Comments of Legal & Safety Employer Research, Inc. (LASER) & Concerned Citizens of Henry County Regarding a Proposed Air Quality Permit for Patriot Renewable Fuels LLC, Annawan, IL

Presented to

Illinois Environmental Protection Agency
Permit Section, Air Pollution Control Division,

&

U.S. Environmental Protection Agency, Region V,
Air & Radiation Division, Permits & Grants Section
& Air Enforcement Section

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1 Introduction

Legal & Safety Employer Research, Inc. (LASER) and Concerned Citizens of Henry County (CCHC) have produced these comments as part of an independent review the groups commissioned of the air permit application and draft permit for the proposed Patriot Renewable Fuels, LLC facility. We submit these comments for filing with the Illinois Environmental Protection Agency, Division of Air Pollution Control and the U.S. Environmental Protection Agency, Region 5, Air & Radiation Division.

2 Underestimation of Expected Emissions for Certain Criteria Pollutants Renders Applicant's Submittal Unapprovable as a Minor Source Permit

The comments in subsequent sections identify a number of serious problems with Applicant's and IEPA's underestimation of expected emissions from specific emission units at the proposed facility. If expected emissions of any criteria pollutant exceed 100 tons per year, Applicant's permit as proposed may not be approved since the facility would not have undergone the required Prevention of Significant Deterioration review, including a determination of Best Available Control Technology for criteria pollutants and an air quality impact analysis. The latter analysis must necessarily include a review of compliance with PSD ambient increments and a demonstration that attainment and maintenance of the National Ambient Air Quality Standards will not be jeopardized. None of the required PSD-related determinations have been made by IEPA for the subject facility.

The margin of IEPA-admitted emissions below the 100 ton threshold for the subject facility are very small, as derived from Table 1. These are shown in the table below (100% DDGS – no wet cake basis/no biomethanator flare) on an 8760 hour year potential to emit basis:

Pollutant	Annual Potential to Emit on 100% DDGS basis (tons) (from Table 1)	Margin Between PTE and 100 ton Threshold (tons)
Particulate Matter	99.54	0.46
Nitrogen Oxides	95.27	4.73
Volatile Organic Compounds	97.73	2.27
Sulfur Dioxide	81.97	18.03
Carbon Monoxide	93.05	6.95

Note that IEPA indicates a total of 97.40 in its table for the total of PM/PM-10 emissions. However, this result must be in error as adding all of the potential to emit elements from each emission unit for 100% DDGS operation (no wet loadout and no biomethanator flare) clearly yields a total of 99.54 tons per year for PM-PM-10.

In subsequent subsections of this comment, we identify a number of emission unit/process areas where expected emissions are underestimated. When the margins from the amount of these underestimates can be quantified and summed, it is clear that the subject facility will have criteria pollutant emissions exceeding the 100 ton major stationary source threshold.

Notwithstanding the major stationary threshold issue, the individual process unit emission characterizations constitute error in cases where we identify underestimation of expected emissions.

3 Plant wide conditions

3.1 Annual Allowable Process Corn Throughput Exceeds Corn Throughput Basis Used for Emission Calculations by 1.8%

Condition 1.1(a) of the draft permit allows 40.0 million bushels per year of shelled corn process input to the facility, based on a rolling 12 month average. However, the application's emission calculations are based on 1.1 million tons of corn process input or 39,285,716 bushels per year at 56 lbs of corn per bushel. The draft permit's 40.0 million bushel physical process input limitation is thus 1.8% higher than the fundamental emission calculation throughput basis for the facility.

Either the provision should be altered to limit corn process input to no more than 1.1 million tons per year or the application should be withdrawn to recalculate all emission rates to account for the higher throughput of 40.0 million bushels, contrary to what was indicated in the application.

3.2 The Draft Permit Fails to Require Stack Compliance Testing of Condensible Particulate Matter at Important Sources

Recent tests at the Vera Sun - Fort Dodge, IA facility show (see Attachment #5) that condensible particulate emissions constitute the majority of emissions from grain handling and receiving and at hammermill discharge points. The stack testing provisions of the draft permit should be amended to require condensible particulate emission determinations at such grain handling and hammermill fabric filter discharge points.

3.3 The Draft Permit Fails to Clarify the Matter of Application of Scalars to Results from EPA Method 25/25A Volatile Organic Compound Determination

The draft permit contains a footnote appended to the stack testing method requirements for volatile organic matter as USEPA Method 18 and 25/25A:

> "Testing shall be conducted in accordance with industry-specific guidance from USEPA on testing VOM and HAP emissions at ethanol plants."

This is a vague, indeterminate qualification on the volatile organic compound testing requirements of the draft permit. The draft permit should be amended to specifically cite an EPA guidance document published on a specific date and the effect of such a guidance document on enforcement and compliance with volatile organic compound emission limitations. Permit language should be added to clarify that all Method 25/25A determinations should be subject to EPA's current scalar of 2.2 and the result measured against the legally enforceable volatile organic compound emission limitation for emission units discharging VOCs. The draft permit should provide that an EPA Method 18 determination of total VOCs measured as specific compounds or a Method 25/25A determination as modified by the scalar factor of 2.2, whichever is larger, can be used to enforce the permit's volatile organic compound emission limitations.

3.4 Chemical Speciation Listing for EPA Method 18 Determinations Should be Extended

EPA Method 18 determinations should included all of the following specific speciated volatile organic compound emissions:

acetaldehyde
acetic acid
ethanol
formaldehyde
formic acid
2-furaldehyde
methanol
butyric acid
glycerol
pyruvic acid
lactic acid
propionic acid
butanol
acrylamide

acrolein
isoamyl alcohol
ethyl acetate
succinic acid
butanediol
isoamyl acetate
acetone

4 Discussion of Permit Regulatory Sections and Emission Calculations by Process

4.1 Firewater Pump - Emergency Equipment

4.1.1 Application, Process and Emission Calculation

The facility has proposed installation of a 300 hp diesel engine for firewater pumping and emergency electrical generation. The diesel engine is subject to a 300 hour per year limitation on the potential to emit. The table below shows emission factors in the air permit application and AP-42 emission factors for uncontrolled diesel engine emissions:

Pollutant	**Emission Factor from PRF's Application**	**AP-42 3.3 Emission Factor for Uncontrolled Diesel Engines**	**Factor AP-42/application factor**
NOX	0.0115	0.031	2.7
SO2	0.0013	0.0025	1.9
CO	0.0006	0.00668	11.1
PM 10	0.0002	0.0022	11.0
VOC	0.0003	0.00247	8.2

The table above indicates that the emission factors used for calculating emissions from the emergency diesel engine are significantly lower than the AP-42 uncontrolled emission factors.

Although the air permit application indicates that these are manufacturer's emission factors, no supporting information from the manufacturer was provided. No vendor guarantees or product literature is provided in the application. No information is provided on any emission control equipment that is intended for installation on the emergency diesel generator.

It appears likely that emission control equipment or engine process modifications will be necessary to meet the claimed diesel engine emission factors claimed by Applicant in the air permit application.

The permit application is thus incomplete because there is no information detailed anywhere in the application to support the claimed emission control performance. The application's emission calculations should not be approved unless and until it is supplemented by specific vendor guarantee information and information about diesel engine emission controls, if any.

The diesel fuel tank and any potential emissions are missing from the application.

4.1.2 Permit Provisions

If emergency diesel engine performance depends on the use of emission control devices, such as trap oxidizers and other equipment, then additional provisions should be incorporated in Section 2.1 of the permit to ensure that such emission controls are tested, monitored and maintained to assure compliance with the stated emission factors.

4.2 Grain Receiving, Handling, Milling, and Processing

4.2.1 Application, Process and Emission Calculation

4.2.1.1 Failure to Provide Effective Unloading Grate Area and Physically Apportioned Airflow Information Renders the Application Incomplete to Ensure Compliance with Fugitive Emission Requirements

The Applicant failed to submit technical information on the design of the unloading baghouse process fugitive emissions collection system and the unloading grate area design, including the effective grate area for the major dump-pit area (marked "tbd" – to be determined). This failure is unacceptable because it is impossible to know if the design of these systems will ensure that fugitive emissions will be properly collected. Any increase in the size of the flow to the baghouse to correct fugitive emission problems or failure of the fugitive emission collection system to properly function threatens to push the overall plant emissions over the major stationary source threshold for the potential to emit calculation on PM emissions.[1]

[1] The major source threshold is 100 tons of PM. The source estimated emissions presented by Applicant is projecting 99.23 tons/year of PM; Table 1 of the permit shows 97.4 tons PM per year

The application indicates the unloading fabric filter evacuation system with gas flow rates of 48,000 SCFM, but this system serves more sources that just the unloading pit. The General Plant Process Flow Diagram for Plant Emissions indicates that this collection system serves the following grain handling processes:

Corn unloading
Elevator leg to storage bins
Storage bin fill conveyor
Storage bin emptying conveyor
Elevator leg to corn day bin
Corn day bin

The application contains no information on the apportionment of fugitive emission gas collection system flows to each of these processes and no information on baffles or other system controls. Without the effective grate area and information on gas collection system flow apportionment in the design, there is no way to ensure that the design of the system and the grate area facial velocities will provide the claimed 95% capture and control efficiency shown in the grain receiving and handling emission calculations.

The applicant should be denied unless and until these details of system design are provided.

4.2.1.2 Applicant Failed to Consider and Incorporate Condensible Particulate Emissions from Hammermill and Grain Handling Fabric Filter Discharge Points

In a Method 5 and 202 test conducted at the Verasun Fort Dodge Iowa facility, a 110 MMGalEth/year facility, it was found that condensible particulate emissions constitute the greater proportion of total particulate emissions from both the hammermill and grain handling fabric filter discharge points. Method 202 condensible PM emissions from the hammermill fabric filter were 0.069 lb/hr and were 0.132 lb/hr from the grain handling fabric filter. See Attachment #5. The combined condensible PM emissions from these two sources generate a potential to emit of 0.88 tons of PM/year at the Verasun facility.

The Application must be revised to consider condensible PM emissions from these two emission units at the Patriot Renewables facility.

4.2.2 Permit Provisions

4.2.2.1 Applicant's Proposed Facility is Not Entitled to Exemption From, or Contingent Compliance Schemes with Requirements on Grain Handling Operations Under 35 IAC 212.462; All Grain Receiving Fugitive Emission Controls Must be Made Mandatory Without Requiring the Contingency of an Adverse IEPA Inspection

Condition 2.2.5(b) of the draft permit states:

> "b. Individual grain handling operations shall comply with applicable requirements of 35 IAC 212.462 (see below), if a certified investigation performed by the Illinois EPA determines that such operation is causing or tending to cause air pollution. [Section 9 of the Environmental Protection Act]"

Condition 2.2.5(b) thus makes requirements under Condition 2.2.5(b)(i) through (iii) conditionally applicable on the existence of an IEPA investigation report of air pollution violation involving the grain handling dust or emissions. The provision making Condition 2.2.5(b)(i) through (iii) only applicable based on a contingency about an adverse inspection result should be stricken from the permit and the provisions of Condition 2.2.5(b)(i) through (iii) should be made mandatory for the following reasons.

First, Applicant is not entitled to the contingent approach to compliance with Condition 2.2.5(b)(i) through (iii) requirements. Section 9 of the Environmental Protection Act provides:

> "Any grain elevator located outside of a major population area, as defined in Section 211.3610 of Title 35 of the Illinois Administrative Code, shall be exempt from the requirements of Section 212.462 of Title 35 of the Illinois Administrative Code provided that the elevator: (1) does not violate the prohibitions of subsection (a) of this Section or have a certified investigation, as defined in Section 211.970 of Title 35 of the Illinois Administrative Code, on file with the Agency and (2) is not required to obtain a Clean Air Act Permit Program permit pursuant to Section 39.5. Notwithstanding the above exemption, new stationary source performance standards for grain elevators, established pursuant to Section 9.1 of this Act and Section 111 of the federal Clean Air Act, shall continue to apply to grain elevators."[2]

Since the entire subject facility, including the grain handling unit portion, is required to obtain a Clean Air Act Permit Program permit pursuant to Section 39.5 because of certain other NSPS applicable units, the facility is not entitled to the exemption provided in

[2] 415 ILCS 5/9(f), in part

Section 9(f). Moreover, the primary activity and purpose of this facility is not to act as a grain elevator in the traditional sense that motivated the legislative intent of the statutory language. This is primarily an ethanol production plant and not a stand-alone grain elevator facility.

The facility is also not entitled to be exempted since it is a new facility under 35 IAC 212.462(e) that has a throughput over 300,000 bushels per year, and further, it doesn't qualify for an exemption under 35 IAC 212.462 through reference to 35 IAC 212.461(c) or (d).

Second, to assure compliance with both emission limitations in the grain handling emission unit (particularly the fugitive emission limit from grain unloading) as well as compliance with PM emission limitation less than the major stationary source limit and the 95% capture and control basis of the fugitive emission calculation, it is essential to ensure the design and operation of the facility to achieve the face velocity specified in what is now contingent permit language at Section 2.2.5(b)(ii)(A). This and the related sections must be made mandatory applicable requirements under the permit rather than be contingently applicable on the basis of an adverse inspection by IEPA.

4.2.2.2 The Proposed Permit Does Not Provide Sufficient Monitoring to Assure Compliance for Grain Receiving and Handling Fugitive Emission Limitations

Once it is recognized that Condition 2.2.5(b)(i) through (iii) cannot be put on a contingent applicability basis and must be made mandatory, compliance assurance aspects of the operations in this process location must be addressed. Compliance testing procedures and parameter monitoring requirements should be put in place to ensure continued assured compliance with fugitive controls inherent in all of the provisions under Condition 2.2.5(b)(i) through (iii). These would include measuring collection system flow rates at critical locations based on a compliance test of facial velocities and establishment of set points for compliance evaluation based on flow rates, means to ensure that apportioned ACFM gas collection rates were being achieved, a periodic opacity monitoring requirement to address the no visible emission requirement and monitoring elements for each aspect of Condition 2.2.5(b)(i) through (iii). In addition, ongoing parameter monitoring and measures to assure compliance are absolutely essential to ensuring compliance with the fugitive emission limitations of Condition 2.2.6(a)(ii), (iii) and 2.2.6(b)(ii) since these are completely dependent on maintaining a 95% control level on uncontrolled fugitive emissions.

Operation of the grain unloading and hammermill fabric filter control units must provide sufficient monitoring measures to assure compliance during times when a Method 5 compliance test is not being conducted. Mere monitoring of pressure drop may be sufficient to ensure that gross fabric filter failures are detected, but fabric filter pressure

drop is not a sufficiently sensitive technique to detect small leaks and other smaller fabric filter failures that will interfere with compliance with a 0.005 grains per standard cubic foot emission limitation at Condition 2.2.6(a)(i).

Use of "manufacture recommendations" in operational requirements and monitoring provisions at Conditions 2.2.5(c) and 2.2.5(d)(i) is vague and indeterminate; such provisions cannot be enforced in practice. Instead, specific enforceable requirements for emissions and parameter monitoring should be added to the permit. For example, the fabric filter pressure drop parameters and an envelope of variance from such parameters should be determined and fixed during a compliance stack test. The permit should establish a procedure by which such limitations on parameter set points and maintenances of minimal tolerances as an envelope of operation is established pursuant to a compliance stack test and communications with IEPA. The permit should require minimum standard for accuracy and testing concerning pressure drop sensing equipment.

Continuous bag leak detection systems must be put in place to ensure continued compliance withe the 0.005 grains per standard cubic foot emission limitation on the grain receiving and handling and the hammermill fabric filtration units. Merely requiring and annual fabric filter inspection is not sufficiently frequent monitoring to provide and assurance that compliance with emission limitations is being achieved.

4.2.2.3 Other Permit Language Clarification Needed in Section 2.2

Condition 2.2.7 contains the words "as requested" which opens the permit to a contradictory impression that testing requirements in the grain handling area are not mandatory as per Section 3.1. This wording should be changed to eliminate that impression.

Condition 2.2.6(b)(i) should be more specifically referenced to emission point descriptors and discharge stacks downstream from fabric filters and induced draft fans. The present language used doesn't specifically identify the location of applicability for these emission limitations. In the same vein, the fugitive emission points and process equipment for which Condition 2.2.6(b)(ii) is applicable should be specifically named to eliminate any potential for unclear interpretation of the effectiveness of this applicable requirement.

Conditions 2.2.6(a)(ii) and 2.2.6(a)(iii) should either specifically state that these limitations apply on an instantaneous basis and any such instantaneous limit exception is a violation, or they should be qualified with an averaging time not to exceed a six minute average for compliance evaluation purposes.

4.2.2.4 The Permit Language Should be Amended to Preclude Straight Grain Truck Unloading Operations and Outdoor Grain Management

The permit should be amended to specifically prohibit deliveries of grain to the facility via ordinary straight grain trucks without gondola-bottom gate style unloading capability. All fugitive emission calculations for the facility assumed that all deliveries would be made by rail road cars and trucks with bottom-style loading capability. Emission factors for grain unloading from straight trucks and dump vehicles are considerably higher and were never considered in the facility emission characterization during air permitting. Any subsequent deliveries of grain by straight trucks and subsequent truck dumping would push the facility over the 100 ton/year major stationary source threshold for particulate so it is especially important to ensure that such grain deliveries do not take place.

If the facility intends to accept shipments by straight truck (for example, shipments generated by area farmers), then the emission calculation must be redone and a limit placed on the number of such vehicles per year that will allowed for grain unloading at the facility. At the very least, the Applicant must disclose the expected split between deliveries between straight and hopper bottom trucks. If the subject facility is ever intended to receive undried grain directly from area farmers, the particular emissions estimation method used from grain receiving would be a significant underestimate of actual emissions.

The permit should be amended to prohibit all outdoor storage or management piles of grain for any reason, such as storage of off-specification grain or spent distiller's grain from upsets of the fermentation process.

4.3 Feed Preparation and Fermentation Permit Conditions and Process Area

4.3.1 Applicant Must Explain the Basis of Differences in the Emission Factors and Fermentation Scrubber Features Developed by the Same Consultant for the Parties, Marquis Energy and Patriot Renewable Fuels, Who Both Have Permit Applications at IEPA at the Same Time

Documentation of emission factors for the VOC emissions from the fermentation scrubbers at both Marquis Energy LLC and Patriot Renewable Fuels LLC is poor. Both applications are presently before IEPA and are up for approval. Yet, the VOC emission information used in the Marquis Energy LLC application is 698 lb/MMGalEth and 38.39 tons of VOC per year; in the Patriot Renewable Fuels application, the emission factor is 910 lb VOC/MMGalEth and 50.0 tons per year.

There is no documentation provided as to whether these are EPA Method 25/25A determinations or scaled determinations for total VOC compounds considering the mass contribution of oxygenates as per EPA's policy.

Until such information is revealed and the basis of such determinations provided, the Applications should be considered incomplete and non-approvable.

4.3.2 The Draft Permit Doesn't Impose Effective Physical Limitations on Production Rate and/or Throughput in Order to Limit the Potential to Emit for the CO2 Scrubber Emission Point

Condition 2.3.6 provides:

> "The VOM Emissions from the effected processes that are to be controlled, i.e., the fermentation tanks and beer well, shall not exceed 910 lb/million gallons ethanol or be controlled by at least 98 percent by weight."

This condition doesn't provide effective physical limitations on production rate and/or process throughput and therefore doesn't limit the physical potential to emit.

First, the provision appears to allow the alternative of either a pound per ethanol final product limitation or a 98% control alternative. The latter is not a physical limitation on the production rate or process throughput and does not constitute a physical limitation on the potential to emit.

Second, attempting to limit the potential to emit of a fermentation scrubber exhaust VOC emission on the basis of a final product production rate which is several process steps removed and far downstream in the overall production process is not appropriate and doesn't adequately restrain the potential to emit at the scrubber exhaust emission point. The reason such an approach relying on the final production rate will fail to actually limit the potential to emit is because of the variabilities of the intermediary and downstream processes from the fermentation area. The final production rate will also depend, for example, on the overall distillation efficiency of process units downstream of the fermentation process area.

Third, there is no short term production rate or process throughput rate commensurate with the 11.4 lb/hr short term VOC emission rate. The maximum rate of grain charge input to the facility must be limited on an hourly basis in order to limit potential to emit on a short term basis.

Commenters urge that the potential to emit for this emission point be limited through limitations on the actual rolling average annual and daily feed rate of liquified slurry input (preferred) or the amount of milled corn introduced into the process.

4.3.3 Compliance Testing and Monitoring Provisions are Unacceptable

Condition 2.3.5(a)(i) provides:

> "The key operating parameters of the scrubber for the affected units shall be maintained at levels consistent with levels at which emission testing demonstrated compliance with applicable requirements:"

This language is vague and confusing since "affected units" is previously defined in Condition 2.3.3(a) to be more process units than ones that are actually controlled by the fermentation scrubber. For example, the fermentation scrubber control and limitations on the potential to emit have nothing at all to do with emissions and controls for the mixer, yeast tanks and slurry tanks which are also defined by the permit language as "affected units."

If the intent is that "differential pressure across the scrubber" is also a "key operating parameter," the language is confusing because "differential pressure across the scrubber" is not listed under Condition 2.3.5(a)(i). Finally, the language above is not sufficiently explicit and specific to make enforceable a process whereby the facility does a compliance test under different process operating variables and an envelope of acceptable scrubber operating parameters is determined and then made enforceable on the subject facility in order to assure compliance on a continual basis. Based on parameter monitoring, there must ultimately be a clear method that provides enforceable criteria as to when a facility must be considered out of compliance.

In particular, the language at Condition 2.3.5(a)(ii) of an operating range of the differential pressure as "defined by the Permittee" being keyed to required compliance actions is particularly offensive in that it imparts to the owner/operator sole discretion to determine the final form of an applicable requirement without reference to the determination through a compliance test or another agreed upon procedure. Such provisions are not practically enforceable in a federally enforceable synthetic minor permit. At the same time, there is nothing in Condition 2.3.5(a)(i) which defines how the key parameters of scrubber operation will be determined and applied.

Differential pressure across the fermentation scrubber is not as important as maintaining the scrubber flow rate and managing the scrubber liquid temperatures. This is a packed tower and not a high energy venturi scrubber. Scrubber flow rate and scrubber water temperatures are much more germane to proper operation and maintenance of control that differential pressure across a packed spray tower.

Condition 2.3.3(b) contains a wrong IEPA rule citation.

Condition 2.3.5(b)(iii)(C) does not contain a time deadline for retesting the facility.

There is no provision in the permit that requires compliance tests conducted on the fermentation scrubber to be conducted at a process throughput rate which is at least 95+% of the maximum fermentation input rate.

4.3.4 Monitoring, Recordkeeping and Reporting Requirements are Inadequate

Condition 2.3.8(a) indicates the monitoring equipment "....shall be installed, operated, maintained and calibrated according to the supplier's specifications...." Such language is vague and unenforceable and should be replaced with specific requirements and standards for accuracy of monitoring devices, testing and calibration requirements and requirements for at least 95% valid data recovery from such process and scrubber parameter monitoring devices.

Actual uncontrolled process generation of VOCs from the fermentation process depends on the fermentation cycle in each tank, tank breathing losses, displacement vapors upon tank filling and other factors. Actual VOC emissions depend on surrogate parameters of both the uncontrolled process generation of VOCs and the parameters of scrubber operation. As a result, the recordkeeping operations required under Condition 2.3.9(a) are insufficient to reflect process and scrubber control parameters from which emissions can be determined and compliance with emission limitations assured.

None of the recordkeeping requirements of Condition 2.3.9 reflect the extensive parameter monitoring requirements of Condition 2.3.8. At a minimum, all parameter monitoring of Condition 2.3.8 must be incorporated into required recordkeeping.

If the fermentation units are operated as batch operations, then recordkeeping must reflect aspects of the fermentation cycle on each of the seven fermentation tanks rather than merely fermentation tank liquid levels. That would include the time of tank filling, tank temperatures, tank blowdown to the beer well, hourly average grain fermentation rate, rate of input charge to the beer well on an hourly basis and potentially other factors. The rate of emissions would be functions of both these factors and the control device parameters. At this writing, nothing in the draft permit indicates exactly how the fermentation scrubber emissions would be calculated from the data required for monitoring and recordkeeping at times when a compliance test was not being conducted. Until there is a firm method for making usual and ordinary emission determinations from this emission unit from control device and process parameters presently listed in the draft and potentially supplemented, the permit should not issue. If emissions will instead be related solely to a function of control device parameters for the scrubber and process throughput in the fermentation area, then this decision should be committed to the record and sufficient monitoring, recordkeeping and reporting provisions should be added to

support both emission determination and means to assure compliance with applicable emission limitations.

In retrospect, because of process and control device variability and because of the small margin of compliance with VOC major stationary source applicability threshold, permit provisions for the fermentation exhaust scrubber should incorporate a continuous VOC emissions monitor which is clearly available technology and appropriate for this particular emission unit.

Condition 2.3.10(a)(i) is not specific enough to properly enforce as there is no clear meaning as to what a 2.0% exceedance of conditions at 2.3.8 mean; for example, a 2% exceedance on a degree centigrade temperature would mean something different from a 2% exceedance on a degrees Kelvin scale for the same monitored parameter. Does a 2% exceedance mean 2% above a floor or a maximum on parameter operation? The existing language is too vague and indeterminate to enforce and will lead to subjective determinations. Instead, the language should be rewritten to address parameter envelopes of expected operations proposed for establishment on control device and process parameters during a compliance stack test and a subsequent approval by IEPA.

4.3.5 PM Emissions from the Scrubber Exhaust

Condition 2.3.6(b)(ii) is written on the basis that the PM emissions from the scrubber exhaust shall not exceed 0.1 lb/hr and 0.44 tons/year. However, the permit is written with no monitoring or testing conditions to verify compliance with these limits. Applicant has provided no details on physical control measures to limit PM emissions from this process unit, such as limitations on the dissolved solids concentration of water to be used in the scrubber, the average aerodynamic aerosol diameter of the spray equipment at the top of the pack tower scrubber or what type of demisting pad or other technology will be used at the exhaust, if any. In the absence of such information there is no basis to make the determination that emissions of PM matter will meet the subject limits.

4.4 Miscellaneous VOC Emission Sources

4.4.1 The Application, Permit and Process Diagrams Contain Inconsistent Information on Miscellaneous VOC Emission Units in the Feed Preparation and Fermentation Process Areas

Condition 2.3.1 of the draft permit states, in part, that the cook water tank and the flash tank “would be controlled” by the thermal oxidizer; the conditional nature of the “would be controlled” should be changed to “shall be controlled.”

The table in Condition 2.3.2 indicates the flash tank, cook water tank and liquifaction tanks will be uncontrolled. Condition 2.3.6 indicates that the thin stillage tank, syrup tank, cook water tank, liquefaction tans and whole stillage tank will not be controlled.

The "General Plant Process Flow Diagram Plant Emissions (Preliminary)" indicates the mixer, cook water tank, flash tank, yeast tank and slurry tanks will be controlled, while the liquifaction tanks will be uncontrolled. This diagram doesn't show the centrate tank or any control of it.

The preceding paragraphs illustrate that the application and permit contain elements involving these VOC emission units which are not internally consistent.

The process flow diagram shows the flash tank being controlled through direction to the side stripper column, but the permit is not written to require this or to show the side stripper column as a control unit.

Absolute clarity is required as to the matter of potential VOC sources at the site and how and whether they are controlled because of the extremely limited margin in the application below the major stationary source threshold of 100 tons/year of potential emissions.

4.4.2 Basis for Allowing Uncontrolled Tank Process Units is Inadequate; If Allowed, Uncontrolled Tanks Must be Monitored for VOC

The application attempts to discount the need for controlling VOC emissions from several process tanks on the basis of brief OVA measurements on a much smaller facility. Nothing in the application indicates that the tank process variables and design are the same or different between the planned facility and the one for which measurements were done. For example, it is impossible to know from the application whether the tanks envisioned for the proposed facility and the tanks whose emissions were measured on the smaller facility both had submerged fills – a detail which would be extremely relevant as to whether the emissions could be compared or scaled.

The emission projections for the vents on the stillage tank, the syrup tank, the cook water tank, the liquifaction tank and the whole stillage tank were all calculated on the basis of the CFM discharge rates on tanks from a plant with only 41% of the production capacity of the subject facility. There is no reason to believe the tank vent discharge volumes used to calculate the emission rates will be the same with the proposed larger facility with higher throughput volumes and larger tanks. This facility has projected potential to emit VOC emissions that are no more that about 2.27 tons/year below the major stationary source threshold for VOC emissions. Failure to properly consider the potential of these small emissions to add up and put the overall facility over the plant-wide 100 ton/year potential to emit limit will likely lead to improper permitting and regulation of this

facility. At the very least, the permit should require some infrequent but periodic monitoring of such process vents and a requirement that such vents be controlled if they exceed a threshold based on a subdivision of the 2.27 ton/year margin under the major source limit.

The emission characterization in the application for the CIP screen vent indicates it will be controlled in the thermal oxidizer, but this fact is not reflected in either the permit language or Attachment A

Finally, Condition 2.3.6(c) is not practically enforceable as written because there are no testing and monitoring conditions that would provide for compliance determination and there is no short term emission limitation that would make practical enforcement possible.

4.4.3 The Application Does Not Consider the Emission Potential of the Thin Stillage Evaporation-Condensing Process

Although the process flow diagram in the application and the process description contain information showing that the concentrated stream from the evaporators is mixed with the wet grains from the centrifuge before drying and that the evaporated water is sent to the methanator, this description is not sufficient to ensure that emissions of VOCs are not released as noncondensibles or overhead vapor flow from a condensation operation to which evaporator vapors are directed. There is no information on whether eductors are used as a motive force for condenser throughput and whether there is any atmospheric discharge associated with an evaporation-condensation-evaporator hotwell process.

4.4.4 The Application has Failed to Properly Characterize the Wet Distiller's Grain Handling, Storage and Loading Emission Unit and to Calculate its Annual Potential to Emit for VOC Emissions

The Application is not complete because there are no firm details on how wet distiller's grains and modified wet distiller's grains will be managed. There is no information in the application on the expected dispatch of spent distiller's grain between drying operations, the wet grain and modified wet grain product management options. Because there is no information on process management in this area, no information on the temperature of the material as it is handled, transferred and stored in buildings or in the open from any screening operation, no information on exposed surface area, indoor vs. outdoor management, etc. the application is not complete and any emission characterization in the application for this emission unit lacks completeness and credibility.

The "miscellaneous units" in Table 1 is shown as 0.65 tons of VOM per year. However, a table in the emission calculation section shows that this total consists of emissions from

the thin stillage tank vent, syrup tank vent, cook water tank vent, liquifaction tank #1 and the whole stillage tank vent. It is clear that no part of this total of 0.65 ton/year is accounted for by emissions of VOCs from wet distiller's grain management, handling, storage and product loading.

Because no potential to emit calculation and emissions characterization was carried out on a source which could be a major stationary source since disclosed emissions from known sources are at least 97.73 tons of VOC per year[3], there can be no compliance with required State Implementation Plan requirements under 40 CFR 52.21(b)(4) to properly calculate the potential to emit for all emission units.

In a page in the application titled "Fugitive VOC Survey," the Applicant admits that the "CIP mash screen" where wet distiller's grain solids exit the distillation process is a process that should be controlled. But downstream fugitive process VOC emissions potential for the wet solids flow is not completely characterized.

The Applicant did not make any attempt to ramp up expected emissions from some of the example smaller ethanol production plant information cited for wet grain related emissions. The Applicant did not submit adequate drawings to show whether ventilation flow through the centrifuges is routed to the dryers. However, if the dryers are control units for centrifuge offgases during drying operations, then when wet spent grain management is practiced, there may be an effect on the centrifuges as a VOC emission unit.

If indoor storage is used for wet grains then fugitive VOCs to building ventilation must be considered. The Applicant submitted one test of such emissions but there was no effort to scale emissions to a 110 MMGal/year plant size. In the information cited, half of the wet grains were four days old, but emissions of the most volatile organics can be expected to flash off very soon after the spent grains leave the screening location at elevated temperatures. Because of this reason, the cited case for pad storage of wet distiller's grains cannot be considered as reflecting the full potential to emit for such an emission unit. If outdoor pad storage of wet grains is used, then emissions characterization must consider maximum potential outdoor temperatures together with maximum potential process material temperature with introduction to pad storage. The Natural Resource Group work submitted by the Applicant was done in what sounded like an unheated indoor storage location in Minnesota on November 2, 2004 and would not reflect the maximum potential to emit resulting from different temperature scenarios. Finally, in the absence of restrictions on the maximum storage time, wet grains should be considered for potential to generate VOCs from potential fermentation processes that resume under conditions of longer term storage. As a result, the permit must require "first in, first out"

[3] 100% DDGS basis with no wet loadout and no biomethanator flare emissions.

methods of dispatch for wet distiller's grains and other controls on the length of time for storage in order to properly limit the potential to emit for this emission unit.

If outdoor, uncovered storage of wet distiller's grains is used, such a storage management unit poses a risk for water pollution from stormwater leaching and transport from the pile, including the likelihood of high BOD5 releases. If such stormwater is controlled in a pond, such a wastewater management unit must also be considered a potential emission unit in addition to the outdoor storage pad itself.

4.5 Distillation Section

4.5.1 The Application is Incomplete Because No Information is Provided on Potential Emissions from Molecular Sieve Regeneration Vacuum Operations

Molecular sieve technology traditionally features two parallel process trains, with one in use for ethanol dehydration and the other in a regeneration cycle at any given time. The regeneration cycle features vacuum processing of the molecular sieve matrix to regenerate it by removing water/weak ethanol solution by vacuum. The vacuum apparatus, any condenser and steam eductors used are likely to have some type of venting. Note that the condenser associated with molecular sieve regeneration will be different from the 200 proof condenser, which is used to process the outflowing ethanol vapor output of the molecular sieves.

The application is incomplete in the absence of details showing the disposition of process offgases from the molecular sieve regeneration cycle.

4.5.2 Other Permit Language Matters

Condition 2.4.3(b) and (c) appear to contain erroneous citations to other conditions of the permit.

Condition 2.4.5 should clarify that continued operation of the oxidizer/boiler shall be maintained above a specific heat input level during the process of shutdown of the facility that has been previously demonstrated in a compliance stack test to show compliance with percentage reduction and mass rate emission limitations.

Condition 2.4.9(b) really belongs in Section 2.5 where all of the requirements relating to the thermal oxidizer operation should be consolidated.

4.5.3 CIP Mash Screen and Centrate Tank

In the emission characterization section of the application the emission calculation in "Fugitive VOC Survey" indicates the CIP Mash Screen and Centrate Tank would be controlled by the thermal oxidizer. However, Condition 2.4.2 does not list the Centrate Tank and the CIP Mash Screen is shown without control, so the permit is written to allow uncontrolled emissions from these tanks. Calculating the VOC emissions from the Centrate Tank by the methods in the emission characterization section (based on a 40 MMgal/year plant, not 110 Mmgal/year) would yield a VOC emission of 2.5 lbs/hr and 10.7 tons per year, putting the plant well over the 100 ton major stationary source threshold. The Centrate Tank and the CIP Mash Screen were not incorporated into the application's miscellaneous VOC emission sources of 0.65 ton/year.[4]

4.5.4 Distillation Process Monitoring

Conditions 2.4.9(a)(iii) and (iv) are vague and unrealistic indicators. Does the "feed rate" refer to the respective condensers and thus the "feed" that is measured is ethanol vapor? Is this really meant to be liquid output rate of the respective condensers? The language just isn't descriptive enough to know what it means.

It isn't clear that monitoring the process parameters indicated can be used as predictive parameters on emissions from the thermal oxidizer. If the objective of process-related monitoring is to be able to determine emissions, then the gas flow from the two distillation condensers will be among the appropriate parameters of interest. If the calculation of emissions at the oxidizer exhaust associated with distillation VOC destruction is the objective then it would also be necessary to determine the mass rate of VOCs in such flows during a compliance stack test to go along with continuous volumetric monitoring. If the objective of the conditions is to try to relate VOC emissions from the oxidizer to the distillation process rate it isn't clear at all on how the four independent variables of information collected in Condition 2.4.9(a) will achieve such a purposes.

If recordkeeping is required for distillation process parameters, the presence of monitoring devices to gain such information is clearly implied. However, there are no conditions that require such monitoring devices to be calibrated, to be periodically checked for accuracy and to conform to accurate measurement standards.

[4] The entire scope of emissions in this estimation was occupied completely by VOC emissions from vents on the thin stillage tank, the syrup tank, the cook water tank, the liquifaction tank #1 and the whole stillage tank.

4.5.5 Gas Collection System Bypass

The application is not complete because there is no information on the potential for distillation area gas collection system bypass and releases, such as would occur through pressure operated relief valves and ruptured disks. If the facility intends to construct its facility with pressure operated relief valves, rupture disks, flow diversion valves or any other kind of bypass release device in the distillation system gas collection train, these devices should be listed and any emissions from them be subject to recordkeeping and reporting requirements. If these devices are incorporated in the design, reference to any such emissions should be incorporated into the provisions of Condition 2.4.9(d).

In addition, pressure operated relief valves should be subject to Leak Detection and Repair emission controls.

4.6 Thermal Oxidizer, Boiler, DDGS Dryers Process Area and DDGS Cooler

4.6.1 Thermal Oxidizer Nitrogen Oxide Emission Factor

A recent test of the Verasun Fort Dodge thermal oxidizer showed nearly 0.07 lbs/MMBTU as a NOX emission factor, which is higher than the 0.05 lb/MMBTU factor cited as a manufacturer's guarantee for the Patriot Renewables Facility. Nothing in the permit requires a showing of continuing compliance on an hourly basis with the 0.05 lb/MMBTU factor, except for testing during a stack test.

4.6.2 The Applicant Has Not Placed on the Record and IEPA Permit Staff Have Not Reviewed the Basis of Emission Factors Used for Thermal Oxidizer Carbon Monoxide, Volatile Organic Compound and PM-10 Emission Calculations

The Applicants cites emission factors of 0.465 lb/ton DDGS (controlled) and 10 lb/ton DDGS (uncontrolled) for carbon monoxide, 0.13 lb/ton DDGS (controlled) and 10 lb/ton DDGS (uncontrolled) for volatile organic compounds and 0.150 lb/ton DDGS (controlled) and 2.0 lb/ton DDGS (uncontrolled) for PM-10. The citation for these factors in the emission factor section of the permit application is to the "ICM Emission Guide."

On June 8, 2006, Commentors submitted a public records request for all materials in the PRF permit application file and all materials relied upon by IEPA permit staff in making their decision to issue the permit. Within 10 days we received a response and the ICM Emission Guide was not among the materials provided. As a result, we must conclude that IEPA never reviewed that material and never considered it for purposes of the public record. Both the application and IEPA's review of it must be considered incomplete

unless and until any such "Guide" is placed in the public record of the permit application so it can be evaluated and subjected to public scrutiny.

Finally, the claimed emission factors should not be considered unless they are identified either on the basis of past compliance stack test at comparable facilities or they are to be certified as a manufacturer's guaranteed performance. The Application does neither yet the permit limits are based on these emission factors. If ICM and John Zink as manufacturers are backing up the claimed performance, they should say so in the application rather than deferring to some "Guide" document.

4.6.3 Applicants CO and VOC Emission Factors Used in Draft Permit Conditions for the Thermal Oxidizer System Are Not Supported by Claimed Uncontrolled Emission Characterization and Control Factors; Gas Concentration Limits Are Not Practically Enforceable as Presently Written

Applicant's claimed emission factors of 0.465 lb CO/ton DDGS and 0.13 lb VOC/ton DDGS, and the resulting emission limits in pounds per hour and ton per year limits, were established as permit emission limitations. However, evaluation of the stated basis cited does not agree with the emission factors.

Applicant states that the carbon monoxide emission factor is based on RTO control at 95% control efficiency on an uncontrolled emission rate of 10 lbs CO/ton DDGS. At 356,880 tons/year, that computes to an annual emission of 89.22 tons CO per year which would make the facility a major stationary source when added to the other sources.

Applicant states that the volatile organic compound factor is based on RTO control at 97% control efficiency on a 10 lb VOC/ton DDGS uncontrolled emission rate. At 356,880 tons/year, that computes to an annual emission of 53.5 tons per year rather than the claimed 23.20 tons per year. A 0.13 lb VOC/ton DDGS controlled rate on an uncontrolled rate of 10 lb VOC/ton DDGS is equivalent to a 98.7% control rate and not a 97% control rate.

Condition 2.5.6(a)(i) calls for a 98% control efficiency or a 10 ppmv emission limitation whichever is less stringent for VOC. Condition 2.5.6(a)(ii) calls for a 90% control efficiency on carbon monoxide or a concentration of 100 ppmv, whichever is less stringent. Based on consideration of the emission rollback calculation, neither of the control efficiency requirements in the two permit conditions will allow compliance with the time rate of mass emission limitations.

There is no demonstration that compliance with the gas concentration limits will similarly support compliance with the mass rate limits for CO and VOC.

Setting stack gas concentration limits for CO and VOC without specifying a correction to dry standard conditions and to a specific oxygen concentration renders the gas concentration limits unenforceable in practice. In addition, if stack gas concentration-based limits are used for compliance evaluation and monitoring, the permit should be amended to require a standard method for stack gas flow monitoring to allow determination of mass emissions without the need for making any assumptions about flue gas flow.

4.6.4 The Permit Should be Amended to Incorporate Certain Natural Gas Combustion and Wet Spent Grain Charging Limits

The permit presently provides an annual limit on the amount of natural gas burned at the facility. However, there is no corresponding short term limit on the amount of natural gas allowed to be burned in order to physically limit the potential to emit in order to meet short term emission limitations for nitrogen oxides from the thermal oxidizer and dryers. Finally, there is no annual or short term production rate limitation on the amount of wet grains charged to the dryers or alternatively, on DDGS produced, in order to provide a physical limitation on the potential to emit for the dryers. A limit on natural gas combustion will not alone limit production of uncontrolled emissions of VOC, PM and CO from the dryer units. All of the physical limitations on the potential to emit mentioned in this section should be incorporated into the permit and adapted to the most restrictive corresponding mass rate pollutant limits on both an hourly and annual basis.

Condition 2.5.5(a)(ii) is not written in the manner that limits the actual maximum heat input rate to the thermal oxidizer and dryers. The use of the word “capacity” renders these provisions as design limits rather than operational limits on production rate/process rate limitations. The provisions need to be revised to limit the actual BTU heat input rate, rather than just the “capacity.” The physical operating limitations on either wet feed in or DDGS out should be added in the same condition.

4.6.5 Thermal Oxidizer Emission Calculations and Limits Do Not Address “Assist Gas” Introduced to the Waste Hydrocarbon Flow from the Dryers

The John Zinc Thermal Oxidizer process unit drawing shows a one inch transfer line from the natural gas main to the 4 inch waste gas line before entry to the thermal oxidizer. No aspect of the emission calculations presented in the permit application addresses the emission consequences or purpose of this line, which is labeled “assist gas.” This is clearly a separate route for introducing natural gas to the thermal oxidizer that is separate and distinct from the 6 inch natural gas line to the main burner shown in the ICM Thermal Oxidizer piping and instrumentation drawing.

The application and draft permit should not be approved unless and until the purpose and emission consequences of the "assist gas" line are fully vetted.

4.6.6 Applicant's Sulfur Dioxide Emission Projection is Unsupported and Unmonitored

Applicant claims an 80+ ton per year sulfur dioxide emission projection was determined through "GLE" [Glacial Lakes Ethanol] stack testing, but no such sulfur dioxide results from that plant was actually included/shown in the application. The proposed permit fails to include any compliance monitoring for this sulfur dioxide emission. At the very least, the thermal oxidizer should be subjected to at least an initial compliance test determination using EPA's approved stack testing method for sulfur dioxide determination and some type of parameter monitoring to ensure compliance on a continuing basis.

4.6.7 The Permit Should be Amended to Prohibit Fired Operation of the Dryer Units During Times When Such Units Are Not Charged with Spent Distiller's Grains

The regulatory determination for the subject facility is that the combined heat input for the two thermal oxidizers is below the 250 MMBtu/hr threshold of applicability of a different New Source Performance Standard than NSPS Part Db. The two thermal oxidizer burners are each at 122 MMBTU/hr for a combined heat rating of 244 MMBtu/hr, which is just shy of the 250 MM BTU/hr threshold.

Although ICM obtained a regulatory interpretation saying that dryer units were not part of the combined cycle system or cogeneration system, that regulatory interpretation assumed:

> "The purpose of the DDGS dryers is to produce marketable dried grains. Although the DDGS exhaust provides some heat input to the TO, the TO is the source providing exhaust gas directly to the HRSG. Furthermore, the combined cycle system of the TO-HRSG can operate to produce the required steam for the plant output without the heat input from the DDGS dryers. Therefore, the EPA finds that the DDGS dryers are separate sources and are not part of the TO-HRSG combined cycle system."[5]

At the present time, nothing in the permit prevents the Applicant from operating their dryer units solely for heat input purposes to the Thermal Oxidizer/Heat Recovery Steam

[5] July 29, 2004 NSPS regulatory interpretation letter by Michael S. Alushin, EPA to William J. Roddy, ICM – control number 0500059

Generator Unit without processing any spent grain. In order to be consistent with the EPA interpretation letter, the permit must be amended to include a provision that the dryer units burners must be prohibited from operating on natural gas at times other than dryer warmup operations when there is no wet spent grains being processed. Operation of the dryers in a manner so as to solely provide heat input to the TO/HRSG system means they are being operated in a manner where there primary purpose is heat input for steam generation rather than for drying wet spent grains.

4.6.8 The Permit and Application Contain Unacceptable, Inconsistent and Contradictory Treatment of the DDGS Cooler Emission

Condition 2.5.2 shows the baghouse and oxidizer boiler system as the control system for the DDGS feed cooling drum. But Condition 2.5.1 contains a provision:

> "Feed cooling drum is controlled by a baghouse and ***partially*** vented through the oxidizer/boiler systems." (emphasis added)

The application page entitled "'Potential to Emit' Emission Estimate: 100%$ DDGS Capability; Patriot Renewable Fuels, LLC, Annawan, IL" indicates:

> "DDGS Cooling System baghouse exhausts to the TOs ***and 13,000 cfm to atmosphere"*** (emphasis added)

Elsewhere in the application on page 6 of the application narrative under point 7:

> "The cooling drum baghouse becomes the combustion air for the Thermal Oxidizers in order to further reduce VOC and particulate matter emissions. ***Approximately 13,000 cfm from the baghouse will exhaust to atmosphere.***" (emphasis added)

Then the permit says:

> "The feed cooler discharge shall be routed through a baghouse to remove particulate matter and then used as combustion air to the dryer burners or vented with the dryer exhaust to the oxidizer/boiler systems. ***There shall be no direct discharge from the cooler or baghouse to the atmosphere.***" (Condition 2.5.5(f))

After saying that, the permit states:

> "Emissions of PM from feed cooler baghouse shall not exceed 0.56 lb/hr and 2.44 tons/year.

> VOM emissions from the feed cooler baghouse shall not exceed 2.04 lb/hr and 8.92 tons/year.
>
> Note: This limit does not include the feed cooler baghouse exhaust that is routed through oxidizer/boiler systems for combustion air." (Condition 2.5.6(c))

The "Potential to Emit" calculation in the application goes on to incorporate these atmospheric releases as actual emissions to the atmosphere.

Then the permit goes on to require:

> "***Records of the monthly and annual PM, VOM, and HAP emissions from the feed cooling*** and transport system, with supporting calculations." (Condition 2.5.9(a)(vi)(B)) (emphasis added)

Finally, the permit states:

> "***Compliance with the emission limits*** of Condition 2.5.5-2 for other pollutants from the oxidizer/boiler ***and the feed cooling and transport system*** shall be based on the equipment operation, as addressed by the records required by Condition 2.5.9, and appropriate emissions factors based on emission testing of the affected units." (emphasis added)

The overall impression is that the Applicant contemplates and IEPA is intending to allow atmospheric discharges from the feed cooler system without writing it into the permit in a transparent manner and notwithstanding some provisions alleging to prohibit such discharges. The permit should be rewritten to clarify all such issues and the Applicant must also bring clarity to the various operating modes planned. Each such operating mode must have a maximum potential to emit calculation associated with it along with clear testing and monitoring requirements.

4.6.9 The Application Contains No Clear Information or Engineering Detail on How the Owner/Operator Will Ensure Through Control Devices and Monitoring that Feed Cooler Process Flows to the Atmosphere Vent Will Be Maintained At or Below the Targeted 13,000 CFM

Applicant's inconsistent and contradictory submittal apparently commits to no more than 13,000 CFM from the 50,000 CFM flow from the feed coolers being discharged to the atmosphere. Applicant's emission calculation depends on this crucial parameter, but nothing the in the application shows how this will be achieved. Compliance with this engineering assumption is by no means assured. A drawing submitted in the application but labeled as being from the Anderson Clymers (IN) facility shows an induced draft fan with a manual damper on the outlet, a 45" by 44" duct and two 40 inch ducts exiting the

discharge duct headed to the thermal oxidizer combustion air input. There are no details and monitoring to ensure that the feed cooler does not discharge more that 13,000 CFM to the atmosphere and that ensures that the facility will stay under major stationary source limits implied with the emission characterization for emissions of VOC and PM to the atmosphere from this source.

At the very least Applicant must have a means to ensure that the volumetric discharge is maintained at the amount shown in a compliance test to be less than the emission limitations for this emission unit. Atmospheric flow discharge in this location will be influenced by the combustion air blowers for the Thermal Oxidizer Unit and any variability in such combustion air rates implicit with overall process variability has the potential to alter pressure in the feed cooler fabric filter discharge duct. Continuous parameter monitoring in the form of volumetric flow sensing must be incorporated into the permit for this particular atmospheric discharge in order to assure compliance with emission limitations. The permit should be amended to prohibit discharge volumes from the atmospheric discharge of the feed cooler to no more than 13,000 CFM.

4.6.9.1 Feed Cooler Atmospheric Discharge, If Allowed, Should be Subjected to VOC Compliance Stack Test Requirements

The feed cooler receives heated spent grain from the DDGS dryer. Such dried grains at elevated temperatures emit VOCs from desorption of VOC containing liquids and from undergoing thermal decomposition as long as the material is at an elevated temperature. Thermal decomposition and VOC outgassing at elevated temperatures can be expected to continue generating VOCs in the feed cooler as it acknowledged in the application. As a result, the feed cooler exhaust should be subjected to stack testing for volatile organic compound emissions and to determination of the actual gas discharge flow.

The permit should be amended to reflect a maximum temperature of DDGS feed introduced to the feed cooler and/or a ceiling on the temperature of the feed cooler implicit as a parameter monitored to ensure compliance with VOC emission requirements at times when a compliance test is not being conducted and on a continuing basis.

4.6.9.2 PM, VOC and CO Emissions from DDGS Dryer Conveyers

The plant process flow diagram and piping schematics show a series of conveyers from Dryer A to Dryer B, from Dryer C to Dryer D, from Dryer B to Feed Cooler and from Dryer D to Feed Cooler. The Application contains no details and information on how PM, VOC and CO emissions will be controlled from these conveyers, if at all. That the feed cooler can be expected to release VOC and PM illustrates the potential of the processed material at these points to release the same pollutants. However, no fugitive emissions controls on the conveyers are shown and there is no attribution from these

conveyers in the overall emission characterization or list of miscellaneous emission units. The application is incomplete in the absence of this information.

4.6.9.3 Applicant Failed to Consider Condensible Particulate Matter from the Feed Cooler Fabric Filter Emission Point

Because of the elevated temperature of the DDGS entering the feed cooler, there is the potential for continuing thermal decomposition of the spent distiller grain and thus offgassing of VOC, CO and particulate matter. Thermal decomposition can be expected to generate condensible particulate matter, but the Applicant failed to incorporate any allowance for condensible particulate matter from the feed cooler fabric filter discharge point. Emissions from that point are calculated solely as filterable particulate based on guaranteed fabric filter performance of 0.005 grains per standard cubic foot. This means that the Applicant never considered condensible emissions from the feed cooler atmospheric discharge.

In a stack test conducted at the Verasun Fort Dodge Iowa plant (a 110 MMGalEth/year facility) feed cooling drum thermal oxidizer bypass, the largest proportion of emitted particulate matter came from Method 202 condensible particulate matter. See Attachment #6. Dry catch only was 0.016 lbs/hr and the Method 202 catch was 0.128 lb per hour or a potential emission of 0.56 ton/year from a source which discharges only a portion of its flow to the atmosphere. Such additional condensible PM emissions which have not been considered from the subject facility can push the total particulate emissions over the major stationary source 100 ton/year threshold.

4.6.9.4 Cook Water Tank

Condition 2.5.1 indicates that the cook water tank emissions will be controlled by the thermal oxidizer. However, this conflicts with what is indicated in Condition 2.3.2. The cook water tank also is listed in the uncontrolled vent list in the emission characterization of the application. The cookwater tank receives once through flow from the CO2 scrubber and should contain significant amounts of ethanol from that source. All of the VOC emissions potential of the mixer – a controlled emission unit – either comes 100% from the ethanol contaminated cook water, or otherwise Applicant has not properly admitted that milled dry corn also releases volatile organic compounds. Applicant's emission characterization for the cook water tank also suffers from being a derivation from a 40 MMgal/year example plant rather than for the considerably larger subject facility. The cook water tank should be required in the permit to be controlled by the thermal oxidizer.

4.6.9.5 Knockout Drum

There is no indication in the application as to air implications of wastewater collected in the knockout drum and its subsequent treatment and management. The knockout drum is used to reduce PM emissions from the thermal oxidizer associated with liquids and aerosols entrained in waste gas flow destined for the thermal oxidizers.

4.6.10 Continuous Emission Monitoring and Compliance Requirements at the Thermal Oxidizer Exhaust and With Dryer Operations

4.6.10.1 Carbon Monoxide Continuous Emission Monitoring Must be Required and Not Made Contingent

The permit should be amended to drop provisions allowing the facility to cease its continuous carbon monoxide emissions monitoring. The emission factor projections for carbon monoxide are considerably below AP-42 projections for combustion of natural gas. Moreover, there is a substantial carbon monoxide contribution from the dryers that requires the thermal oxidizer as a control device. Where a control device and its continued efficacy is needed to assure compliance with emission limitations, continuous emission monitoring should be required to assure compliance during times when compliance stack tests are not being conducted.

The operating ranges for combustion temperature and oxygen in the thermal oxidizer must reflect evaluation of continuous monitoring for both nitrogen oxides and carbon monoxide, since simultaneous compliance with both requirements will increase one pollutant while decreasing another. Carbon monoxide monitoring is also a surrogate for the control of volatile organic compounds. Carbon monoxide monitoring will be a more direct surrogate as a monitored parameter for VOC control and compliance assurance than mere combustion temperature and flue gas oxygen monitoring, both of which should still be required in the permit.

4.6.10.2 Continuous Oxygen, Combustion Temperature and Flue Gas Flow Monitoring Should be Required by the Permit

The permit should be amended to require continuous flue gas oxygen concentration and flue gas flow monitoring as well as thermal oxidizer combustion temperature monitoring. Flue gas flow and oxygen monitoring are required for determination of proper combustion conditions and the ability to use continuous emission monitoring information for compliance with short term time unit of mass rate emission limitations. Each monitoring requirement for such a continuous parameter monitor should include numerical tolerances on the accuracy of such measuring devices, requirements for testing to verify accuracy and the specification of required standards (such as from ASTM) for

quality assurance/quality control testing. None of these provisions should simply rely on a vague indication of 'manufacturer's recommendations.' Condition 2.5.8(f)(ii) is subject to variable interpretation because the temperature scale is not specified and there is no industry standard (such as ASTM) method and procedure indicated for verifying the accuracy of the continuous parameter measurement device.

For other parameter monitoring requirement, such as the damper provisions shown in condition 2.5.8(e), such monitoring requirements should always invoke a recordkeeping requirement to ensure that such monitoring indication information is available for enforcement purposes. In addition, for all parametric monitoring devices, each such monitoring indication that will be relied upon for ensuring compliance must feature a method by which the variance in a monitored parameter can be associated with a threshold for what would be deemed as non-compliant operation of the source or emission unit.

4.6.10.3 Condition 2.5.5(c) is Vague, Indeterminate and Subject to Interpretation

Condition 2.5.5(c)(i) through (iv) should be complete rewritten to eliminate conditional contingent references and references to manufacturers recommendations. Permit language with reference to manufacturer's recommendations are too vague to be practically enforceable.

For Conditions that are established at a compliance stack test and are intended as future compliance guideposts, there should be a clear system of IEPA subsequent approval. Compliance stack tests should be used to establish a range of operating parameters under which the facility can be deemed to be in compliance with emission limitations through subsequent continuous parameter monitoring. The permit provisions to establish such ranges of operating parameters to assure compliance must be written or otherwise established to ensure that a source may not "cherry pick" conditions to comply with only a single emission limitation at any one time. The process of establishing an operating condition envelope for compliance operation must reflect simultaneous compliance with all emission limitations demonstrated with simultaneous and corresponding ranges of physical conditions during the test. For example, a range of combustion temperatures and flue gas oxygen concentrations during test conditions must be shown to demonstrate simultaneous compliance with all pollutant emission limitations during maximum production rate/process rate operations.

The Conditions should require all testing operations to be done at maximum process rates. In addition, further test conditions during a series of compliance stack tests should also show compliance with VOC and CO control requirements, stack gas concentration and

percentage reduction requirements at the lowest thermal oxidizer heat input rate that the facility is ever expected to employ in regular operations.

For any limit depending on a rate of emission per heat input basis, this facility will pose special and complex problems for compliance monitoring that relies on F factors. The introduction of the dryer and feed cooler gases in addition to natural gas combustion means that natural gas F factors cannot directly be used. There must be a clear IEPA-approved procedure for determining F factors for compliance monitoring at this facility.

4.6.10.4 Compliance Testing and Monitoring Considerations on Alternate Operating Modes of the Facility

Condition 2.5.5(c)(iv) raises the possibility of different operating modes of the process equipment at this site. The provision should be clearly rewritten to require that any proposed alternate operating mode of the equipment, including 100% or less wet distiller's grain dispatch from the facility, be evaluated in compliance stack tests for compliance with emission limitations and the major stationary source threshold.

4.6.10.5 Federal Citation to Continuous Monitoring QA/QC Provisions Should be Rewritten for Clarity and Precision

All provisions of Condition 2.5.8(c) should be rewritten to embrace formal citation to federal regulations as to continuous monitoring requirements and methods and procedures of quality assurance, quality control, recordkeeping and other matters. Instead of general mentions of "NSPS," the text should specifically cite federal regulatory requirements written in formal citation to the Code of Federal Regulation. General citations to "NSPS' leave too much room for interpretation and non-definitive conclusions about applicable requirements. Requirements for relative accuracy tests on continuous emission monitoring equipment should be clearly articulated with reference to federal rule requirements in this area.

4.6.10.6 Monitoring of Natural Gas Used for Combustion

While the permit contains a requirement to limit the maximum amount of natural gas used for combustion in process units on the basis of rolling 12 month averages, there is no clearly articulated requirement that natural gas combustion be monitored continuously, either for the entire plant or for each emission unit. Such a requirement should be added to the permit along with recordkeeping and reporting requirements related to such natural gas combustion. Where different combustion devices have different emissions per unit of gas combusted performance, each emission unit should have a specific natural gas combustion monitoring requirement. The recordkeeping function on natural gas

combustion should be sufficiently detailed to determine hourly emissions from each natural gas combustion emission unit each hour of the year.

4.6.10.7 Recordkeeping

All monitoring, recordkeeping and reporting requirements throughout the permit need to be normalized. All monitoring requirements imply some specific datalogging that is essentially recordkeeping, but the present content of the permit does not ensure that monitoring that is used for compliance is always reflected in a datalogging and recordkeeping requirement.

Condition 2.5.9(a)(ii) and (iii) discuss monthly recordkeeping on feed production and natural gas usage, but where compliance requirements and limitations on the potential to emit go to hourly emission limitations, hourly data integration is essential to assure compliance. For annual limitations, recordkeeping should emphasis rolling years on a monthly basis.

4.6.10.8 Reporting Requirements

Condition 2.5.10 on reporting does not appear to require a standard protocol/suite of traditional continuous emission monitoring and continuous parameter monitoring quarterly reports. The reporting provisions should be considerably more robust and emphasis that continuous monitoring reports for NOX and CO be submitted quality and contain indications of all emission standard violations, their causes, all downtime in continuous emission monitoring capability, the causes of such downtime, summaries of both emission standard violations and monitor downtime as a percentage of plant and/or process operating time, and other traditional measures. Similarly reports on accuracy testing on parameter monitoring devices, parameter exception periods, parameter monitoring downtime and summaries of applicable data should be clearly set forth in the permit language as clearly stated applicable requirements.

4.6.10.9 Compliance Procedures

Condition 2.5.11 contains no compliance procedure on maintaining NOX limits.

Condition 2.5.11(b) interferes with EPA's credible evidence rule by creating a presumption that compliance can only be determined by the methods indicated in the text when all credible evidence of a violation should always be considered in compliance determination. As written, the Condition 2.5.11(b) language could even be construed to interfere with using a compliance stack test as a means to determine that a violation

existed or use of other parameter monitoring that is not stated in the language of the provision.

4.6.11 Other Permit Problems

Condition 2.5.8(a)(iii) is incomplete as published on public notice.

Condition 2.5.6(e)(i) should contain "lbs/hour" rather than "lbs/month."

4.7 Cooling Tower Process Unit

4.7.1 Monitoring of the Cooling Tower

In order to assure compliance with the emission limitations and characterization of the cooling towers, the permit must be amended to include monitoring and periodic inspections of the cooling tower. The permit should require monthly monitoring of the total dissolved solids (TDS) content of the recirculating cooling water to ensure that the TDS aqueous concentration does not exceed 2500 ppm. The Applicant must be put under a condition requiring cooling tower blowdown and fresh water addition whenever TDS reaches 2500 ppm.

The permit should be amended to require quarterly measurements of the ethyl alcohol content of cooling water measured at a point directly process-downstream of the 190 and 200 proof condensers at least quarterly to ensure that no breach of the condenser heat exchangers has occurred through corrosion or degradation during the life of the plant.

4.7.2 Introduction of Contact Process Water to Cooling System

The permit should be amended to prohibit any introduction of any kind of any process water or wastewater into the cooling tower recirculation system

4.8 Flares

4.8.1 Enforceable Physical Limitation on Biomethanator Flare Potential to Emit

The permit should be amended to limit the number of hours of operation of the bio-methanator flare to no more than 1000 hours per year to support the emission characterization.

4.8.2 VOC Emissions Estimate is Too Low

The Applicant took the AP-42 VOC emission factor for a flare of 0.14 lbs of VOC per MMBTU and assumed that the methane and ethane content of the flare gas proportion of 63% could be deducted from the factor. As a result, the Applicant rolled the emission factor back to 37% of its total based on an assumption that only regulated VOCs would be accounted for in the flare combustion. Applicant thus used 0.052 lb VOC MMBTU as their emission factor.

This is a flawed and unsupportable approach producing an underestimate of expected VOC emissions from the flares. The Applicant took full credit for what EPA indicated in AP-42 was 8 volume percent emissions of ethane/ethylene, but ethylene is a regulated VOC. Further, ethane is not a likely product of incomplete combustion of ethanol vapors because of the presence of oxygen and its position in the ethanol molecule. Applicant should be required to recalculate flare emissions using the AP-42 emission factor with no methane/ethane deductibles.

4.8.3 Particulate Emissions

The Applicant showed zero biomethanator flare particulate emissions and IEPA's emission's table shows 0.44 tons/year of PM/PM-10.

Applicant did not account for condensible particulate matter emissions from "smokeless" flares.

4.9 Fugitive Road Dust Emissions

4.9.1 Applicant Has Underestimated Particulate Emissions from Site Roadways by Using an Unrealistic Silt Loading Factor Not Supported by AP-42 Factors and Not Typical of Agricultural Commodity-Related Facility Roads as Demonstrated by the Experience of Other Nearby States

4.9.1.1 Applicant's 0.4 g/M^2 Silt Loading Factor is Not Supported by the Text of the Relevant AP-42 Standard

Applicant has proposed and IEPA has tentatively accepted use of a silt loading factor of 0.4 g/M^2 in arriving at emissions estimates of 36.77 tons of PM per year. Applicant's claim of an average factor of 0.4 g/M^2 for silt loading on a non-public road and that this is based on the relevant AP-42 factors is not correct. Applicant's road network is not a public road network. Applicant will operate industrial paved roads on the site.

Even if Applicant's road network was a public road, the minimum factor cited as the "ubiquitous baseline" for public roads with less than 500 average daily traffic (ADT) volume is 0.6 g/M^2. Even this factor is subject to multipliers associated with winter road treatments for anti-skidding.

Calculation of Applicant's fugitive road dust emissions using 0.6 g/M^2 with all other factors being the same would yield expected particulate emissions of 47.8 tons per year. This amount of emissions would put the entire facility over the major stationary source emission threshold for particulate matter.

4.9.1.2 Applicant's 0.4 g/M^2 Silt Loading Factor is Not Supported by Actual Industry Experience, Accepted Permitting Practices and the Common Practices of Other Nearby State Jurisdictions

A review of actual industry data of silt loading factors and permitting practices of other nearby states involving silt loading factors is reviewed in the table below:

Case	Description of Cited Information	Silt Loading Factor Cited (g/M^2)	See attach-ment for further info
MN-1	Measured silt factor at a cereal production facility – Malt-O-Meal cited at air modeling training	0.5	1
MN-2	Measured silt factor in summer at ethanol plant – Chippewa Valley- Benson	0.6	1
MN-3	Measured silt factor in summer at ethanol plant – ADM Marshall, Year 2001 (no cleaning)	0.76 to 2.93	1
MN-4	Measured silt factor in summer at ethanol plant – ADM Marshall, Year 2003 (with cleaning)	0.7 to 0.72	1
MN-5	MPCA Policy - do extensive on-site testing/cleaning, or use AP-42 industrial road values	7.4+ for industrial roads	1
NE-6	Nebraska PSD permit for Archer Daniels Midland Company - Columbus, NE	3.0 - uncontrolled 1.26 - controlled permit limit	2
NE-7	Nebraska PSD permit for Cargill, with actual silt loading values tested by Cargill-MCP	0.92	3
IN-8	Indiana minor source permitting practice for Anderson Clymer and ASA Linden, LLC, with factor taken from AP-42 public road "ubiquitous baseline"	0.6	4

Actual test values at shown in the table indicate that a 0.4 g/M^2 silt loading factor used for emission characterization of the subject facility is too low to reflect loadings actually achieved in practice by the selection of ethanol or agricultural commodity facilities.

In particular, where there has been a prevention of significant deterioration review of fugitive emissions from roads and associated silt loading assumptions, the Applicant and IEPA cannot maintain that the failure in the present case to require any kind of verification or numerical certainty for road fugitive emission controls can achieve lower silt loading than provided for such PSD facilities.

Given that a 0.6 g/M^2 silt loading produces a particulate emission projection that causes the entire facility to exceed the major stationary source threshold, all of the other loadings in the table higher than 0.6 which would appropriately apply to Applicant would make such an exceedance even larger.

4.9.1.3 Nothing in the Draft Permit Requires a Determinant Amount of Fugitive Road Dust Control That Can Be Assured of Achieving the Claimed Low Particulate Emissions

The draft permit contains no measures which will ensure that the 0.4 g/M^2 silt loading and the associated limitation on emissions will actually be achieved. There are no firm requirements for periodic sweeping and cleaning that would allow such a level of silt loading performance to be achieved. Mere reliance on a future plan and completely Applicant-discretionary measures which are not enforceable in practice cannot ensure compliance with the claimed emission limitation.

At a minimum, any permit based on such a low level of silt loading should contain a permit provision actually requiring this silt loading level to be achieved in practice, together with quarterly testing requirements, recordkeeping and reporting. No such measures are presently in the draft permit.

However, under the present circumstances, the permit should not issue because of failure to properly characterize the fugitive road dust emissions from the facility.

4.9.1.4 Nothing in the Draft Permit Section on Road Fugitive Dust is a Physical Limitation on Vehicle Miles Traveled as a Process Throughput that Would Limit the Potential to Emit to the Claimed Values Serving as the Basis of the Emission Characterization

Without a clear, legally enforceable physical limitation on the potential to emit, achievement of the predicted emission limitation for roads cannot be ensured. The emission characterization assumes 35% of denatured alcohol shipments will be by truck. However, nothing actually guarantees that actual truck traffic will be limited in this manner.

Clear, enforceable physical limitations in the form of annual truck VMT limitations reflecting the assumption of the emission characterization should be established as enforceable permit limitations.

4.10 Other Deficiencies

The Applicant can be expected to operate natural gas fired space heating units in the fermentation building and other parts of the facility. Although space heating units may be exempted from permit requirements, they must nevertheless be counted towards the total of emissions for comparisons with and to the major stationary source threshold. Applicant must disclose the total emissions associated with such space heating units as part of a complete application.

Attachment #1

Minnesota Air, Water, and Waste Environmental Conf.

Air Modeling – Training (8am-noon)
Sheraton Bloomington Hotel, Atrium 7

February 14, 2006

Chris Nelson & Dennis Becker
Minnesota Pollution Control Agency

X:\Old_P_Fox\AQPRJ\TOXTEAM\ModelTraining\

AP42 Silt Loading (grams/m2) Section 13.2.1 – Paved Roads

- AP42 Range for "Public" Roads (Table 13.2.1-3)
  - Non-winter Conditions
    - 0.6 for ADT<500
    - 0.2 for ADT 500-5000
    - 0.06 for ADT 5000-10000
    - 0.03 for ADT>10000
  - Winter Conditions
    - 2.4 for ADT<500
    - 0.6 for ADT 500-5000
    - 0.12 for ADT 5000-10000
    - 0.03 for ADT>10000

AP42 Silt Loading (grams/m2) Section 13.2.1 – Paved Roads

- AP42 Range for Industrial Facilities
  - Table 13.2.1-4
  - Mean Silt Loading: 7.4-292 g/m^2
  - Range of Values: 0.09-400 g/m^2
  - MPCA Title V Default: 10.0 g/m^2
- Most Common Errors
  - Assuming "public roads" for "industrial facilities"
  - Assuming 0.015 g/m^2 for "limited access" roads
    - Baseline value for public, limited access roads with > 10,000 ADT (i.e., freeways)

Measured Silt Loading Values

- Measured Values in Minnesota (Summer)
  - OSB Manufacturers (Ainsworth [formerly Potlatch] – Grand Rapids, Bemidji): GR=0.39, B=1.19 g/m^2
    - Similar facilities
    - Both use natural gas and wood
    - Silt loadings differ by factor of 3
  - Cereal Production (N. Gas) (Malt-O-Meal - Northfield): 0.5 g/m^2
  - Soybean Processing (N. Gas, Diesel) (Minnesota Soybean Processors - Brewster): 0.11 g/m^2
  - Coal-Fired Public Utility (Virginia Public Utilities): 0.67 to 9.3 g/m2

Measured Silt Loading Values at Selected Ethanol Facilities

- Measured Values at Ethanol Plants (Summer)
  - Chippewa Valley-Benson (N. Gas): 0.37, 0.6 g/m^2
  - ADM-Marshall (2001): 0.76 to 2.93 g/m^2 (no cleaning)
  - ADM-Marshall (2003): 0.70 to 0.72 g/m^2 (w/ cleaning)
    - Two coal-fired boilers; truck & rail delivery of grain, coal, etc.
    - Silt loading approach and exposure profiling method
    - Daily road cleaning (sweeping, vacuuming, and washing)
    - Onsite speed limit of 5 MPH
    - South Coast Air Quality Management District (SCAQMD) Rule 1186 Certified (80% control) – see next slide
- Companies should expect "some" testing

MPCA Expectations - Silt Loading

- MPCA Expectations
  - Good documentation for proposed silt loading values
  - Companies will do some (extensive) on-site testing/cleaning, or use
    - AP42 Table 13.2.1-4 (Industrial Facilities)

- Permit Requirements
  - Cleaning: sweeping, vacuuming, washing
  - Frequency: daily, weekly, monthly, annual
  - Testing: silt loading and/or exposure profiling

- Other possible solutions
  - Speed limits
  - Salt applications only – no sanding
  - EMISFACT scalars (e.g., SHRDOW7)

Silt Content – Unpaved Roads

- MPCA Title V Default: 10%
- EPA AP-42 Range for Industrial Sites
  - Mean Silt Content: 4.3 – 24%
  - Range of Values: 0.2 – 29%
- No recent testing in Minnesota
- Usual control: paving or watering or chemical dust suppression

Attachment #2

CONSTRUCTION PERMIT

PERMIT NUMBER: CPM02-0006

PREVENTION OF SIGNIFICANT DETERIORATION (PSD)
PERMIT TO MODIFY AN
AIR CONTAMINANT SOURCE
IS HEREBY ISSUED TO:

Archer Daniels Midland Company (ADM)
3000 East 8th Street
Columbus, Nebraska 68601-9073

FOR THE SPECIFIC MODIFICATION OF:

A Wet Corn Milling and Ethanol Production Facility

TO BE LOCATED AT

3000 East 8th Street
Columbus, Nebraska 68601-9073

Pursuant to Chapter 14 of the Nebraska Air Quality Regulations, the public has been notified by prominent advertisement of this proposed modification of an air contaminant source and the thirty (30) day period allowed for comments has elapsed. This Construction Permit approves the proposed construction of two new coal-fired boilers and support equipment, one new natural gas-fired boiler, and modification of the existing gluten flash dryer #2 and the fluid bed germ dryer. In addition, this Construction Permit approves the construction of new control equipment for several existing sources, places new and/or revised emission limits on existing equipment, and supersedes all previous construction permits issued for this source. The operations covered by this permit consists of a facility that manufactures ethanol (primary SIC 2046, secondary SIC 2869), starches, high fructose corn syrup, and animal feed products utilizing the wet milling process.

This permit may contain abbreviations and symbols of units of measure, which are defined in 40 CFR Part 60.3. Other abbreviations may include, but are not limited to, the following: Ammonia (NH_3), Best Available Control Technology (BACT), Boiler Operating Day (BOD), Circulating Fluidized Bed Boiler (CFB Boiler), Carbon Monoxide (CO), Chemical Abstract Service Number (CAS #), Code of Federal Regulations (CFR), Compilation of Air Pollutant Emission Factors, Volume I, Stationary Point and Area Sources (AP-42), Construction Permit (CP), Continuous Emissions Monitor System (CEMs), Continuous Opacity Monitoring System (COMS), Factor Information and Retrieval System (FIRE), Hazardous Air Pollutant (HAP), Hydrochloric acid (HCl), Hydrofluoric acid (HF), Hydrogen Sulfide (H_2S), Lead Compounds (Pb), Lowest Achievable Emission Rate (LAER), Maximum Achievable Control Technology (MACT), Mechanical Recompression (MR), Mercury Compounds (Hg), Million British Thermal Units (MMBtu), National Ambient Air Quality Standards (NAAQS), New Source Performance

APPLICABLE REQUIREMENTS AND VARIANCES OR ALTERNATIVES TO REQUIRED STANDARDS:

Consent Decree

On August 21, 2003, a Consent Decree negotiated under United States v. ADM (C.D. IL, NO. 03-CV-2066), was filed with the U.S. District Court – Central District of Illinois. This Consent Decree required several actions from ADM, including the submittal of a revised PSD application for this facility. This submittal was received by the Department on December 15, 2003 and is covered under this permit. In addition, the Consent Decree contained specific requirements on existing emission units, as well as requiring the source to reduce emissions over time by installing various pieces of control equipment, and by optimizing the performance of existing control equipment.

This permit includes the following revisions, which address the specific control requirements contained within the Consent Decree:

- optimization of the scrubber and establishment of a new PM emissions limit (3.03 lb/hr) for Starch Dryer #1;
- submittal of a road silt management plan for the facility (this plan was submitted as part of the application);
- establishment of revised emission limits for Germ Dryers 1-3 (95% VOC control or 20 ppmvd VOC), the Fluidized Bed Germ Dryer (1.5 lb/hr VOC and 4.02 lb/hr CO), Gluten Flash Dryer #1 (22.8 lb/hr VOC and 15.2 lb/hr CO), and Gluten Flash Dryer #2 (22.2 lb/hr VOC and 4.74 lb/hr CO);
- routing of the Stillage/Steepwater evaporator vents (SV-69 and SV-70) and the Gluten RVF Vents (SV 66-68) to the millhouse scrubber (these units were previously uncontrolled) and 95% control of VOC, or a 20 ppmvd VOC emission limit;
- routing of the distillation operation emissions and non-condensable gas stream to the Fermentation/Distillation scrubber system (SV-32, SV-33, and SV-34) with a VOC limit of 13.5 (lb/hr), which represents greater than 95% control; and
- modification of Boiler #1 to replace the existing burner with a low-NO_x burner capable of meeting a NO_x emission limit of 0.06 lb/MMBtu.

As noted above, the CD also requires ADM to install or optimize controls or other mitigation measures to support the NAAQS and increment compliance demonstration, and to use current information to establish more accurate emissions limits for CO and VOC from certain sources. This permit includes the following conditions, which address these goals:

- establishment of revised PM_{10}, CO, and VOC emission limits for the Carbon Furnaces 1 and 2;
- increased stack height requirements for several existing stacks; and
- establishment of a VOC emission limit for the Fiber Dewatering process.

Title 129, Chapter 4 -National Ambient Air Quality Standards (NAAQS)

The potential hourly emissions of PM_{10}, NO_x, CO, and SO_x from the proposed facility modification exceed the threshold for requiring modeling to show compliance with the applicable 24-hour and annual PM_{10} NAAQS, the 1-hour and 8-hour CO NAAQS, the 3-hour and 24-hour SO_2 NAAQS, and the annual NO_2 NAAQS. The air quality analyses adequately demonstrate compliance with applicable NAAQS for NO_x, CO, and SO_x. The modeling predicted violations to the PM_{10} 24-hour and annual NAAQS, however a receptor significance analysis demonstrates that ADM does not cause or contribute significantly to the modeled violations. Additional information is provided in the "PSD Air Quality Impact Analysis"

RESPONSE TO PUBLIC COMMENTS SUMMARY
On the issuance of a Construction Permit for ethanol production increase and Coal-fired Boiler Project (Facility #39285)

Background Information:

Archer Daniel Midland Company (ADM) submitted a revised Prevention of Significant Deterioration (PSD) Construction Permit application on August 4, 2005. This permit approves the expansion of ethanol production to approximately 120 million gallons per year, and construction of two new coal-fired boilers and support equipment, one new natural gas-fired boiler, and modification of the existing gluten flash dryer #2 and the fluid bed germ dryer.

During the public comment period, The Department received comments from EPA Region VII in Kansas City and from ADM. The following are the Department's responses to the comments received during the public comment period:

COMMENT #1:
EPA recommends that the requirements outlined in the "Truck Traffic Fugitive Control Strategy And Monitoring Plan" (Plan), submitted by ADM with their PSD application, be stated as applicable requirements in the permit.

RESPONSE AND RATIONALE:
Condition XIII.(O)(1)(a) of the draft permit required ADM to develop, maintain, and implement a Plan, however the permit did not specifically address the minimum requirements of the Plan. The requirements outlined in the Plan submitted with the original PSD application include three items:

1) Paving facility roads that will support routine daily process traffic. The draft permit already requires that all roads be paved in Condition XIII.(O)(1).
2) Vacuum sweeping the facility roads three (3) times per week. Instead of a minimum vacuum sweeping frequency mandated in the permit, the Department included in the draft permit the requirement for ADM to conduct daily facility-wide dust surveys to determine when dust control measures should be implemented (Condition XIII.(O)(1)(b)). Visible dust surveys may conclude that vacuum sweeping is required more or less frequently than three times per week. The Department, however, is not opposed to including specific requirements in the permit for ADM to vacuum sweep their roads three times per week. Note that the facility only vacuum swept their roads weekly during the development of site specific emission factors and during the time they were required to test their silt loading to demonstrate compliance with a permit limit of 1.26 grams/square meter.
3) Silt load testing of paved roads between the months of April and October. The Department has determined that silt testing is not necessary to demonstrate that dust emissions from the paved roads are being minimized. This is due to the permit requirement that increases the frequency of vacuum sweeping (three times per week instead of once per week) and because ADM has assumed a more conservative silt loading value of 3.0 grams/square meter when calculating potential emissions from the source. Past testing results show that with weekly vacuum sweeping, ADM has maintained silt loading values well below 3.0 grams/square meter. The requirement to vacuum sweep three times per week makes it even more likely roads will stay clean.

CHANGES:
Permit Conditions XIII.(O)(1)(a) was revised to specify minimum requirements for vacuum sweeping of the ADM paved roads. A corresponding discussion was updated in the Fact Sheet.

APPLICABLE REGULATIONS:
Title 129, Chapter 19 – Prevention of Significant Deterioration; Title 129, Chapter 32 – Duty to Prevent Escape of Dust.

Appendix A: Emission Calculations
Traffic Fugitive PM Emissions (SV TRUCK_FUG)

Condition XIII.(O)

Road Description	Travel Distance	Potential Rate	Paved PM EF[a]	Paved PM_{10} EF[a]	Potential PM Emissions	Potential PM_{10} Emissions
	(miles)	(trucks/yr)	(lb/VMT)	(lb/VMT)	(tons/yr)	(tons/yr)
Grain Transportation	0.96	155,125	0.31	0.06	22.74	4.43
Starch	1.08	365	0.31	0.06	0.06	0.01
Germ	1.08	5,475	0.31	0.06	0.90	0.18
Gluten	1.08	365	0.31	0.06	0.06	0.01
Feed	0.24	27,375	0.31	0.06	1.00	0.20
Ethanol	1.08	2,190	0.31	0.06	0.36	0.07
By-Product	0.89	12,045	0.31	0.06	1.64	0.32
Chem Deliveries - Route 1	0.89	730	0.31	0.06	0.10	0.02
Chem Deliveries - Route 2	1.08	1,095	0.31	0.06	0.18	0.04
Chem Deliveries - Route 3	0.62	365	0.31	0.06	0.03	0.01
Chem Deliveries - Route 4	0.57	365	0.31	0.06	0.03	0.01
Fructose	1.13	4,745	0.31	0.06	0.82	0.16
CoGen Ash	1.51	5,840	0.31	0.06	1.35	0.26
CoGen Lime	1.51	1,460	0.31	0.06	0.34	0.07
CoGen Coal	1.54	16,425	0.31	0.06	3.86	0.75
				Total:	33.5	6.5

Methodology

Potential to Emit (tons/yr) = Travel Distance (miles) x Number of Trucks/yr x Paved EF (lb/VMT) * (ton/2,000 lb)

[a] Paved road emission factor calculated using the paved road equation in AP-42, Section 13.2.1 (12/03 Version), with an adjustment factor of (1/9.1) applied to reflect ADM testing data at their Columbus, NE and Marshall, MN corn wet mills:

$$Lbs/VMT = \left[k\left(\frac{sL}{2}\right)^{0.65}\left(\frac{W}{3}\right)^{1.5} - C\right]\left(1 - \frac{P}{4N}\right)(1/9.1)$$

Where:

Constants	Value	Units
Average Truck Weight (W)	27.5	tons
Rainy Days (P)	90	days/yr
Days in Period (N)	365	days/yr
Paved Road Silt Loading (sL)	3	g/m2
Paved PM particle size factor (k)	0.082	lb/VMT
Paved PM_{10} particle size factor (k)	0.016	lb/VMT
Brake wear emission factor (C)	0.00047	lb/VMT

Attachment #3

D R A F T

CONSTRUCTION PERMIT

PERMIT NUMBER: CP06-0008

PREVENTION OF SIGNIFICANT DETERIORATION (PSD)
PERMIT TO MODIFY AN
AIR CONTAMINANT SOURCE
IS HEREBY ISSUED TO:

Cargill, Incorporated
PO Box 300
Blair, Nebraska 68008-0300

FOR THE SPECIFIC MODIFICATION OF:

A Wet Corn Milling and Ethanol Production Facility

TO BE LOCATED AT:

650 Industrial Road
Blair, Nebraska

Pursuant to Chapter 14 of the Nebraska Air Quality Regulations, the public has been notified by prominent advertisement of this proposed modification of an air contaminant source and the thirty (30) day period allowed for comments has elapsed. This Construction Permit approves the proposed construction of a new 1,500 MMBtu/hr coal-fired boiler and the expansion of the wet corn milling and ethanol facility to increase production by 140 million gallons per year. Conditions XIII.(A), (D), and (G) of this permit supercede Conditions XVIII.(A)(1), XIX.(C), and XX.(C) of the December 3, 2002 construction permit. No other conditions of the December 3, 2002 are being modified by this construction permit.

This permit may contain abbreviations and symbols of units of measure, which are defined in 40 CFR Part 60.3. Other abbreviations may include, but are not limited to, the following: Best Available Control Technology (BACT), Code of Federal Regulations (CFR), Carbon Monoxide (CO), Construction Permit (CP), Circulating Fluidized Bed (CFB), grains per dry standard cubic foot (gr/dscf), Hazardous Air Pollutant (HAP), Hazardous Air Pollutants (HAPs), Maximum Achievable Control Technology (MACT), Million British thermal units per hour (MMBtu/hr), National Ambient Air Quality Standards (NAAQS), New Source Performance Standards (NSPS), Nitrogen Oxides (NO_x), Particulate Matter (PM), Particulate Matter less than or equal to 10 micrometers (PM_{10}), parts per million-volume dry (ppmvd), Prevention of Significant Deterioration (PSD), Regenerative Thermal Oxidizer (RTO), Sulfur Dioxide (SO_2), Volatile Organic Compounds (VOC).

This permit is issued with the following conditions under the authority of Title 129 - Nebraska Air Quality Regulations as amended March 14, 2006:

(4) The owner or operator shall report and keep records as described in 40 CFR 60.487 – Reporting requirements and in 40 CFR 60.486 – Recordkeeping requirements. Each owner or operator shall submit semiannual reports to the Department beginning six months after the initial startup date.

(5) Emissions shall be controlled by the Leak Detection and Repair Program as defined in 40 CFR 60.482-1 through 60.482-10.

Condition XIII.(P) Requirements for the HAUL ROADS

The existing source has a Truck Traffic Fugitive Control Strategy and Monitoring Plan (Plan) that requires sweeping of roads twice a week and requires that all non-paved roads used to support production-related truck traffic will be paved within 6 months of construction in that area. The most recent approved plan, dated September 27, 2000, also requires annual silt testing. Cargill has used an emission factor of 0.04 lb/VMT for haul road emissions estimates, which is based upon a study conducted by MCP, and which has been approved for use by the Department. During the derivation of the lb/VMT emission factor, MCP also tested silt loading values and the average was 0.92 g/m^2. The Department has determined that as long as the future average silt loading values for all samples taken for each periodic testing event, as established by the Plan, are generally at or below 1.0 g/m^2, continued use of the 0.04 lb/VMT emission factor by Cargill would be appropriate; however, if the average silt loading is above 1.0 g/m^2, the Department may decide that use of the 0.04 lb/VMT emission factor is no longer appropriate. The Plan requires that the source sample silt loading each year for a one-month period, one sample per week on each of the road segments. The Plan also requires an average to be calculated for each road segment in order to ensure compliance with the ambient air quality standards. The average that is to be calculated for purposes of Condition XIII.(P) is the average of all samples for all road segments, because the Department has determined that this method will provide adequate support for use of the 0.04 lb/VMT emission factor for purposes of emissions calculations for emissions inventory purposes.

Condition XIII.(Q) Requirements for NAAQS

This condition establishes minimum stack heights and maximum stack diameters as modeled to demonstrate compliance with the NAAQS, and establishes the public access restriction.

Condition XIII.(R) Requirements for TESTING

This condition outlines the procedures the source must follow for performance testing conducted as required by the permit.

Condition XIII.(S) Requirements for BAGHOUSES

This condition outlines operation and maintenance procedures that the source must follow to ensure proper baghouse operation.

The source has elected to use a leak detection device in lieu of having to conduct routine observations, as required by Condition XIII.(S)(5). The source found that an on-line leak detection system would provide a sensitive and accurate method for locating damaged bags. A leak detection system allows quick detection of the troubled module, which leads to quick repair of a damaged bag. After evaluating the capital cost and value to good operation, the source felt that use of a leak detection system is something that should be added to the scope of the project. The source is considering several technologies, including the Auburn Systems Triboguard (Model 4002) and the PCME-US (Dust Sense 30); however, the vendor

Attachment #4

Appendix A: Emission Calculations
Fugitive Emissions From Paved Roads

Company Name: Premier Ethanol, LLC
Address: Portland, Indiana
FESOP: 075-22858-00032
Reviewer: ERG/MP
Date: May 1, 2006

1. Emission Factors: AP-42

According to AP-42, Chapter 13.2.1 - Paved Roads (12/03), the PM/PM10 emission factors for paved roads can be estimated from the following equation:

$$E = (k \times (sL/2)^a \times (w/3)^b - C) \times (1 - p/(4 \times 365))$$

where:

E =	emission factor (lb/vehicle mile traveled)	
sL =	road surface silt loading (g/m^2) =	0.6 (g/m^2) (AP-42, Table 13.2.1-3)
w =	mean vehicle weight (tons) =	27.5 tons
k =	empirical constant =	0.082 for PM and 0.016 for PM10
a =	empirical constant =	0.65
b =	empirical constant =	1.5
C =	emission factor for exhaust, brake and tire wear	0.00047 for PM and PM10
p =	number of days per year with 0.01 inches precipitation	120

PM Emission Factor = $(0.082 \times (0.6/2)^{0.65} \times (27.5/3)^{1.5} - 0.00047) \times (1 \quad 120/1460)$ = **0.95** lbs/mile

PM10 Emission Factor = $(0.016 \times (0.6/2)^{0.65} \times (27.5/3)^{1.5} - 0.00047) \times (1 - 120/1460)$ = **0.19** lbs/mile

2. Potential to Emit (PTE) of PM/PM10 Before Control from Paved Roads:

Vehicle Type	*Ave Weight of Vehicles (tons)	*Trip Number (trips/yr)	* Round Trip Distance (mile/trip)	Vehicle Mile Traveled (VMT) (miles/yr)	Traffic Component (%)	Component Vehicle Weight (tons)	PTE of PM (tons/yr)	PTE of PM10 (tons/yr)
DDGS Load Out	27.5	3,504	0.75	2,628	9.9%	2.73	1.25	0.24
Ethanol Load Out	27.5	4,313	0.75	3,235	12.2%	3.36	1.54	0.30
Denaturant Delivery	27.5	190	0.75	143	0.54%	0.15	0.07	0.01
Grain Delivery	27.5	27,331	0.75	20,498	77.3%	21.27	9.78	1.91
Total				**26,504**	**100%**	**27.5**	**12.6**	**2.46**

* This information is provided by the source.

Methodology

Vehicle Mile Traveled (miles/yr) = Trip Number (trips/yr) x Round-Trip Distance (mile/trip)
Traffic Component (%) = VMT / Total VMT
Component Vehicle Weight = Ave. Weight of Vehicles (ton) x Traffic Component (%)
PTE of PM/PM10 before Control (tons/yr) = VMT (miles/yr) x PM/PM10 Emission Factors x 1 ton/2000 lbs

Appendix A: Emission Calculations
Fugitive Emissions From Paved Roads

Company Name: ASA Linden, LLC
Address: 173 West County Road 1100 North, Linden, IN 47955
FESOP: 107-21453-00061
Reviewer: ERG/YC
Date: November 10, 2005

1. Emission Factors: AP-42

According to AP-42, Chapter 13.2.1 - Paved Roads (12/03), the PM/PM10 emission factors for paved roads can be estimated from the following equation:

$$E = (k \times (sL/2)^a \times (w/3)^b - C) \times (1 - p/(4 \times 365))$$

where:

E =	emission factor (lb/vehicle mile traveled)	
sL =	road surface silt loading (g/m^2) =	0.6 (g/m^2) (AP-42, Table 13.2.1-3)
w =	mean vehicle weight (tons) =	29.0 tons
k =	empirical constant =	0.082 for PM and 0.016 for PM10
a =	empirical constant =	0.65
b =	empirical constant =	1.5
C =	emission factor for exhaust, brake and tire wear	0.00047 for PM and PM10
p =	number of days per year with 0.01 inches precipitation	120

PM Emission Factor = $(0.082 \times (7.4/2)^{0.65} \times (29/3)^{1.5} - 0.00047) \times (1 - 120/1460)$ = **1.03** lbs/mile

PM10 Emission Factor = $(0.016 \times (7.4/2)^{0.65} \times (29/3)^{1.5} - 0.00047) \times (1 - 120/1460)$ = **0.20** lbs/mile

2. Potential to Emit (PTE) of PM/PM10 Before Control from Paved Roads:

Vehicle Type	*Ave Weight of Vehicles (tons)	*Trip Number (trips/yr)	* Round Trip Distance (mile/trip)	Vehicle Mile Traveled (VMT) (miles/yr)	Traffic Component (%)	Component Vehicle Weight (tons)	PTE of PM before Control (tons/yr)	PTE of PM10 before Control (tons/yr)
DDGS Load Out	29	14,814	0.95	14,073	47.7%	13.84	7.27	1.42
Ethanol Load Out	29	15,488	0.95	14,714	49.9%	14.47	7.61	1.48
Denaturant Delivery	29	738	0.95	701	2.38%	0.69	0.36	0.07
Total				**29,488**	**100%**	**29.0**	**15.2**	**2.97**

* This information is provided by the source

Methodology

Vehicle Mile Traveled (miles/yr) = Trip Number (trips/yr) x Round-Trip Distance (mile/trip)
Traffic Component (%) = VMT / Total VMT
Component Vehicle Weight = Ave. Weight of Vehicles (ton) x Traffic Component (%)
PTE of PM/PM10 before Control (tons/yr) = VMT (miles/yr) x PM/PM10 Emission Factors x 1 ton/2000 lbs

3. Potential to Emit (PTE) of PM/PM10 after Control from Paved Roads:

The source proposed to use periodic sweeping to control the fugitive dust emissions.
The control efficiency from sweeping is assumed to be 50%.

PTE of PM after Control = 15.2 tons/yr x (1-50%) = **7.62 tons/yr**

PTE of PM10 after Control = 2.97 tons/yr x (1-50%) = **1.48 tons/yr**

Attachment #5

2 SUMMARY AND DISCUSSION

The results of the air emission compliance tests are summarized in the following tables. An overview of the results is presented below:

METHOD	AVERAGE
Hammermill Baghouse	
METHOD 5/202	
Dry Catch Only	
.....(GR/DSCF)	0.00027
.....(LB/HR)	0.053
Dry + Method 202 Wet Catch	
.....(GR/DSCF)	0.00062
.....(LB/HR)	0.122
OPACITY.....(%)	0
Grain Handling Baghouse	
METHOD 5/202	
Dry Catch Only	
.....(GR/DSCF)	0.00035
.....(LB/HR)	0.094
Dry + Method 202 Wet Catch	
.....(GR/DSCF)	0.00084
.....(LB/HR)	0.226
OPACITY.....(%)	0
Fermentation/Distillation (Wet Scrubber)	
VOC Mass Rate as Method 18	
.....(LB/HR)	2.39
EPA METHOD 25A	
.....(ppm,w as carbon)	75.33
..... (LB/HR as carbon)	1.62

Attachment #6

METHOD	AVERAGE
Cooling Drum TO Bypass	
METHOD 5/202	
Dry Catch Only	
.....(GR/DSCF)	0.00011
.....(LB/HR)	0.016
Dry + Method 202 Wet Catch	
.....(GR/DSCF)	0.0010
.....(LB/HR)	0.144
OPACITY.....(%)	0
VOC Mass Rate as Method 18	
.....(LB/HR)	≤ 0.74
EPA METHOD 25A	
..... (ppm,w as carbon)	13.67
..... (LB/HR as carbon)	0.43
DDGS Handling Equipment Baghouse	
METHOD 5/202	
Dry Catch Only	
.....(GR/DSCF)	0.00008
.....(LB/HR)	0.006
Dry + Method 202 Wet Catch	
.....(GR/DSCF)	0.00050
.....(LB/HR)	0.032
OPACITY.....(%)	0
VOC Mass Rate as Method 18	
.....(LB/HR)	≤ 0.14
EPA METHOD 25A	
..... (ppm,w as carbon)	< 3.0
..... (LB/HR as carbon)	< 0.04

No difficulties were encountered in the field or in the laboratory evaluation of the samples. On the basis of these facts and a complete review of the data and results, it is our opinion that the concentrations and emission rates reported herein are accurate and closely reflect the actual values which existed at the time the tests were performed.