Permit #: **28.0501-12**

Effective Date: **April 28, 2008**

Expiration Date: **August 10, 2010**

SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

TITLE V AIR QUALITY OPERATING PERMIT

Steven M Pirner, Secretary
Department of Environment and Natural Resources

Under the South Dakota Air Pollution Control Regulations

Pursuant to Chapter 34A-1-21 of the South Dakota Codified Laws and the Air Pollution Control Regulations of the State of South Dakota and in reliance on statements made by the owner designated below, a permit to operate is hereby issued by the Secretary of the Department of Environment and Natural Resources. This permit authorizes such owner to operate the unit(s) at the location designated below and under the listed conditions:

A. Owner

1. Company Name and Address

Broin Enterprises, Inc.
851 Washington Street
Scotland, South Dakota 57059

2. Actual Source Location and Mailing Address if Different from Above

851 Washington Street
Scotland, South Dakota 57059

3. Permit Contact

Daren Zigich, Environmental Engineer
(605) 965-2241

4. Facility Contact

Deb Roth, Microbiologist
(605) 583-2258

5. Responsible Official

Gary Gall, General Manager
(605) 583-2258

B. Permit Revisions or Modifications

April 28, 2008 – Permit Modification – The permit was modified to include the expansion of the research facility to allow pilot scale research and development on a process for production of cellulose based ethanol and an associate anaerobic digester for the production of biogas.

C. Type of Operation

This is an ethanol production facility capable of producing up to 12 million gallons of undenatured ethanol per year.

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1.0 STANDARD CONDITIONS

1.1 <u>Construction and operation of source.</u> In accordance with Administrative Rules of South Dakota (ARSD) 74:36:05:16.01(8), the owner or operator shall construct and operate the units, controls, and processes as described in Table #1 in accordance with the statements, representations, and supporting data contained in the complete permit application submitted and dated August 12, 2003, amended October 28, 2004, December 14, 2004, and December 18, 2007, unless modified by the conditions of this permit. The application consists of the application forms, supporting data, and supplementary correspondence. If the owner or operator becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in an application, such information shall be promptly submitted.

Table #1
Description of Permitted Units, Operations, and Processes

Identification	Description	Maximum Operating Rate	Control Device
Unit #1	Grain receiving, grain transfer, and storage bin loading. Trucks transport corn to the ethanol plant and dump corn into a receiving pit located in a partially enclosed building. Elevator legs transport the corn from the receiving pit to grain storage bins.	100 tons of grain per hour	Not applicable
Unit #2	A Superb corn dryer, model number SA625C. The dryer is fired by natural gas.	19.6 tons of grain per hour and 8 million Btus per hour heat input	Not applicable
Unit #3	Germ and fiber fractionation system. An elevator leg transports the corn from the storage bins to the germ fractionation system. This system separates the germ from the rest of the corn. The corn is then transported to the fiber fractionation system. This system separates the fiber from the rest of the corn.	15 tons of grain per hour	A separate baghouse controls emissions from each system. Exhaust gases from both baghouses are routed through a common stack.
Unit #4	Fiber and germ conveyor system. The fiber and germ are transported to the wet distillers grains storage area.	2.3 tons of fiber and/or germ per hour	Baghouse

Identification	Description	Maximum Operating Rate	Control Device
Unit #5	Fluid bed germ dryer and cooler system. The dryer is fired with natural gas. A multicyclone collects the dried germ.	1.3 tons of dried germ per hour and 2.4 million Btus per hour heat input	Not applicable
Unit #6	Grain milling. An elevator leg transports the fractionated grain or whole grain from the surge bin to a 2003 Roskamp Champion hammer mill. The hammer mill grinds the fractionated grain or whole grain into flour.	15 tons of grain per hour	Baghouse
Unit #7	Grain milling. An elevator leg transports the fractionated grain or whole grain from the surge bin to a 1998 Bliss hammer mill, model # 2636. The hammer mill grinds the fractionated grain or whole grain into flour.	12 tons of grain per hour	Baghouse
Unit #8	Fermentation system. Ethanol is produced from the fermentation process. The fermentation process occurs in five fermenters and the liquid beer is stored in a beer well.	42 tons of corn mash, yeast, and/or water per hour	Wet scrubber
Unit #9	Pilot plant fermentation system. Ethanol is produced from the fermentation process. The fermentation process occurs in five fermenters and the liquid beer is stored in a beer well.	9 tons of corn mash, yeast, and/or water per hour	Wet scrubber
Unit #10	Carbon dioxide recovery system. The air emissions from the fermentation process (Unit #8) are routed through a 1997 Salof Refrigeration Company carbon dioxide skid. There are three emission points: the side stripper vent, the carbon bed drier, and the alumina bed drier	Not applicable	Not applicable

		Maximum	Control
Identification	**Description**	**Operating Rate**	**Device**
Unit #11	Distillation process. The distillation process distills the liquid beer. The distillation process consists of the beer stripper, rectifier, side stripper, molecular sieve, and evaporator.	31 tons of beer (ethanol, mash, and/or water) per hour	Wet scrubber
Unit #12	A rotary drum dryer. The dryer is fired with natural gas. The dried distiller grain is collected by multi cyclones.	4.5 tons of dried distillers grain per hour and 17 million Btus per hour heat input	Not applicable
Unit #13	Dried distillers grain cooling drum. The dried distillers grain is cooled in this system prior to storage.	4.5 tons of dried distillers grain per hour	Not applicable
Unit #14	Dried distillers grain shipping. The dried distillers grain is loaded out be trucks and railcar. The loadout occurs in a partially enclosed building	100 tons of dried distillers grain per hour	Not applicable
Unit #15	Ethanol truck and railcar loadout(s)	24,000 gallons per hour	Not applicable
Unit #16	Seven industrial cooling towers	Not applicable	Not applicable
Unit #17	Boiler #1 – 1977 Cleaver-Brooks steam boiler, model # CB-200-700, fired with natural gas and propane.	29.3 million Btus per hour heat input	Not applicable
Unit #18	Boiler #2 – 2003 Superior Boiler Works steam boiler, model # 6_X-3500-S300-ICCF-G, fired with natural gas and propane.	29.3 million Btus per hour heat input	Not applicable
Unit #19	Tank #2 – A fixed roof above ground storage tank. The tank will store 190-proof ethanol.	30,000 gallons	Not applicable
Unit #20	Tank #3 – A fixed roof above ground storage tank. The tank will store 200-proof ethanol.	25,000 gallons	Not applicable
Unit #21	Tank #4 – A fixed roof above ground storage tank. The tank will store 190-proof ethanol.	30,000 gallons	Not applicable
Unit #22	Tank #5 – A fixed roof above ground storage tank. The tank will store denatured ethanol	39,500 gallons	Not applicable

Unit #23	Tank #6 – A fixed roof above ground storage tank. The tank will store denatured ethanol	39,500 gallons	Not applicable
Unit #24	Tank #7 – A fixed roof above ground storage tank. The tank will store denatured ethanol	39,500 gallons	Not applicable
Unit #25	Cellulose receiving, cellulose transfer, and storage silo loading. Trucks transport cellulose to the ethanol plant and dump the screened cobs into a receiving hopper. A bucket elevator transports the cellulose from the receiving hopper to the storage silo, then to the mill feed bin. Fiber from Unit #3 may also be transferred to the feed bin.	20 tons of cellulose per hour	Not applicable
Unit #26	Cellulose/fiber processing. A conveyor transports the cellulose/fiber from the feed bin to a 2008 Scott Mill. The mill grinds the cellulose and fiber.	1.5 tons per hour	Baghouse
Unit #27	Ground cellulose/fiber transfer and weigh bins. A pneumatic conveyor feeds the ground cellulose/fiber to a fabric separator. The cellulose and fiber are separated and transferred into two weigh bins.	1.5 tons per hour	Baghouse
Unit #28	Cellulose pretreatment and fermentation. Ground cellulose and fiber are dropped through the transfer filter separator into two pretreatment vessels. A screw conveyor transfers the cellulose/fiber mixture to six fermentation tanks. The liquid beer is transferred to the beer well associated with Unit #9.	195 pounds of cellulose/fiber solids mix per hour	Wet Scrubber
Unit #29	Anaerobic Digestion and Biogas Flare. Whole stillage from the beer stripper and a portion of thin stillage from corn mill facility is pumped to the anaerobic digester for processing into biogas. The	1.0 Million Btus per hour heat input	Flare

	biogas is then flared.		

1.2 Duty to comply. In accordance with ARSD 74:36:05:16.01(12), the owner or operator shall comply with the conditions of this permit. An owner or operator who knowingly makes a false statement in any record or report or who falsifies, tampers with, or renders inaccurate, any monitoring device or method is in violation of this permit. A violation of any condition in this permit is grounds for enforcement, reopening this permit, permit termination, or denial of a permit renewal application. The owner or operator, in an enforcement action, cannot use the defense that it would have been necessary to cease or reduce the permitted activity to maintain compliance. The owner or operator shall provide any information requested by the Secretary to determine compliance or whether cause exists for reopening or terminating this permit.

1.3 Property rights or exclusive privileges. In accordance with ARSD 74:36:05:16.01(12), the State's issuance of this permit, adoption of design criteria, and approval of plans and specifications does not convey any property rights of any sort, any exclusive privileges, any authorization to damage, injure or use any private property, any authority to invade personal rights, any authority to violate federal, state or local laws or regulations, or any taking, condemnation or use of eminent domain against any property owned by third parties. The State does not warrant that the owner's or operator's compliance with this permit, design criteria, approved plans and specifications, and operation under this permit, will not cause damage, injury or use of private property, an invasion of personal rights, or violation of federal, state or local laws or regulations. The owner or operator is solely and severally liable for all damage, injury or use of private property, invasion of personal rights, infringement of federal, state or local laws and regulations, or taking or condemnation of property owned by third parties, which may result from actions taken under the permit.

1.4 Penalty for violating a permit condition. In accordance with SDCL 34A-1, a violation of a permit condition may subject the owner or operator to civil or criminal prosecution, fines of not more than $10,000 per day per violation, injunctive action, administrative permit action, and other remedies as provided by law.

1.5 Inspection and entry. In accordance with SDCL 34A-1-41, the owner or operator shall allow the Secretary to:

1. Enter the premises where a regulated activity is located or where pertinent records are stored;
2. Have access to and copy any records that are required under this permit;
3. Inspect operations regulated under this permit; and/or
4. Sample or monitor any substances or parameters for the purpose of assuring compliance.

1.6 Severability. In accordance with ARSD 74:36:05:16.01(11), any portion of this permit that is void or challenged shall not affect the validity of the remaining permit requirements.

1.7 Permit termination, modification, or revocation. In accordance with ARSD 74:36:05:46, the Secretary may recommend that the Board of Minerals and Environment

terminate, modify, or revoke this permit for violations of SDCL 34A-1 or the federal Clean Air Act or for nonpayment of any outstanding fee or enforcement penalty.

2.0 PERMIT FEES

2.1 Annual air fee required. In accordance with ARSD 74:36:05:06.01, the owner or operator shall submit an annual administrative fee and an annual fee. The fee is based on actual emissions in accordance with ARSD 74:37.

2.2 Annual operational report. In accordance with ARSD 74:37:01:06, the Secretary will supply the owner or operator with an annual operational report in January of each year. The owner or operator shall complete and submit the operational report to the Secretary by March 1 of each year. The responsible official shall sign the operational report in the presence of a notary public.

2.3 Annual air fee. In accordance with ARSD 74:37:01:08, the Secretary will notify the owner or operator of the required annual air emission fee and administrative fee by June 1 of each year. The fees shall accrue on July 1 and are payable to the Department of Revenue by July 31 of each year.

3.0 PERMIT AMENDMENT AND MODIFICATION CONDITIONS

3.1 Permit flexibility. In accordance with ARSD 74:36:05:30, the owner or operator shall have the flexibility to make changes to the source during the term of this permit. The owner or operator shall provide the Secretary written notice at least seven days in advance of the proposed change (NOTE: The Secretary will forward a copy of the written notice to EPA). The written notice shall include a brief description of the change, the date on which the change is to occur, any change in emissions, and the proposed changes to this permit.

The Secretary will notify the owner or operator whether the change is an administrative permit amendment, a minor permit amendment, or a permit modification. A proposed change that is considered an administrative permit amendment or a minor permit amendment can be completed immediately after the Secretary receives the written notification. The owner or operator must comply with both the applicable requirements governing the change and the proposed permit terms and conditions until the Secretary takes final action on the proposed change.

A proposed change that is considered a modification can not be constructed until the Secretary takes final action on the proposed change. Permit modifications are subject to the same procedural requirements, including public comment, as the original permit issuance except that the required review shall cover only the proposed changes.

3.2 Administrative permit amendment. In accordance with ARSD 74:36:05:33, the Secretary has 60 days from receipt of a written notice to verify that the proposed change is an

administrative permit amendment. The Secretary considers a proposed change an administrative permit amendment if the proposed change accomplishes one of the following:

1. Corrects typographical errors;
2. Changes the name, address, or phone number of any person identified in this permit or provides a similar minor administrative change at the source;
3. Requires more frequent monitoring or reporting by the source;
4. The ownership or operational control of a source change and the Secretary determines that no other change in this permit is necessary. However, the new owner must submit a certification of applicant form and a written statement specifying the date for transfer of operating permit responsibility, coverage, and liability; or
5. Any other changes that the Secretary determines to be similar to those requirements in this condition.

3.3 Minor permit amendment. In accordance with ARSD 74:36:05:38, the Secretary has 90 days from receipt of a written notice or 15 days after the end of EPA's 45-day review period, whichever is later, to take final action on a minor permit amendment. Final action consists of issuing or denying a minor permit amendment or determining that the proposed change is a permit modification. The Secretary considers a proposed change to be a minor permit amendment if the proposed change:

1. Does not violate any applicable requirements;
2. Does not involve significant changes to existing monitoring, reporting, or record keeping requirements;
3. Does not require or change a case-by-case determination of an emission limit or other standard, a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis; or
4. Does not seek to establish or change a permit term or condition for which the source has assumed to avoid an applicable requirement, a federally enforceable emission cap, or an alternative emission limit. An alternative emission limit is approved pursuant to regulations promulgated under section 112(i)(5) of the federal Clean Air Act.

3.4 Permit modification. In accordance with ARSD 74:36:05:39, an owner or operator may apply for a permit modification. A permit modification is any proposed change that meets the definition of a modification in ARSD 74:36:01:10 or is not an administrative amendment or a minor permit amendment. Modification is defined as a physical change or change in operation that increases the amount of air pollutant emitted by the source or results in the emission of an air pollutant not previously emitted. Permit modifications are subject to the same procedural requirements, including public comment, as the original permit issuance except that the required review shall cover only the proposed changes.

3.5 Permit revision. In accordance with ARSD 74:36:05:40, the Secretary may reopen and revise this permit to meet requirements of SDCL 34A-1 or the federal Clean Air Act.

3.6 Addition or replacement of equipment. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.480(c), the addition or replacement of equipment subject to 40 CFR,

Part 60, Subpart VV for the purpose of process improvement which is accomplished without a capital expenditure shall not by itself be considered a modification but considered a minor permit amendment.

3.7 Changing boiler fuel. In accordance with ARSD 74:36:07:05, as referenced to 40 CFR § 60.40c, Boiler #2 shall be fueled only with natural gas and propane. If the boiler is fueled with other fuels such as distillate oil, coal, or wood, additional standards and requirements in 40 CFR, Part 60, Subpart Dc may apply. The owner or operator shall apply for and obtain approval from the Secretary before other fuels can be used.

3.8 Testing new fuels or raw materials. In accordance with ARSD 74:36:11:04, an owner or operator may request permission to test a new fuel or raw material to determine if it is compatible with existing equipment before requesting a permit amendment or modification. A complete test proposal shall consist of the following:

1. A written proposal that describes the new fuel or raw material, operating parameters, and parameters that will be monitored and any testing associated with air pollutant emissions during the test;
2. An estimate of the type and amount of regulated air pollutant emissions that will result from the proposed change; and
3. The proposed schedule for conducting the test. In most cases the owner or operator will be allowed to test for a maximum of one week. A request for a test period longer than one week will need additional justification. A test period shall not exceed 180 days.

The Secretary shall approve, conditionally approve, or deny in writing the test proposal within 45 days after receiving a complete proposal. Approval conditions may include changing the test schedule or pollutant sampling and analysis methods. Pollutant sampling and analysis methods may include, but are not limited to performance testing, visible emission evaluation, fuel analysis, dispersion modeling, and monitoring of raw material or fuel rates.

If the Secretary determines that the proposed change will result in an increase in the emission of a regulated air pollutant or result in the emission of an additional regulated air pollutant, the Secretary shall give public notice of the proposed test for 30 days. The Secretary shall consider all comments received during the 30-day public comment period before making a final decision on the test.

The Secretary will not approve a test if the test would cause or contribute to a violation of a national ambient air quality standard.

4.0 PERMIT RENEWAL REQUIREMENTS

4.1 Permit effective. In accordance with ARSD 74:36:05:07, this permit shall expire five years from date of issuance unless reopened or terminated for cause.

4.2 **Permit renewal.** In accordance with ARSD 74:36:05:08, the owner or operator shall submit an application for a permit renewal at least 180 days before the date of permit expiration if the owner or operator wishes to continue an activity regulated by this permit. The current permit shall not expire and shall remain in effect until the Secretary takes final action on the timely permit renewal application.

4.3 **Permit expiration.** In accordance with ARSD 74:36:05:28, permit expiration terminates the owner's or operator's right to operate any unit covered by this permit.

5.0 RECORD KEEPING REQUIREMENTS

5.1 **Record keeping.** In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall maintain all monitoring data, records, reports, and pertinent information specified by this permit for five years from the date of sample, measurement, report, or application unless otherwise specified in this permit. The records shall be maintained on site for the first two years and may be maintained off site for the last three years. All records must be made available to the Secretary for inspection. All notifications and reports shall be submitted to the following address:

South Dakota Department of Environment and Natural Resources
Air Quality Program
523 E. Capitol, Joe Foss Building
Pierre, SD 57501-3181

5.2 **Monthly records.** In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall calculate and record the following amounts each month:

1. The amount of particulate matter less than or equal to 10 microns in diameter (PM10), in tons, emitted into the ambient air from the permitted units and fugitive operations associated with the pilot plant during the month and during the 12-month rolling period for that month. The amount of PM10 emitted to the ambient air from permitted units and fugitive sources shall be calculated using formulas, emission factors, and methods described in the statement of basis. Once the required performance tests are conducted for permitted units, the amount of PM10 emissions shall be calculated using the results of the most recent performance test; and
2. The amount of corn processed through the pilot plant during the month, and during the 12-month rolling period for that month.

5.3 **Annual records.** In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall calculate and record the following amounts from January 1 to December 31 of each year:

1. The amount of undenatured ethanol produced in gallons;
2. The amount of natural gas and propane consumed in Units #2, #5, #12, #17, and #18;
3. The amount of grain received (Unit #1), in bushels or pounds;
4. The amount of grain dried (Unit #2), in bushels or pounds;

5. The amount of grain separated (Unit #3), in bushels or pounds;
6. The amount of grain milled (Units #6 and #7), in bushels or pounds;
7. The amount of distillers grain and solubles (dry) produced and shipped (Units #5, #12 and #14) in pounds;
8. The amount of distillers grain and solubles (wet) produced;
9. The amount of denatured ethanol loaded out (Unit #15), in gallons;
10. The number of hours each unit in Table #1 operated;
11. The amount of undenatured ethanol produced, in gallons, from the dry corn mill ethanol production plant;
12. The amount of undenatured ethanol produced, in gallons, from the research and development facility (pilot plant); and
13. The amount of cellulose based undenatured ethanol produced in gallons.

The amount of undenatured ethanol produced and the amount fuel consumed shall be based on production records, consumption records, purchase records, etc. The annual records will be used in conjunction with the operational report required in permit condition 2.2.

5.4 **Monitoring log.** In accordance with ARSD 74:36:05:16.01(9), the owner or operator must maintain a monitoring log. The monitoring log shall contain the following information:

1. Maintenance schedule for the air pollution control equipment specified for Units #3, #4, #6, #7, #8, #9, #11, and #26, #27, #28, and #29. At a minimum, the maintenance schedule shall meet the manufacturer's recommended schedule for maintenance. The following information shall be recorded for maintenance:
   a. Identify the unit;
   b. The date and time maintenance was performed;
   c. Description of the type of maintenance;
   d. Reason for performing maintenance; and
   e. Signature of person performing maintenance;
2. The following information shall be recorded for each visible emission reading required in permit condition 19.2:
   a. Identify the unit;
   b. The date and time the visible emission reading was performed;
   c. If visible emissions were observed;
   d. Description of maintenance performed to eliminate visible emissions;
   e. Visible emission evaluation if visible emissions are not eliminated; and
   f. Signature of person performing visible emission reading and/or visible emission evaluation;
3. The water flow rate records for Units #8, #9, #11, and #28 that are required in permit condition 19.1 and the following information pertaining to water flow rates that fall below the desired flow rates for the appropriate wet scrubber on Units #8, #9, #11, and #28:
   a. The date, time and duration the flow rate fell below the desired flow rate;
   b. The reason the flow rate fell below the desired value; and
   c. The maintenance or procedures that were performed to bring the flow rate back above the desired value;

5.5 Tank dimensions. In accordance with ARSD 74:36:07:14, as referenced to 40 CFR § 60.116b(a) and (b), the owner or operator shall maintain records showing the dimension and an analysis showing the capacity of Tanks #2, #3, #4, #5, #6, and #7. These records must be maintained for the life of the tank.

5.6 Record of products stored in tanks. In accordance with ARSD 74:36:07:14, as referenced to 40 CFR § 60.116b(a) and (c), the owner or operator shall maintain a record of the volatile organic liquid stored, the period of storage, and the maximum true vapor pressure of the liquid during the respective storage period for Tanks #2, #3, #4, #5, #6, and #7. These records must be maintained for at least two years from the date of such record.

5.7 Equipment log. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.486(e), the owner or operator shall record the following information for equipment subject to the requirements in chapters 8.0 through 16.0, inclusive, of this permit:

1. A list of identification numbers for equipment subject to the requirements in chapters 8.0 through 16.0, inclusive, of this permit;
2. A list of identification numbers for equipment that are designated for no detectable emissions under the provisions of permit conditions 8.3, 9.3, and 13.2. The designation of equipment for no detectable emissions shall be signed by the responsible official;
3. A list of equipment identification numbers for pressure relief devices required to comply with chapter 10.0 of this permit;
4. The date of each compliance test as required in permit conditions 8.3, 9.3, and 13.2 and chapter 10.0 of this permit. The background level measured during each compliance test and the maximum instrument reading measured at the equipment during the compliance test shall also be recorded; and
5. A list of identification numbers for equipment in vacuum service.

5.8 Identification of unsafe equipment. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-10(l), the owner or operator shall record the following information to identify equipment that is unsafe to inspect:

1. Identification of all parts of the closed vent system that are designated as unsafe to inspect, an explanation of why the equipment is unsafe to inspect, and the plan for inspecting the equipment;
2. Identification of all parts of the closed vent system that are designated as difficult to inspect, an explanation of why the equipment is difficult to inspect, and the plan for inspecting the equipment;
3. For each inspection during which a leak is detected, a record of the information specified in permit condition 5.12;
4. For each inspection conducted in accordance with permit condition 17.9 during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected; and
5. For each annual visual inspection required in permit condition 16.1 and conducted in accordance with permit condition 17.9 during which no leaks are detected, a record that the

inspection was performed, the date of the inspection, and a statement that no leaks were detected.

5.9 Exempt valve log. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.486(f), the owner or operator shall maintain the following information pertaining to all valves subject to the requirements in permit conditions 13.3 and 13.4:

1. A list of identification numbers for valves that are designated as unsafe-to-monitor, an explanation for each valve stating why the valve is unsafe-to-monitor, and the plan for monitoring each valve; and
2. A list of identification numbers for valves that are designated as difficult-to-monitor, an explanation for each valve stating why the valve is difficult-to-monitor, and the plan for monitoring each valve.

5.10 Design criterion for determining leaks. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.486(h) and (j), the owner or operator shall maintain the following information in a log:

1. Design criterion required in permit conditions 8.2(5) and 9.1(5) and explanation of the design criterion;
2. Any changes to this criterion and the reasons for the changes; and
3. Information and data used to demonstrate that a piece of equipment is not in volatile organic compound service.

5.11 Labeling leaky equipment. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.486(b), if a leak is detected as specified in chapters 8.0, 9.0, 13.0, and 14.0 of this permit, the owner or operator shall attach a weatherproof and readily visible identification tag on the leaking equipment. The identification tag shall be marked with the equipment identification number.

The identification tag for a valve may be removed after the valve has been monitored for two successive months, as specified in permit condition 13.1, and no leak has been detected during those two months. The identification tag for equipment other than valves may be removed after the equipment has been repaired.

5.12 Maintaining a log of equipment leaks. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.486(c), if a leak is detected as specified in chapters 8.0, 9.0, 13.0, and 14.0 of this permit, the owner or operator shall record the following information in a log.

1. The instrument and operator identification numbers and the equipment identification number;
2. The date the leak was detected and the dates of each attempt to repair the leak;
3. The repair methods applied in each attempt to repair the leak;
4. Record "Above 10,000", if the maximum instrument reading measured by the methods specified in permit condition 17.8 after each repair attempt is equal to or greater than 10,000 parts per million;

5. Record "Repair delayed" and the reason for the delay if the leak is not repaired within 15 calendar days after discovery of the leak;
6. The signature of the person whose decision it was that repair could not be completed without a process shutdown;
7. The expected date of successful repair of the leak if the leak is not repaired within 15 calendar days;
8. The dates of process unit shutdown that occur while the equipment is unrepaired; and
9. The date of successful repair of the leak.

5.13 Records for closed vents and control devices. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.486(d), the owner or operator shall maintain the following information pertaining to the design requirements for closed vent systems and control devices described in permit conditions 16.1 through 16.5, inclusive:

1. Detailed schematics, design specifications, and piping and instrumentation diagrams;
2. The dates and descriptions of any change in the design specifications;
3. A description of the parameter or parameters monitored, as required in permit condition 16.1 to ensure that control devices are operated and maintained in conformance with their design and an explanation of why that parameter or parameters was selected for the monitoring;
4. Periods when the closed vent systems and control devices required in chapters 8.0 through 11.0, inclusive, of this permit are not operated as designed; and
5. Dates of startups and shutdowns of the closed vent systems and control devices required in chapters 8.0 through 11.0, inclusive, of this permit.

5.14 Valve log - alternative standards. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.486(g), the owner or operator shall maintain the following information for valves complying with permit condition 13.6:

1. A schedule of monitoring; and
2. The percent of valves found leaking during each monitoring period.

6.0 REPORTING REQUIREMENTS

6.1 Reporting. In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall submit all notifications and reports to the following address:

South Dakota Department of Environment and Natural Resources
Air Quality Program
523 E. Capitol, Joe Foss Building
Pierre, SD 57501-3181

6.2 Signatory requirements. In accordance with ARSD 74:36:05:12, all applications submitted to the Secretary shall be signed and certified by a responsible official. A responsible official for a corporation is a responsible corporate officer and for a partnership or sole proprietorship is a general partner or the proprietor, respectively. All reports or other information

submitted to the Secretary shall be signed and certified by a responsible official or a duly authorized representative. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to the Secretary; and
2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

The responsible official shall notify the Secretary if an authorization is no longer accurate. The new duly authorized representative must be designated prior to or together with any reports or information to be signed by a duly authorized representative.

6.3 Certification statement. In accordance with ARSD 74:36:05:16.01(14)(a), all documents required by this permit, including reports, must be certified by a responsible official or a duly authorized representative. The certification shall include the following statement:

> "I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this document and all attachments are true, accurate, and complete."

6.4 Initial startup notification. In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.7(a)(3) and ARSD 74:36:07:04, as referenced to 40 CFR § 60.49b(a), the owner or operator shall notify the Secretary of the actual date of initial startup of the pilot ethanol plant. Initial startup of the pilot ethanol plant is the date when ethanol is first produced from the pilot ethanol plant. The initial startup notification shall be postmarked within 15 days after such date and contain the following information:

1. Identify submittal as initial startup notification;
2. Name of facility, permit number, and reference to this permit condition; and
3. Actual date of initial startup of the ethanol plant;.

6.5 Notification of alternative standards for valves. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.487(d), the owner or operator shall notify the Secretary 90 days in advance of electing to implement permit conditions 13.5 and/or 13.6.

6.6 Quarterly reporting. In accordance with ARSD 74:36:06:16.01(9), the owner or operator shall submit a quarterly report to the Secretary by the end of each calendar quarter. The quarterly report shall contain the following information:

1. Name of facility, permit number, reference to this permit condition, identifying the submittal as a quarterly report, and calendar dates covered in the reporting period;
2. The quantity of particulate matter less than or equal to 10 microns in diameter emitted, in tons, in each month and the 12-month rolling total for each month in the reporting period and supporting documentation from the pilot plant and de-bottlenecked units;

3. The amount of corn processed through the pilot plant during the month, and during the 12-month rolling period for that month;
4. The quantity of particulate matter less than or equal to 10 microns in diameter emitted, in tons, in each month and the 12-month rolling total for each month in the reporting period and supporting documentation from the cellulose based ethanol expansion equipment;
5. The quantity of volatile organic compounds emitted, in tons, in each month and the 12-month rolling total for each month in the reporting period and supporting documentation from the cellulose based ethanol expansion equipment;
6. The amount of undenatured ethanol produced, in gallons, from the dry corn mill ethanol production plant;
7. The amount of undenatured ethanol produced, in gallons, from the research and development facility (pilot plant); and
8. The amount of cellulose based undenatured ethanol produced in gallons.

The first quarterly report must be postmarked no later than 30 days after the end of the calendar quarter in which initial startup occurred. The remaining reports must be postmarked no later than 30 days after the end of the reporting period (i.e., April 30th, July 30th, October 30th, and January 30th).

6.7 Semiannual reports. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.487(a), (b), and (c) and ARSD 74:36:07:04, as referenced to 40 CFR § 60.49b(h) and (w), the owner or operator shall submit semiannual reports to the Secretary. The semiannual reports shall include a summary of the following information:

1. Name of facility, permit number, reference to this permit condition, identifying the submittal as a semiannual report, and calendar dates covered in the reporting period;
2. The number of valves subject to the requirements in permit condition 13.1, excluding those valves designated for no detectable emissions under the provisions of permit condition 13.2;
3. The number of pumps subject to the requirements in permit conditions 8.1 and 8.2, excluding those pumps designated for no detectable emissions under the provisions of permit condition 8.3 and those pumps complying with permit condition 8.4;
4. The number of compressors subject to the requirements in permit condition 9.1, excluding those compressors designated for no detectable emissions under the provisions of permit condition 9.3 and those compressors complying with permit condition 9.2;
5. The number of valves for which leaks were detected as described in permit conditions 13.1 or 13.6 and the number of valves for which leaks were not repaired as required in permit condition 13.1;
6. The number of pumps for which leaks were detected as described in permit conditions 8.1 and 8.2 and the number of pumps for which leaks were not repaired as required in permit conditions 8.1 and 8.2;
7. The number of compressors for which leaks were detected as described in permit condition 9.1 and the number of compressors for which leaks were not repaired as required in permit condition 9.1;
8. The facts which explain each delay of repair and where appropriate, why an ethanol plant shutdown was technically infeasible; and

9. Dates the ethanol plant was shut down during the semiannual reporting period;
10. Any changes which have occurred since the initial semiannual report or subsequent revisions to the initial semiannual report;

The first semiannual report must be postmarked no later than 30 days after the end of the calendar half in which initial startup occurred. The remaining reports must be postmarked no later than 30 days after the end of the reporting period (i.e., July 30th and January 30th).

6.8 Annual compliance certification. In accordance with ARSD 74:36:05:16.01(14), the owner or operator shall submit an annual compliance certification letter to the Secretary by March 1 of each year this permit is in effect (NOTE: The Secretary will forward a copy of the certification letter to EPA). The certification shall contain the following information:

1. Methods used to determine compliance, including: monitoring, record keeping, performance testing and reporting requirements;
2. The source is in compliance and will continue to demonstrate compliance with all applicable requirements;
3. In the event the source is in noncompliance, a compliance plan that indicates how the source has or will be brought into compliance; and
4. Certification statement required in permit condition 6.3.

6.9 Reporting permit violations. In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall report all permit violations. A permit violation should be reported as soon as possible, but no later than the first business day following the day the violation was discovered. The permit violation may be reported by telephone to the South Dakota Department of Environment and Natural Resources at (605) 773-3151 or by FAX at (605) 773-5286.

A written report shall be submitted within five days of discovering the permit violation. Upon prior approval from the Secretary, the submittal deadline for the written report may be extended up to 30 days. The written report shall contain:

1. Description of the permit violation and its cause(s);
2. Duration of the permit violation, including exact dates and times; and
3. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the permit violation.

The Secretary may waive the written report on a case-by-case basis if the oral report has been received within the reporting period and dependent upon the severity of the permit violation.

6.10 Initial startup notification. In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.7(a)(3) and ARSD 74:36:07:04, as referenced to 40 CFR § 60.49b(a), the owner or operator shall notify the Secretary of the actual date of initial startup of Unit #28. The initial startup notification shall be postmarked within 15 days after such date and contain the following information:

4. Identify submittal as initial startup notification;
5. Name of facility, permit number, and reference to this permit condition; and

6. Actual date of initial startup of Unit #28.

7.0 STATE EMISSION LIMITS

7.1 **Visibility limit.** In accordance with ARSD 74:36:12:01, the owner or operator may not discharge into the ambient air an air contaminant of a density equal to or greater than that designated as 20 percent opacity from any permitted unit, operation, or process listed in Table #1. This provision does not apply when the presence of uncombined water is the only reason for failure to meet the requirement.

7.2 **Visibility exceedances.** In accordance with ARSD 74:36:12:01, an exceedance of the operating limit in permit conditions 7.1 is not considered a violation during soot blowing, start-up, shutdown, or malfunctions. Malfunction means any sudden and unavoidable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. A failure caused entirely or in part by poor maintenance, careless operation, preventable equipment breakdown, or any other cause within the control of the owner or operator of the source is not a malfunction and is considered a violation.

7.3 **Total suspended particulate limits.** In accordance with ARSD 74:36:06:02(1) and ARSD 74:36:06:03(1), the owner or operator shall not allow the emission of total suspended particulate in excess of the emission limit specified in Table #2 for the appropriate permitted unit, operations, and process:

Table #2
Total Suspended Particulate Emission Limit

Identification	Description	Emission Limit
Unit #3	Fiber/Germ Fractionation System	1.7 lbs/ton
Unit #4	Fiber/Germ Conveyor	3.1 lbs/ton
Unit #5	Germ Dryer	3.8 lbs/ton
Unit #6	2003 Hammer mill	1.7 lbs/ton
Unit #7	1998 Hammer mill	1.8 lbs/ton
Unit #12	DDGS Dryer	2.5 lbs/ton
Unit #13	DDGS Cooling Drum	2.5 lbs/ton
Unit #17	Boiler #1	0.5 lbs/MMBtu heat input
Unit #18	Boiler #2	0.5 lbs/MMBtu heat input
Unit #26	2008 Scott Mill	5.3 pounds per hour
Unit #27	Separators and Weigh Bins	5.3 pounds per hour

7.4 **Sulfur dioxide limit.** In accordance with ARSD 74:36:06:02(2), the owner or operator shall not allow the emission of sulfur dioxide in excess of the emission limit specified in Table #3 for the appropriate permitted unit, operations, and process:

Table #3
Sulfur Dioxide Emission Limit

Identification	Description	Emission Limit
Unit #5	Germ Dryer	3.0 pounds per million Btu heat input
Unit #12	DDGS Dryer	3.0 pounds per million Btu heat input
Unit #17	Boiler #1	3.0 pounds per million Btu heat input
Unit #18	Boiler #2	3.0 pounds per million Btu heat input

Compliance with the sulfur dioxide emission limit is based on a three-hour rolling average, which is the arithmetic average of three contiguous one-hour periods.

7.5 **Pilot plant particulate limit.** In accordance with ARSD 74:36:05:16.01(8), the owner or operator shall not emit into the ambient air greater than or equal to 14.3 tons of particulate matter less than or equal to 10 microns in diameter (PM10) per 12-month rolling period from the pilot plant expansion. The pilot plant expansion consists of Units #1, #3, #4, #5, #7, #12, #13, #14, and #18, and fugitive dust emissions from truck traffic. The 12-month rolling total shall be calculated every month using that month's value and the previous 11 months' values. The initial startup of the pilot plant shall be the first month of the 12-month rolling period.

A short term limit (pounds per hour) is established in Table #4 to ensure that the long term limit of 14.3 tons per 12-month rolling period is not exceeded.

Table #4
PM10 Short Term Limit

Identification	Description	Emission Limit
Unit #3	Fiber/Germ Fractionation System	0.15 pounds per ton of grain
Unit #4	Fiber/Germ Conveyor	0.04 pounds per ton of grain
Unit #5	Germ Dryer	0.50 pounds per ton product
Unit #7	1998 Hammer Mill	0.06 pounds per ton of grain
Unit #12	DDGS Dryer	0.50 pounds per ton of product
Unit #13	DDGS Cooling Drum	0.60 pounds per ton of product

The PM10 emission limit is based on a three-hour rolling average, which is the arithmetic average of three contiguous one-hour periods. Compliance with the short term limit will be based on the stack testing requirements in permit conditions 17.7.

7.6 Volatile organic compound limits. In accordance with ARSD 74:36:09:02, as referenced to 40 CFR § 52.21(j)(3), the owner or operator shall limit air emissions of volatile organic compound emissions from the permitted units less than or equal to the emission limits in Table #5.

Table #5
Volatile Organic Compound Limits

Unit	VOC Emission Limit
#9	96 percent collection efficiency

Compliance with the emission limit shall be based on determining the collection efficiency across the wet scrubber by testing the inlet and outlet of the wet scrubber using 40 CFR Part 60, Appendix A, Method 25A or an alternative method approved by the Secretary and calculating the percentage of emission reduction.

7.7 Hazardous air pollutant emission limit. In accordance with ARSD 74:36:05:16.01(8), the owner or operator shall not emit greater than or equal to 9.5 tons of a single hazardous air pollutant or 23.8 tons of a combination of hazardous air pollutants from permitted units and fugitive sources per 12-month rolling period. The amount of hazardous air pollutants emitted to the ambient air shall be calculated using formulas, emission factors, and methods described in the statement of basis. The 12-month rolling total shall be calculated every month using that month's value and the previous 11 months' values.

7.8 Restriction on water treatment chemicals for industrial process cooling towers. In accordance with ARSD 74:36:08:11, as referenced to 40 CFR §§ 63.402 and 63.404(b), no owner or operator shall use chromium based water treatment chemicals in an industrial process cooling tower. A cooling water sample residual hexavalent chromium concentration in excess of 0.5 parts per million by weight shall be considered a violation.

7.9 Operating without the control equipment not allowed. In accordance with ARSD 74:36:05:16.01(8), the owner or operator shall operate the control equipment as described in Table #1 at all times, while the facility is in operation unless otherwise noted in this permit. The control equipment shall be operated in accordance with the manufacturer's specifications.

7.10 Air emission exceedances – emergency conditions. In accordance with ARSD 74:36:05:16.01(18), the Secretary will allow for an emission exceedance of a technology-based emission limit if the exceedance is caused by an emergency condition and immediate action is taken by the owner or operator to restore the operations back to normal. An emergency condition is a situation arising from a sudden and reasonably unforeseeable event beyond the control of the source, including acts of God. An emergency shall not include an emission exceedance to the extent caused by improperly designed equipment, lack of preventive maintenance, careless or improper operation, or operator error. The owner or operator shall notify the Secretary within two working days of the incident and take all steps possible to eliminate the excess emissions.

7.11 Circumvention not allowed. In accordance with ARSD 74:36:05:47.01, the owner or operator may not install, use a device, or use a means that conceals or dilutes an air emission that would otherwise violate this permit. This includes operating a unit or control device that emits air pollutants from an opening other than the designed stack, vent, or equivalent opening.

7.12 Minimizing emissions. In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.11(d), the owner or operator shall at all times, when practicable, maintain and operate all permitted units in a manner that minimizes air pollution emissions.

7.14 Cellulose based expansion particulate limit. In accordance with ARSD 74:36:05:16.01(8), the owner or operator shall not emit into the ambient air greater than or equal to 14.3 tons of particulate matter less than or equal to 10 microns in diameter (PM10) per 12-month rolling period from the cellulose based ethanol production expansion. The cellulose based ethanol expansion consists of Units #25, #26, #27, #28, and #29, and fugitive dust emissions from truck traffic. The 12-month rolling total shall be calculated every month using that month's value and the previous 11 months' values. The initial startup of the cellulose based ethanol expansion plant shall be the first month of the 12-month rolling period.

A short term limit (pounds per hour) is established in Table #6 to ensure that the long term limit of 14.3 tons per 12-month rolling period is not exceeded.

Table #6
PM10 Short Term Limit

Identification	Description	Emission Limit
Unit #26	2008 Scott Mill	0.2 pounds per hour
Unit #27	Separators and Weigh Bins	0.1 pounds per hour

The PM10 emission limit is based on a three-hour rolling average, which is the arithmetic average of three contiguous one-hour periods. Compliance with the short term limit will be based on the stack testing requirements in permit conditions 17.14.

7.15 Cellulose Expansion particulate limit. In accordance with ARSD 74:36:05:16.01(8), the owner or operator shall not emit into the ambient air greater than or equal to 38 tons of volatile organic compounds (VOCs) per 12-month rolling period from the cellulose based ethanol production expansion. The cellulose based ethanol expansion consists of Units #25, #26, #27, #28, and #29. The 12-month rolling total shall be calculated every month using that month's value and the previous 11 months' values. The initial startup of the cellulose based ethanol expansion plant shall be the first month of the 12-month rolling period.

A short term limit (pounds per hour) is established in Table #7 to ensure that the long term limit of 14.3 tons per 12-month rolling period is not exceeded.

Table #7
VOC Short Term Limit

Identification	Description	Emission Limit
Unit #28	Cellulose Fermentation	0.3 pounds per hour

The volatile organic compound emission limit is based on a three-hour rolling average, which is the arithmetic average of three contiguous one-hour periods. Compliance with the short term limit will be based on the stack testing requirements in permit conditions 17.15.

7.16 Dry corn mill plant ethanol production limit. In accordance with ARSD 74:36:05:16.01, the owner or operator shall not produce more than 10 million gallons of undenatured ethanol during any 12-month rolling period from the dry corn mill ethanol production plant. The 12-month rolling total shall begin the day the permit is issued.on the initial startup of the ethanol plant.

7.17 Pilot plant ethanol production limit. In accordance with ARSD 74:36:05:16.01, the owner or operator shall not produce more than 1.8 million gallons of undenatured ethanol during any 12-month rolling period from the research and development facility (pilot plant). The 12-month rolling total shall begin the day the permit is issued.

7.18 Cellulose based ethanol production limit. In accordance with ARSD 74:36:05:16.01, the owner or operator shall not produce more than 30,000 gallons of cellulose based undenatured ethanol or 100,000 gallons of traditional undenatured corn ethanol during any 12-month rolling period from the cellulose based ethanol production expansion equipment. The 12-month rolling total shall begin on the initial startup of Unit #28.

8.0 PUMPS IN LIGHT LIQUID SERVICE

8.1 Weekly and monthly monitoring of pumps in light liquid service. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-2(a), (b) and (c), each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal. "In light liquid service" means that the piece of equipment contains a liquid that meets the conditions specified in permit condition 17.11. A leak is detected if there is an indication of liquids dripping from the pump seal.

Each pump in light liquid service shall be monitored monthly to detect leaks by the method specified in permit condition 17.8. A leak is detected if an instrument reading of 10,000 parts per million or greater is measured.

A first attempt at repairing a leak shall be made no later than five calendar days after each leak is detected. A leak shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in permit condition 15.1.

The owner or operator shall comply with this permit condition, except as provided in permit conditions 8.2, 8.3, 8.4, and 18.1.

8.2 Pumps in light liquid service equipped with a dual mechanical seal system exempt from weekly and monthly monitoring. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-2(d), each pump equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from permit condition 8.1 provided the following requirements are met:

1. Each dual mechanical seal system is:
   a. Operated with the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure;
   b. Equipment with a barrier fluid degassing reservoir that is connected by a closed vent system to a control device that complies with the requirements of chapter 16.0 of this permit; or
   c. Equipped with a system that purges the barrier fluid into a process stream with zero volatile organic compound emissions to the atmosphere;
2. The barrier fluid system is in heavy liquid service or is not in volatile organic compound service;
3. Each barrier fluid system is equipped with a sensor that will detect failure of the seal system, the barrier fluid system, or both. Each sensor shall be checked daily or equipped with an audible alarm;
4. Each pump is checked by visual inspection, each calendar week, for indications of liquids dripping from the pump seals; and
5. The owner or operator determines, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.

A leak is detected if there are indications of liquids dripping from the pump seal or the sensor indicates failure of the seal system, the barrier fluid system, or both based on the criterion determined in subsection 5 above. A first attempt at repairing a leak shall be made no later than five calendar days after each leak is detected. A leak shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in permit condition 15.1.

8.3 Pumps in light liquid service with no detectable emissions exempt from monitoring. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-2(e), any pump that is designated by permit condition 5.7(1) and (2) for no detectable emission is exempt from permit conditions 8.1 and 8.2 if the pump:

1. Has no externally actuated shaft penetrating the pump housing;
2. Is demonstrated to be operating with no detectable emissions as indicated by an instrument reading of less than 500 parts per million above background as measured by the methods specified in permit condition 17.9; and
3. Is tested for compliance with subsection 2 initially upon designation, annually, and at other times requested by the Secretary.

8.4 Pumps in light liquid service with a closed vent system exempt from monitoring. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-2(f), any pump equipped with a closed vent system capable of capturing and transporting any leakage from the seal or seals to a control device is exempt from monitoring provided the control device is in compliance with chapter 16.0 of this permit**.**

9.0 COMPRESSORS

9.1 Compressor seal system. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-3(a) through (g), inclusive, each compressor shall be equipped with a seal system that includes a barrier fluid system and that prevents leakage of volatile organic compounds to the atmosphere. Each compressor seal system and barrier fluid system shall meet the following requirements:

1. Each compressor seal system shall be:
   a. Operated with the barrier fluid at a pressure that is greater than the compressor stuffing box pressure;
   b. Equipped with a barrier fluid system that is connected by a closed vent system to a control device that complies with the requirements in chapter 16.0 of this permit; or
   c. Equipped with a system that purges the barrier fluid into a process stream with zero volatile organic compound emissions to the atmosphere;
2. The barrier fluid system shall be in heavy liquid service or shall not be in volatile organic compound service;
3. The barrier fluid system shall be equipped with a sensor that will detect failure of the seal system, barrier fluid system, or both;
4. Each sensor shall be checked daily or shall be equipped with an audible alarm;
5. The owner or operator shall determine, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both; and
6. A leak is detected if the sensor indicates failure of the seal system, the barrier system, or both based on the criterion determined in subsection 5. A first attempt at repairing a leak shall be made no later than five calendar days after each leak is detected. A leak shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in permit condition 15.1.

The owner or operator shall comply with this permit condition, except as provided in permit conditions 9.2, 9.3, and 18.1.

9.2 Compressors equipped with a closed vent system exempt from barrier fluid. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-3(h), a compressor equipped with a closed vent system capable of capturing and transporting any leakage from the seal to a control device is exempt from permit condition 9.1. The control device must comply with the requirements of chapter 16.0 of this permit**.**

9.3 Compressors with no detectable emissions. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-3(i), a compressor that is designated by permit condition 5.7(1) and (2) for no detectable emissions is exempt from permit condition 9.1 and 9.2 if the compressor:

1. Is demonstrated to be operating with no detectable emissions as indicated by an instrument reading of less than 500 parts per million above background as measured by the methods specified in permit condition 17.9; and
2. Is tested for compliance with subsection 1 initially upon designation, annually, and at other times requested by the Secretary.

10.0 PRESSURE RELIEF DEVICE IN GAS/VAPOR SERVICE

10.1 No detectable emissions from a pressure relief device in gas/vapor service. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-4(a) and (b), each pressure relief device in gas/vapor service shall be operated with no detectable emissions, except during pressure releases. "In gas/vapor service" means that the piece of equipment contains process fluid that is in the gaseous state at operating conditions.

No later than five calendar days after each pressure release, except as provided in permit condition 15.1, the pressure relief device shall be monitored to confirm the condition of no detectable emissions. No detectable emissions shall be demonstrated by an instrument reading of less than 500 parts per million above background as determined by the methods specified in permit condition 17.9.

The owner or operator shall comply with this permit condition, except as provided in permit condition 10.2.

10.2 Pressure relief device exemption. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-4(c), any pressure relief device equipped with a closed vent system capable of capturing and transporting leakage through the pressure relief device to a control device is exempt from permit condition 10.1. The control device must comply with the requirements of chapter 16.0 of this permit.

11.0 SAMPLING CONNECTION SYSTEMS

11.1 Sampling connection system. In accordance with ARSD 74:36:07:22 as referenced to 40 CFR § 60.482-5(a) and (b), each sampling connection system shall be equipped with a closed purged, closed loop, or closed vent system. Each closed purged, closed loop, or closed vent system shall comply with the following requirements:

1. Return the purged process fluid directly to the process line;
2. Collect and recycle the purged process fluid to a process; or

3. Be designed and operated to capture and transport all the purged process fluid to a control device that complies with the requirements of chapter 16.0 of this permit.

The owner or operator shall comply with this permit condition, except as provided in permit conditions 11.2 and 18.1.

11.2 In situ sampling systems and sampling systems without purges exempt. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-5(c), in situ sampling systems and sampling systems without purges are exempt from permit condition 11.1. "In-situ sampling system" means non-extractive samplers or in-line samplers.

12.0 OPEN-ENDED VALVES OR LINES

12.1 Open-ended valves or lines. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-6(a) and (b), each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve. The cap, blind flange, plugs, or second valve shall seal the open end at all times except during operations requiring process fluid flow through the open-ended valve or line. Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the process fluid end is closed before the second valve is closed.

The owner or operator shall comply with this permit condition, except as provided in permit conditions 12.2 and 18.1.

12.2 Double block-and-bleed system exemption. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-6(c), when a double block-and-bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with permit condition 12.1 at all other times.

13.0 VALVES IN GAS/VAPOR SERVICE AND LIGHT LIQUID SERVICE

13.1 Monthly monitoring valves in gas/vapor and light liquid service. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-7(a) through (e), inclusive, each valve shall be monitored monthly to detect leaks by the methods specified in permit condition 17.8. A leak is detected if an instrument reading of 10,000 parts per million or greater is measured. Any valve for which a leak is not detected for two successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected. Once a leak is detected, the valve shall be monitored monthly again until a leak is not detected for two successive months.

A first attempt at repairing a leak shall be made no later than five calendar days after the leak is detected. The leak shall be repaired as soon as practicable, but not later than 15 calendar days after the leak is detected, except as provided in permit condition 15.1. First attempts at repair include, but are not limited to, the following best practices where practicable:

1. Tightening of bonnet bolts;

2. Replacement of bonnet bolts;
3. Tightening of packing gland nuts; and
4. Injection of lubricant into lubricated packing.

The owner or operator shall comply with this permit condition, except as provided in permit conditions 13.2, 13.3, 13.4, 13.5, 13.6, and 18.1.

13.2 Monitoring valves with no detectable emissions exempt. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-7(f), any valve that is designated by permit condition 5.7(2) for no detectable emissions is exempt from permit condition 13.1 if the valve:

1. Has no external actuating mechanism in contact with the process fluid;
2. Is operated with emissions less than 500 parts per million above background as measured by the methods specified in permit condition 17.9; and
3. Is tested for compliance with subsection 2 initially upon designation, annually, and at other times requested by the Secretary.

13.3 Unsafe-to-monitor valves exempt. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-7(g), any valve that is designated by permit condition 5.9(1) as an unsafe-to-monitor valve is exempt from permit condition 13.1 if:

1. The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with permit condition 13.1; and
2. The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practicable during safe-to-monitor times.

13.4 Difficult-to-monitor valves exempt. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-7(h), any valve that is designated by permit condition 5.9(2) as a difficult-to-monitor valve is exempt from permit condition 13.1 if:

1. The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than two meters above a support surface;
2. The process unit within which the valve is located either becomes an affected facility through a modification or reconstruction or the owner or operator designates less than 3.0 percent of the total number of valves as difficult-to-monitor; and
3. The owner or operator of the valve follows a written plan that requires monitoring of the valve at least once per calendar year.

13.5 Alternative standard for valves in gas/vapor and light liquid service. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.483-1(a), (b), and (d), the owner or operator may elect to comply with permit condition 13.1 with an allowable percentage of valves leaking of equal to or less than 2.0 percent. This can be accomplished by following the requirements listed below:

1. The owner or operator must notify the Secretary that the owner or operator has elected to comply with the allowable percentage of valves leaking before implementing this alternative standard, as specified in permit condition 6.5;
2. A performance test, as specified in permit condition 17.13, shall be conducted initially upon designation, annually, and at other times requested by the Secretary; and
3. If a valve leak is detected, it shall be repaired in accordance with the time frame specified in permit condition 13.1.

The owner or operator who elects to comply with this permit condition shall not have a leak percentage greater than 2.0 percent. If the leak percentage is greater than 2.0 percent, the owner or operator shall comply with the requirements described in permit condition 13.1.

13.6 Additional option for valves in gas/vapor and light liquid service. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.483-2, after complying initially with permit condition 13.1 an owner or operator may elect to comply with one of the alternative work practices listed below after notifying the Secretary in accordance with permit condition 6.5:

1. After two consecutive quarterly leak detection periods with the percent of valves leaking equal to or less than 2.0, an owner or operator may begin to skip one of the quarterly leak detection periods for the valves in gas/vapor and light liquid service; or
2. After five consecutive quarterly leak detection periods with the percent of valves leaking equal to or less than 2.0, an owner or operator may begin to skip three of the quarterly leak detection periods for the valves in gas/vapor and light liquid service.

The percent of valves leaking shall be determined by dividing the sum of valves found leaking during current monitoring and valves for which repair has been delayed by the total number of valves subject to the requirements of this section. If the percent of valves leaking is greater than 2.0, the owner or operator shall comply with permit condition 13.1 but can again elect to use this permit condition. The owner or operator shall keep a record of the percent of valves found leaking during each leak detection period.

14.0 OTHER PUMPS, VALVES, PRESSURE RELIEF DEVICES, FLANGES, AND CONNECTORS

14.1 Monitoring pumps, valves, pressure relief devices, flanges, and other connectors. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-8, the owner or operator shall monitor pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors within five days of detecting a potential leak. Visual, audible, olfactory, or any other detection method may be used to determine a potential leak. A leak is detected if a monitor reading of 10,000 parts per million or greater is measured.

A first attempt at repairing a leak shall be made no later than five calendar days after each leak is detected. A leak shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in permit condition 15.1. First attempts at repair include, but are not limited to the following best practices where practicable:

1. Tightening of bonnet bolts;
2. Replacement of bonnet bolts;
3. Tightening of packing gland nuts; and
4. Injection of lubricant into lubricated packing.

15.0 DELAY OF REPAIR

15.1 Repair delay. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-9, a delay of repair of equipment for which leaks have been detected will be allowed in the following circumstances:

1. A delay may occur if the repair is technically infeasible without a process unit shutdown. Repair of this equipment shall occur before the end of the next process unit shutdown;
2. A delay of repair of equipment will be allowed for equipment which is isolated from the process and which does not remain in volatile organic compound service;
3. A delay of repair for valves will be allowed if:
   a. The owner or operator demonstrates that emissions of purged material resulting from immediate repair are greater than the fugitive emissions likely to result from delay of repair; and
   b. When repair procedures are effected, the purged material is collected and destroyed or recovered using a control device complying with chapter 16.0 of this permit;
4. Delay of repair for pumps will be allowed if:
   a. Repair requires the use of a dual mechanical seal system that includes a barrier fluid system; and
   b. Repair is completed as soon as practicable, but not later than six months after the leak was detected; and
5. Delay of repair beyond a process unit shutdown will be allowed for a valve, if valve assembly replacement is necessary during the process unit shutdown, and valve assembly supplies had been sufficiently stocked and have been depleted. Delay of repair beyond the next process unit shutdown will not be allowed unless the next process unit shutdown occurs sooner than six months after the first process unit shutdown.

16.0 CLOSED VENT SYSTEMS AND CONTROL DEVICES

16.1 Standard for a closed vent system and control device. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-10(a), (b), (e), (f), (g), and (m), the owner or operator of a closed vent system and control device shall comply with the following:

1. Vapor recovery systems such as a condenser or adsorber shall be designed and operated to recover the volatile organic compound emissions vented to them with an efficiency of 95 percent or greater;
2. The control device shall be monitored to ensure that the control device is operated and maintained in conformance with its design. In addition, the owner or operator shall monitor the

fresh water flow into the control device. The flow rate should be greater than or equal to the flow rate, in gallons per minute, recorded during the latest performance test that demonstrated compliance with this permit condition. The flow rate shall be recorded every two hours when the control device is operating; and

3. Except as provided in permit conditions 16.3, 16.4, and 16.5, each closed vent system shall be inspected according to the following procedures:
   a. If the vapor collection system or closed vent system is constructed of hard piping, the owner or operator shall conduct an initial inspection according to permit condition 17.8 and conduct annual visual inspections for visible, audible, or olfactory indications of leaks; and
   b. If the vapor collection system or closed vent system is constructed of ductwork, the owner or operator shall conduct an initial and annual inspection according to permit condition 17.8.

Leaks as indicated by an instrument reading greater than 500 parts per million by volume above background or by visual inspections, shall be repaired as soon as practicable except as provided in permit condition 16.2. A first attempt at repair shall be made no later than five calendar days after the leak is detected. Repair shall be completed no later than 15 calendar days after the leak is detected.

A closed vent system and control device used to comply with this permit condition shall be operated at all times when emissions may be vented to them.

16.2 Delay in repairing leaks. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-10(h), the owner or operator may delay the repair of a closed vent system for which leaks have been detected. The delay may occur if the repair is technically infeasible without a process unit shutdown or if the owner or operator determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. The leak shall be repaired by the end of the next process unit shutdown.

16.3 Vapor collection system or closed vent system under vacuum exempt from inspection. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-10(i), the owner or operator is exempt from inspecting a vapor collection system or closed vent system that is operated under a vacuum.

16.4 Unsafe to inspect closed vent system. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-10(j), the owner or operator is exempt from inspecting any part of the closed vent system that is designated, as described in permit condition 5.8, as unsafe to inspect if the owner or operator complies with the following:

1. The owner or operator determines that the equipment is unsafe to inspect because inspection personnel would be exposed to an imminent or potential danger as a consequence of complying with permit condition 16.1(3); and
2. The owner or operator has a written plan that requires inspection of the equipment as frequently as practicable during safe-to-inspect times.

16.5 Difficult to inspect closed vent system. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-10(k), the owner or operator is exempt from inspecting any part of the closed vent system that is designated, as described in permit condition 5.8, as difficult to inspect if the owner or operator complies with the following:

1. The owner or operator determines that the equipment cannot be inspected without elevating the inspection personnel more than two meters above a support surface;
2. The process unit within which the closed vent system is located becomes an affected facility through modification or reconstruction or the owner or operator designates less than 3.0 percent of the total number of closed vent system equipment as difficult to inspect; and
3. The owner or operator has a written plan that requires inspection of the equipment at least once every five years.

17.0 PERFORMANCE TESTS

17.1 Performance test may be required. In accordance with ARSD 74:36:11:02, the Secretary may request a performance test. A performance test shall be conducted while operating the unit at or greater than 90 percent of its maximum design capacity, unless otherwise specified by the Secretary. A performance test that is conducted while operating less than 90 percent of its maximum design capacity will result in the operation being limited to the percent achieved during the performance test. The Secretary has the discretion to extend the deadline for completion of performance test required by the Secretary if circumstances reasonably warrant but will not extend the deadline past a federally required performance test deadline.

17.2 Test methods and procedures. The owner or operator shall conduct the performance test in accordance with 40 CFR Part 60, Appendix A, 40 CFR Part 63, Appendix A, and 40 CFR Part 51, Appendix M. The owner or operator may alter these test methods provided EPA approves the alteration in advance and provides written approval to the Secretary. The Secretary may approve an alternative method if a performance test specified in 40 CFR Part 60, Appendix A, 40 CFR Part 63, Appendix A, and 40 CFR Part 51, Appendix M is not federally applicable or federally required.

17.3 Representative performance test. In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.8(c), performance tests shall be conducted under such conditions as the Secretary shall specify to the owner or operator based on the representative performance of the unit being tested. The owner or operator shall make available to the Secretary such records as may be necessary to determine the conditions of the performance tests. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test nor shall emissions in excess of the level of the applicable emission limit during periods of startup, shutdown, and malfunction be considered a violation of the applicable emission limit unless otherwise specified in this permit.

17.4 Submittal of test plan. In accordance with ARSD 74:36:11:01, the owner or operator shall submit the proposed testing procedures to the Secretary at least 30 days prior to any

performance test. The Secretary will notify the owner or operator if the proposed test procedures are approved or denied. If the proposed test procedures are denied, the Secretary will provide written notification that outlines what needs to be completed for approval.

17.5 Notification of test. In accordance with ARSD 74:36:11:03, the owner or operator shall notify the Secretary at least 10 days prior to the start of a performance test to arrange for an agreeable test date when the Secretary may observe the test. The Secretary may extend the deadline for the performance test in order to accommodate schedules in arranging an agreeable test date.

17.6 Performance test report. In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall submit a performance test report to the Secretary within 60 days after completing the performance test or by a date designated by the Secretary. The performance test report shall contain the following information:

1. A brief description of the process and the air pollution control system being tested;
2. Sampling location description(s);
3. A description of sampling and analytical procedures and any modifications to standard procedures;
4. Test results;
5. Quality assurance procedures and results;
6. Records of operating conditions during the test, preparation of standards, and calibration procedures;
7. Raw data sheets for field sampling and field and laboratory analyses;
8. Documentation of calculations;
9. All data recorded and used to establish parameters for compliance monitoring; and
10. Any other information required by the test method.

17.7 Performance test for Units #3, #4, #5, #7, #12 and #13. In accordance with ARSD 74:36:11:02, the owner or operator shall conduct a performance test on Units #3, #4, #5, #7, #12 and #13 within 60 days after initial startup of the pilot plant. The performance test shall be conducted on the outlet of the control equipment to determine particulate emission rates and demonstrate compliance with emission limits.

The particulate performance test shall determine both the total suspended particulate and particulate less than or equal to 10 microns in diameter (PM10). The owner or operator may use the total suspended particulate performance test results as the result for the PM10 performance test if the total suspended particulate test demonstrates compliance with PM10 emissions limits.

17.8 Compliance with pumps, compressors, pressure relief devices, and valves. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.485(b), the owner or operator shall demonstrate compliance with chapters 8.0, 9.0, and 10.0 using 40 CFR Part 60, Appendix A, Method 21. Method 21 shall be used to determine the presence of leaking equipment. The instrument shall be calibrated by the procedures specified in Method 21 prior to each day's use. The following calibration gases shall be used:

1. Zero air (less than 10 parts per million of hydrocarbon in air); and

2. A mixture of methane or n-hexane and air at a concentration of about, but less than, 10,000 parts per million methane or n-hexane.

17.9 Compliance with no detectable emission standards. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.485(c), the owner or operator shall demonstrate compliance with permit conditions 8.3, 9.3, 10.1, 13.2, and 16.1 using 40 CFR Part 60, Appendix A, Method 21. Method 21 shall be used to determine the background level and the presence of leaking equipment. The instrument shall be calibrated by the procedures specified in Method 21 prior to each day's use. The following calibration gases shall be used:

1. Zero air (less than 10 parts per million of hydrocarbon in air); and
2. A mixture of methane or n-hexane and air at a concentration of about, but less than, 10,000 parts per million methane or n-hexane.

All potential leak interfaces shall be traversed as close to the interface as possible. The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 parts per million for determining compliance.

17.10 Demonstrating a process unit is not in volatile organic compound service. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.485(d), the owner or operator shall test each piece of equipment unless it is demonstrated that a process unit is not in volatile organic compound series. "Not in volatile organic compound series" would occur if the volatile organic compound content would never be reasonably expected to exceed 10 percent by weight. The following methods shall be followed to demonstrate a process unit is not in volatile organic compound series:

1. Procedures that conform to the general methods in ASTM E-260, E-168, E-169 shall be used to determine the percent volatile organic compound content in the process fluid that is contained in or contacts a piece of equipment;
2. Organic compounds that are considered to have negligible photochemical reactivity may be excluded from the total quantity of organic compounds in determining the volatile organic compound content of the process fluid; or
3. Engineering judgment may be used to estimate the volatile organic compound content, if a piece of equipment had not been shown previously to be in service. If the Secretary disagrees with the judgement, subsections 1 and 2 of this permit condition shall be used to resolve the disagreement.

17.11 Demonstrating equipment is light liquid service. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.485(e), the owner or operator shall demonstrate equipment is in light liquid service by showing that all of the following conditions apply:

1. The vapor pressure of one or more of the components is greater than 0.3 kilo Pascal at 20 degrees Celsius. Standard reference texts or ASTM D-2879 shall be used to determine the vapor pressures;
2. The total concentration of the pure components having a vapor pressure greater than 0.3 kilo Pascal at 20 degrees Celsius is equal to or greater than 20 percent by weight; and

3. The fluid is a liquid at operating conditions.

17.12 Testing representative samples. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.485(f), the samples used in conjunction with permit conditions 17.10 and 17.11 shall be representative of the process fluid that is contained in or contacts the equipment.

17.13 Performance test for allowable percentage of valves leaking. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.483-1(c), a performance test of the allowable percentage of valves leaking shall be conducted in the following manner:

1. All valves in gas/vapor and light liquid service within the ethanol plant shall be monitored, within one week of the owner or operator notifying the Secretary in accordance with permit condition 13.5, by the testing methods specified in permit condition 17.8;
2. A leak is detected if an instrument reading of 10,000 parts per million or greater is measured; and
3. The leak percentage shall be determined by dividing the number of valves for which leaks are detected by the number of valves in gas/vapor and light liquid service.

17.14 Performance test for Units #26 and #27. In accordance with ARSD 74:36:11:02, the owner or operator shall conduct a performance test on Units #26 and #27 within 60 days after initial startup of Unit #28 The performance test shall be conducted on the outlet of the control equipment to determine particulate emission rates and demonstrate compliance with emission limits.

The particulate performance test shall determine both the total suspended particulate and particulate less than or equal to 10 microns in diameter (PM10). The owner or operator may use the total suspended particulate performance test results as the result for the PM10 performance test if the total suspended particulate test demonstrates compliance with PM10 emissions limits.

17.15 Performance test for Unit #28. In accordance with ARSD 74:36:11:02, the owner or operator shall conduct a performance test on Unit #29 within 60 days after initial startup of Unit #28. The performance test shall be conducted on the outlet of the control equipment to determine volatile organic compound emission rates and demonstrate compliance with emission limits.

17.16 Initial performance test for Unit #29. In accordance with ARSD 74:36:11:02, the owner or operator shall conduct an initial performance test on Unit #29 within 60 days after issuance of this permit. The performance test shall be conducted to determine the visible emissions, the net heat heating value, and the actual exit velocity of the flare.

The owner or operator may use the manufacturer's certified design specifications for the net heating value and actual exit velocity instead of conducting an onsite performance test.

18.0 EQUIVALENT LIMITS AND EXEMPTIONS

18.1 Emission limit equivalence. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR §§ 60.482-1(c) and 60.484(a) and (d), the owner or operator may apply to the Administrator of EPA through the Secretary for determination of emission limit equivalence. Emission limit equivalence means the owner or operator shall achieve a reduction in emissions of volatile organic compounds at least equivalent to the reduction in emissions of volatile organic compounds achieved by the controls required in chapters 8.0, 9.0, 11.0, 12.0, 13.0, 14.0, and 16.0 of this permit. An owner or operator may offer a unique approach to demonstrate the equivalence of any equivalent means of emission limit.

If the Administrator of EPA approves the determination of emission limit equivalence, the owner or operator shall comply with the requirements of that determination. The Secretary will use the minor permit amendment procedures to amend this permit to include the requirements of the determination.

18.2 Determination of equivalence to equipment design and operation requirements. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.484(b), determination of equivalence to the equipment design and operations requirements of this permit will be evaluated by the following guidelines:

1. Each owner or operator applying for an equivalence determination shall be responsible for collecting and verifying test data to demonstrate equivalence of means of emission limitation;
2. The Administrator of EPA will compare test data for the means of emission limitation to test data for the equipment, design, and operational requirements; and
3. The Administrator of EPA may condition the approval of equivalence on requirements that may be necessary to assure operation and maintenance to achieve the same emission reduction as the equipment, design, and operational requirements. A requirement by the Administrator of EPA that is necessary to assure operation and maintenance to achieve the same emission reduction as the equipment, design, and operational requirements will be added to this permit as a minor permit amendment.

18.3 Determination of equivalence to work practices. In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.484(c), determination of equivalence to the required work practices required by this permit will be evaluated by the following guidelines:

1. Each owner or operator applying for an equivalence determination shall be responsible for collecting and verifying test data to demonstrate equivalence of means of emission limitation;
2. The emission reduction achieved by the required work practice shall be demonstrated;
3. The emission reduction achieved by the equivalent means of emission limitation shall be demonstrated;
4. The owner or operator shall commit in writing to work practices that provide for emission reductions equal to or greater than the emission reductions achieved by the required work practice;

5. The Administrator of EPA will compare the demonstrated emission reduction for the equivalent means of emission limitation to the demonstrated emission reduction for the required work practices and will consider the commitment by the owner or operator; and
6. The Administrator of EPA may condition the approval of equivalence on requirement that may be necessary to assure operation and maintenance to achieve the same emission reduction as the required work practice. A requirement by the Administrator of EPA that assures operation and maintenance to achieve the same emission reduction as the required work practice will be added to this permit as a minor permit amendment.

18.4 <u>In vacuum service equipment exemption.</u> In accordance with ARSD 74:36:07:22, as referenced to 40 CFR § 60.482-1(d), equipment that is in vacuum service is exempt from the requirements of chapters 8.0, through 16.0, inclusive, of this permit, if the equipment is identified in accordance with permit condition 5.7(5). "In vacuum service" means that equipment is operating at an internal pressure, which is at least five kilo Pascal below ambient pressure.

19.0 MONITORING

19.1 <u>Monitoring water flow rate for Units #8, #9, #11, and #28.</u> In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall continuously monitor and record the water flow rate for the wet scrubbers associated with Units #8, #9, #11, and #28. The monitor shall record the water flow rate at a minimum of 15-minute increments. If the water flow rate falls below the desired flow rate for the appropriate wet scrubber, the owner or operator must record the incident in the monitoring log required in permit condition 5.4.

The owner or operator shall maintain the water flow rate of the wet scrubbers associated with Unit #8, #9, #11, and #28 as follows:

1. The initial water flow rate shall be maintained according to the manufacturer's specification;
2. The water flow rate may be modified based on the most recent performance test that was conducted to verify compliance with permit condition 7.6 and/or 7.7; and
3. If the average water flow rate falls below the desired flow rate by more than 20 percent in any three consecutive one hour periods, the owner or operator shall perform the following steps:
   a. The owner or operator will only operate Unit #8, #9, #11, and/or #28 with the wet scrubber at or above the average water flow rate established by the manufacturer's specification or achieved during a performance test that demonstrated compliance with permit conditions 7.6 and/or 7.7; and
   b. Conduct a performance test on the wet scrubber to determine compliance with permit conditions 7.6 and/or 7.7 at the lower water flow rate. The performance test shall be conducted within 60 days after the date the flow rate dropped below the desired flow rate by more than 20 percent in any three consecutive one hour periods.

   If the performance test demonstrates compliance at the lower water flow rate, the water flow rate shall be maintained equal to or greater than the average water flow rate achieved during that performance test.

19.2 <u>Periodic monitoring for opacity limits.</u> In accordance with ARSD 74:36:13:07, the owner or operator shall demonstrate compliance with the opacity limits in Chapter 7.0, except for Units #8 through #11, inclusive, #19 through #24, inclusive, #28, and #29 on a periodic basis. Periodic monitoring shall be based on the amount of visible emissions from each unit and evaluated according to the following steps:

Step 1: If there are no visible emissions from a unit subject to an opacity limit, periodic monitoring shall consist of a visible emission reading. A visible emission reading shall consist of a visual survey of each unit over a two-minute period to identify if there are visible emissions. The visible emission reading must be conducted while the unit is in operation; but not during periods of startup, shutdown, or malfunctions. Visible emission readings on each unit subject to an opacity limit in Chapter 7.0 shall be based on the following frequency:

a. The owner or operator shall conduct a visible emission reading once per calendar month, if that unit is operated that month;
b. If no visible emissions are observed from a unit in six consecutive monthly visible emission readings, the owner or operator may decrease the frequency of readings from monthly to semiannually for that unit; or
c. If no visible emissions are observed from a unit during the semiannual visible emission reading, the owner or operator may decrease the frequency of testing of readings from semiannually to annually for that unit; and

Step 2: If visible emissions are observed from a unit at any time other than periods of startup, shutdown, or malfunction, the owner or operator shall conduct a visible emission test on that unit to determine if the unit is in compliance with the opacity limit specified in Chapter 7.0. The emission test shall be for six minutes and conducted in accordance with 40 CFR Part 60, Appendix A, Method 9. The visible emission test must be conducted while the unit is in operation; but not during periods of startup, shutdown, or malfunctions. Visible emission tests shall be based on the following frequency:

a. The visible emission test must be conducted within one hour of witnessing a visible emission from a unit during a visible emission reading;
b. If the visible emission test required in Step 2(a) results in an opacity value less than or equal to 50 percent of the opacity limit for the unit, the owner or operator shall perform a visible emission test once per month;
c. If the opacity value of a visible emission test is less than five percent for six straight monthly tests, the owner or operator may revert back to monthly visible emission readings as required in Step 1;
d. If the visible emission test required in Steps 2(a) or 2(b) results in an opacity value greater than 50 percent of the opacity limit but less than the opacity limit, the owner or operator shall perform a visible emission test once per week; or
e. If the visible emission test in Step 2(d) results in an opacity value less than or equal to 50 percent of the opacity limit for six straight weekly readings, the owner or operator may revert back to a monthly visible emission test as required in Step 2(b).

The person conducting the visible emission test must be certified in accordance with 40 CFR Part 60, Appendix A, Method 9. If a visible emission test is required before a person is certified in accordance with permit condition 19.3, the owner or operator shall notify the Secretary within

24 hours of observing the visible emissions to schedule a visible emission test performed by a state inspector.

19.3 Certified personnel – visible emission tests. In accordance with ARSD 74:36:13:07, within 180 days after permit issuance the owner or operator shall retain a person that is certified to perform a visible emission test in accordance with 40 CFR Part 60, Appendix A, Method 9. The owner or operator shall retain a certified person throughout the remaining term of this permit.

20.0 PREVENTION OF SIGNIFICANT DETERIORATION

20.1 Prevention of significant deterioration review exemption. The owner or operator is exempt from a prevention of significant deterioration review for particulate matter less than or equal to 10 microns in diameter (PM10) from the construction and operation of the pilot plant. The exemption is based on operational and air emission limits in permit conditions 1.1, and 7.5. Any relaxation in the permit conditions stated above that increases applicable emissions from the pilot plant equal to or greater than 14.3 tons of PM10 per 12-month rolling period may require a full prevention of significant deterioration review as though construction had not commenced on the source.

20.2 MACT exemption. The owner or operator is exempt from the National Emission Standards for Hazardous Air Pollutants for Miscellaneous Organic Chemical Manufacturing. The exemption for hazardous air pollutants is based on the operational and air emission limits in permit condition 1.1 and 7.8. Any relaxation in the permit conditions that increases the hazardous air pollutant emissions equal to or greater than 9.5 tons per 12-month rolling period for a single hazardous air pollutant or 23.8 tons per 12-month rolling period for any combination of hazardous air pollutants may require a the owner or operator to be applicable to the MACT standard as though construction had not commenced on the source.

21.0 FLARE OPERATIONAL REQUIREMENTS

21.1 Flare operational limits. In accordance with ARSD 74:36:07:01, as reference to 40 CFR §§ 60.18(c) and 60.18(e), the owner or operator shall conduct the following for the flare in conjunction with Unit #29, as follows:

1. Operate with no visible emissions except for periods not to exceed 5 minutes during any two consecutive hours as determine by permit condition 21.2;
2. Operate with a flame present at all times when the air emissions may be vented to the flare as determined by permit condition 21.3;
3. For a non-assisted flare, operate with a diameter of 3 inches or greater, have a hydrogen content of 8.0 percent or greater and are designed with an exit velocity less than 37.2 meters per second and less than the velocity of permitted maximum velocity. The permitted maximum velocity is determined by permit condition 21.7. The actual exit velocity is determined by permit condition 21.5;

4. For a non-assisted flare, operate only with the net heating value of the gas being combusted being 200 Btu/scf or greater. The net heat value shall be determined by permit condition 21.4;
5. For a steam-assisted or air-assisted flare, operate only with the net heating value of the gas being combusted being 300 Btu/scf or greater. The net heating value shall be determined by permit condition 21.4;
6. For a non-assisted or steam-assisted flare, operate with an exit velocity of 18.3 meters per second or greater as determined by permit condition 21.5 with the following two exceptions:
   a. The exit velocity is greater than 18.3 meters per second but less than 122 meters per second and the gas being burned is greater than 1000 Btu/scf.
   b. The exit velocity is less than the maximum permitted velocity as determined by permit condition 21.8 and less than 122 meters per second.
7. For an air-assisted flare, operate with an exit velocity as determined by permit condition 21.5 less than the maximum permitted velocity as determined by permit condition 21.6.

21.2 Monitoring visible emissions. In accordance with ARSD 74:36:07:01, as reference to 40 CFR § 60.18(f)(1), the owner or operator shall monitor the visible emissions in accordance with 40 CFR Appendix A Method 22.

21.3 Monitoring for a flame. In accordance with ARSD 74:36:07:01, as reference to 40 CFR § 60.18(f)(2), the owner or operator shall monitor the presence of a pilot flame using a thermocouple ro any other equivalent device to detect the presence of a flame.

21.4 Monitoring net heating value. In accordance with ARSD 74:36:07:01, as reference to 40 CFR § 60.18(f)(3), the owner or operator shall monitor the net heating value of the gas being combusted by using the following equation:

$$Ht = K\sum_{i=1}^{n} CiHi$$

Where Ht = net heating value of the sample in mega joules per standard cubic meters.
Ci = concentration of sample component I in parts per million on a wet basis
Hi = Net heat of combustion of sample component I in kilocalories per gram mole at 25 degrees Celsius and 760 millimeters of mercury
K = a constant of 0.000000174 gram mole-mega joules per part per million – standard cubic meters - kilocalorie

21.5 Monitoring actual exit velocity. In accordance with ARSD 74:36:07:01, as reference to 40 CFR § 60.18(f)(4), the owner or operator shall monitor the actual exit velocity by dividing the volumetric flow rate as determined by 40 CFR Appendix A Methods 2, 2A, 2C or 2D by the cross sectional area of the flare tip.

21.6 Monitoring maximum permit velocity for air-assisted flares. In accordance with ARSD 74:36:07:01, as reference to 40 CFR § 60.18(f)(6), the owner or operator shall monitor the maximum the following equation:

$$V\max = 8.706 + (0.7084)(Ht)$$

Where Vmax = maximum permit velocity
Ht = the net heating value as determined by permit condition 21.4.

21.7 <u>Monitoring maximum permit velocity for non-assisted flares.</u> In accordance with ARSD 74:36:07:01, as reference to 40 CFR § 60.18(c)(3)(i)(A), the owner or operator shall monitor the maximum the following equation:

$$V\max = (X - K1)(K2)$$

Where Vmax = maximum permit velocity
X = the volume percent of hydrogen on a wet basis as calculated by ASTM method D1946-77
K1 = constant of 6.0 volume percent hydrogen
K2 = constant of 3.9 meters per second per volume percent hydrogen

21.8 <u>Monitoring maximum permit velocity for steam-assisted flares.</u> In accordance with ARSD 74:36:07:01, as reference to 40 CFR § 60.18(c)(3)(i)(A), the owner or operator shall monitor the maximum the following equation:

$$Log10(V\max) = (Ht + \_\,28.8)/(31.7)$$

Where Vmax = maximum permit velocity
Ht = the net heating value as determined by permit condition 21.4.