREEN3 Model Run
Simple Terrain Inputs:

Source Type	=	Flare
Emission Rate (G/S)	=	0.63400E-02
Stack Height (M)	=	0.91
Total Heat Release (Cal/s)	=	0.304558E07
Receptor Height (M)	=	0.0000
Urban/Rural Option	=	RURAL
Building Height (M)	=	0.0000
Minimum Horizontal Building Dimension (M)	=	0.0000
Maximum Horizontal Building Dimension (M)	=	0.0000

Summary of ScreenView Model Results

Calculation Procedure	Maximum 1 Hour Concentration ($\mu g/m^3$)	Maximum 24-Hour Concentration ($\mu g/m^3$)	Maximum Annual Concentration ($\mu g/m^3$)	Distance to Maximum (M)	Terrain Height (M)
Simple Terrain	0.05876	0.023504	0.005876	453	0

VII. Health Risk Assessment

A health risk assessment was conducted to determine if the flares at the EOG facility comply with the negligible risk requirement of MCA 75-2-215. The emission inventory did not contain sufficient quantities of any pollutant on the Department's list of pollutants for which non-inhalation impacts must be considered; therefore, the Department determined that inhalation risk was the only necessary pathway to consider. Only those HAPs for which there were established emission factors were considered in the emission inventory.

Hazardous Air Pollutant	Speciated HAP Annual Concentration ($\mu g/m^3$)	Cancer Potency Factor	ELCR	Non-Cancer RFC Factor	Non-Cancer Hazard Quotient
2-Methylnaphthalene	7.4697E-08	ND	ND	ND	ND
3-Methylnaphthalene	5.6023E-09	ND	ND	ND	ND
7,12-Dimethylbenz(a)anthracene	4.9798E-08	ND	ND	ND	ND
Acenaphthene	5.6023 E-09	ND	ND	ND	ND
Benz(a)anthracene	5.6023 E-09	ND	ND	ND	ND
Benzene	6.5360E-06	8.30E-06	5.42E-11	7.10E-01	9.21E-06
Benzo(a)pyrene	3.7348E-09	2.10E-03	7.84E-12	ND	ND
Benzo(b)fluoranthene	5.6023 E-09	ND	ND	ND	ND
Benzo(g,h,I)perylene	3.7348E-09	ND	ND	ND	ND
Benzo(k)fluoranthene	5.6023 E-09	ND	ND	ND	ND
Chrysene	5.6023 E-09	ND	ND	ND	ND
Dibenzo(a,h)anthracene	3.7348E-09	1.20E-03	4.48E-12	ND	ND
Dichlorobenzene	3.7348E-09	ND	ND	ND	ND
Fluoranthene	9.3371E-09	ND	ND	ND	ND
Fluorene	8.7146E-09	ND	ND	ND	ND
Formaldehyde	2.3343E-04	1.30E-05	3.03E-09	3.6E00	6.48E-05
Hexane	5.6023E-03	ND	ND	2.00E02	2.80E-05
Indeno(1,2,3-cd)pyrene	5.6023 E-09	ND	ND	ND	ND
Naphthalene	1.8985E-06	ND	ND	1.40E-01	1.36E-05
Phenanathrene	5.2910E-08	ND	ND	ND	ND
Pyrene	1.5562E-08	ND	ND	ND	ND
Toluene	1.0582E-05	ND	ND	4.00E02	2.65E-08
Arsenic	6.2247E-07	ND	ND	ND	ND
Beryllium	3.7348E-08	ND	ND	ND	ND
Cadmium	3.4236E-06	1.80E-03	6.16E-09	3.50E00	9.78E-07
Chromium	4.3573E-06	ND	ND	ND	ND
Cobalt	2.6144E-07	ND	ND	ND	ND
Manganese	1.1827E-06	ND	ND	5.00E-02	2.37E-05
Mercury	8.0921E-07	ND	ND	3.00E-01	2.70E-06
Nickel	6.5360E-06	ND	ND	2.40E-01	2.72E-05
Selenium	7.4697E-08	ND	ND	5.00E-01	1.49E-07
Total			**9.26E-09**		**1.70E-04**

ELCR = Excess Lifetime Cancer Risks
ND = Not Determined, No Available Information
* A copy of the Screen View modeling conducted for this project is on file with the Department.

The Department determined that the risks estimated in the risk assessment are in compliance with the requirement to demonstrate negligible risk to human health and the environment. As detailed in the above table, and in accordance with the negligible risk requirement, no single HAP concentration results in an excess lifetime cancer risk (ELCR) greater than 1.00E-06 and the sum of all HAPs results in an ELCR of less than 1.00E-05. Further, the sum of the non-cancer hazard quotient is less than 1.0 as required to demonstrate compliance with the negligible risk requirement.

VIII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

IX. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air Resources Management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued To: EOG Resources, Inc.
Irigoin 15-23H Battery
P.O. Box 250
Big Piney, WY 83113

Air Quality Permit Number: 3311-00

Preliminary Determination Issued: March 26, 2004
Department Decision Issued: April 27, 2004
Permit Final: May 13, 2004

1. *Legal Description of Site*: EOG's Irigoin 15-23H Battery would be located in Section 23, Township 25 North, Range 53 East, in Richland County, MT.

2. *Description of Project*: EOG proposed to construct and operate a crude oil tank farm battery. The maximum capacity of the wells to supply the battery is estimated to be 700-bbl/day. The facility would consist of 3 production oil tanks, 1 produced water tank, a heater treater burner, an 85-Hp pumping unit engine, and 2 flares.

3. *Objectives of Project*: The proposed project would generate business and revenue for the company by allowing them to extract crude oil from the oil field and transport the oil to sale destinations.

4. *Alternatives Considered*: In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the Montana Air Quality Permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because EOG demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls*: A list of enforceable conditions, including a BACT analysis, would be included in Permit #3311-00.

6. *Regulatory Effects on Private Property*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions would be reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and would not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			√			Yes
B	Water Quality, Quantity, and Distribution			√			Yes
C	Geology and Soil Quality, Stability and Moisture			√			Yes
D	Vegetation Cover, Quantity, and Quality			√			Yes
E	Aesthetics			√			Yes
F	Air Quality			√			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			√			Yes
H	Demands on Environmental Resource of Water, Air and Energy			√			Yes
I	Historical and Archaeological Sites			√			Yes
J	Cumulative and Secondary Impacts			√			Yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

Minor impacts on terrestrial or aquatic life and habitats would be expected from the proposed project because the facility would be a source of air pollutants and minor amounts of land disturbance would be required to construct the facility. While the facility would emit air pollutants and corresponding deposition of pollutants would occur, the Department determined that any impacts from deposition would be minor due to dispersion characteristics of the pollutants and the atmosphere (See Section 7.F of this EA) and conditions that would be placed in Permit #3311-00. In addition, minor land disturbance would occur to construct the facility. Any impacts from facility construction would be minor due to the relatively small size of the project. Overall, any impacts to terrestrial and aquatic life and habitats would be minor.

B. Water Quality, Quantity, and Distribution

Minor, if any, impacts would be expected on water quality, quantity, and distribution from the proposed project because of the relatively small size of the project. The nearest surface water is West Charlie Creek, which is located approximately 0.5 miles west of the facility. While the facility would emit air pollutants and corresponding deposition of pollutants would occur, the Department determined that any impacts from deposition would be minor due to dispersion characteristics of pollutants and the atmosphere (See Section 7.F of this EA) and conditions that would be placed in Permit #3311-00. In addition, facility construction would not impact water quality, quantity, or distribution because there is no surface water at or near the site and only minor amounts of construction would be required to construct the facility. Overall, any impacts to water quality, quantity, and distribution would be minor.

C. Geology and Soil Quality, Stability, and Moisture

Minor impacts would occur on the geology and soil quality, stability, and moisture from the proposed project because minor construction would be required to complete the project. Any impacts to the geology and soil quality, stability and moisture from facility construction would be minor due to the relatively small size of the project. In addition, while deposition of pollutants would occur, the Department determined that the chance of deposition of pollutants impacting the geology and soil in the areas surrounding the site would be minor due to dispersion characteristics of pollutants and the atmosphere (See Section 7.F of this EA). The conditions that would be placed in Permit #3311-00 would also minimize impacts to geology and soil by limiting the amount of equipment that would be installed at the facility and limiting the emissions from the facility. Overall, any impacts to the geology and soil quality, stability and moisture would be minor.

D. Vegetation Cover, Quantity, and Quality

Minor impacts would occur on vegetation cover, quantity, and quality because minor construction would be required to complete the project. Any impacts to the vegetation cover, quantity, and quality from facility construction would be minor due to the relatively small size of the project. In addition, while deposition of pollutants would occur, the Department determined that the chance of deposition of pollutants impacting the vegetation in the areas surrounding the site would be minor due to dispersion characteristics of pollutants and the atmosphere (See Section 7.F of this EA). The conditions that would be placed in Permit #3311-00 would also minimize the impacts to vegetation by limiting the amount of equipment that would be installed at the facility and limiting the emissions from the facility. Overall, any impacts to vegetation cover, quantity, and quality would be minor.

E. Aesthetics

Minor impacts would result on the aesthetics of the area because the facility would be a new facility. Production tanks would be constructed to house the crude oil that would be received by the wells. The flares would also be visible. The facility would only create minimal additional noise in the area. Overall, any aesthetic impacts would be minor due to the relatively small size of the facility.

F. Air Quality

The air quality of the area would realize minor impacts from the proposed project because the facility would emit very small amounts of PM, PM_{10}, and HAPs. The facility would also emit relatively small amounts of NO_x, CO, and VOC. Air emissions from the facility would be minimized by conditions that would be placed in Permit #3311-00. Conditions would include, but would not be limited to, a barrel per year production limit, facility-wide opacity limitations, requirements to control VOC emissions from the heater treater, the production tanks, and from truck loading operations, as well as requirements to control NO_x and CO emissions from the pumping unit engine. Permit #3311-00 would also include conditions requiring EOG to use reasonable precautions to control fugitive dust emissions, as well as requiring inspection and repair requirements for fugitive VOC emissions.

In addition, the Department conducted air dispersion modeling to determine the ambient air quality impacts from HAPs that would be generated by the flares. The ScreenView model was selected for the air dispersion modeling. The full meteorology option was selected to provide a conservative result. Receptors were placed from 1 to 5000 meters in a simple terrain array. Simple terrain receptors were used to represent the topography of the project area. The model predicted a cumulative 1-hour modeled impact of 0.05876 $\mu g/m^3$, which the Department used to

conduct a risk assessment. The health risk assessment demonstrated that the risks associated with the flares are in compliance with the negligible risk requirement contained in MCA 75-2-215.

While deposition of pollutants would occur as a result of operating the facility, the Department determined that any air quality impacts from deposition of pollutants would be minor due to dispersion characteristics of pollutants (stack height, stack temperature, etc.), the atmosphere (wind speed, wind direction, ambient temperature, etc.), conditions that would be placed in Permit #3311-00.

G. Unique Endangered, Fragile, or Limited Environmental Resources

In an effort to identify any unique endangered, fragile, or limited environmental resources in the area, the Department contacted the Montana Natural Heritage Program, Natural Resource Information System (NRIS). The NRIS search did not identify any species of special concern in the vicinity of the project area. In this case, the area was defined by the section, township, and range of the proposed location with an additional 1-mile buffer zone. Due to the minor amounts of construction that would be required, the relatively low levels of pollutants that would be emitted, dispersion characteristics of pollutants and the atmosphere, conditions that would be placed in Permit #3311-00, and because the NRIS search did not identify any species of special concern in the vicinity of the project area, the Department determined that the chance of the project impacting any known species of special concern would be minor.

H. Demands on Environmental Resource of Water, Air, and Energy

The proposed project would have minor impacts on the demands on the environmental resources of air and water because the facility would be a source of air pollutants. However, the facility's PTE would be relatively small by industrial standards. While deposition of pollutants would occur, as explained in Sections 7.B and 7.F of this EA, the Department determined that the chance of the proposed project impacting demands on air and water resources would be minor due to dispersion characteristics of pollutants and the atmosphere, and conditions that would be placed in Permit #3311-00.

The proposed project would also have impacts on the demand on the environmental resource of energy because the facility utilizes several pieces of equipment that consume natural gas. However, any impacts to the non-renewable resource of natural gas would be minor due to the very small size of the equipment that consumes natural gas. In addition, the non-renewable resources of crude oil and natural gas would have impacts because the facility would extract commingled crude oil/natural gas. Overall, any impacts to the non-renewable resources of crude oil and natural gas would be minor due to the relatively small size of the operation.

I. Historical and Archaeological Sites

In an effort to identify any historical and archaeological sites near the proposed project area, the Department contacted the Montana Historical Society, State Historic Preservation Office (SHPO). According to SHPO records, there have not been any previously recorded historic or archaeological sites within the proposed area. In addition, SHPO records indicated that no previous cultural resource inventories have been conducted in the area. SHPO recommended that a cultural resource inventory be conducted to determine if cultural or historic sites exist and if they would be impacted. However, neither the Department nor SHPO has the authority to require EOG to conduct a cultural resource inventory. The Department determined that due to the previous disturbance in the area (the area is an active crude oil field) and the small amount of land disturbance that would be required to construct the facility, the chance of the project impacting any cultural or historic sites would be minor.

J. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts on the physical and biological aspects of the human environment in the immediate area would be minor due to the relatively small size of the project. Potential emissions from the facility would be relatively small by industrial standards. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #3311-00. Additional cumulative impacts may result from EOG's intentions to construct a pipeline to route gas to a gas plant for processing. However, any impacts from constructing a pipeline would be minor because pipelines are typically buried in the ground and surface conditions typically return to prior condition within a relatively short period of time.

8. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores				√		Yes
B	Cultural Uniqueness and Diversity				√		Yes
C	Local and State Tax Base and Tax Revenue			√			Yes
D	Agricultural or Industrial Production			√			Yes
E	Human Health			√			Yes
F	Access to and Quality of Recreational and Wilderness Activities			√			Yes
G	Quantity and Distribution of Employment			√			Yes
H	Distribution of Population				√		Yes
I	Demands for Government Services			√			Yes
J	Industrial and Commercial Activity			√			Yes
K	Locally Adopted Environmental Plans and Goals			√			Yes
L	Cumulative and Secondary Impacts			√			Yes

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores

The proposed project would not cause a disruption to any native or traditional lifestyles or communities (social structures or mores) in the area because the proposed project would take place in a relatively remote location in which oil and gas exploration and extraction activities currently occur. The proposed project would not change the predominant use of the surrounding area. The nearest home not associated with the project would be approximately 1 mile from the facility and the facility would be relatively small by industrial standards.

B. Cultural Uniqueness and Diversity

The cultural uniqueness and diversity of the area would remain unchanged from the proposed project (no impact) because the proposed project would take place in a relatively remote location in which oil and gas exploration and extraction activities are present. The proposed project would not change

the predominant use of the surrounding area. The nearest home not associated with the project would be approximately 1 mile from the facility and the facility would be relatively small by industrial standards.

C. Local and State Tax Base and Tax Revenue

The proposed project would result in minor, if any, impacts to the local and state tax base and tax revenue because the proposed project would not require new permanent employees to be hired. In addition, only minor amounts of construction would be needed to complete the project.

D. Agricultural or Industrial Production

The current land use of the proposed location is agricultural; therefore, the proposed project would result in minor impacts to agricultural production from constructing the relatively small facility. The proposed project would not have any impacts to industrial production because the proposed project would not displace any industrial land. However, oil and gas operations are currently present, including drilling, in the area. While air emissions would continue to occur, as Section 7.F of this EA explains, the Department determined that the chance of deposition of pollutants impacting agricultural or industrial production in the area surrounding the site would be minor due to dispersion characteristics of pollutants and the atmosphere, and due to conditions that would be placed in Permit #3311-00. Overall, any impacts to agricultural or industrial production would be minor.

E. Human Health

The proposed project would result in only minor, if any, impacts to human health because of the relatively small potential emissions. As explained in Section 7.F of this EA, deposition of pollutants would occur. However, the Department determined that the proposed project, permitted by Permit #3311-00, would comply with all applicable air quality rules, regulations, and standards. These rules, regulations, and standards are designed to be protective of human health.

In addition, the peak annual ambient impact from operating the flares would be 0.005876 $\mu g/m^3$. The predicted annual ambient impact for each individual HAP was determined by multiplying the peak annual ambient concentration by the emission rate of the HAP. The impacts calculated for each HAP are compared to the cancer and non-cancer levels specified in Tables 1 and 2 of ARM 17.8.770. If the predicted ambient impact of a particular HAP is less than the level specified in the table and the inhalation pathway is the only appropriate pathway, that HAP can be excluded from the human health risk assessment. The table summarized in Section VII of the permit analysis indicates the calculated ambient impacts of the HAPs, the cancer and non-cancer levels, and whether or not each HAP passes the screening criteria. The emission inventory did not contain sufficient quantities of any pollutant on the Department's list of pollutants for which non-inhalation impacts must be considered; therefore, the Department determined that inhalation risk would be the only necessary pathway to consider.

As detailed in Section VII of the permit analysis, a health risk assessment was conducted to determine if the proposed flares at the facility would comply with the negligible risk requirement of MCA 75-2-215 and ARM 17.8.770. As defined in ARM 17.8.740(10), negligible risk is "*an increase in excess lifetime cancer risk of less than 1.0 x 10^{-6} for any individual pollutant, and 1.0 x 10^{-5} for the aggregate of all pollutants, and an increase in the sum of the non-cancer hazard quotients for all pollutants with similar toxic effects of less than 1.0 in order to determine negligible risk*." For the purposes of determining negligible risk for the flares, all HAPs resulting from natural gas combustion were included in the human health risk assessment.

All of the individual pollutant concentrations for the ELCR meet the acceptable risk limit because they are less than 1.00E-06 for each pollutant and less than 1.00E-05 for the aggregate of all pollutants. Further, the sums of the chronic and acute non-cancer hazard quotients are less than 1.0. Therefore, the flares at the facility meet the criteria of ARM 17.8.770 and operation of the flares would be considered a negligible risk to public health, safety, welfare, and to the environment. Overall, any impacts to human health in the proposed project area would be minor.

F. Access to and Quality of Recreational and Wilderness Activities

The proposed project would not have any impacts on access to recreational and wilderness activities because of the relatively small size of the facility. The proposed project would have minor, if any, impacts on the quality of recreational and wilderness activities in the area because the facility, while relatively small by industrial standards, would be visible. Overall, any impacts on access to and quality of recreational and wilderness activities would be minor.

G. Quantity and Distribution of Employment

The proposed project would not affect the quantity and distribution of employment because no permanent employees would be hired as a result of the proposed project. However, temporary construction-related positions could result from this project. Any impacts to the quantity and distribution of employment would be minor due to the relatively small size of the facility.

H. Distribution of Population

The proposed project would not affect distribution of population in the area because the facility would be located in a relatively remote location. The proposed project would not create any new permanent employment that would cause an increase in population in the area. In addition, the proposed project would not have impacts that would cause a decrease in the distribution of population in the surrounding area because the facility would be relatively small by industrial standards and the facility would only emit relatively small amounts of emissions.

I. Demands for Government Services

There would be minor impacts on demands of government services because additional time would be required by government agencies to issue Permit #3311-00 and to monitor compliance with applicable rules, standards, and Permit #3311-00. In addition, the roads in the area may realize a minor increase in vehicle traffic because tanker trucks would be used to unload the oil from the production tanks and Permit #3311-00 would require monthly inspections to be conducted by the company. However, any impacts on government services to regulate the minor increase in traffic would be minor due to the overall small size of the operation. Overall, any impacts on the demands for government services would be minor.

J. Industrial and Commercial Activity

Only minor impacts would be expected on the local industrial and commercial activity because the proposed project would represent only a minor increase in the industrial and commercial activity in the area. However, as crude oil wells in the area continue to produce crude oil, additional crude oil tank batteries would locate in the area thereby increasing the industrial and commercial activity. However, any new crude oil tank batteries with the PTE greater than 25 tons per year of any regulated air pollutant would be required to obtain a Montana Air Quality Permit and the Department would perform an EA for each permit application, evaluating impacts to industrial and commercial activity for each proposed project.

K. Locally Adopted Environmental Plans and Goals

The Department is not aware of any locally adopted environmental plans and goals that would be affected by issuing Permit #3311-00. The state standards would protect the proposed site and the environment surrounding the site.

L. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from the proposed project would result in minor impacts to the economic and social aspects of the human environment in the immediate area due to the relatively small size of the facility. Due to the relatively small size of the project, the industrial production, employment, and tax revenue (etc.) would not be significantly impacted by the proposed project. The Department would not expect other industries to be impacted by the proposed project and the Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #3311-00.

Recommendation: No EIS is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permitting action is for the construction and operation of a crude oil tank farm battery. Permit #3311-00 would include conditions and limitations to ensure the facility would operate in compliance with all applicable rules and regulations. In addition, there are no significant impacts associated with this proposal.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program

Individuals or groups contributing to this EA: Department of Environmental Quality – Air Resources Management Bureau, Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program

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