

PERMIT BOOK

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **062010-009** Project Number: 2010-04-053

Parent Company: ICM

Parent Company Address: 310 North Street, Colwich, KS 67030

Installation Name: ICM IBR

Installation Number: 021-0125

Installation Address: 28 South 11th Street, St. Joseph, MO 64503

Location Information: Buchanan County, S20, T57, R35W

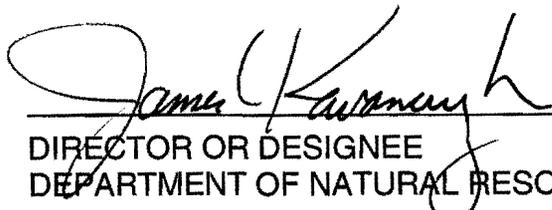
Application for Authority to Construct was made for:

The installation of a 260,000 gallon per year cellulosic ethanol production operation. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

-
- Standard Conditions (on reverse) are applicable to this permit.
- Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

JUN 18 2010

EFFECTIVE DATE



DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

Page No.	3
Permit No.	
Project No.	2010-04-053

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

ICM IBR
Buchanan County, S20, T57, R35W

1. Emission Limitation
 - A. ICM IBR shall emit less than 660 pounds (0.33 tons) of acetaldehyde and 1040 pounds (0.52 tons) of combined Hazardous Air Pollutants (HAPs) from the emission units listed in Appendix A in any consecutive twelve (12) month period.
 - B. Attachments A and Attachment B or equivalent forms approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 1.A.
 - C. To track acetaldehyde emissions from the packed tower wet scrubber using Attachment A, ICM IBR shall use an emission factor developed through performance testing according to Special Condition 2. Until the performance testing has been completed, ICM IBR shall use an emission factor of 0.000246 pounds acetaldehyde per gallon ethanol produced. After an emission factor has been developed according to Special Condition 2, then ICM IBR shall revise the previous months emissions recorded in Attachment A.
 - D. To track combined HAP emissions from the packed tower wet scrubber using Attachment B, ICM IBR shall use an emission factor developed through performance testing according to Special Condition 2. Until the performance testing has been completed, ICM IBR shall use an emission factor of 0.000269 pounds combined HAP per gallon ethanol produced. After an emission factor has been developed according to Special Condition 2, then ICM IBR shall revise the previous months emissions recorded in Attachment B.
 - E. To track fugitive acetaldehyde and combined HAP emissions using Attachment A and Attachment B, ICM IBR shall use an emission factor developed by completing table 1 below:

Page No.	4
Permit No.	
Project No.	2010-04-053

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Table 1: HAP Emission Factors for Equipment Leak Emissions

	A	B	C	D	E	F
Service/Equipment Type	Equipment Count ^[1]	Emission Factor (lb/hr/unit) ^[2]	% Acetaldehyde ^[3]	% Combined HAPs ^[4]	Acetaldehyde Emission Factor (lb/hr)	Combined HAPs Emission Factor (lb/hr)
Light Liquid/Valves		0.0089			= A * B * C	= A * B * D
Light Liquid/Pumps		0.0439			= A * B * C	= A * B * D
Light Liquid/Connectors		0.0040			= A * B * C	= A * B * D
Gas/Valves		0.0132			= A * B * C	= A * B * D
Gas/Compressors		0.5027			= A * B * C	= A * B * D
Gas/ Pressure Relief Valves ^[5]	5	N/D	N/D	N/D	0.0036	0.0041
Gas/Connectors		0.0040			= A * B * C	= A * B * D
Composite Emission Factor for use in Attachments A and B					= Sum of E	= Sum of F

N/D = Not Determined; Blanks = to be completed by applicant prior to the start of operation

¹Enter number of units of each equipment type per process stream.

²Except where noted, emission factors obtained from EPA 453/R-95-017 (November 1995)

³Enter the composition (percent by weight) of acetaldehyde in the process stream

⁴Enter the composition (percent by weight) of all HAPs combined in the process stream

⁵Emission Factors provided by applicant for Pressure Relief Valves (EU28)

2. Performance Testing Requirement – Packed Tower Wet Scrubber

- A. The Packed Tower Wet Scrubber, used to control emissions from (EU09-EU18), shall be tested in order to develop appropriate emission factors for the compliance tracking worksheets, Attachment A and Attachment B, for the following pollutants in units of pounds pollutant per gallon ethanol produced:
 - 1) Acetaldehyde
 - 2) All HAPs combined
- B. The operating parameters (i.e. water flowrate, pH level, amount of additives, temperature, pressure, etc.) at which the stack tests are conducted shall be used to set the appropriate values used in actual operations.
- C. The operating parameters in Special Condition 2.B. shall be determined and agreed upon by the Air Pollution Control Program's Enforcement Section and ICM IBR before the start of the performance tests.

Page No.	5
Permit No.	
Project No.	2010-04-053

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- D. The operating parameters in Special Condition 2.B. shall be recorded on record keeping sheet(s) and be made available to Department of Natural Resources personnel upon request. The frequency of the record keeping is dependent upon the parameters being kept and should be determined and agreed upon by the Air Pollution Control Program's Enforcement Section and ICM IBR before the start of the performance tests.
- E. The performance tests shall be conducted for one of the following time periods:
- 1) A complete cycle, defined as the time period between transferring the contents of one fermenter to the beer well and transferring the contents of the next fermenter; or
 - 2) During period(s) of representative emissions. ICM IBR shall submit, in the proposed test plan outlined in Special Condition 2.G sufficient data to determine the point(s) of representative emissions. The representative emissions are the average of 3 points identified as highest airflow, lowest airflow, and mid-range airflow going up or down the pressure curve. Testing will consist of three (3) 1-hour runs at each of the 3 points. These points must be approved by the Air Pollution Control Program's compliance/assistance section prior to conducting the tests. If sufficient data is not supplied supporting these representative emission points, ICM IBR must conduct testing for the time period outlined in Special Condition 2.E.1).
- F. The test shall be performed no later than 180 days after the initial start of operations.
- G. A completed Proposed Test Plan Form must be submitted to the Air Pollution Control Program 30 days prior to the proposed test date so that the Air Pollution Control Program may arrange a pretest meeting, if necessary, and assure that the test date is acceptable for an observer to be present. The Proposed Test Plan may serve the purpose of notification and must be approved by the Director prior to conducting the required emission testing.
- H. Two (2) copies of a written report of the performance test results shall be submitted to the Director within 30 days of completion of any required testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required U.S. EPA Method for at least one (1) sample run.

Page No.	6
Permit No.	
Project No.	2010-04-053

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

3. Ethanol Production Limits

- A. ICM IBR shall not exceed an annual production limit of 260,000 gallons of ethanol per twelve (12) consecutive month period.
- B. ICM IBR shall record the monthly and the sum of the most recent consecutive twelve (12) months production of denatured ethanol in gallons from this installation. Attachment C, or an equivalent form shall be used for this purpose.

4. Capture Device Requirements

ICM IBR shall use total enclosures to capture emissions from the applicable equipment (as specified in Appendix A). A total enclosure is an enclosure that completely surrounds emissions from an emissions unit.

5. Control Device Requirement – Fabric Filter Dust Collectors

- A. ICM IBR shall control emissions from the applicable equipment (as specified in Appendix A) using fabric filter dust collectors with an expected control efficiency of 99 percent for Particulate Matter less than 10 microns in diameter (PM₁₀) according to manufacturer's performance specifications
- B. The fabric filter dust collectors shall be operated and maintained in accordance with the manufacturer's specifications. Baghouse dust collectors shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. These gauges or meters shall be located such that the Department of Natural Resources' employees may easily observe them.
- C. Replacement filters for the fabric filter dust collectors shall be kept on hand at all times. The bags or filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
- D. ICM IBR shall monitor and record the operating pressure drop across the baghouses at least once every 24 hours of operation. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
- E. ICM IBR shall maintain an operating and maintenance log for the fabric filter dust collectors which shall include the following:

Page No.	7
Permit No.	
Project No.	2010-04-053

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
- 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.

6. Control Device Requirement – Packed Tower Wet Scrubber

- A. The scrubber must be in use at all times when the associated equipment (as specified in Appendix A) are in operation.
- B. The scrubber and any related instrumentation or equipment shall be operated and maintained in accordance with the manufacturer's specifications. The scrubber shall be equipped with a gauge or meter that indicates the pressure drop across the scrubber. The scrubber shall be equipped with a water flow meter that indicates the water flow through the scrubber. This gauge and meter shall be located in such a way they may be easily observed by Department of Natural Resources' employees.
- C. ICM IBR shall monitor and record the operating pressure drop across the scrubber at least once every twenty-four (24) hours or more frequently if required by special condition 2.D. The operating pressure drop shall be maintained within the operating parameters determined according to special condition 2.C.
- D. ICM IBR shall monitor and record the water flow rate through the scrubber at least once every twenty-four (24) hours or more frequently if required by special condition 2.D. The water flow rate shall be maintained within the operating parameters determined according to special condition 2.C.
- E. ICM IBR shall maintain an operating and maintenance log for the scrubber which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
 - 3) A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.

Page No.	8
Permit No.	
Project No.	2010-04-053

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

7. Cooling Tower Operating Requirements

- A. The cooling tower(s) shall be operated and maintained in accordance with the manufacturer's specifications. Manufacturer's specifications shall be kept on site and made readily available to Department of Natural Resources' employees.
- B. The drift loss from the towers shall not exceed 0.005 percent of the water circulation rate. Verification of drift loss shall be by manufacturer's guaranteed drift loss and shall be kept on site and made readily available to Department of Natural Resources' employees upon request.
- C. The total dissolved solids (TDS) concentration in the circulated cooling water shall not exceed a TDS concentration of 2,500 parts per million (ppm). A TDS sample shall be collected, tested, and recorded at least once per calendar month.

8. Record Keeping and Reporting Requirements

- A. ICM IBR shall maintain all records required by this permit for not less than five (5) years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.
- B. ICM IBR shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than ten days after the end of the month during which any record required by this permit show an exceedance of a limitation imposed by this permit.

9. Applicability of Maximum Achievable Control Technology Standards (MACT)
Within 30 days of the initial start of operation, ICM IBR shall submit a determination to the Enforcement section of the Air Pollution Control Program on the applicability of 40 CFR 63, Subpart VVVVVV, "National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources". ICM IBR shall provide sufficient justification to verify applicability of the standard.

10. Sulfur Content Testing Requirement

- A. In order to verify that the sulfur compounds introduced into the process are being emitted ICM IBR shall verify that the sulfur content of the dried (EU10) material is greater than or equal to 0.20 (dry wt%). This test shall be performed one time per biomass feedstock type (e.g. bran, switch grass, energy sorghum).

Page No.	9
Permit No.	
Project No.	2010-04-053

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- B. ICM IBR shall determine the sulfur content of the dried (EU10) material by collecting and testing samples from (EU10). A written analytical report of the testing shall include the test method, the raw data, the sulfur content (dry wt%) of the sample, the test date, and the original signature of the individual performing the test. Within 30 days of completion of the required testing, the report shall be filed on-site.

- C. If the sulfur content is less than 0.20 (dry wt%), then ICM IBR shall have 60 days to submit a report to the Compliance/Enforcement section of the Air Pollution Control Program with a total process sulfur mass balance and an evaluation of what effects the mass balance has on the potential emissions calculations of sulfur containing compounds.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2010-04-053
Installation ID Number: 021-0125
Permit Number:

ICM IBR
28 South 11th Street
St. Joseph, MO 64503

Complete: April 19, 2010

Parent Company:
ICM
310 North Street
Colwich, KS 67030

Buchanan County, S20, T57, R35W

REVIEW SUMMARY

- ICM IBR has applied for authority to construct a 260,000 gallon per year cellulosic ethanol production operation.
- Hazardous Air Pollutant (HAP) emissions, including acetaldehyde, acrolein, methanol, and formaldehyde, are expected from the ethanol production process. HAPs are also expected due to the combustion of natural gas.
- 40 CFR 60 Subpart VVa, "Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006" applies to the equipment. According to an applicability determination from the U.S. Environmental Protection Agency (EPA), dated March 14, 2004, (control number 0400029), ethanol created from natural fermentation processes is excluded from the following New Source Performance Standards (NSPS) 40 CFR 60 Subparts III, NNN, and RRR. However, fuel ethanol is not excluded from the requirements of 40 CFR 60 Subpart VVa, and therefore, this subpart applies to the equipment. However, ICM IBR has indicated that they intend to apply for an exemption from this requirement. An application for an exemption should be submitted to the Compliance/Enforcement Section of the Air Pollution Control Program.
- 40 CFR 63 Subpart F, "National Emission Standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry", does not apply to the installation because it does not produce one of the applicable chemicals.
- 40 CFR 63 Subpart FFFF, "National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing", does not apply to the installation because it is not a major source of HAPs. Ethyl alcohol production by natural fermentation (grain or cellulosic) is classified under North American Industry

Classification System (NAICS) code 325193 and therefore the standard would apply if the source were considered major for HAPs.

- 40 CFR 63 Subpart VVVVVV, "National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources", may apply to the installation. As the applicability of this area source standard depends on the concentration of HAP in process fluids (liquid and gaseous streams), a special condition of this permit is to require ICM IBR to submit an applicability determination with supporting justification to the Compliance/Enforcement Section of the Air Pollution Control Program.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation.
- A packed tower wet scrubber is being used to control emissions of Volatile Organic Compounds (VOC), HAP, and Particulate Matter less than 10 and 2.5 microns in diameter (PM₁₀ and PM_{2.5}). Fabric filter dust collectors are being used to control PM₁₀ and PM_{2.5} emissions.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.
- This installation is located in Buchanan County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels. However, LifeLine Foods (021-0016) must include the potential PM₁₀ and Nitrogen Oxide (NO_x) emissions from the equipment in this permit in the revised Ambient Air Quality Impact Analysis for the amendment to Permit Number 082007-017.
- Emissions testing are required for the equipment in this permit.
- An application for an Intermediate Operating Permit is required for this installation within 90 days of equipment start-up. As LifeLine Foods and ICM IBR are considered the same source for construction and operating permit purposes, ICM IBR may apply for a separate Intermediate Operating Permit or the equipment in this permit must be included in LifeLine Foods' Intermediate Operating Permit.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

ICM IBR has proposed to construct a 260,000 gallon per year fuel ethanol production facility. The process will convert cellulosic materials (renewable biomass) to fuel ethanol through a natural fermentation process. ICM IBR has proposed to construct this operation on leased land located at the LifeLine Foods property (021-0016) in St. Joseph, Missouri. Although ICM IBR will manage the cellulosic ethanol production site (021-0125) independently of LifeLine Foods' grain ethanol production site (021-0016), ICM IBR has 49 percent ownership of LifeLine Foods which qualifies as common control of the two sites. Therefore, the two sites are considered the same source for construction and operating permit purposes.

LifeLine Foods is an existing minor source located across the street from a residential neighborhood in St. Joseph, Missouri in Buchanan County. LifeLine Foods operates a corn milling operation which produces ingredients for cereal manufacturers and also a grain ethanol operation which produces ethanol for fuel. LifeLine Foods has recently received some fugitive dust complaints stemming from a malfunctioning baghouse. Additionally, the performance test results required by LifeLine Foods' permit number 082007-017 showed that the emission rates for PM₁₀ and NO_x were higher than those used in the ambient impact analysis. Since LifeLine Foods has not demonstrated compliance with the National Ambient Air Quality Standards and the Increment Standards as required by permit number 082007-017, the emissions from the equipment in this permit shall be included in the revised ambient impact analysis for permit number 082007-017.

No permits have been issued to ICM IBR from the Air Pollution Control Program. However, LifeLife foods has been issued several construction permits. The following permits have been issued to LifeLine Foods from the Air Pollution Control Program.

Table 2: Construction Permit History

Permit Number	Description
0686-003	Replacement of two boilers
1289-002	Installation of two cereal manufacturing lines
0790-004	Installation of additional dry and wet dust collection systems
0791-007	Replacement of two hammermills and the associated baghouse dust collectors
0596-002	Modification to the ingredient transfer system
112001-006	Installation of three dryers and three coolers for the grain milling operation
082007-017	Installation of a 50 million gallon per year grain ethanol production operation

PROJECT DESCRIPTION

ICM IBR requested the maximum design rates and the process flow diagrams submitted in the application be treated as confidential. The company believes that the information identified as confidential has competitive value because this is a new technology and disclosure of the information would allow competitors to enter the business without having to expend equivalent resources. Therefore, a separate confidential permit has been prepared and may be reviewed by employees of the Missouri Department of Natural Resources and the United States Environmental Protection Agency upon request.

EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition. Potential emissions of the paved haul road (EU01) were determined using the predictive equations found in AP-42, Section 13.2.2 "Unpaved Roads" (November 2006).

Potential emissions of material handling operations (EU02-05 and EU07-08) were calculated using the predictive drop-point equation found in Section 13.2.4 "Aggregate Handling and Storage Piles" (November 2006). This equation accounts for moisture content and wind speed to develop an emission factor. The entire material handling system, including the truck unloading area, will be enclosed within a building, so the lowest wind speed multiplier (U) recommended for the equation was selected (U = 1.3 miles per hour). The materials are expected to have a very high moisture content of approximately 12.5 percent by weight. Therefore, the highest moisture content (M) recommended for the equation was selected (M = 4.8 percent). Emissions from all material handling operations will be captured with a total enclosure capture device and vented to a fabric filter control device. A total enclosure is an enclosure that completely surrounds the emissions from an emissions unit and assumes 100% capture efficiency.

The control efficiency of 99% for PM₁₀ and PM_{2.5} were obtained from AP-42, Appendix B.2 "Generalized Particle Size Distributions" (September 1996) and assuming all particulate is emitted as PM_{2.5}. Potential emissions for (EU06) and the load-out operations for (EU19) and (EU20) were calculated using the emission factors found AP-42, Section 9.9.1 "Grain Elevators And Processes" (May 2003).

Emissions of particulate matter, VOCs, and HAPs are expected from the ethanol production processes. Process equipment under vacuum was assumed to have zero emissions. Emissions from (EU9), (EU10), (EU11-EU14), (EU15), and (EU16-EU18) will be captured and vented to a packed tower wet scrubber. Potential emissions were provided by the applicant and compared to test data included in the Air Pollution Control Program Memo, entitled "Lifeline Foods Grain Milling and Ethanol Plant Test Report" (February 26, 2009). This memo summarizes the test data for LifeLine's (021-0016) packed tower wet scrubber which was tested without the use of sodium bisulfite additive on September 9-11, 2008. The controlled acetaldehyde emissions from the testing resulted in an emission factor of 0.0010 pounds acetaldehyde per gallon ethanol.

However, ICM IBR has proposed an emission factor of 0.000246 pounds acetaldehyde per gallon ethanol for this process because the packed tower will be oversized for the process. Due to the uncertainty in the emission factor and also because of the low limits on annual emissions of acetaldehyde and total combined HAPs, a special condition of this permit is to require performance testing of the wet scrubber. Test results will be used to develop emission factors which will be used to show compliance with the annual limits on HAP emissions.

Fugitive VOC emissions are expected from the process vessels (EU28) that vent to the ambient air. Fugitive VOC emissions from these process vessel vents (EU28) were estimated by the applicant based on test data at similar facilities. Fugitive VOC emissions are also expected due to equipment leaks from flanges (EU27), valves (EU24, EU26), and pumps (EU25). Potential emissions due to equipment leaks were calculated based on the methodology provided in the EPA document 453/R-95-017 (November 1995). Fugitive HAP emissions were calculated assuming 15.5 percent of the fugitive VOC emissions were acetaldehyde.

Potential emissions for the natural gas-fired boiler (EU22) and the natural gas-fired dryer (EU21) were calculated using the emission factors obtained from AP-42, Section 1.4, "Natural Gas Combustion" (July 1998). A fabric filter dust collector is being used to control emissions from the dryer (EU22), and a 99% control efficiency was applied to emissions of PM₁₀ and PM_{2.5}. The SO_x emission factor for the dryer (EU21) was provided by the applicant to account for SO_x emissions due to process drying in addition to the emissions associated with combustion of natural gas.

Potential emissions of particulate matter from the cooling tower (EU23) were calculated using the methodology described in AP-42, 13.4 "Wet Cooling Towers" (January 1995) and assuming a maximum total dissolved solids (TDS) content of 2500 parts per million (ppm) in the recirculating water and a maximum drift loss of 0.005 percent. All particulate emissions were assumed to be PM_{2.5}.

Some emissions of SO_x are expected due to the natural sulfur content of the biomass materials and also due to the use of dilute sulfuric acid used in the biomass pretreatment process. The applicant expects most of the sulfur from the sulfuric acid treatment to be entrained in (EU10) material that will be sent off-site for gasification. A special condition of this permit is to test the sulfur content of the (EU10) material to verify that most of the sulfur introduced into the process is entrained in the (EU10) material as opposed to being emitted to the ambient air.

As LifeLine and ICM IBR are considered the same source, the potential emissions from both facilities are counted together toward major source levels. Therefore, in order for the source to remain an area source of HAPs, both facilities must be conditioned to less than 10 tons for individual HAPs and less than 25 tons for combined HAPs. Although the facilities have common ownership and a cooperative working relationship, the daily operations are managed independently, and the facilities have requested separate emission limits and separate tracking for compliance demonstration purposes. Therefore, LifeLine must obtain an amendment to their construction permit number 082007-017 limiting their potential emissions of HAPs to less than 9.67 tons individually

and 24.48 tons combined before the initial start of operation of the ICM IBR cellulosic ethanol facility. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year.) The following table provides an emissions summary for this project.

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions ^[1]	Existing Actual Emissions (2008 EIQ)	Potential Emissions of the Application	Project Conditioned Potential ^[2]
PM ₁₀	15.0	182.93	76.85	1.40	N/A
PM _{2.5}	10.0	N/D	2.97	1.16	N/A
SO _x	40.0	95.59	32.42	0.45	N/A
NO _x	40.0	157.73	36.40	3.54	N/A
VOC	40.0	<100	6.25	11.79	10.23
CO	100.0	<100	22.39	2.98	N/A
Individual HAP	10.0	<10	N/D	1.79	<0.33
Combined HAPs	25.0	<25.0	18.52	2.08	<0.52

N/D = Not Determined

¹Existing potential emissions obtained from permit number 082007-017

²Represents the conditioned potential emissions of the project, not the conditioned potential emissions of the entire installation. Emissions of VOCs proportionately reduced based on the conditioned potential emissions of HAPs

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

APPLICABLE REQUIREMENTS

ICM IBR shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110

The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.

- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-2.070

SPECIFIC REQUIREMENTS

- *New Source Performance Regulations*, 10 CSR 10-6.070 – New Source Performance Standards (NSPS), *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006*, 40 CFR 60 Subpart VVa,
- *Maximum Achievable Control Technology (MACT) Regulations*, 10 CSR 10-6.075, *National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources*, 40 CFR Part 63, Subpart VVVVVV
- *Maximum Allowable Emission of Particulate Matter From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-2.040

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

 Kathi Jantz
 Environmental Engineer

 Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated April 16, 2010, received April 19, 2010, designating ICM as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

- Kansas City Regional Office Site Survey, dated April 22, 2010.

Appendix A –Emission Unit Summary

ICM IBR
 Buchanan County, S20, T57, R35W
 Project Number: 2010-04-053
 Installation ID Number: 021-0125
 Permit Number: _____

Emission Unit	Unit Description	MHDR	MHDR Units	Capture Device	Control Device
EU1				N/A	100% paving
EU2				Total Enclosure	Fabric Filter/Baghouse
EU3				Total Enclosure	Fabric Filter/Baghouse
EU4				Total Enclosure	Fabric Filter/Baghouse
EU5				Total Enclosure	Fabric Filter/Baghouse
EU6				Total Enclosure	Fabric Filter/Baghouse
EU7				Total Enclosure	Fabric Filter/Baghouse
EU8				Total Enclosure	Fabric Filter/Baghouse
EU09-EU18				Total Enclosure	Scrubber
EU19				N/A	N/A
EU20				N/A	N/A
EU21				Total Enclosure	Fabric Filter/Baghouse
EU22				N/A	N/A
EU23				N/A	N/A
EU24				N/A	N/A
EU25				N/A	N/A
EU26				N/A	N/A
EU27				N/A	N/A
EU28				N/A	N/A

