

STATE OF MISSOURI



PERMIT BOOK

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: **08 2007 - 017** Project Number: 2006-02-004

Parent Company: LifeLine Foods, LLC

Parent Company Address: 2811 South 11th Street, St. Joseph, MO 64503

Installation Name: LifeLine Foods, LLC

Installation Address: 2811 South 11th Street, St. Joseph, MO 64503

Location Information: Buchanan County, S20, T57, R35W

Application for Authority to Construct was made for:  
Installation of 50 million gallon per year denatured ethanol manufacturing plant.  
This review was conducted in accordance with Section (6), 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.

\_\_\_\_\_  
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 not more than 60 days but at least 30 days in advance of this date. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located with 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.

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**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."*

LifeLine Foods, LLC  
Buchanan County, S20, T57, R35W

1. Emission Limitation
  - A. LifeLine Foods, LLC shall emit less than 100 tons of Volatile Organic Compounds (VOCs) from this installation in any consecutive 12-month period.
    - 1) LifeLine Foods, LLC shall record the monthly and the sum of the most recent consecutive twelve (12) months VOC emissions in tons from this installation. Attachment A, Monthly VOC Emission Tracking Record, or an equivalent form shall be used for this purpose. The emission rates shall be verified through performance testing, as detailed in Special Conditions 12.
    - 2) LifeLine Foods, LLC shall report to the Air Pollution Control Program's (APCP) Enforcement Section, P.O. Box 176 Jefferson City, Missouri 65102, no later than ten (10) days after the end of the month during which the records required by Special Condition Number 1.A(1) show that the emission limitation has been exceeded.
  - B. LifeLine Foods, LLC shall emit less than 100 tons of Carbon Monoxide (CO) from this installation in any consecutive 12-month period.
    - 1) LifeLine Foods, LLC shall record the monthly and the sum of the most recent consecutive twelve (12) months CO emissions in tons from this installation. Attachment B, Monthly CO Emission Tracking Record, or an equivalent form shall be used for this purpose. The emission rates shall be verified through performance testing, as detailed in Special Conditions 12.
    - 2) LifeLine Foods, LLC shall report to the Air Pollution Control Program's (APCP) Enforcement Section, P.O. Box 176 Jefferson City, Missouri 65102, no later than ten (10) days after the end of the month during which the records required by Special Condition Number 1.B(1) show that the emission limitation has been exceeded.
  - C. LifeLine Foods, LLC shall emit less than ten (10.0) tons of any individual

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Hazardous Air Pollutants (HAPs), specifically acetaldehyde, and twenty-five (25.0) tons of combined HAP from this installation in any consecutive twelve (12) month period. The remaining HAPs of concern shall be below their respective Screen Modeling Action Level (SMAL) as indicated in Attachment E.

- 1) LifeLine Foods, LLC shall record the monthly and the sum of the most recent consecutive twelve (12) months HAP emissions in tons from this installation. Attachment C, Monthly Individual HAP Emission Tracking Record, Attachment D, Monthly Combined HAP Emission Tracking Record or an equivalent form shall be used for this purpose. The emission rates shall be verified through performance testing, as detailed in Special Conditions 12.
- 2) LifeLine Foods, LLC shall report to the APCP's Enforcement Section, P.O. Box 176 Jefferson City, Missouri 65102, no later than ten (10) days after the end of the month during which the records required by Special Condition Number 1.C(1) show that the emission limitation has been exceeded.

D. LifeLine Foods, LLC shall not discharge PM<sub>10</sub> into the atmosphere from the following stacks in excess of the listed amounts:

Control ID	Emission Point	Description	Lbs/hr
C10	S10	Dryers and RTO	2.055
C40	S40	Fermentation Scrubber	0.03
	S105	Ash Storage	0.17
	S106	Syn Gas Boiler	0.247
	S107	Lime Storage Baghouse	0.018
	S104	Bran Storage	0.03
P70	S70	Cooler Cyclone	0.258
	S101	Degermer Baghouse	0.51
	S120	Anderson Dryer	0.10
	S121	Anderson Cooler	0.137
	S71	Germ Cooler Cyclone	0.258
	SANDJ	Source "J" Units-Aux Corn Mill	2.4

These emission rates shall be verified through performance testing, as detailed in Special Conditions 12.

E. LifeLine Foods, LLC shall not discharge nitrogen oxides (NO<sub>x</sub>) into the atmosphere from the following stacks in excess of the listed amounts:

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

Control ID	Emission Point	Description	Lbs/hr
C10	S10	Regenerative Thermal Oxidizer	0.32
C106	S106	Syngas Boiler	18.15
C110	S110	Package Boiler	0.9

These emission rates shall be verified through performance testing, as detailed in Special Conditions 12.

- F. LifeLine Foods, LLC shall not discharge sulfur oxides (SO<sub>x</sub>) into the atmosphere from the following stacks in excess of the listed amounts:

Control ID	Emission Point	Description	Lbs/hr
C10	S10	Regenerative Thermal Oxidizer	4.17
C106	S106	Syngas Boiler	17.33

These emission rates shall be verified through performance testing, as detailed in Special Conditions 12.

2. Grain Receiving Operational Limits

- A. LifeLine Foods, LLC shall not exceed a daily grain receiving limit of 2034 tons of grain per day, for the purpose of ethanol production.
- B. To demonstrate compliance with Special Condition 2.A., Lifeline Foods, LLC shall keep a record of the daily weight (tons) of grain received per day. Attachment E, or equivalent form(s), shall be used for this purpose.

3. Ethanol Production Limits

- A. LifeLine Foods, LLC shall not exceed an annual production limit of 50,000,000 gallons of denatured ethanol per twelve (12) consecutive month period.
- B. LifeLine Foods, LLC shall record the monthly and the sum of the most recent consecutive twelve (12) months production of denatured ethanol in gallons from this installation. These records shall be kept on-site for five (5) years and shall be made immediately available for inspection to Department of Natural Resources' personnel upon request. Attachment F, or an equivalent form shall be used for this purpose.

4. Control Equipment - Baghouses

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**SPECIAL CONDITIONS:**

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

- A. The baghouses listed below must be in use at all times when the associated equipment is in operation:

Control ID No.	Emission Point	Emission Unit controlled
C70	S70	DDG Cooler
C71	S71	Germ Cooler
C101	S101	Degermers
CSJ	SandJ	All Dry Fractionation and Sizing equipment including Grain Cleaning, Grader, Rollermill, Sifting, Aspirators & Cyclones, and Oat Milling
C104	S104	Bran Storage
C105	S105	Ash Storage/Loadout
C120	S120	Anderson Dryer
C121	S121	Anderson Cooler
C107	S107	Lime Storage/Handling
C106	S106	Syngas Boiler

- B. The baghouse(s) and any related instrumentation or equipment shall be operated and maintained in accordance with the manufacturer's specifications. The baghouse(s) shall be equipped with a gauge or meter that indicates the pressure drop across each baghouse. This gauge or meter shall be located in such a way it may be easily observed by Department of Natural Resources' employees.
- C. Replacement bags for all baghouse(s) shall be kept on hand at all times. The bags shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance and abrasion resistance).
- D. Visible emissions will be used as an indicator of the proper operation of the control device. During proper operation no visible emissions are expected from this emission unit. The existence of visible emissions will indicate a decrease in the efficiency of the control device and corrective actions will be implemented
- 1) Visible emissions from the exhaust shall be monitored on a daily basis when the process is in operation.
  - 2) The duration of the observation shall be for a 2 minute time period.
  - 3) The condition of no visible emissions is considered normal for this emission unit. When visible emissions are noted from the emission

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**SPECIAL CONDITIONS:**

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

unit, it shall be documented and corrective actions taken.

E. The observation of visible emissions from this emission unit will be considered an excursion and corrective actions shall be implemented within a reasonable period. An excursion does not necessarily indicate a violation of the applicable requirement. When the level of excursions exceed three percent of the of the total number of observations in a six month period and corrective actions fail to return the emission unit to a no visible emission condition, then the permittee shall conduct source testing within 90 days of the last excursion to demonstrate compliance with 10 CSR 10-6.400. If the test demonstrates noncompliance with the above emission limitation the permittee shall propose a schedule to implement further corrective actions to bring the source into compliance and demonstrate that compliance.

F. LifeLine Foods, LLC shall monitor and record the operating pressure drop across the baghouse(s) at least once in every twenty-four (24) hour period when the associated equipment is operated. The operating pressure drop shall be maintained within the normal operating range specified by the manufacturer's performance warranty. If the pressure drop reading should fall outside of this normal operating range, then the associated equipment shall be shut down as quickly as is reasonably practical. Corrective actions shall be taken to address the cause of the non-normal pressure drop and the baghouse(s) shall be returned to normal operation before re-starting the equipment.

G. LifeLine Foods, LLC shall inspect the baghouse(s) at least once every six (6) months and at a minimum, conduct the following activities:

- 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.

5. Control Equipment - Fermentation Wet Scrubbers

A. The scrubbers listed below must be in use at all times when the associated equipment is in operation:

Control ID No.	Emission Point	Emission Unit controlled
C40	S40	Four Fermentation Tanks and One Beer Well

B. The scrubbers and any related instrumentation or equipment shall be

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

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. LifeLine Foods, LLC shall monitor and record the operating pressure drop across each scrubber at least once every twenty-four (24) hours. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
  - D. LifeLine Foods, LLC shall monitor and record the water flow rate through the scrubber at least once every twenty-four (24) hours. The water flow rate shall be maintained within the design conditions specified by the manufacturer's performance warranty.
  - E. LifeLine Foods, LLC 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.
6. Control Equipment – Cyclone
- A. The DDG Cooling Cyclone (P70) must be in use at all times when the DDGS and Germ Dryers (P10) are in operation. The DDG Cooling Cyclone shall be operated and maintained in accordance with the manufacturer's specifications.
  - B. Visible emissions will be used as an indicator of the proper operation of the control device. During proper operation no visible emissions are expected from this emission unit. The existence of visible emissions will indicate a decrease in the efficiency of the control device and corrective actions will be implemented
    - 1) Visible emissions from the exhaust shall be monitored on a daily basis when the process is in operation.
    - 2) The duration of the observation shall be for a 2 minute time period.
    - 3) The condition of no visible emissions is considered normal for this

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

emission unit. When visible emissions are noted from the emission unit, it shall be documented and corrective actions taken.

- C. The observation of visible emissions from this emission unit will be considered an excursion and corrective actions shall be implemented within a reasonable period. An excursion does not necessarily indicate a violation of the applicable requirement. When the level of excursions exceed three percent of the of the total number of observations in a six month period and corrective actions fail to return the emission unit to a no visible emission condition, then the permittee shall conduct source testing within 90 days of the last excursion to demonstrate compliance with 10 CSR 10-6.400. If the test demonstrates noncompliance with the above emission limitation the permittee shall propose a schedule to implement further corrective actions to bring the source into compliance and demonstrate that compliance.
- D. LifeLine Foods, LLC shall maintain an operating and maintenance log for the DDG Cooling Cyclone 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.
- 7. Control Equipment – Regenerative Thermal Oxidizer (C10)
  - A. The thermal oxidizer must be in use at all times when the DDGS and Germ Dryers (P10) are in operation or any time that regulated PM<sub>10</sub>, volatile organic compounds (VOC) or hazardous air pollutant (HAP) emissions are possible. The thermal oxidizer shall be operated and maintained in accordance with the manufacturer's specifications. Emission rates of PM<sub>10</sub>, VOC, HAPs, CO and NO<sub>x</sub> will be tested, as detailed in Special Conditions 12, to verify the thermal oxidizer is operating as assumed.
  - B. The operating temperature of the thermal oxidizer shall be continuously monitored and recorded during operation. The operating temperature of the thermal oxidizer shall be maintained on a rolling 3-hour average within 50 degrees Fahrenheit of the average temperature of the oxidizer recorded during the compliance test specified in Special Conditions 12 which demonstrated compliance with the emission limits. The acceptable

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

temperature range may be reestablished by performing a new set of emission tests.

- C. LifeLine Foods, LLC shall maintain an operating and maintenance log for the thermal oxidizer 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.
  
- 8. Control Equipment – Biomethanator Flare
  - A. Emissions from Methanator #1 and Methanator #2 will be directed to the syngas boiler (S106), the package boiler (S110), the biomethanator flare (S60) or vented to the atmosphere. If in the future, it is determined that criteria pollutants are being emitted from Methanator #1 and/or Methanator #2, LifeLine Foods, LLC will be required to direct these emissions to the syngas boiler (S106), the package boiler (S110), or the biomethanator flare (S60). The flare shall be operated and maintained in accordance with the manufacturer’s specifications.
  
  - B. The biomethanator flare may be operated for a total of 4,380 hours per year.
  
  - C. LifeLine Foods, LLC shall maintain an operating and maintenance log for the flare 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.
    - 4) A written record of the total number of hours the biomethanator flare is used including the date and time of the usage.
  
- 9. Control Equipment – Ethanol Loadout Flare
  - A. The flare (S50) must be in use at all times to control emissions from denatured ethanol truck loadout into non-dedicated tanks (P50). The flare shall be operated and maintained in accordance with the manufacturer’s specifications.

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

- B. The flare may be operated for a total of 2500 hours per year.
  - C. LifeLine Foods, LLC shall maintain an operating and maintenance log for the flare 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.
    - 4) A written record of the total number of hours the flare is used including the date and time of the usage.
10. Pavement of Haul Roads
- A. LifeLine Foods, LLC shall pave the specified haul roads (FS-02) with materials such as asphalt, concrete, and/or other material(s) after receiving approval from the Program. The pavement will be applied in accordance with industry standards for such pavement so as to achieve "Control of Fugitive Emissions" while the plant is operating.
  - B. LifeLine Foods, LLC shall inform the Air Pollution Control Program, in writing within fifteen (15) days, of the date when operation has commenced at this site and of the date when the paving has been completed.
  - C. LifeLine Foods, LLC shall finish paving the haul roads before start of operations.
  - D. Maintenance and/or repair of the surfaces will be conducted as necessary to ensure that the physical integrity of the pavement is adequate to achieve control of fugitive emissions from these areas while the plant is operating.
  - E. LifeLine Foods, LLC shall periodically water, wash and/or otherwise clean all of the paved portions of the haul road as necessary to achieve control of fugitive emissions from these areas while the plant is operating.
  - F. LifeLine Foods, LLC shall maintain a daily log detailing when watering/cleaning was performed and methods used to water/clean the haul roads.
11. 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

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

Resources' employees.

- B. The cooling water circulation rate shall not exceed 1,200,000 gallons per hour.
  - C. 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.
  - D. The total dissolved solids (TDS) concentration in the circulated cooling water shall not exceed a TDS concentration of 2,500 parts per million (ppm) for any 12 consecutive calendar month period. A TDS sample shall be collected at least once per calendar month.
12. Performance Testing
- A. LifeLine Foods, LLC shall conduct performance tests on the stacks listed in Table 1 Column A. The emission rates for the pollutants listed in Column C shall be determined using the units described in Column D and used in the Attachments described in Column E for compliance with the special conditions described in Column F.

Table 1: Testing Requirement

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

Column A	Column B	Column C	Column D	Column E	Column F
Emission Point	Description	Pollutant	Units	Attachments	Special Condition
S10	Dryers and RTO	VOC, HAP, CO, PM <sub>10</sub> , NO <sub>x</sub>	lb of pollutant/hr, lb of pollutant/ton DDGS	A, B, C, and D	1.A, 1.B, 1.C, 1.D, 1.E
S40	Fermentation Scrubber	VOC, HAP, PM <sub>10</sub>	lb of pollutant/hr, lb of pollutant/gallon EtOH produced	A, C and D	1.A, 1.C, 1.D
S105	Ash Storage	PM <sub>10</sub>	lb of pollutant/hr, lb of pollutant/ton ash received		1.D
S106	Syn Gas Boiler	VOC, CO, PM <sub>10</sub> , NO <sub>x</sub> , SO <sub>x</sub>	lb of pollutant/hr, lb of pollutant/MMBTU	A, and B	1.A, 1.B, 1.C, 1.D, 1.E, 1.F
S107	Lime Storage Baghouse	PM <sub>10</sub>	lb of pollutant/hr, lb of pollutant/ton lime received		1.D
S104	Bran Storage	PM <sub>10</sub>	lb of pollutant/hr, lb of pollutant/ton bran processed		1.D
S70	Cooler Cyclone	VOC, HAP, PM <sub>10</sub>	lb of pollutant/hr, lb of pollutant/ton DDGS	A, C, and D	1.A, 1.C, 1.D
S101	Degermer Baghouse	PM <sub>10</sub>	lb of pollutant/hr, lb of pollutant/ton grain processed		1.D
S120	Anderson Dryer	VOC, HAP, PM <sub>10</sub>	lb of pollutant/hr, lb of pollutant/ton grain processed	A, C, and D	1.A, 1.C, 1.D
S121	Anderson Cooler	VOC, HAP, PM <sub>10</sub>	lb of pollutant/hr, lb of pollutant/ton grain processed	A, C, and D	1.A, 1.C, 1.D
S71	Germ Cooler Cyclone	VOC, HAP, PM <sub>10</sub>	lb of pollutant/hr, lb of pollutant/ton grain processed	A, C, and D	1.A, 1.C, 1.D
SANDJ	Source "J" Units-Aux Corn Mill	PM <sub>10</sub>	lb of pollutant/hr, lb of pollutant/ton grain processed		1.D
S110	Package Boiler	CO, NO <sub>x</sub>	lb of pollutant/hr, lb of pollutant/MMBTU	B	1.B

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**SPECIAL CONDITIONS:**

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

- 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 of the following control devices.
  - 1.) The Wet Scrubber.
  - 2.) The Syngas Boiler.
  - 3.) The Regenerative Thermal Oxidizer.
  
- C. The operating parameters in Special Condition 12.B. shall be determined and agreed upon by the Air Pollution Control Program's Enforcement Section and Lifeline Foods, LLC before the start of the performance tests.
  
- D. The operating parameters in Special Condition 12.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 Lifeline Foods, LLC before the start of the performance tests.
  
- E. The performance tests for the fermentation wet scrubber (S40) 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. Lifeline Foods, LLC shall submit, in the proposed test plant outlined in Special Condition 12, 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, Lifeline Foods, LLC must conduct testing for the time period outlined in Special Condition 12.E.1.
  
- F. The testing required in Special Condition 12.A(4) may be limited to conducting tests on a representative piece(s) of each type of equipment upon approval by the Director. In addition, an alternate method(s) of quantifying the emission rates of criteria air pollutants (e.g. PM<sub>10</sub>) from

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

these sources may be used in place of the above testing requirement if requested by LifeLine Foods, LLC and approved by the Director.

- G. These tests shall be performed within sixty (60) days after achieving the maximum production rate of the installation, but not later than 180 days after initial start-up for commercial operation and shall be conducted in accordance with the stack test procedures outlined in Special Condition 13.
  - H. LifeLine Foods, LLC shall conduct performance tests to verify the emission rates as indicated in Special Condition 12.A once every 5 years from the date of the most recent performance tests.
13. Proposed Test Plan and Test Report Requirements
- A. 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.
  - B. 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.
  - C. The test report is to fully account for all operational and emission parameters addressed both in the permit conditions as well as in any other applicable state or federal rules or regulations.
  - D. If the performance testing required by Special Condition 12 of this permit indicates that any of the emission limits specified in Special Condition 1 are being exceeded, LifeLine Foods, LLC must propose a plan to the Air Pollution Control Program within thirty (30) days of submitting the performance test results. This plan must demonstrate how LifeLine Foods, LLC will reduce the emission rates below those stated in Special Condition 1. LifeLine Foods, LLC shall implement any such plan immediately upon its approval by the Director.

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**SPECIAL CONDITIONS:**

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

14. **Haul Road Operation Requirements**  
Haul road usage shall be limited to operation between 7 a.m. and 5 p.m.
15. **Operating Permit Requirements**  
LifeLine Foods, LLC shall apply for and receive an Intermediate Operating Permit from the Air Pollution Control Program for this installation.
16. **Requirements for Future Emission Alterations**  
If a situation arises such that LifeLine Foods, LLC wishes to alter Special Condition 1.A. and/or 1.B. of this permit in order to allow this project to emit more than 100 tons per year of VOC and/or CO, LifeLine Foods, LLC will be required to conduct a New Source Review in accordance with 10 CSR 10-6.060(8). Such a review will include a Best Available Control Technology (BACT) analysis utilizing current technologies and any other requirements that the Director deems necessary pursuant to 10 CSR 10-6.060(8).
17. **Recordkeeping Requirements**  
The most recent sixty (60) months of records required by any of the special conditions in this permit shall be maintained on-site and shall be made immediately available to Missouri Department of Natural Resources' personnel upon request.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (6) REVIEW

Project Number: 2006-02-004  
Installation ID Number: 021-0016  
Permit Number:

LifeLine Foods, LLC  
2811 South 11th Street  
St. Joseph, MO 64503

Complete: April 20, 2007  
Reviewed: August 3, 2007

Parent Company:  
LifeLine Foods, LLC  
2811 South 11th Street  
St. Joseph, MO 64503

Buchanan County, S20, T57, R35W

REVIEW SUMMARY

- LifeLine Foods, LLC has applied for authority to install a 50 million gallon per year denatured ethanol manufacturing plant.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. The HAPs expected are acetaldehyde, acrolein, formaldehyde and methanol. The main HAP of concern is acetaldehyde.
- New Source Performance Standards (NSPS) apply to this installation. Specifically, 40 CFR Part 60 Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels*, applies to the storage tanks (T61-T66); Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional-Steam Generating Units* applies to the boilers (S106 and S110); Subpart VV, *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry (SOCMI)* applies to this installation. Subpart III, *Standards of Performance for VOC Emissions from SOCMI Air Oxidation Unit Processes*, Subpart NNN, *Standards of Performance for Volatile Organic Compound Emissions from SOCMI Distillation Operations*, and Subpart RRR, *Standards of Performance for Volatile Organic Compound Emissions from SOCMI Reactor Processes*, do **not** apply to this installation. Subpart XX, *Standards of Performance for Bulk Gasoline Terminals*, does **not** apply since the fuel ethanol (alcohol/petroleum distillate blend) manufactured by the installation does not satisfy the Subpart XX definition of gasoline.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) or currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment.
- Baghouses, wet scrubbers, cyclones, and a regenerative thermal oxidizer will be

used to control PM<sub>10</sub>, VOC, NO<sub>x</sub>, CO, and HAP emissions from the equipment in this permit.

- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all criteria pollutants are below major source levels.
- This installation is located in Buchanan County, an attainment area for all criteria air pollutants.
- This installation is not on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2].
- Ambient air quality modeling was performed to determine the ambient impact of PM<sub>10</sub>, CO, NO<sub>x</sub>, and SO<sub>x</sub>.
- Emissions testing is required for the equipment.
- An Intermediate Operating Permit is required for this installation within 30 days of equipment startup.
- Approval of this permit is recommended with special conditions.

### INSTALLATION DESCRIPTION

LifeLine Foods, LLC is a cereal manufacturing plant located in St. Joseph, Missouri. This plant was previously owned by The Quaker Oats Company. Locally grown grains are milled and processed into food products and ingredients for various companies. This installation is considered a minor source under construction permits. LifeLine Foods, LLC was issued a Part 70 Operating Permit on September 12, 2000.

The following construction permits have been issued to LifeLine Foods, LLC from the Air Pollution Control Program.

Table 2: Issued construction permits

Permit Number	Description
0686-003	Two (2) boiler replacements
1289-002	Installation of two (2) cereal manufacturing lines
0790-004	Installation of additional dry and wet dust collecting systems
0791-007	Installation of two hammermills and baghouses replacements
0596-002	Modification to the ingredient transfer system
112001-006	Installation of three (3) dryers and three (3) coolers for the corn milling operation

In past decisions, the U.S. Environmental Protection Agency (EPA) has concluded that fuel grade ethanol production plants are members of the Synthetic Organic Chemical Manufacturing Industry (SOCMI). Several of the New Source Performance Standards (NSPS) apply to SOCMI installations, including Subpart III, *Standards of Performance*

*for VOC Emissions from SOCOMI Air Oxidation Unit Processes, Subpart NNN, Standards of Performance for VOC Emissions from SOCOMI Distillation Operations, Subpart RRR, Standards of Performance for VOC Emissions from SOCOMI Reactor Processes, and Subpart VV, Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry.* Subpart III does not apply to this installation, as there are no air oxidation units involved in these processes. After reviewing the background information documentation for the NSPS, it appears that EPA chose not to consider bio-processes in the development of Subparts NNN or RRR; therefore, these subparts are not applicable. However, since ethanol production plants are classified as SOCOMI facilities, Subpart VV, dealing with equipment leaks, does apply to this installation.

## PROJECT DESCRIPTION

LifeLine Foods, LLC has applied for authority to install a 50 million gallon per year (MMgal/yr) denatured ethanol plant in St. Joseph, Missouri. Grain will be received by conveyor from the existing grain elevator storage bins and processed through a new dry fractionation plant. In the new dry fractionation plant, the grain is cleaned and tempered with water to facilitate germ and bran release. The tempered corn is conveyed to the degermers where the germ and bran are split from the corn and separated into graded grain material. Part of the grain material is sent back the existing LifeLine Foods plant for further processing. The remaining grain material is sent to aspirators and cyclones to separate bran from germ and endosperm. The bran is sent through the bran purification process and another cyclone separator before being sent to a gasifier system to produce synthetic gas for the syngas boiler.

The grain materials are rollermilled and sifted into different sizes of materials, germ and endosperm. The germ is sent to purification where it is either directed to the gasifier or to the oil expelling process. The germ cake is sent to the ethanol plant slurry tank along with the endosperm.

In the ethanol process, the corn powder is blended with water and enzymes to form a mash slurry for the fermentation process. Yeast and more enzymes are added to this mash in the four fermentation tanks. After fermentation, the resultant mixture (beer), containing approximately ten percent (10%) ethanol by volume, is stored in a beer well. Emissions from the fermentation process and beer well (e.g. carbon dioxide) flow to a scrubber, before being released into the atmosphere.

The beer well provides a continuous flow to the distillation columns. The resultant products are approximately 190 proof ethanol and whole stillage. Using molecular sieves, most of the remaining water will be removed from the ethanol to produce 200 proof ethanol. This is then combined with five percent (5%) natural gasoline by volume and sold as denatured ethanol.

The whole stillage is centrifuged to yield thin stillage and solid fractions. Emissions from the centrifuge will be vented to the RTO. The thin stillage is further evaporated to produce a syrup that contains thirty percent dry matter. This syrup will be sold individually as a byproduct or combined with the centrifuged wet solids and dried and

cooled to generate Distiller Dried Grain and Solubles, DDGS. The water stream from the evaporators goes to the methanator, which is an anaerobic biological water treatment system that converts organic material in the process water into fuel gas.

Steam tube dryers will be used to dry the DDGS. The exhaust from this process, along with the mixer, slurry tank, yeast tank, centrate tank, CIP screen, 190 and 200 proof condensers, is vented to the RTO for emission control. The RTO will be tested to verify emissions. The DDGS will be stored and then loaded onto trucks or rail cars for distribution as DDGS. The DDGS load out system will be controlled by a baghouse to minimize emissions.

Two new boilers, a syngas boiler and a package boiler, are being constructed to supplement the existing two boilers. The syngas boiler will utilize the fuel gas produced by the methanator as a supplement to the synthetic gas produced by the bran gasifier. Emissions from the syngas boiler are controlled with a baghouse. When the syngas boiler is not in operation, the fuel gas will be vented to a flare or combustion device prior to being released into the atmosphere. The package boiler will combust natural gas and will be equipped with an ultra low NO<sub>x</sub> and low CO burner.

A 100,000-gallon storage tank (T65) is available for 190 proof ethanol. The 200 proof ethanol is stored in a 100,000-gallon tank (T63). The 200 proof ethanol is mixed with a denaturant, gasoline, stored in a 100,000-gallon gasoline storage tank (T64). The denatured ethanol is stored in one of two 500,000-gallon denatured alcohol storage tanks (T61 and T62). Corrosion inhibitor is stored in a 2,300 gallon tank (T66). The denatured ethanol is loaded into trucks or railcars for delivery to customers through the loadout system (S50). Emissions from truck loadout are controlled by a flare.

## EMISSIONS/CONTROLS EVALUATION

The pollutants of concern for the purpose of this review are PM<sub>10</sub>, VOCs, CO, HAPs, and NO<sub>x</sub>. These emissions are discussed according to the processes that emit them: Grain Handling and Storage, Fermentation and Distillation, DDGS Drying and Storage, Tanks and Loadout, and Haul Roads.

### Grain Handling and Storage

PM<sub>10</sub> is primarily emitted from the grain dry fractionation and sizing processes. Baghouses are used to control PM<sub>10</sub> emissions from these operations with a control efficiency of 99%. The applicant has provided estimates of emissions from these operations based on manufacturer's guarantees. Therefore, these operations will be tested to verify emissions. The emission factors for estimating fugitive PM<sub>10</sub> emissions from these processes were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 9.9.1 *Grain Elevators and Processes* (5/98).

### Fermentation and Distillation

VOCs and HAPs are primarily emitted from the fermentation and distillation processes. Emissions from the fermentation process are controlled by wet scrubbers, while emissions from the distillation process are controlled by the regenerative thermal oxidizer. Potential emissions of VOC and HAPs emitted from these processes were estimated by the applicant based on testing at other ethanol plants. Therefore testing is required for the proposed scrubbers and RTO for compliance with emission limits of this permit.

Fugitive leaks will be controlled in accordance with *New Source Performance Standards (NSPS) for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry*, 40 CFR Part 60, Subpart VV.

### DDGS Drying and Storage and Boilers

Distillers Grain is dried using steam tube dryers. VOCs, HAPs, and PM<sub>10</sub> are emitted from DDGS drying. VOC and HAP emissions from the DDGS dryers are controlled using the regenerative thermal oxidizer.

PM<sub>10</sub>, VOCs, NO<sub>x</sub>, sulfur oxides (SO<sub>x</sub>) and carbon monoxide (CO) are emitted from the combustion of natural gas. The emission factors used to determine combustion emissions from the RTO (8 MMBtu/hr), the syngas boiler (82.5 MMBTU/hr) and the package boiler (90 MMBtu/hr) were obtained from AP-42, Section 1.4, *Natural Gas Combustion (3/98)*. However, AP-42 emission factors are not appropriate for the RTO and syngas boiler which use emissions from the ethanol production process as fuel in addition to natural gas. The applicant has provided emission factors for the RTO, syngas boiler and package boiler based on manufacturer's guarantees. Therefore, testing is required to demonstrate compliance with emission limits of this permit.

### Tanks and Loadout

VOCs are emitted from storage tanks and truck/rail loadout. Fugitive leaks will be controlled in accordance with *New Source Performance Standards (NSPS) for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry*, 40 CFR Part 60, Subpart VV. Storage tank emissions were calculated using TANKS 4.0.

Loadout emissions were determined using AP-42, Section 5.2, *Transportation and Marketing of Petroleum Liquids*. It was assumed that dedicated ethanol tanks were not used for truck loadout. Therefore, loading loss emissions were calculated using gasoline as the displaced vapor. Emissions from truck loadout are controlled through a flare. For rail loadout emissions, dedicated ethanol tanks were used to determine loading loss.

### Haul Roads

Unpaved haul road emissions were obtained from AP-42, Section 13.2.2, *Unpaved Roads (9/98)*. A control efficiency of 95% is given to the haul roads for paving and undocumented watering. The hours of operation on the haul roads are limited based on modeling requirements.

Testing by other ethanol installations has demonstrated that VOC, CO, and HAPs are emitted from these processes in larger quantities than previously expected. Since LifeLine Foods, LLC is a named source, the major source level for this installation is 100 tons per year of any criteria air pollutant, 10 tons per year for each individual HAP and 25 tons per year for aggregate HAPs. Therefore, a 100-ton per year limitation was set forth on the emissions of VOC and CO, each and a 10/25-ton per year limit was given for HAPs. The HAPs of concern from these processes are acetaldehyde, acrolein, formaldehyde and methanol. However, acetaldehyde is the HAP with the greatest emission rate.

Performance tests required by this permit will verify the emission rate of the aforementioned HAPs and determine compliance with the emission limitation given in Special Condition 1.C. If these limitations are exceeded, the applicant will be required to curtail production or install control equipment to meet these limitations.

Existing potential emissions were taken from a previous permit (Permit Number 112001-006). Actual emissions were taken from the installation's 2005 Emission Inventory Questionnaire (EIQ). The project conditioned potential emissions were based upon findings from other ethanol plants. Special conditions for emissions of VOC, HAPs and CO are required for review under Section (6) of Missouri State Rule 10 CSR 10-6.060 rather than for major source review under Section (8) or Section (9). The following table provides an emissions summary for this project.

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2005 EIQ)	Potential Emissions of the Application	New Project Conditioned Potential
PM <sub>10</sub>	15.0	144.7	74.71	38.23	N/A
SO <sub>x</sub>	40.0	1.2	0.09	94.39	N/A
NO <sub>x</sub>	40.0	71.3	2.43	86.43	N/A
VOC	40.0	2.5	0.13	97.59	<100
CO	100.0	37.6	2.04	99.06	<100
HAPs	10.0/25.0	N/A	N/D	14.65	<10.0/25.0

\*N/A = Not Applicable; N/D = Not Determined

### PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all criteria pollutants are below major source levels.

## APPLICABLE REQUIREMENTS

LifeLine Foods, LLC 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.

### 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 April 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 10-3.090*

### SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes, 10 CSR 10-6.400*
- *New Source Performance Regulations, 10 CSR 10-6.070 – New Source Performance Standards (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units, 40 CFR Part 60, Subpart Dc*
- *New Source Performance Regulations, 10 CSR 10-6.070 – New Source Performance Standards (NSPS) for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry, 40 CFR Part 60, Subpart VV*
- *New Source Performance Regulations, 10 CSR 10-6.070 – New Source Performance Standards (NSPS) for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction or Modification Commenced After July 23, 1984, 40 CFR Part 60, Subpart Kb*
- *Maximum Allowable Emissions of Particulate Matter From Fuel Burning Equipment Used for Indirect Heating, 10 CSR 10-3.060*

## AMBIENT AIR QUALITY IMPACT ANALYSIS

Ambient air quality modeling was performed to determine the ambient impact of PM<sub>10</sub>, CO, NO<sub>x</sub>, and SO<sub>x</sub>. For further details on the modeling, please refer to the memo titled "Ambient Air Quality Impact Analysis for LifeLine Foods, Inc. - April 20, 2007 - Revision".

### STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

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Emily E. Wilbur  
Environmental Engineer

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Date

### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated January 27, 2006, received January 30, 2006, designating LifeLine Foods, LLC 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.











