DEPARTMENT OF ENVIRONMENTAL QUALITY
PERMITTING AND COMPLIANCE DIVISION
Air and Waste Management Bureau

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May 24, 1999

Charles Brown
Environmental Compliance Director
MSE Technology Application, Inc.
P.O. Box 4078
Butte, MT 59702

Dear Mr. Brown:

Air Quality Permit #1528-08 is deemed final as of May 22, 1999, by the Department of Environmental Quality. This permit is for an engineering test facility. All conditions of the department's decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For the department,

Richard Knatterud
Air Permitting Section Supervisor

RK:kd

Enclosure

Montana Department of Environmental Quality
Permitting and Compliance Division

# Air Quality Permit #1528-08

MSE Technology Application, Inc.
P.O. Box 4078
Butte, MT 59702

May 22, 1999

Air Quality Permit

Issued to: MSE Technology Application, Inc.
P.O. Box 4078
Butte, MT 59702

Permit #1528-08
Complete Application Received: 3/11/99
Preliminary Determination Issued: 4/20/99
Department Decision Issued: 5/06/99
Permit Final: 5/22/99
AFS #: 30-093-0013

An air quality permit is granted to MSE Technology Application, Inc., (MSE), pursuant to Section 75-2-204 and 211, Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.701, *et seq.*, as amended, for the following:

SECTION I: Permitted Facilities

A. Plant Location:

An engineering test facility known as the MSE Technology Applications, Inc. Facility which is located at Section 18, Township 2 North, Range 7 West, Silver Bow County, approximately 5 miles south of Butte, Montana in the Butte Industrial Park. This facility supports the development, testing, and integration of several projects at any one time. A description of the permitted equipment can be found in the Permit Analysis.

B. Current Permit Action:

The current permit action is an alteration to the existing permit to allow the construction and operation of a new unit at the MSE facility. MSE is proposing to install a Mobile Plasma Treatment System. The Mobile Plasma Treatment System will be skid mounted and use high temperature plasma incineration to treat various waste streams. MSE is requesting that an operational limitation of 1000 hours be placed in the permit because this is a demonstration project that will not operate continuously. The controlled emissions from this project are approximately 2 tpy of NOx.

This permitting action will also identify a project at MSE that is allowed to occur under ARM 17.8.705(1)(q). MSE is proposing to install a pilot scale multi-stage combustion NOx removal system, referred to as a NOXidizer, on the end of the Plasma Centrifugal Furnace off-gas slipstream. The NOXidizer will be installed using a separate stack on the furnace. There will not be an increase in emissions as a result of this project.

SECTION II: Limitations and Conditions

A. Emission Control Requirements

MSE shall install, operate, and maintain the following emission control equipment, process equipment and practices, and all emission control equipment and practices as specified in their Montana air quality permit applications.

1. All exposed coal stockpiles shall be treated with chemical surfactant, as needed, to maintain compliance with the 20% opacity limitation (ARM 17.8.308).

2. All access roads shall be treated with water and/or chemical stabilization as necessary to maintain compliance with the 20% opacity standard (ARM 17.8.308).

3. MSE shall install, operate and maintain a baghouse and wet scrubbers (as described in permit application #1528-02) on the coal pre-dryer (ARM 17.8.715).

4. On the Plasma Centrifugal Furnace (PCF), MSE shall install, operate, and maintain an off-gas treatment system consisting of a quencher, a contact condenser/absorber, a scrubber/agglomerator/demister, an electric superheater, a baghouse, a roughing HEPA filter, a carbon bed/HEPA filter, an electric reheater, a catalytic $NO_x$ reactor, and an afterburner/secondary combustion chamber/particulate removal unit (ARM 17.8.715).

5. MSE shall construct, operate, and maintain the Small Scale Plasma Furnace (SSPF) process consisting of the following: 1) a primary combustion chamber; 2) an afterburner; 3) an exit gas system; and, 4) auxiliary systems (ARM 17.8.710).

6. MSE shall construct, operate, and maintain the exit gas system on the SSPF, which shall consist of the following: 1) a mixing tee; 2) filter baghouse; and, 3) an air blower (ARM 17.8.715).

7. MSE shall construct, operate, and maintain the secondary combustion chamber, the dry scrubber system, and the electric reheater and NOx removal reactor on the Mobile Plasma Treatment System (ARM 17.8.715).

8. MSE shall operate all equipment to provide the maximum air pollution control for which the equipment was designed (ARM 17.8.715)

9. MSE shall operate the afterburner as part of the SSPF at a minimum of 1400° F and with a minimum residence time of 2 seconds (ARM 17.8.715).

10. MSE shall be allowed to use as feedstock to the SSPF inorganic feedstock, pyrotechnic ordnance, Resource Conservation and Recovery Act (RCRA) heavy metals, surrogates for radioactive materials, fuel oil, and small quantities of hazardous waste (ARM 17.8.710).

B. Emission Limitations

1. MSE shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of twenty percent (20%) or greater averaged over a six-minute period (ARM 17.8.304)

2. MSE shall not cause or authorize to be discharged into the atmosphere, from the coal processing building's coal direct-fired air heater stack, the coal predryer oil heater stack, the coal predryer scrubber stack, and/or the baghouse stack, combined particulate emissions in excess of 9.6 tons per year (ARM 17.8.715).

3. MSE shall not cause or authorize to be discharged into the atmosphere, from the coal processing building's coal direct-fired air heater stack, the coal predryer oil heater stack, the coal predryer scrubber stack, and/or the baghouse stack, combined particulate emissions in excess of 19.2 pounds per hour (ARM 17.8.715).

4. MSE shall not cause or authorize to be discharged into the atmosphere, from all stacks associated with the PCF, NOx emissions in excess of 5.4 tons per year (ARM 17.8.715). Actual NOx emissions shall be monitored by use of a NOx CEM. The NOx monitoring results will be used to determine compliance with the annual NOx emission limitation.

5. MSE shall not cause or authorize to be discharged into the atmosphere, from the PCF, NOx emissions in excess of 7 pounds per hour (ARM 17.8.715).

6. MSE shall not cause or authorize to be discharged into the atmosphere, from the PCF, particulate emissions in excess of 0.03 grains per dry standard cubic foot (gr/dscf) (ARM 17.8.715).

7. MSE shall not cause or authorize to be discharged into the atmosphere, from the SSPF, particulate emissions in excess of 0.02 grains per dry standard cubic foot (gr/dscf) (ARM 17.8.715).

8. MSE shall not cause or authorize to be discharged into the atmosphere, from the SSPF, NOx emissions in excess of 3.2 pounds per hour (ARM 17.8.715).

C. Emission Testing

1. MSE shall conduct compliance particulate source tests on the Coal Processing Building and the PCF to determine compliance with the applicable particulate emission standards in Sections II.B.2, II.B.3, and II.B.6 in 1997 and every

four years thereafter, or another schedule as determined by the Department of Environmental Quality (department).

2. MSE shall conduct compliance opacity, particulate, and NOx source tests on the SSPF to determine compliance with the applicable emission standards in Sections II.B.1, II.B.7, and II.B.8, within 180 days of start up of the SSPF and every four years thereafter.

3. These tests shall include determination of total mass particulate. Total mass particulate levels shall serve as a surrogate for PM-10 levels if the back half/impinger catch is included.

4. All source tests shall be conducted in accordance with the Montana Source Test Protocol and Procedures Manual (ARM 17.8.105).

5. The department may require further testing at the facility (ARM 17.8.105).

D. Emission Monitoring and Reporting

1. MSE shall install, calibrate, operate, and maintain continuous emission monitoring systems (CEMS) to monitor and record NOx concentrations of a representative portion of the gases discharged into the atmosphere from the PCF to determine compliance with the applicable emission standards in Sections II.B.4 and II.B.5 (ARM 17.8.710).

   a. The NOx CEMS shall conform to all requirements of 40 CFR Part 60, Appendix B, Performance Specification 2--Specifications and Test Procedures for $SO_2$ and NOx Continuous Emission Monitoring Systems in Stationary Sources (PS2).

   b. The CEMS data will be used to demonstrate compliance with the applicable NOx limitations for the PCF. MSE shall maintain, as a minimum, compliance with the applicable limitations, as demonstrated by the CEMS, 95% of the time the CEMS is operating.

2. MSE shall submit a written report of all excess emissions quarterly. Periods of excess emissions shall be defined as those averaged over a one-hour period for which the average emission rate is greater than the applicable emission standard. The report shall be in the format contained in Attachment A and including, as a minimum, the following:

   a. The magnitude and duration of excess emissions and the date and time of commencement and completion of each time period of excess emissions.

   b. Specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions of the affected facility. The nature and cause of any malfunction (if known), the corrective action taken or preventative measures adopted.

c. The date and time identifying each period during which the CEMS were inoperative, except for zero and span checks. The nature of the system repairs or adjustments must also be reported.

d. When no excess emissions have occurred or the CEMS have not been inoperative, repaired, or adjusted, such information shall be stated in the report.

e. The percentage of time the CEMS were available. This shall be calculated as

$$1 - \frac{\text{CEMS downtime in hours during point source operation}}{\text{hours of point source operation}} \times 100$$

This shall be reported as percent CEMS availability during point source operation. MSE shall maintain a minimum of 95% CEMS availability during point source operation.

f. The percentage of time the CEMS indicated compliance. This shall be calculated as:

$$1 - \frac{\text{total hours of excess emissions during monitor operation}}{\text{total hours of monitor operation}} \times 100$$

This shall be reported as percent compliance. MSE shall maintain, as a minimum, compliance with the applicable emission standard as demonstrated by the CEMS, 95% of the time the point source is operating.

g. The excess emission reports shall be submitted within 45 days following the end of the reporting period (January-March, April-June, July-September, and October-December).

3. MSE shall inspect and audit the CEMS quarterly. MSE shall conduct these audits using the appropriate procedures and forms in accordance with 40 CFR Part 60 Appendix F. The results of these inspections and audits shall be included in the quarterly excess emission report.

4. MSE shall develop and implement a standard operating procedures manual and a quality assurance plan for the CEMS. These documents shall be submitted to the department for approval within 180 days of commencement of the Proof-of-Concept (POC) testing.

5. MSE shall maintain a file of all measurements from the CEMS, and performance testing measurements; all CEMS performance evaluations; all CEMS or monitoring device calibration checks and audits; adjustments and maintenance performed on these systems or devices recorded in a permanent form suitable for inspection. The file shall be retained on site

for at least three years following the date of such measurements and reports. MSE shall supply these records to the Department of Environmental Quality upon request.

E. Operational Limitations

1. MSE shall not operate the PCF more than 3000 hours in any calendar year (ARM 17.8.710).

2. MSE shall not operate the Mobile Plasma Treatment System more than 1000 hours in any calendar year (ARM 17.8.710).

3. MSE may only replace or modify components of existing systems, add new components to existing systems or make any changes in the existing processes or procedures, as part of an ongoing, planned testing process. MSE may not make any physical changes in equipment or changes in the existing processes or procedures that will increase emissions beyond the allowable emission limits contained in this permit without obtaining a permit alteration prior to installation of the equipment or implementation of the procedural changes (ARM 17.8.710).

F. Operational Monitoring

1. Magnehelic gauges, manometers or other devices capable of measuring the pressure drops shall be installed and maintained on the following control equipment:

   a. Coal pre-dryer exhaust,

   b. Coal Processing Building: baghouse, and

   c. Plasma Centrifugal Furnace: scrubber/agglomerator/demister, baghouse, roughing HEPA filter, and carbon bed/HEPA filter.

2. For each piece of control equipment, pressure drop measurements shall be recorded on a daily basis during operation of process equipment. These readings shall be maintained by MSE for a minimum of five years and shall be made available for review by department or EPA personnel upon request.

G. Operational Reporting Requirements

1. MSE shall supply the 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 Section I of this permit. 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 units as required by the department.

In addition, MSE shall submit the following information annually to the department by March 1st of each year. This information is required to verify compliance with permit limitations and may also be used in the annual emission inventory (ARM 17.8.505).

a. Total amount of coal handled;
b. Hours of operation of the PCF;
c. Hours of operation of the SSPF;
d. Hours of operation of the Mobile Plasma Treatment System;
e. A listing of all emission factors used and their sources (source test, AP-42 etc.); and
f. All emission calculations.

2. MSE shall notify the department of any construction or improvement project conducted pursuant to ARM 17.8.705(1)(q) that would change the facility's annual emission inventory. The notice must be included with the annual emission inventory submitted to the department and must include information sufficient to calculate the facility's estimated actual emissions (ARM 17.8.708).

3. The records compiled in accordance with this permit shall be maintained by MSE as a permanent business record for at least five years following the date of the measurement, shall be submitted to the department upon request, and shall be available at the plant site for inspection by the department (ARM 17.8.710).

H. Notification

MSE shall provide the department with written notification of the following dates within the specified time periods:

1. Any replacement of any existing equipment or component, at least 30 days prior to installation (ARM 17.8.710).

2. Source tests protocols, CEMS Performance Specification tests or audits on the PCF, at least 25 working days prior to the test (ARM 17.8.105).

SECTION III: General Conditions

A. Inspection - The recipient shall allow the department's representatives access to the source at all reasonable times for the purpose of making inspections, 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 all the terms, conditions, and matters stated herein shall be deemed accepted if the recipient fails to appeal as indicated below.

C. Compliance with Statutes and Regulations - Nothing in this permit shall be construed as relieving the permittee of the responsibility for complying with any applicable federal, or Montana statute, rule or standard, except as specifically provided in ARM 17.8.701, *et seq.* (ARM 17.8.717).

D. Enforcement - Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement 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 fifteen (15) days after the department renders its decision, upon affidavit setting forth the grounds therefor, 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 fifteen (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 the conclusion of the hearing and issuance of a final decision by the Board.

F. Permit Inspection - As required by ARM 17.8.716 Inspection of Permit, a copy of the air quality permit shall be made available for inspection by department personnel at the location of the permitted source.

G. Construction Commencement - Construction must begin within three years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked.

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

I. The department may modify the conditions of this permit based on local conditions of any future site. These factors may include, but are not limited to, local terrain, meteorological conditions, proximity to residences, etc.

ATTACHMENT A

INSTRUCTIONS FOR COMPLETING EXCESS EMISSIONS
AND MONITORING SYSTEMS REPORTS (EER)

PART 1 Complete as shown.

PART 2 Complete as shown. Report total time the point source operated during the reporting period in hours. The determination of point source operating time includes time during unit startup, shutdown, malfunctions, or whenever pollutants (of any magnitude) are generated, regardless of unit condition or operating load.

Normal calibrations and maintenance as prescribed by the CEMS manufacturer need not be listed in subpart i or counted as CEMS downtime.

Percent of time CEMS was available during point source operation is to be determined as:

$$1 - \frac{\text{(CEMS downtime in hours during point source operation)}}{\text{(total hours of point source operation during reporting period)}} \times 100$$

Excess emissions include all time periods when emissions, as measured by the CEMS, exceed any applicable emission standard for any applicable time period.

Percent of time in compliance is to be determined as:

$$1 - \frac{\text{(total hours of excess emissions during point source operation)}}{\text{(total hours of point source operation during reporting period)}} \times 100$$

PART 3 Complete a separate sheet for each pollutant control device associated with a CEMS. Be specific when identifying control equipment operating parameters. For example: primary and secondary amps and spark rate for ESPs; pressure drop and effluent temperature for baghouses; and liquid flow rate and pH levels for scrubbers. For the initial EER, include a diagram or schematic for each piece of control equipment.

TABLE 1 Use Table I as a guideline to report all excess emissions. Complete a separate sheet for each CEMS. Sequential numbering of each excess emission is recommended. For each excess emission, indicate: 1) time, duration and magnitude, 2) nature and cause, and 3) the action taken to correct the condition of excess emissions. Do not use computer reason codes for corrective actions or nature and cause, rather be specific in the explanation. If no excess emissions occur during the reporting period, it must be so stated. Use Table II as a guideline to report all CEMS upsets or malfunctions. Complete a separate sheet for each CEMS. List the time, duration, nature and extent of problems, as well as the action taken to return the CEMS to proper operation. Do not use reason codes for nature, extent or corrective actions. Include normal calibrations and maintenance as prescribed by the CEMS manufacturer. Do not include zero and span checks.

TABLE III Complete a separate sheet for each pollutant control device associated with a CEMS. Use Table III as a guideline to report operating status of control equipment during the excess emission. Follow the number sequence as recommended for excess emissions reporting. Report operating parameters consistent with Part 3, subpart f.

EXCESS EMISSIONS AND MONITORING SYSTEMS REPORT

PART 1

a. Emission Reporting Period _____

b. Report Date _____

c. Person Completing Report _____

d. Plant Name _____

e. Plant Location _____

f. Person Responsible for Review and Integrity of Report _____

g. Mailing Address for 1.f. _____
Street Address or P.O. Box

_____
City State Zip Code

h. Phone Number of 1.f. _____

i. Certification for Report Integrity, by person in 1.f.

THIS IS TO CERTIFY THAT THE INFORMATION PROVIDED IN THIS REPORT IS COMPLETE AND ACCURATE.

SIGNATURE _____

NAME _____

TITLE _____

DATE _____

j. Comments _____

PART 2 - CEMS Information: Complete for each CEMS.

a. Point Source _____

b. CEMS Type (circle one):
Opacity $SO_2$ NOx $O_2$ CO $CO_2$ TRS

c. Manufacturer _____

d. Model No. _____ e. Serial No. _____

f. Automatic Calibration Value: Zero _____ Span _____

g. Date of Last CEMS Performance Test _____

h. Total Time Point Source Operated During Reporting Period _____

i. Percent of Time CEMS Was Available During Point Source Operation: _____

Show calculations _____

_____

j. Allowable Emission Rate _____

k. Percent of Time in Compliance _____

Show calculations _____

_____

l. CEMS Repairs or Replaced Components Which Affected or Altered Calibration Values

_____

_____

_____

_____

_____

_____

_____

_____

PART 3 - Pollution Control Equipment Operating Parameter Monitor. (Complete one sheet for each pollutant control device associated with a CEMS.)

a. Point source _____

b. Pollutant (circle one): Opacity Particulate $SO_2$ NOx TRS

c. Type of Control Equipment _____

d. Control Equipment Description and Identification (Model # and Serial #)

_____

_____

_____

e. Control Equipment Operating Parameters (i.e., pressure drop [delta P], effluent temperature, scrubber water flow rate and pH levels, primary and secondary amps, spark rate) _____

_____

_____

_____

_____

f. Date of Control Equipment Performance Test _____

g. Control Equipment Operating Parameter During Performance Test

_____

_____

_____

_____

h. Type and Amount of Material Produced or Processed During the Reporting Period _____

i. Type and Amount of Fuel Used During the Reporting Period _____

_____

_____

_____

_____

TABLE I

EXCESS EMISSIONS

| Date | Time From | Time To | Duration | Magnitude | Explanation/ Corrective Action |
|---|---|---|---|---|---|

TABLE II

CONTINUOUS MONITORING SYSTEM OPERATION FAILURES

| Date | Time From | To | Duration | Problem/ Corrective Action |
|---|---|---|---|---|

TABLE III

CONTROL EQUIPMENT OPERATION DURING EXCESS EMISSIONS

| Date | Time From | To | Duration | Operating Parameters | Corrective Action |
|---|---|---|---|---|---|

Permit Application Analysis
MSE Technology Application Inc.
Permit #1528-08

I. Introduction/Process Description

A. Permitted Equipment:

1. Coal Processing Building including, but not limited to, the coal direct-fired air heater stack, coal predryer oil heater stack, coal predryer scrubber stack, and baghouse.

2. Plasma Centrifugal Furnace (PCF) and associated equipment, including a NOXidizer.

3. Small Scale Plasma Furnace (SSPF).

B. Permit History

The original permit issued to MSE was **permit #1528** issued on December 1, 1980. This permit was a temporary one-year permit for the operation of the magneto hydrodynamic (MHD) process. This permit was renewed annually through 1984.

The temporary permits required that an application be submitted for a final permit when operating parameters were established and before firing with coal. MSE applied for and received this final permit given **permit #1528-A** on July 5, 1984.

**Permit #1528-02** was issued to MSE on August 31, 1992. MSE applied for an alteration to their existing air quality permit for construction of a new MHD combustor and construction of new NOx and CO control equipment on the new MHD combustor.

**Permit #1528-03** was issued to MSE on June 11, 1993. This permit modification was to change the method of demonstrating compliance with the $SO_2$ emission limitations and to identify the control equipment installed on the Plasma Centrifugal Furnace (PCF) as a hot-gas cyclone instead of a hot-gas filter.

The modification allowed MSE to demonstrate compliance with the $SO_2$ emission limitations in the permit through testing. The previous method of determining compliance was through the use of a CEM. MSE was having problems with the CEMS $SO_2$ analyzer due to ammonia interference in the stack gas from the operation of the ammonia injection system. MSE agreed to the operation of a potassium carbonate ($K_2CO_3$) injection system to control $SO_2$ emissions 95% of the time the MHD combustor is in operation as a permit condition, along with additional reporting requirements.

The change in control equipment on the PCF eliminated the rapid plugging problem of the scrubber liquid filters by removing at least 50% of off-gas particulate before

entering the scrubber. The hot-gas filters were cost prohibitive when compared to the cyclones. MSE is still able to meet the emission limitations contained in the permit.

The modification also removed references to the coal fines exhaust point source emissions. The coal fines exhaust was originally anticipated to be used when the coal fines were not being reinjected into the process. The coal fines are now always reinjected into the process.

**Permit #1528-04** was issued to MSE on August 19, 1993. This alteration was for the total replacement of the existing control equipment with an enhanced control system and did not affect emission rates. Modifications to the Plasma Centrifugal Furnace (PCF) systems were necessary to increase reliability and ensure emission compliance, while demonstrating the level of performance required by the Pit 9 Project.

The Pit 9 project was a joint effort with Lockheed to provide remediation services for the Department of Energy at the Idaho National Engineering Laboratory (INEL). Prior to award of the remediation contract, the DOE decided to conduct "Proof of Process" testing to verify the technologies chosen for the remediation. Proof of Process testing required changing the basic process operation from batch to continuous and approximately doubling the throughput. System modifications to meet these test requirements were employed during the summer of 1993. Two 100-hour test sequences were planned following systems modification. Listed below are the system modifications:

Feed System: The main component of the feed system is a single, hydraulically driven, Archimedes screw. The single screw was replaced by larger dual Archimedes screw feeders to provide continuous feed capability. This activity included structural support modifications, feeder platform modifications, and utility hook-ups.

Slag System: The previous slag removal procedures require shutdown of the PCF. This modification provided automated, continuous, slag removal capability. This modification required changes to the existing slag pour assembly, installation of the slag pour chamber, installation of automated control equipment, and facility interface modifications.

Pressure Control System: The existing pressure control system was modified to recirculate any gas vented as a result of a pressure surge to the inlet of the off-gas system.

Pollution Control System: The modifications to the pollution control system included added controls for both NOx and particulate emissions. These modifications included the addition of a baghouse, carbon bed, and a selective catalytic reduction system (aqueous ammonia). The baghouse and dual HEPA filters, ensure proper particulate control, the selective catalytic reduction system reduced NOx emissions, and the carbon bed caught any volatilized trace metals. The existing HEPA filters were up-sized to meet the increased throughput requirements. The enhancements to the pollution control system ensured emissions remained below the specified limitations.

**Permit #1528-05** allowed for the construction and operation of a new Small Scale Plasma Furnace (SSPF), incorporate changes made to the Plasma Centrifugal Furnace (PCF), and incorporate a new hours-of-operation limitation on the MHD process.

The SSPF is a small treatment process to be used for treating inorganic feedstock, pyrotechnic ordnance, RCRA heavy metals, surrogates for radioactive materials, fuel oil, and small quantities of hazardous waste. The feedstock will be in the form of contaminated soils. The process is similar to the existing PCF, except smaller. The emissions from the SSPF are expected to be very similar in type to those from the PCF, but at lower quantities.

The SSPF consists of the following: 1) a primary combustion chamber, 2) an afterburner, 3) an exit gas system, and 4) auxiliary systems. The major components of the exit gas system are a mixing tee, a particulate filter baghouse, and an air blower.

The planned changes to the PCF were to modify the off-gas piping configuration between the existing primary combustion chamber and the quench vessel. This change would result in the removal of the existing hot-gas cyclone and the addition of a new afterburner/secondary combustion chamber. The purpose of the change is to alleviate plugging problems in the throat area of the primary combustion chamber, reduce the amount of particulate in the off-gas stream, and increase the temperature and residence time in the secondary combustion chamber. This change is being made in accordance with the requirement contained in Section II.H.1 of permit #1528-04.

MSE also requested that the hours of operation be limited for the MHD to keep the facility below 100 tons of any pollutant. If the facility is under 100 tons, it will not be defined as a major source for criteria pollutants under the current operating permit program contained in ARM 17.8. Subchapter 12. The department has agreed to impose such an hourly limitation. The allowable operating hours limitation was changed from 1000 hours to 500 hours.

MSE was issued final **permit #1528-06** on December 29, 1996. The alteration to the permit deleted all references to the MHD Coal-Fired Combustor, increased the annual operating hours of the PCF, and decreased the minimum temperature requirement for the SSPF afterburner. In addition, equipment originally permitted in #1528-A and 1528-02 was identified. This alteration was based on MSE's initial request dated July 25, 1996. This permitting action resulted in a net decrease in the facility's annual emissions.

MSE removed the MHD Coal-Fired Combustor from the facility; therefore, all references to the MHD were eliminated from the permit.

The annual operating hours of the PCF were increased from 1212 hours per year to 3000 hours per year. Annual allowable emissions of the PCF increased from 0.04 to 0.09 tons per year for both TSP and PM-10; $NO_x$ emissions increased 3.65 tons per year from 1.75 to 5.40 tons per year.

The SSPF requirement to operate the afterburner at a minimum of 2000° F and with a minimum residence time of 2 seconds was changed. The new limitation required a minimum temperature of 1400° F with a minimum residence time of 2 seconds.

In addition, the permit alteration listed equipment that was not clearly identified in the previous permits. The following process equipment was permitted in #1528-A and 1528-02 as the coal processing building: railcar bottom dump load-out; railroad car unloading conveyor; radial stacker; belt-feeder surge hopper; coal crusher; bucket elevator; raw coal storage bin; raw coal screw feeder; coal predryer; coal predryer scrubber; therminol expansion tank; coal predryer oil heater; pulverizer surge bin; pulverizer cyclone collector; baghouse; direct-fired air heater; prepared coal storage bin; pulverized coal screw conveyor; pulverized coal separator screen; coal feed injector; coal filter/receiver; coal storage injector; coal primary injector; raw coal truck loud-out; and dry coal truck load-out. Some of the emission points associated with the coal processing building include: front end loading of coal into the belt feeder surge hopper; the coal crusher; material transfer points; the coal predryer scrubber exhaust; emissions from the coal predryer oil heater; the vent from the direct-fired air heater; coal fines filter/receiver; and, the vent from the baghouse.

In addition, the permit alteration clarified the confusion surrounding the coal process building's emission limits. Permit #1528-05 identified in section I.A.2 that the coal processing building included three individual point sources and stacks. However, section II.B.12 of permit #1528-05 identified four individual point sources and stacks associated with the coal processing building and set a particulate emissions limit in tons per year for the coal processing building. Condition II.B.13 of permit #1528-05 set a pounds-per-hour particulate emission limit for the coal processing building that did not specify a given number of point sources and stacks. For permitting action #1528-06, particulate emission limitations for four individual point sources and stacks were included in condition 2 and 3 of section II. B. The direct-fired air heater, the predryer oil heater, the scrubber emissions from the coal predryer, and baghouse exhaust were identified as the four individual point sources and stacks.

The coal crusher and material transfer points were added to the emission inventory of this permit. Consequently, the emission inventory of this permit reflected larger emissions for TSP than permit #1528-05. The coal crusher and material transfer were previously permitted items that were not included in previous emission inventories. This permitting action did not result in an increase of allowable emissions at the facility; the deletion of the MHD Combustor resulted in an overall net decrease in emissions at the facility.

A Seed Preparation and Injection System associated with the MHD Combustor was located at the facility. Although this equipment was no longer in operation, it remained permitted equipment in permit #1528-06.

On April 24, 1998, **permit #1528-07** was issued to MSE which was a modification to the existing permit to account for additional testing involving the PCF and associated equipment. This permit was necessary to clarify that MSE's proposal was covered by their air quality permit. As proposed to the department, the incorporation of the Alternate Thermal Driver, the Mercury Removal System, and the PODS into the PCF process was a deminimis change under ARM 17.8.705(1)(q) and was

covered by the Operational Limitations (Section E.2) of the Permit. A brief description of the upcoming projects at MSE is given below.

Alternate Thermal Driver - The Alternate Thermal Driver will use oxygen-enriched natural gas combustion to provide a hot off-gas stream for testing off-gas treatment and emissions monitoring systems when material processing by a plasma torch is not a requirement. The Alternate Thermal Driver will be installed in the center port of the PCF primary chamber. No increased emissions are expected from the Alternate Thermal Driver.

Mercury Removal - The mercury removal testing will be performed with a pre-manufactured process system supplied by ADA Technologies Inc. Two sorbent reactors will be used to treat the mercury vapors created by a mercury vapor generator and moved through the system with a blower. Furthermore, the gas stream (including purge air) exiting the sorbent reactors will be routed through a conventional mercury removal process consisting of sulfur impregnated carbon. This process should reduce the mercury concentration in the gas stream to $<0.005$ ug/m$^3$ prior to returning the gas stream to the PCF off-gas system immediately downstream of the NOx control equipment. Minor increases in emissions are expected from the Mercury Removal system.

The PODS - The purpose of the PODS is to treat pyrotechnic ordinance. Dirt and metal will be the only feedstock used for the operational testing. The PODS primary treatment chamber, slag collection chamber, and process control system will be assembled and test fired at MSE's facility in Butte, Montana, prior to delivery. The existing PCF off-gas treatment system will be used to ensure emissions from the PODS testing are properly treated prior to being released to the atmosphere. No increased emissions are expected from the PODS.

C. Current Permit Action

On March 11, 1999, the department received a complete application from MSE to alter the existing permit to allow the construction and operation of a new unit at MSE's facility. MSE is proposing to install a Mobile Plasma Treatment System. The Mobile Plasma Treatment System will be skid mounted and use high temperature plasma incineration to treat various waste streams. MSE is requesting that an operational limitation of 1000 hours be placed in the permit because this is a demonstration project that will not operate continuously. The controlled emissions from this project are approximately 2 tpy of NOx.

The Mobile Plasma Treatment System is capable of processing 125 lbs/hr of waste and consists of the following major components:

- the primary processing chamber;
- the plasma arc torch;
- the secondary combustion chamber;
- the dry scrubber system;
- the electric reheater and NOx removal reactor; and
- the pressure blowers.

This permitting action will also identify a project at MSE that is allowed to occur under ARM 17.8.705(1)(q). MSE is proposing to install a pilot scale multi-stage combustion NOx removal system, referred to as a NOXidizer, on the end of the Plasma Centrifugal Furnace off-gas slipstream. The NOXidizer will be installed using a separate stack on the furnace. There will not be an increase in emissions as a result of this project.

When the preliminary determination was issued for this permit application, it referenced a Biomet Sulfate Reducing Bacteria Process proposed by MSE. This process uses combustion off-gases as nutrients for the bacteria which are used to treat acid rock drainage. The burner that provides the combustion gases is fired on diesel or natural gas. However, during the comment period, MSE notified the department that they were no longer proposing to test this process. Therefore, all references to the Biomet Sulfate Reducing Bacteria Process have been removed from MSE's permit. **Permit #1528-08** replaces permit #1528-07.

D. Additional Information

Additional information, such as applicable rules and regulations, BACT determinations, air quality impacts, and environmental assessments are included in the analysis associated with each change to the permit.

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 Administrative Rules of Montana and are available upon request from the department. Upon request, the department will provide references for locations 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 17.8.105, 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.

2. ARM 17.8.106, Source Testing Protocol. MSE shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual. A copy of the manual is available from the department upon request.

3. ARM 17.8.110, Malfunctions. (2) The department must be notified promptly by phone 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.

4. ARM 17.8.111, Circumvention. (1) No person shall cause or permit the installation or use of any device or any means which, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant which would otherwise violate an air pollution

control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner that a public nuisance is created.

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

1. ARM 17.8.210, Ambient Air Quality Standards for Sulfur Dioxide,
2. ARM 17.8.211, Ambient Air Quality Standards for Nitrogen Dioxide,
3. ARM 17.8.212, Ambient Air Quality Standards for Carbon Monoxide,
4. ARM 17.8.221, Ambient Air Quality Standards for Visibility, and
5. ARM 17.8.223, Ambient Standards for PM-10.

MSE must comply 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 to an 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. This section requires an opacity limitation of 20% for all fugitive emission sources and that reasonable precautions be taken to control particulate emissions from fugitive sources.

3. ARM 17.8.309, Particulate Matter, Fuel Burning Equipment. This section states that emissions of particulate matter caused by the combustion of fuel shall not exceed the hourly rate set forth in this section.

4. ARM 17.8.310, Particulate Matter, Industrial Process. This section states that particulate matter emissions from any operation, process, or activity, shall not exceed the amounts set forth in ARM 17.8.310.

5. ARM 17.8.316, Incinerators. MSE meets the definition of an incinerator in 17.8.101(22); therefore, ARM 17.8.316 is applicable.

6. ARM 17.8.322, Sulfur Oxide Emissions, Sulfur-in-Fuel. This section limits the sulfur content of the coal to one pound of sulfur per million Btu fired.

7. ARM 17.8.340, Standards of Performance for New Stationary Sources. The owner or operator of any stationary source or modification, as defined and applied in 40 CFR Part 60, shall comply with the standards and provisions of 40 CFR Part 60. There are no standards applicable to the MSE facility.

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. MSE shall 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. MSE has submitted the appropriate permit application fee.

2. ARM 17.8.505, Air Quality Operation Fees. 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; and the air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

The annual assessment and collection of the air quality operation fee, as 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 which pro-rate 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 17.8.705, When Permit Required--Exclusions. This rule requires a facility to obtain an air quality permit or permit alteration if they construct, alter, or use an air contaminant source which has the potential to emit more than 25 tons per year of any pollutant. MSE has the potential to emit more than 25 tons per year of PM-10; therefore, a permit is required.

2. ARM 17.8.706, New or Altered Sources and Stacks, Permit Application Requirements. This section requires that an application for an air quality permit be submitted for a new or altered source. A permit application was submitted by MSE for the new Mobile Plasma Treatment System.

3. ARM 17.8.707, Waivers. ARM 17.8.707 requires the permit application be submitted 180 days before construction begins. This section allows the department to waive this time limit. The department hereby waives this time limit.

4. ARM 17.8.710, Conditions for Issuance of Permit. This section requires that MSE demonstrate compliance with applicable rules and standards before a permit can be issued. MSE has demonstrated compliance with applicable rules and standards as required for permit issuance.

5. ARM 17.8.715, Emission Control Requirements. MSE is required to install on a new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that a best available control technology shall be utilized. The required BACT analysis was completed for the new or altered source permitted in this action.

6. ARM 17.8.716, Inspection of Permit. MSE must maintain a copy of their air quality permit on site and make that copy available for inspection by department personnel upon request.

7. ARM 17.8.717, Compliance with Other Statutes and Rules. MSE must comply with all other applicable state, federal and local laws and regulations.

8. ARM 17.8.720, Public Review of Permit Applications. This section requires that the applicant notify the public of its application for permit. MSE has submitted proof of compliance with the public requirements.

9. ARM 17.8.731, 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 one year after the permit is issued.

10. ARM 17.8.733, Modification of Permit. An air quality permit may be modified for changes in any applicable rules and standards adopted by the board or changed conditions of operation at a source or stack which do not result in an increase in emissions because of those changed conditions of operation. A source may not increase its emissions beyond those found in its permit unless the source applies for and receives another permit.

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

ARM 17.8.801, Definitions. MSE is not defined as a "major stationary source" because it is not a listed source and does not have the potential to emit more than 250 tons of any pollutant.

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

(6)(b) Commercial Hazardous waste incinerator does not include a research and development facility that receives federal or state research funds and that burns hazardous waste primarily to test and evaluate waste treatment remediation technologies.

Since MSE is an existing facility, MSE does not have to meet the requirements of ARM 17.8.706(5).

III. Best Available Control Technology Analysis

A Best Available Control Technology (BACT) determination is required for each new or altered source. MSE shall install on the new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that best available control technology shall be utilized.

MSE is proposing to install and operate a secondary combustion chamber, a dry scrubber, and a NOx removal reactor to control emissions from the Mobile Plasma Treatment System. These control devices will be extremely effective in controlling the combustion gases, particulate, acid gases, $SO_2$, and NOx from the unit. Because the control equipment proposed by MSE is the most effective equipment available to control emissions from this type of emission unit, the department will not consider other control options. Therefore, the department has determined that the operation and maintenance of the secondary combustion chamber, the dry scrubber, and the NOx removal reactor constitutes BACT for the new Mobile Plasma Treatment System.

The control options that have been selected contain control equipment and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

IV. Existing Air Quality and Ambient Impacts

MSE is located in the Butte PM-10 nonattainment area. A PM-10 State Implementation Plan to achieve compliance with the ambient PM-10 standards has been developed.

The permitting action for permit #1528-02 utilized two dispersion models. Complete modeling results and description are contained in permit application #1528-02. The results indicated compliance with all ambient standards.

Permit **#1528-08** will result in a very minor increase in PM-10 emissions. Therefore, the department expects this facility to still be in compliance with all ambient standards.

V. Emission Inventory

Maximum rated production figures were submitted to the department by MSE, Inc. as part of permit application #1528-02 and #1528-04.

Annual Allowable Emissions (Tons/Year)

Emission Inventory -- Permit # 1528-08

| | Tons/Year | | | | | |
|---|---|---|---|---|---|---|
| Source | TSP | PM-10 | NOx | VOC | CO | SOx |
| Direct fired air heater, etc. | 9.60 | 9.60 | | | | |
| Crusher | 9.20 | 4.60 | | | | |
| Material Transfer | 30.66 | 15.33 | | | | |
| Plasma Centrifugal Furnace | 0.09 | 0.09 | 5.40 | | | |
| Small Scale Plasma Furnace | 0.0186 | 0.0186 | 14.0160 | 0.0020 | 0.0010 | 0.0100 |
| Mobile Plasma Treatment System | 0.11 | 0.11 | 2.00 | | | |
| Total Emissions | 49.68 | 29.75 | 21.42 | 0.00 | 0.00 | 0.00 |

**Coal Processing Building**

Direct-fired air heater, Predryer oil heater, Scrubber emissions from the coal predryer, and Baghouse exhaust

Hours of Operation: 1000 hrs/yr

TSP Emissions

Controlled Emission Rate: 19.2 lbs/hr (Permitted Allowable)
Control Efficiency/Equipment: 98% (Baghouse & Wet Scrubber)
Calculations: 1000 * hrs/yr * 19.2 lbs/hr * 0.0005 tons/lb = 9.60 tons/yr

PM-10 Emissions:

Controlled Emission Rate: 19.2 lbs/hr (Permitted Allowable)
Control Efficiency/Equipment: 98% (Baghouse & Wet Scrubber)
Calculations: 1000 * hrs/yr * 19.2 lbs/hr * 0.0005 tons/lb = 9.60 tons/yr

Crusher

Process Rate: 35 tons/hr
Hours of operation: 8760 hr/yr

TSP Emissions:

| | | |
|---|---|---|
| Emission Factor: | 0.06 | lbs/ton (Department's Coal Mining Emission Factors) |
| Control Efficiency: | 0% | |
| Calculations: | 0.060 | lbs/ton * 35 tons/hr = 2.10 lbs/hr |
| | 2.10 | lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 9.198 tons/yr |
| | 1.05 | tons/yr * (1.00 - 0.00) = 9.198 tons/yr |

PM-10 Emissions:

| | | |
|---|---|---|
| Emission Factor: | Assume 50% of TSP | |
| Calculation: | 0.06 | lbs/ton*35 tons/year*8760 hr/year*0.0005 tons/year* 50%= 4.60 tons/year |

Material Transfer

| | | |
|---|---|---|
| Process Rate: | 35 | tons/hr |
| Number of Transfers | 3 | Transfers |
| Hours of operation: | 8760 | hr/yr |

TSP Emissions:

| | | |
|---|---|---|
| Emission Factor: | 0.2 | lbs/ton (Department's Coal Mining Emission Factors) |
| Control Efficiency: | 0% | |
| Calculations: | 0.20 | lbs/ton * 35 tons/hr = 7.00 lbs/hr |
| | 21.00 | lbs/hr * 8760 hr/yr * 0.0005 tons/lb = 30.66 tons/yr |
| | 30.66 | tons/yr * (1.00 - 0.00) = 30.66 tons/yr |

PM-10 Emissions:

| | | |
|---|---|---|
| Emission Factor: | Assume 50% of TSP | |
| Calculation: | 0.20 | lbs/ton*35 tons/year*8760 hr/year*0.0005 tons/year* 50%= 15.33 tons/year |

**Plasma Centrifugal Furnace**

| | | |
|---|---|---|
| Va = Stack Flow (actual): | 660 | acf/min |
| Ta = Stack Temp (actual): | 800 | deg F 1260 deg R |
| Pa = Stack Press (actual): | 12.11 | psia |
| Ts = Stack Temp (standard): | 68 | deg F 528 deg R |
| Ps = Stack Press(standard): | 14.7 | psia |
| Vs = Stack Flow (standard): | | dscf/min |

Vs = Pa * Va * Ts / Ps * Ta
Vs = ( 12.11 psia * 660 acf/min * 528 deg R) / (14.7 psia * 1260 deg R)
Vs = 227.84 dscf/min (Maximum Process Airflow Rate)

| | | |
|---|---|---|
| Hours of operation: | 3000 | hr/yr |

TSP Emissions

| | | |
|---|---|---|
| Emission Factor: | 0.03 | gr/dscf |
| Calculations: | 0.03 | gr/dscf * 227.84 dscf/min * 1/7000 lbs/gr * 60 min/hr = 0.058588 lbs/hr |
| | 0.06 | lbs/hr * 3000 hr/yr * 0.0005 tons/lb = 0.087882 tons/yr |

PM-10 Emissions:

| | | |
|---|---|---|
| Emission Factor: | 0.03 | gr/dscf (Assume 100% of TSP is PM-10) |
| Calculations: | 0.03 | gr/dscf * 227.84 dscf/min * 1/7000 lbs/gr * 60 min/hr = 0.058588 lbs/hr |
| | 0.06 | lbs/hr * 3000 hr/yr * 0.0005 tons/lb = 0.087882 tons/yr |

NOx Emissions:

| | | |
|---|---|---|
| Controlled Emission Rate: | 3.6 | lbs/hr (Estimated average emission rate) |
| Control Efficiency/Equipment: | 80.0% | Catalytic NOx Reactor |
| Calculations: | 3000 | hr/yr * 3.6 lbs/hr * 0.0005 tons/lb = 5.40 tons/yr |

Note: Actual NOx emissions shall be monitored by use of a NOx CEM. The NOx monitoring results will be used to determine compliance with the NOx emission limitation as specified in the permit.

**SSPF**

TSP Emissions

| | | |
|---|---|---|
| Emission Factor: | 0.02 | gr/dscf (permit condition) |
| Calculations: | 0.02 | gr/dscf * 24.8 scf/min * 1/7000 lbs/gr * 60 min/hr = 0.0043 lbs/hr |
| | 0.0043 | lbs/hr * 8760 hr/year * 0.0005 tons/lb =0.0186 tons/yr |

NOx Emissions

| | | | |
|---|---|---|---|
| Emission Factor: | 3.2 | lbs/hr | (permit condition) |
| Calculations: | 3.2 | lbs/hr * 8760 hr/year *0.0005 tons/lb = 14.016 tons/yr | |

SO2 Emissions

| | | | |
|---|---|---|---|
| Emission Factor: | 0.00228 | lb/hr | (ratio from PFC test in 1991) |
| Calculations: | 0.002280 lb/hr * 8760 hr/yr*0.0005 tons/lb = 0.0100 tons/yr | | |

CO Emissions

| | | | |
|---|---|---|---|
| Emission Factor: | 0.000228 lb/hr | | (ratio from PFC test in 1991) |
| Calculations: | 0.000228 lb/hr * 8760 hr/year *0.0005 tons/lb = 0.0010 tons/yr | | |

VOC Emissions

| | | | |
|---|---|---|---|
| Emission Factor: | 0.000456 lb/hr | | (ratio from PFC test in 1991) |
| Calculations: | 0.000456 lb/hr * 8760 hr/yr*0.0005 tons/lb = 0.0020 tons/yr | | |

**Mobile Plasma Treatment System**

| | | | |
|---|---|---|---|
| Process Rate: | 50 | lbs/hr | |
| Air Flow: 309 | dscfm | | |
| Hours of operation: | 1000 | hr/yr | |

TSP Emissions:

| | | | |
|---|---|---|---|
| Emission Factor: | 0.08 | gr/dscf | (Information from Company) |
| Control Efficiency: | 0% | | |
| Calculations: | 0.08 | gr/dscf*309 dscfm*1 lb/7000 gr = 0.0035 lbs/min | |
| | 0.0035 | lbs/min*60 min/hr* 1000 hr/yr* 0.0005 tons/lb = 0.11 tons/yr | |

PM-10 Emissions:

| | | | |
|---|---|---|---|
| Emission Factor: | 0.08 | gr/dscf | (Assume 100% of TSP is PM-10) |
| Control Efficiency: | 0% | | |
| Calculations: | 0.08 | gr/dscf*309 dscfm*1 lb/7000 gr = 0.0035 lbs/min | |
| | 0.0035 | lbs/min*60 min/hr* 1000 hr/yr* 0.0005 tons/lb = 0.11 tons/yr | |

NOx Emissions:

| | | | |
|---|---|---|---|
| Emission Factor: | 0.333 | lbs/min | (Information from Company) |
| Control Efficiency: | 80% | (NOx Reactor) | |
| Calculations: | 0.333 | lbs/min*60 min/hr* 1000 hr/yr* 0.0005 tons/lb*0.2 =2.00 tons/yr | |

## VI. Taking or Damaging Implication Analysis

As required by 2-10-101 through 105, MCA, the department has conducted a private property taking and damaging assessment and has determined there are no taking or damaging implications.

## VII. 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 and Waste Management Bureau
1520 East Sixth Avenue
P.O. Box 200901, Helena, Montana 59620-0901
(406) 444-3490

## FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued For: MSE Technology Applications, Inc.
P.O. Box 4078
Butte, Montana 59702

Permit Number: 1528-01

Preliminary Determination on Permit Issued: April 20, 1999
Department Decision Issued: May 6, 1999
Final Permit Issued: May 22, 1999

Montana Environmental Policy Act (MEPA) Compliance: An environmental assessment required by MEPA was completed for this project as follows.

Legal Description of Site: NW¼ Section 18, Township 2 North, Range 7 West, Silver Bow County, Montana

Description of Project: MSE proposes to install a Mobile Plasma Treatment System at their facility to test the feasibility of using it to treat various waste streams.

Benefits and Purpose of Proposal: This project will allow MSE to continue their research and development in the area of waste treatment technology.

Description and analysis of reasonable alternatives whenever alternatives are reasonably available and prudent to consider: None considered.

A listing and appropriate evaluation of mitigation, stipulations and other controls enforceable by the agency or another government agency: A listing of the enforceable permit conditions and a permit analysis, including a best available control technology analysis, are contained in permit #1528-08.

Description and analysis of regulatory impacts on private property rights: The department has considered alternatives to the conditions imposed in this permit as part of the permit development. The department has determined the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

## Potential Impact on Physical Environment

| | | Major | Moderate | Minor | None | Unknown | Comments |
|---|---|---|---|---|---|---|---|
| 1 | Terrestrial and Aquatic Life and Habitats | | | X | | | Yes |
| 2 | Water Quality, Quantity and Distribution | | | | X | | Yes |
| 3 | Geology and Soil Quality, Stability and Moisture | | | | X | | Yes |
| 4 | Vegetation Cover, Quantity and Quality | | | | X | | Yes |
| 5 | Aesthetics | | | X | | | Yes |
| 6 | Air Quality | | | X | | | Yes |
| 7 | Unique Endangered, Fragile or Limited Environmental Resource | | | X | | | Yes |
| 8 | Demands on Environmental Resource of Water, Air and Energy | | | X | | | Yes |
| 9 | Historical and Archaeological Sites | | | | X | | Yes |
| 10 | Cumulative and Secondary Impacts | | | X | | | Yes |

## Potential Impact on Human Environment

| | | Major | Moderate | Minor | None | Unknown | Comments |
|---|---|---|---|---|---|---|---|
| 1 | Social Structures and Mores | | | | X | | Yes |
| 2 | Cultural Uniqueness and Diversity | | | | X | | Yes |
| 3 | Local and State Tax Base and Tax Revenue | | | X | | | Yes |
| 4 | Agricultural or Industrial Production | | | | X | | Yes |
| 5 | Human Health | | | X | | | Yes |
| 6 | Access to and Quality of Recreational and Wilderness Activities | | | | X | | Yes |
| 7 | Quantity and Distribution of Employment | | | X | | | Yes |
| 8 | Distribution of Population | | | | X | | Yes |
| 9 | Demands for Government Services | | | X | | | Yes |
| 10 | Industrial and Commercial Activity | | | | X | | Yes |
| 11 | Locally Adopted Environmental Plans and Goals | | | | X | | Yes |
| 12 | Cumulative and Secondary Impacts | | | X | | | Yes |

Potential Impact on Physical Environment

1. Terrestrial and Aquatic Life and Habitats
   Water Quality, Quantity and Distribution
   Geology and Soil Quality, Stability and Moisture
   Vegetation Cover, Quantity and Quality
   Aesthetics
   Unique Endangered, Fragile or Limited Environmental Resources
   Historical and Archeological Sites

   There will be no impacts to these areas because MSE is an existing facility that is testing an additional waste treatment unit. There will not be an expansion of the existing facility and no further impact to these areas is expected.

2. Air Quality
   Demands on Environmental Resources of Water, Air and Energy
   Cumulative and Secondary Impacts

   The impacts to these areas will be minor because there will be an emission increase from the facility as a result of this permitting action. However, the addition of the Mobile Plasma Treatment System will result in only a small increase in allowable emissions. In addition, this system is only a pilot-scale demonstration project that has very efficient control and monitoring equipment.

Potential Impact on Human Environment

1. Social Structures and Mores
   Cultural Uniqueness and Diversity
   Distribution of Population
   Local and State Tax Base and Tax Revenue
   Access to and Quality of Recreational and Wilderness Activities
   Quantity and Distribution of Employment
   Locally Adopted Environmental Plans and Goals

   There will be no impacts to these areas because MSE is an existing facility that is testing an additional waste treatment unit. There will not be an expansion of the existing facility and no further impact to these areas is expected.

2. Demands of Government Services
   Agricultural or Industrial Production
   Industrial and Commercial Activity
   Human Health
   Cumulative and Secondary Impacts

   The impacts to these areas will be minor because there will an emission increase from the facility as a result of this permitting action. However, this permitting action results in only a

small increase in allowable emissions. The amount of material used for each test will not result in a significant change to MSE's existing facility.

Recommendation: An EIS is not required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The source is applying the Best Available Control Technology and the analyses indicates compliance with all applicable air quality rules and regulations.

Other groups or agencies contacted or which may have overlapping jurisdiction: None

Individuals or groups contributing to this EA: Department of Environmental Quality - Air and Waste Management Bureau.

EA prepared by: David Klemp
Date: April 15, 1999