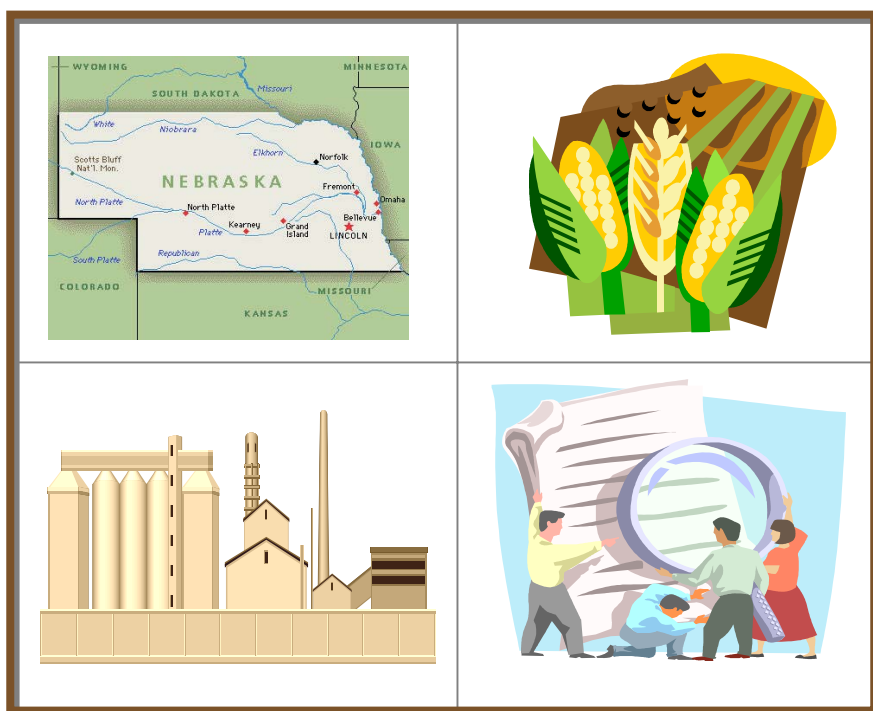


# AIR QUALITY AND ETHANOL PRODUCTION Nebraska's Experience



**“Good Communication is the Key  
to a Successful Permitting Process.”**

**Nebraska Department of Environmental Quality  
October 2002**

# Acknowledgements

The Department would like to thank the Minnesota Pollution Control Agency for allowing us to use information contained in their publications to create this document. Much of the information contained in the Overview, Ethanol Production, and Potential Air Issues – DDGS Dryer Emission sections of this document were replicated from Minnesota’s “Ethanol Production in Minnesota” and “Air Emissions from Ethanol Plants: Recent Findings” publications. Their willingness to share their experience and expertise has been invaluable.

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# Overview

Ethanol (also known as ethyl alcohol or grain alcohol) is a clear, colorless liquid made by fermenting and distilling organic material, most commonly corn. One bushel of corn produces between two and three gallons of ethanol.

In recent years, ethanol has been used primarily as an “oxygenate” for gasoline – in other words, ethanol adds oxygen to gasoline, which allows the gasoline to burn more completely. Burning gasoline with ethanol generates less carbon monoxide pollution from motor vehicles.<sup>1</sup> However, the production of ethanol creates volatile organic compounds (VOCs), which is a major component of ozone formation or smog.

Another oxygenate, methyl tertiary butyl ether (MTBE,) was widely used until recent studies found that MTBE had been contaminating water supplies. Ethanol competes favorably with MTBE because it has a higher oxygen content than MTBE. Therefore, only about half the volume of ethanol is required to produce the same oxygen level in gasoline as MTBE. If there is a ban on the use of MTBE as an oxygenate, the demand for ethanol could rapidly increase.<sup>2</sup>

The production of ethanol in the U.S. over the last few years has increased due to ethanol producer tax credits, U.S. Department of Agriculture incentive programs, and increased market demand. During 2000 and 2001, ethanol production increased by 550 million gallons per year and 15 new facilities were added. In 2002, the ethanol industry planned on adding 400 million gallons per year of ethanol production and 13 new facilities.<sup>3</sup> The National Corn Growers Association is calling for Congress to help triple the biofuels market by 2010. Further, the Senate Energy Bill establishes a minimum renewable fuels standard that grows to 5 billion gallons of ethanol by 2012.<sup>4</sup>

All of these factors contribute to the number of existing plants that want to expand their ethanol production and the number of new plants that are being proposed. Due to the increased activity in the ethanol industry, the Nebraska Department of Environmental Quality (NDEQ) recognized the need to provide a report to the general public, industry personnel of both existing and proposed ethanol plants, environmental consultants, community officials, and economic development professionals that would encompass varying aspects of the ethanol industry and the Clean Air Act.

This document is a compilation of documents, articles, presentations, and regulatory information related to the ethanol industry. The document will discuss the ethanol production process, air pollution emission points, NDEQ’s air quality permitting process, and air quality permitting and compliance issues. Information about Nebraska’s ethanol plants is also included.

# Ethanol Production

Ethanol is produced using either a dry milling or wet milling process. Both types of mills operate in Nebraska; however, the majority of ethanol plants utilize the dry milling process. Corn and milo are the grains used to produce ethanol in Nebraska.

## Dry Milling Process

Grain is delivered to ethanol plants by truck or rail car and then it is ground in a hammer mill and made into “meal.” This process is referred to as “dry milling” because the grain is dry when it is ground into meal. The meal is mixed with water to form a “mash” and enzymes are added, which changes the cornstarch to a fermentable sugar. This step takes place in a high-temperature cooker. Figure 1 illustrates the dry milling process.

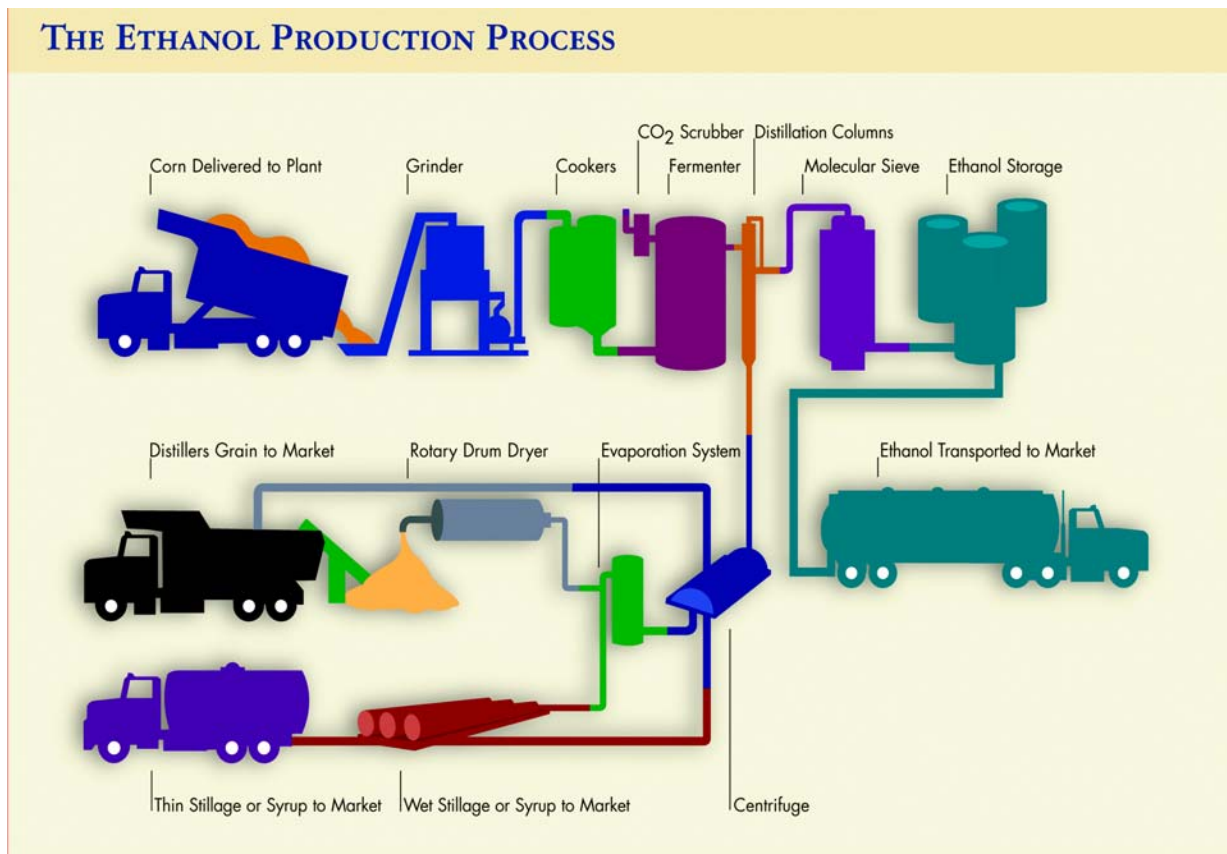


Figure 1

Renewable Fuels Association

After the mash has cooled, it is transferred to fermenters and yeast is added to ferment the sugars, creating ethanol and carbon dioxide. There are two types of fermentation that a plant will utilize, continuous or batch. In a continuous process, the fermenting mash flows through several fermenters until the mash is fully fermented. In a batch process, the mash stays in one fermenter for about 48 hours before the distillation process is started.

The fermented mash, now called "beer," is about 10 percent alcohol and 90 percent water and leftover solids from grain and yeast. The beer is pumped to the distillation system, where alcohol is separated from the solids and water.

The alcohol leaves its final distillation at about 95 percent strength (190 proof). The residual mash, called "stillage," is transferred to the distiller grain processing area and separated alcohol passes through a dehydration system where any remaining water is removed. Most ethanol plants use a molecular sieve to capture the last bit of water in the alcohol. The alcohol at this stage is called "anhydrous ethanol" and is 100 percent alcohol or 200 proof.

Anhydrous ethanol intended for fuel use is denatured with about five percent of a product like gasoline to make it undrinkable and thus not subject to liquor taxes. Once the ethanol has been denatured, it is ready for shipment to gasoline terminals or retailers to be mixed with gasoline and sold as ethanol fuel.

In the distiller grain processing area, the leftover stillage passes to a centrifuge that separates coarse grain from soluble material. Solubles are concentrated by evaporation to make "syrup," which can be sold on its own or mixed back with coarse grain to form "distillers grain." Distillers grain is sold as animal feed in either a wet state called wet distillers grain solids (WDGS), also known as "wet cake," or after drying as dried distillers grain solids (DDGS). Distillers grain solids are high in protein and other nutrients and are a highly valued livestock feed ingredient.

Another major byproduct created by ethanol production is carbon dioxide, given off during the fermentation process. Many ethanol plants collect the carbon dioxide, clean it and sell it for use in the carbonated beverage and dry-ice industries.<sup>1</sup>

## Wet Milling Process

Grain is delivered to the plant by truck or rail car. After the grain is received, it is soaked or "steeped" in water and a dilute sulfuric acid for one to two days, thus the term "wet milling" is used. Steeping makes it possible to separate the corn into its many component parts. Figure 2 illustrates the wet milling process.

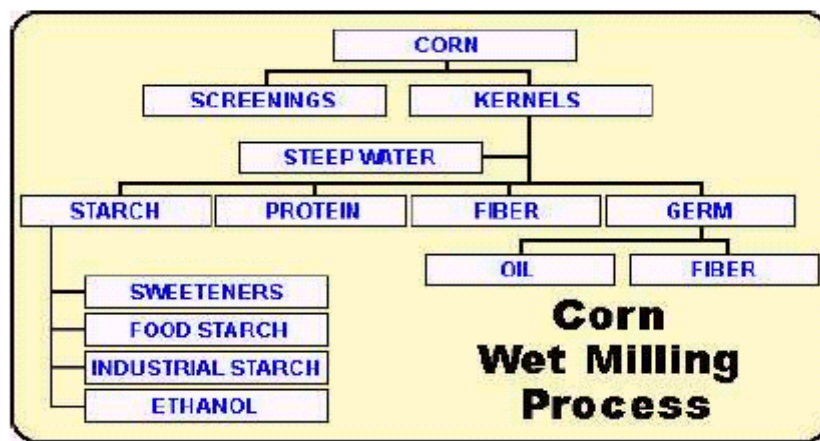


Figure 2

Minnesota Pollution Control Agency

After the corn has finished steeping, the slurry is passed through a series of grinders, centrifuges, screens, and separators. These processes separate the corn into starch, protein, fiber, and germ. Starch and

remaining water are processed into ethanol through a fermentation process very similar to the dry mill process described in the previous section.

Ethanol is just one of many products that wet mills may produce. Other products include food starch, corn gluten, feed for livestock, corn syrup, and corn oil.<sup>1</sup>



## Air Emissions from Ethanol Plants

Before discussing the details of the permitting process, it is important to be familiar with the regulated pollutants emitted from an ethanol plant.

As grain is delivered to the plant, then handled and milled, tiny particles (particulate matter less than 10 microns in diameter,  $PM_{10}$ ) are released into the air.  $PM_{10}$  is also emitted during the drying process.

During fermentation, distillation and drying, volatile organic compounds (VOCs) are released. Some of these VOCs are known as hazardous air pollutants (HAPs). These include some or all of the following: acetaldehyde, acrolein, ethanol, formaldehyde, 2-furaldehyde, methanol, acetic acid and lactic acid.

Carbon monoxide (CO), nitrogen oxides ( $NO_x$ ) and sulfur oxides ( $SO_x$ ) are generated from combustion in the boilers of the plant. CO may also be generated in the drying process.<sup>1</sup>

Other emissions may result from activities not associated with the production process such as: Hydrogen sulfide ( $H_2S$ ) and VOCs released from the wastewater treatment process;  $PM_{10}$  from the cooling towers; fugitive  $PM_{10}$  and VOC emissions from haul road traffic and equipment leaks, respectively;  $PM_{10}$ ,  $NO_x$ ,  $SO_x$ , CO, and VOCs from emergency equipment; and potential VOC evaporative loss emissions from the wet distiller's grain solids (WDGS) storage piles (NDEQ is currently researching methods to quantify these emissions).

Figure 3 illustrates the typical emission points at a dry mill ethanol plant and the air pollutants emitted from each emission point.

## Dry Mill Emission Points

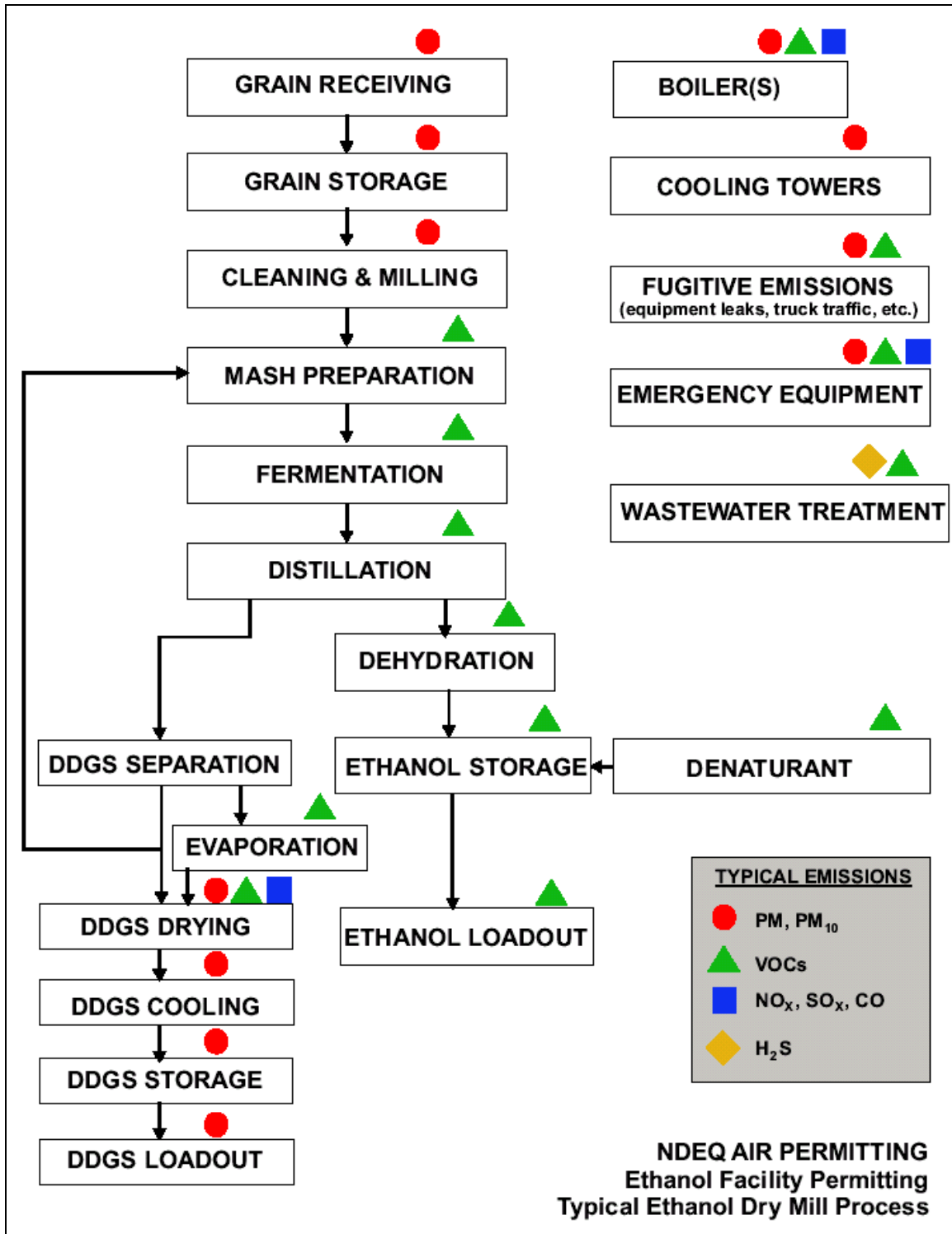


Figure 3

Nebraska Department of Environmental Quality

# Air Quality Permit Program

The Nebraska air quality regulations require that facilities with the potential to emit air pollutants above specified levels must obtain construction permits and/or operating permits. This section will discuss the air quality permits an ethanol plant may need and when they must obtain them, permit application tips, and what information may be incorporated in a permit including a discussion of the federal regulations that could apply to ethanol plants.

## Construction Permits

Before a new plant is built or before an existing facility expands or modifies its plant, an air quality construction permit may be required. There are two types of construction permits: state construction permits and federal construction permits, known as Prevention of Significant Deterioration (PSD) permits. The type of construction permit that is needed will depend on the air pollutants that potentially could be released from the new plant or expansion project.

### Purpose

First and foremost, air quality construction permits are needed to protect the ambient air quality. Ambient air is the air outside of buildings that the general public has access to. The U.S. Environmental Protection Agency (EPA) has developed national ambient air quality standards (NAAQS) to protect the public health, welfare, and the environment.

Predictive computer modeling is conducted prior to issuing construction permits to evaluate the potential impact the plant will have on the ambient air quality. A construction permit cannot be issued if the plant will cause or significantly contribute to violations of the ambient air quality standards.

Construction permits also impose federally enforceable requirements that are recognized by the EPA. Construction permits include emission and/or production limits that will ensure air quality protection. The permits contain recordkeeping, reporting, monitoring, and testing requirements to ensure the plant is able to demonstrate that the permits limits can be met.

The public is given notice that a construction permit may be issued and is given an opportunity to comment on activities that affect their environment. The public notice also provides an opportunity for communities to be educated about the environmental impacts of plants locating in their area.

Finally, construction permits are required by the Nebraska Air Quality Regulations – Title 129. Chapter 17 lists the requirements to obtain a state construction permit and Chapter 19 lists the requirements to obtain a federal construction permit. A copy of Title 129 can be obtained by contacting the NDEQ Air Quality Division; Title 129 can also be viewed on the agency website.

### State Construction Permits

The NDEQ has had an air quality construction permit program since 1972. The program was modified in the early 1990s to reflect changes brought about by the Clean Air Act Amendments of 1990. Facilities are required to obtain a construction permit before they construct, reconstruct or modify any air contaminant source or emission unit where there is a net increase in the potential-to-emit above prescribed quantities. Potential-to-emit (PTE) means the maximum emissions that would result from

operating the source at full capacity 24 hours a day, 7 days a week, 52 weeks a year taking into consideration federally enforceable requirements.

The increases in PTE that trigger construction permits by pollutant are:

- 15 tons per year (tpy) of PM<sub>10</sub>,
- 40 tpy of SO<sub>2</sub> or SO<sub>3</sub> or any combination thereof,
- 40 tpy of NO<sub>x</sub> (calculated as NO<sub>2</sub>),
- 40 tpy VOC,
- 50 tpy CO,
- 0.6 tpy Pb (Lead), or
- 2.5 tpy of any single HAP or 10 tpy of all HAPs combined.

If a plant exceeds the HAP threshold requiring a state construction permit, they must conduct a control device review and install the best available air pollution control technology (BACT) based on that review. In lieu of a BACT analysis, the plant may choose to take a permit limit to keep their emissions below the HAP threshold (2.5 tpy of a single HAP or 10 tpy of combined HAPs).

A facility obtaining a state construction permit may be required to conduct an air quality review using computer modeling to predict the impacts that a facility may have on the ambient air. Whether or not a facility needs to model will depend on the rate of emissions increase, facility history, plant location, type of source, and emission point configurations (e.g. stack heights). More information can be found in the NDEQ modeling guidelines located on the agency website or by contacting the NDEQ Air Quality Division.

### Federal Construction Permits

EPA developed the federal construction permit program, known as the New Source Review program, in 1977. NDEQ has incorporated the federal program into the state regulations and has the authority to implement and enforce these rules. This program assures the following: economic growth will occur in harmony with the preservation of existing clean air resources; public health and welfare will be protected from adverse affects which might occur even at pollution levels below the ambient standards; and the air quality in areas of special natural recreation, scenic, or historic value, such as national parks and wildlife areas, will be preserved, protected, and enhanced.<sup>5</sup>

Under the New Source Review program there are two types of preconstruction permits. In areas that have pollution levels below the NAAQS, referred to as attainment areas, sources that meet the appropriate criteria will obtain a Prevention of Significant Deterioration (PSD) permit. In areas that have pollution levels above the NAAQS, referred to as nonattainment areas, sources meeting the appropriate criteria will obtain a nonattainment New Source Review permit. Currently, there are no nonattainment areas in Nebraska.

In order for a facility to trigger the emission levels that require a PSD or New Source Review construction permit, they must meet both of the following criteria:

1. The facility must have the PTE of:
  - 100 tons per year (tpy) of any criteria pollutant\* if the source is one of 28 specific source categories listed in the PSD rules (40 Code of Federal Regulations (CFR) §52.21(b))
  - OR
  - 250 tpy of any criteria pollutant\* for sources not specifically listed in the PSD rules, and

2. Have net emissions increases of:

- 15 tons per year (tpy) of PM<sub>10</sub>
- 40 tpy of SO<sub>2</sub> or SO<sub>3</sub> or any combination thereof,
- 40 tpy of NO<sub>x</sub> (calculated as NO<sub>2</sub>),
- 40 tpy VOC,
- 100 tpy CO, or
- 0.6 tpy Pb (lead)
- Other pollutants with significance thresholds include total suspended particulate (TSP), fluorides, sulfuric acid mist, hydrogen sulfide (H<sub>2</sub>S), total reduced sulfur (TRS), and reduced sulfur compounds.

*\* Criteria pollutants are PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>x</sub>, CO, VOCs (used as an alternative to ozone), and Pb.*

Chemical process plants are considered a major stationary source. It has been determined that ethanol plants are chemical process plants, so they are subject to the major stationary source requirements and the 100 ton per year threshold.

If a plant needs to obtain a PSD construction permit under the PSD program it must conduct a control device review and install BACT based on that review. The plant must also conduct an air quality review using computer modeling to assure that they will not exceed the NAAQS or impact areas of special natural recreation, scenic, or historical significance. As part of the air quality review, an increment analysis must also be performed. Increment is the portion of the ambient air that a facility is allowed to impact. This ensures each facility doesn't excessively pollute the air and affect future growth in the area. PSD permits may be subject to review by EPA, federal land managers, bordering states, and tribal organizations.

## Operating Permits

The ethanol plant may also need to obtain an air quality operating permit. There are two types of operating permits: major source (federal program) and minor source (state program). Again, the potential emissions from the plant will determine whether a facility will obtain a major or minor operating permit.

### Purpose

The federal operating permit program, known as the Title V program, was created by the Clean Air Act Amendments of 1990 and was designed to create a "one stop" permit. The Title V operating permit compiles all of the applicable state and federal regulatory requirements, existing construction permit provisions, and recordkeeping, reporting, testing, and monitoring requirements into one permit. The intention behind listing everything in one permit is to assist facilities with maintaining compliance. Oftentimes, a facility will have several construction permits for several pieces of equipment and it is difficult to keep track of all of the requirements in each permit. One permit with all of the facility's requirements is intended to make it easier to track the requirements.

Notification to the public is also an important aspect of the operating permit program. The public is notified when an operating permit is proposed and is given the opportunity to comment during the 30-

day public notice period. This gives the public the opportunity to become educated about the impacts that the facility may have on their environment.

The Department was required with the passage of LB1257 (1992) by the Nebraska Legislature to establish and implement a comprehensive operating permit program for facilities emitting certain air pollutants. Nebraska took the operating permit program one step further than the federal Title V operating permit program. The federal program only regulates larger facilities (or major sources) of air pollution while the Nebraska operating permit program regulates both larger and smaller facilities (or minor sources) of air pollution. Nebraska's major source operating permit program is also called the Class I program and the minor source operating permit program is the Class II program. The Class I and Class II operating permit programs are discussed further in the following sections.

Unlike a construction permit that must be obtained prior to construction and is valid for the entire life of the emission unit, an operating permit must be applied for within 12 months after the facility begins operation and is valid for up to five years. The operating permit requirements can be found in Title 129, Chapters 5 and 7 through 12. For a copy of the regulations contact the Air Quality Division or the air quality regulations can be viewed on NDEQ's website.

### Class I Operating Permits

The Class I program (or the Title V program) regulates major sources of air pollution. A Class I source or major source has the potential-to-emit (PTE) quantities greater than:

- 100 tpy of any criteria air pollutant\* excluding Pb (lead),
- 10 tpy of any single HAP or 25 tpy of a combination of HAPs or,
- 5 tpy of Pb

*\* Criteria pollutants are PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>x</sub>, CO, VOCs (used as an alternative to ozone), and Pb.*

The benefit of operating as a Class I source is the flexibility allowed in your operation because your PTE is not limited (unless a historical construction permit limits your PTE). However, a Class I source will be subject to paying fees based on their actual emissions, may have more stringent monitoring requirements, and has additional reporting and recordkeeping requirements. Class I permits are also subject to review by EPA, nearby states, and nearby local or tribal air quality programs.

### Class II Operating Permits

The Class II program regulates minor sources of air pollution. There are two classifications for minor sources: synthetic minor and natural minor.

- Synthetic Minor
  - PTE above Class I emission levels (see previous section)
  - Federally enforceable limits are taken to keep emissions below Class I emission levels
- Natural Minor
  - PTE below the Class I emission levels
  - Actual emissions above 50% of Class I emission levels
    - 50 tpy of criteria pollutant except Pb
    - 5 tpy of any single HAP or 12.5 tons per year of a combination of HAPs or,
    - 2.5 tpy of Pb

The benefits of becoming a Class II source include: no requirements to pay emission fees, and the possibility of less stringent monitoring requirements, less reporting, and less recordkeeping. However, Class II sources have less operational flexibility because they must maintain their emissions below the Class I threshold. Class II operating permits are not subject to review by EPA.

## Permit Process

An air quality construction permit must be obtained from NDEQ prior to construction. The construction permit application needs to be submitted to NDEQ as soon as possible. Generally, a construction permit will take at least six months to a year or longer to process. Operating permit applications must be submitted to NDEQ within 12 months after the facility begins operating. Permit applications can be obtained by contacting the Air Quality Division, or downloaded from the NDEQ website.

Although the permits will differ, the process is the same for both the construction permit and operating permit. Once the permit application is received by NDEQ, it is reviewed for administrative completeness. The reviewer will determine if a responsible official has signed the application, if the application contains completed forms, and if the applicant has requested confidentiality. If the facility has properly requested confidentiality in accordance with Title 115, Chapter 4 - Public Records Confidentiality, the request will be forwarded to the NDEQ director for approval or disapproval. If the confidentiality request is not filed in accordance with Title 115, the application will be returned to the facility. Once the application has been deemed administratively complete, it is assigned to a permit writer for a technical completeness evaluation.

The permit writer will determine if the application provides enough detailed information to draft a permit that accurately reflects the facility while assuring that all of the regulatory requirements have been addressed. The following information is a guide to what information the permit writer will look for during the technical completeness evaluation.

### √ **General Information**

- Is it a new source or modification of an existing source?
- If it is a modification, has the applicant provided information regarding the existing source?
- Are all of the applicable forms complete with the appropriate information?
- Have emission points been identified, described, and consistently named?
- Does the plant diagram show heights and locations of all buildings, delineations of ambient air (e.g. property boundaries), and emission points?

### √ **Emissions Information**

- Are fuel types, fuel use, raw production materials, consumption, production rates, and operating schedule provided?
- Have both actual and potential emissions of regulated air pollutants been provided?
- Have the assumptions and calculations of the actual and potential emissions been included?
- Are citations of emission factors included?
- Can a major or minor source determination be made?
- Is the project subject to Prevention of Significant Deterioration (PSD) review?

- √ **Control Equipment and Methodology**
  - Has emissions control equipment been identified and described?
  - Is supporting information on control equipment efficiencies included?
  - Did the facility propose limits on plant operation or work practices that may affect emissions?
  - If it is a PSD project, has a Best Available Control Technology (BACT) analysis been provided?
- √ **Monitoring, Recordkeeping, and Reporting**
  - Have compliance monitoring devices or activities been identified and described?
  - Has the facility proposed testing of any emission units?
  - Did the facility provide information on existing or proposed record-keeping practices?
- √ **Modeling**
  - Is the project subject to modeling? (For a copy of the modeling guidance, see the Air Quality Publications/Guidance Documents on the NDEQ web page or contact the Air Quality Division)
  - If yes, has a modeling protocol been submitted and approved?
  - Have the modeling inputs, assumptions, etc. been provided to NDEQ on CD or diskette?
  - Was the modeling conducted in accordance with the approved protocol?
  - If it is a PSD project, have the ambient standards, PSD increment, and other impacts analyses been provided?

Not only must the application be technically complete prior to drafting the permit, the permit writer must review the plant's historical information such as compliance and/or enforcement status and existing permits limits. The construction permit writer must also assess how the plant modification or expansion will impact existing processes and support facilities.

After the historical issues are reviewed, the permit writer must make sure that all of the calculations are correct, all of the regulatory requirements have been appropriately addressed, and the recordkeeping, testing, and monitoring is adequate to demonstrate compliance. This step is the most complex in the permitting process and will take at least 60-90 days to complete for construction permits.

In drafting the operating permit, the permit writer must make sure that all of the existing construction permit requirements and applicable state and federal requirements are included.

After the operating or construction permit is drafted, the permit will undergo a series of reviews to determine if the emissions were properly evaluated, permit limits are appropriate, and the permit is clear, concise, and consistent. Those that may review the draft permits include Air Division staff, other DEQ staff not in the Air Division, contracted personnel, other states, and other agencies. The draft permit will also be provided to the facility for their review. EPA may also elect to review the draft permit if the facility is subject to PSD review or the Class I operating permit program.

Once the draft permit is reviewed and approved, it is prepared for public notice. The public notice is published in local newspapers and sent to the local library. The public comment period lasts 30 days. The public may also request a hearing during the public notice period. If a hearing is requested and granted by the NDEQ director, a hearing notice will be published in local newspapers 30 days prior the scheduled hearing.



Once the public comment period has ended, a response document is drafted to address all of the public comments received. The response document is shared with all of those who commented and the facility. If the permit requires substantial changes, the permit may have to undergo another public comment period.


After public comments are addressed, the permit will be prepared for signature. Once the permit is signed copies are distributed to the appropriate parties. The entire construction permit process will take between 150-190 days if there are no significant issues or problems and the facility has submitted a complete application.

## Permit Application Tips

NDEQ understands that there is a significant amount of information that is required in the construction permit and operating permit applications. This is a lengthy process that can oftentimes be complicated. Following are some tips that will facilitate the process to help it flow more smoothly for the plant and NDEQ.

**Start early.** As soon as you begin your plans for an ethanol plant, complete and submit an air quality construction permit application to the NDEQ. A construction permit will take several months to process, depending on the complexity of the permit.

**Talk with NDEQ.** Make an appointment to meet with the air permit program during the early planning stages. By talking early in the process, we can avoid some of the questions that may arise while completing the permit application. Also, it is advisable to set up a meeting with NDEQ soon after you submit the permit application. This will clear up any preliminary questions we have with the information in the application and give the plant representatives a sense of what they should expect from NDEQ in the following months. If you are required to conduct an analysis of the impacts your project will have on the ambient air, it is important to contact the air quality modeler to discuss the modeling requirements and development of the modeling protocol.



**“Good communication  
is the key to a  
successful permitting  
process.”**

**Make sure the permit application is complete, accurate, and signed.** Complete the application in blue or black ink. Also, have a responsible official sign the application in ink. Be sure to include information for all of the equipment that you plan to install. Not only is it important to tell us what you will install, but also it is very important that you install the equipment that you specified in your permit application. By avoiding “as built” differences, you can avoid potential permit violations and having to wait for a permit modification. If your plans change after you have submitted an application, you have an obligation to submit updated information to NDEQ.

**Address confidentiality issues appropriately.** If a facility would like to claim information in the permit application as confidential material, the claim must be made at the time of submittal. In order to claim confidentiality, the facility must certify that the information or record is entitled to protection. In addition, the facility must explain its reasons why confidentiality should be granted. The NDEQ director will review the request to determine whether the information or record relates to processes or methods entitled to protection. Facilities may not keep plant-wide emissions data confidential. The director may not withhold records as confidential if they have been disclosed in an open court, open

administrative proceeding, open meeting or disclosed by the Department in its duties. For further information on confidentiality, please refer to Title 115, Chapter 4 - Public Records Confidentiality and Neb. Rev. Stat. §84-712.05 and 81-1527 or contact the Air Quality Division.

**Include calculations and citations with your permit application.** Including emission calculations and emission factor citations with the permit application helps us review your project. Without such citations and calculations, we will have to reproduce the work that you have done to ensure that the facility will meet state and federal requirements.

**Research.** Generally, ethanol plants are subject to various federal standards as well as state regulations. The federal requirements could influence your decisions regarding equipment that you install. The federal regulations that ethanol plants may be subject to are discussed in the Permit Content section of this document.

**Be aware of current regulatory issues.** As the ethanol industry continues to expand throughout the nation and more emissions data is gathered, state agencies have to face new and oftentimes challenging issues. Some of the current air quality issues that Nebraska and other states are facing involve emissions from the DDGS Dryers and requiring fencing to assure compliance with the NAAQS. These issues are discussed later in this document. Many of these issues are best dealt with in the early planning stages of the ethanol plant. By communicating with the Air Quality Division and being aware of these current issues, you may be able to save time and/or money. *Good communication is the key to a successful permitting process.*

**Get help.** Although not required, we encourage plants to consult with persons who are familiar with Nebraska's air quality regulations, air quality construction and operating permits, and the ethanol plant processes. This not only expedites the permit process but also ensures that the permit application is complete and accurate. A Directory of Environmental Consultants and Engineers is available on the NDEQ website located under Programs/Environmental Assistance Programs/Environmental Assistance.

**You may submit a first draft of a permit package.** The NDEQ Air Quality Division has been encouraging plants to make the first attempt to draft their permit when submitting an application. To draft an air quality permit takes knowledge of and experience with the air quality regulations. It could expedite the permit process. It is also helpful for NDEQ to know what methods of monitoring and record keeping the plant may have in place or are planning to put in place. Please keep in mind the NDEQ may revise the draft in order to meet state and federal requirements and to ensure consistency with other similar projects.

**Read and make comments to the draft permit.** Once the application is reviewed and deemed technically complete by NDEQ, the permit writer will draft the air quality permit. The draft permit will be sent to ethanol plant representatives for comment prior to public notice. Make sure the references to equipment are correct and that you will be able to operate under the required conditions. Be sure you understand and are prepared to comply with all of the record keeping, reporting and monitoring requirements in the permit. Making changes to the draft permit is easier than having to amend or modify the permit after it is issued.

## Permit Content

Construction permits and operating permits consist of the same basic elements. Each permit will contain general conditions and specific conditions.

### General Conditions

The general conditions are provisions which will be applied to every facility that obtains a particular type of permit. Construction and operating permit general conditions will reference provisions in Title 129 that apply to all facilities such as general duty clauses and the open burning and fugitive dust regulations.

The general conditions of a construction permit will include provisions such as commencement of continuous construction, notifications of anticipated startup and actual startup, and submittal of facility changes to the NDEQ. The general conditions explain the provisions to reopen, revoke, reissue, terminate, or modify the permit and the permit renewal requirements.

The following reporting requirements are found in the general conditions:

- All sources with a permit must submit an annual emission inventory by March 31<sup>st</sup>. The emission inventory is documentation of the facility's actual emissions based on production, combustion, and consumption for the previous year.
- Class I sources must submit their air emission fees (based on the annual emission inventory report) by July 1<sup>st</sup> every year.
- Sources with an operating permit are required to submit an annual certification of compliance by March 31<sup>st</sup> verifying compliance with their permit conditions for the previous year.
- Class I sources with an operating permit must submit semiannual excess emissions or deviations reports by September 30<sup>th</sup> and March 31<sup>st</sup> (submitted with their certification of compliance report) that document if there have been any deviations from their permit conditions.

### Specific Conditions

The specific conditions will contain provisions that are specific to that facility. Both construction and operating permits may contain permit limits; emissions testing, monitoring, recordkeeping, and reporting requirements; and applicable federal rules.

The limits contained in the permit will depend on the type of permit and the limits the facility is willing to take. Permits may impose emission limits, production limits, or limits to ensure compliance with the NAAQS. Examples that might be included in a permit are:

- An emission limit - "PM<sub>10</sub> emissions shall not exceed X lb/hour (and X tons/year if applicable)."
- A limit to restrict the plant emissions below the Class I or PSD emission levels.
- A production limit - "Grain handling and milling operations shall not exceed X tons of grain per calendar month or X tons per calendar year."

It is important facilities understand the permit limits and make sure that they are able to comply with the limits. It is best to address concerns with the permit limits early in the process or at least during the

permit draft review. It may be that the permit will have to be altered to better meet the facility's needs. It is much easier to fix the problem before the permit is issued rather than taking the chance of the facility exceeding their permit limits after the permit is issued.

The specific conditions will list any control equipment that the facility is required to install and properly maintain. There will likely be maintenance, monitoring, and recordkeeping provisions associated with the control equipment.

Facilities may also be required to conduct emissions testing at their plant. Whether or not emissions testing is required will depend on the size of the emission unit(s), how close the emission unit is to the PSD or Class I threshold, how good the emission factor rating is, whether the emissions will be controlled, and what efficiencies are being claimed for the control device. Emissions testing is required 180 days after startup or 60 days after reaching maximum capacity. Emissions testing is conducted when the facility is operating at its maximum production rate. Facilities need to keep records of production during the test for verification purposes.

The specific conditions will include the facility's monitoring requirements. Some of those requirements may include continuous emission monitors, opacity monitors, Method 9 opacity readings, visual inspections, or leak detection and repair programs.

A list of records that must be kept will be included in the specific conditions. Usually (unless otherwise specified) records must be kept and made available for five years. Records that will typically be required include production records; emission levels and calculations; fuel consumption; grain received, milled, or processed; equipment maintenance; monitoring; and startup, shutdowns, and malfunctions. Records kept should correlate to the production or emission limits in the permit to assure compliance with the permit conditions.

In addition to the reports listed in the general conditions, the specific conditions will list reports that the source must submit. The reports that may be required include performance tests; startup, shutdown, and malfunction; and others required by federal regulations.

### Federal Regulations

Ethanol plants may be subject to several federal regulations and the requirements for those regulations will be found in the specific conditions of the permit. However, it is important to note that a facility may be subject to federal regulations not listed in the permit. This may occur when a new rule is promulgated after permit issuance, or when a source becomes subject to a rule after the permit is issued.

#### *New Source Performance Standards*

New Source Performance Standards (NSPS) establish technology-based standards that regulate criteria air pollutants from new or modified sources. These regulations were developed to assure that sources are installing the best-demonstrated technology to reduce emissions.<sup>6</sup>

NSPS regulations contain emission limits; control device or equipment requirements; and work practice, performance testing, monitoring, recordkeeping, notification, and reporting requirements. NSPS regulations can be found in 40 Code of Federal Regulations (CFR) Part 60. The following NSPS rules typically apply to ethanol plants.

- Subpart A – General Provisions
  - Sources subject to NSPS requirements may be subject to all or only a portion of the general provisions.
- Subpart Db – Industrial, Commercial, Institutional Steam Generating Units
  - Units with a capacity >100 million Btu per hour (MMBtu/hr)
  - Built, reconstructed, or modified after June 19, 1984
  - Regulated pollutants
    - NO<sub>x</sub>, PM, SO<sub>2</sub>
    - Opacity
- Subpart Dc - Industrial, Commercial, Institutional Steam Generating Units
  - Units with a capacity ≥10 MMBtu/hr and ≤ 100 MMBtu/hr
  - Built, reconstructed, or modified after June 9, 1989
  - Regulated pollutants
    - PM, SO<sub>2</sub>
    - Opacity
- Subpart Kb – Volatile Organic Liquid Storage Vessels
  - Vessels with a capacity ≥ 40 m<sup>3</sup> (approx. 10,000 gallons)
  - Built, reconstructed, or modified after July 23, 1984
  - Regulated pollutant
    - VOCs
- Subpart DD – Grain Elevators
  - Storage capacity ≥ 1 million bushels
  - Built, reconstructed, or modified after August 3, 1978
  - Regulated pollutants
    - PM
    - Opacity
- Subpart VV – Synthetic Organic Chemical Manufacturing Industry (SOCMI) Equipment Leaks
  - Ethanol is on the list of regulated SOCMI chemicals.
  - Units built, reconstructed, or modified after January 5, 1981
  - Regulated pollutant
    - VOCs

Facilities should be cognizant of these rules during the planning stages of a new plant or modification. The NSPS requirements may have influence over the equipment and control devices that will be installed.

#### *National Emission Standards for Hazardous Air Pollutants*

National Emission Standards for Hazardous Pollutants (NESHAPs) regulate HAP emissions from stationary sources through technology-based standards, known as Maximum Achievable Control Technology (MACT) standards. MACT standards are designed to require that a given type of source install the best-demonstrated control technology available. New and existing facilities that fall within listed source categories and are major sources of HAP are subject to the MACT standards (although, there are a few MACT standards that include area sources).<sup>6</sup> A major source of HAP has the potential

to emit 10 tons per year of a single HAP or 25 tons per year of a combination of HAPs. There are 188 regulated HAPs. The list of HAPs can be found in Appendix II of Title 129.

MACT standards contain emission limits; control device or equipment requirements; and work practice, performance testing, monitoring, recordkeeping, notification, and reporting requirements. MACT standards can be found in 40 CFR Part 63. The following MACT standards may apply to ethanol plants.

- Subpart A – General Provisions
  - Sources subject to MACT requirements may be subject to all or portions of the general provisions
- Subpart B – Case-by-Case MACT
  - Major sources of HAP that construct or reconstruct, that are not already covered by a MACT must obtain a construction permit with a case-by-case MACT
  - Major sources of HAP that fall into a source category for a rule that has not been promulgated by May 15, 2002
    - Should have submitted a Part 1 Title V Application by 5/15/02
    - Must submit a Part 2 Title V Application 12 months following Part 1 submittal\*
    - Case-by-case MACT must be included in Title V operating permit
- Subpart FFFF – Miscellaneous Organic Chemical Production & Processes
  - Major HAP source that operate miscellaneous organic chemical manufacturing process units that uses or produces HAPs.
  - Organic chemicals include:
    - Classified in SIC Code 282, 283, 284, 285, 286, 287, 289 or 386
    - Classified in NAICS Code 3251, 3252, 3253, 3254, 3255, 3256, or 3259
  - Was not promulgated as of 10/16/02, rule was originally proposed on 4/4/02
- Subpart GGGG – Solvent Extraction for Vegetable Oil Production
  - Major HAP source using n-hexane to extract oil from soybean, corn germ, safflower etc.
  - Promulgation date 4/12/01
- Subpart DDDDD – Industrial, Institutional, & Commercial Boilers & Process Heaters
  - Major HAP sources that have any size boiler and/or indirect-fired process heater
    - Units themselves do not have to emit HAP or be major for HAP
  - Was not proposed as of 10/16/02

It is imperative for a facility to be aware of the MACT standards that may apply to their plant prior to construction. Facilities that construct after a rule that they will be subject to has been proposed must be in compliance with that rule by the time they begin operation of the plant.

\* EPA published a proposed settlement agreement with the Sierra Club on August 15, 2001 that changed the Part 2 application submittal date from 24 months after the Part 1 application has been submitted to 12 months after the Part 1 application has been submitted. The final rule amendment was not published as of 10/16/02.

# Potential Air Quality Issues

As the ethanol industry expands, NDEQ and other states have experienced an increase in issues associated with the permitting of these plants. NDEQ, other states, and the ethanol industry have faced a tremendous learning curve associated with air quality permitting and compliance. This section will explain several of those common issues that have been faced. We hope to give the industry, the public, and local government officials an understanding of the facts behind the issues to prevent further uncertainty and noncompliance.

## DDGS Dryer Emissions

Recently, new information regarding the air emissions from ethanol plant dried distillers grain solids (DDGS) dryers has been revealed by the Minnesota Pollution Control Agency that may have a far-reaching affect in Nebraska and across the nation. It was found that ethanol plants emit some pollutants in greater quantities than previously believed.

Up until now, it was believed that methanol and ethanol were the only significant volatile organic compounds (VOCs) emitted from the dryers. Therefore, when emissions testing was conducted at an ethanol plant, the test method used was designed to detect only methanol and ethanol.

The Minnesota Pollution Control Agency has recently conducted VOC testing at several Minnesota plants using a different test method. The results from those tests indicate that methanol and ethanol are emitted in greater quantities than initially believed and there are numerous other pollutants emitted from the drying process including: acetaldehyde, acrolein, formaldehyde, 2-furaldehyde, acetic acid, and lactic acid. Some of these pollutants are considered hazardous air pollutants (HAPs). Tests were conducted in Illinois that indicated carbon monoxide (CO) emissions from the dryers might also have been significantly underestimated.

The tests have shown that the dryer emissions may be substantial enough to have caused violations of state and federal permitting programs. This means that new plants may need to obtain Prevention of Significant Deterioration (PSD) permits or state construction permits that have considerably stricter restrictions and pollution control requirements. It may also mean that existing plants are emitting at higher levels than previously believed, and will have to modify their existing permits and possibly install additional emissions control equipment.<sup>7</sup>

Nebraska and the EPA will address the new emissions information with each of the ethanol plants. Compliance with federal and state regulations and permit programs will be evaluated on a case-by-case basis. There are different methods in which compliance may be determined and achieved including, but not limited to, gathering additional emissions testing data, issuing permit modifications, installation of additional emission controls, taking operational limitations, and/or enforcement action. NDEQ and EPA, depending on the particular case, may use one or several of these options when addressing the dryer emissions. Recently, EPA Region VII has approved an emissions testing protocol. This protocol will be used by Nebraska and other states to ensure consistency in the evaluation of the emissions data throughout the region.

## Compliance With Ambient Air Quality Standards

NDEQ must ensure that a facility constructing or expanding their plant will comply with the national ambient air quality standards (NAAQS). Those standards are set to protect the public health, welfare, and the environment. Predictive computer modeling is the tool used to demonstrate compliance with the ambient standards. The model will utilize meteorological information (worst case), maximum air emissions, stack heights, and property boundaries in the assessment.

If modeling predicts a violation of the ambient standards, the facility must rectify the violation before a permit can be issued. The violation must be addressed by the facility to reduce emissions sufficiently to prevent noncompliance with the ambient standards. The following options are available to address the predicted violation: install additional controls; take operational limitations; reconfigure emission points (e.g. raise stack heights); delineate the ambient air boundary around the facility; or a combination of these options.

NDEQ has received several questions regarding how to delineate the ambient air boundary around the facility. For a facility to adequately delineate an ambient air boundary they must own the land or have legal right to exclusive use of the land and the public must be effectively excluded from the land. In theory, by delineating an ambient air boundary, the air inside the boundary is “exempt” from being classified as ambient air. In other words, the area inside the boundary does not have to demonstrate compliance with the NAAQS. A continuous physical or active barrier is required to adequately delineate the boundary and prevent knowing or unknowing trespassers from entering the property.

Examples of adequate physical barriers include: 4.5-foot tall 4-strand barbed wire fence; 6-foot chain link fence; or an equivalent proposal by the facility. Terrain features may also be used as a physical barrier as long as: an extraordinary effort is required to cross the particular terrain feature; it is not traversed by a trail, road, or railroad; and it cannot be traversed by an off-road vehicle.

No matter which option is selected the facility must submit a detailed plan on how they will maintain security and verify the integrity of the fence. The plan must include the following:

- Details about how the property will be posted. At a minimum, “No Trespassing” signs will be posted at an interval of every 250 feet and at every opening in the fence. The signs must be visible and easily read during daylight hours from a distance of 125 feet.
- The facility must submit details about how they will monitor the fence for integrity and trespassers, e.g., cameras posted at locations enabling surveillance staff to see each portion of the fence, security patrols making surveillance rounds, or equivalent.
- All gates must be monitored when not in use, e.g., equipped with cameras, have guards that have an unobstructed view of the opening, or equivalent.
- The facility must submit details on how they will monitor gates when not in use.

Active barriers may also be used to delineate an ambient air boundary. However, this option is used as a last resort and will be approved on a case-by-case basis. Adequate active barriers include a combination of surveillance, signs, and security patrols. The option to use an active barrier may not be allowed for PSD sources, Class I sources, sources located in an area that is not in compliance with an ambient standard, or sources that have a potential-to-emit near the PSD or Class I emission levels.



## **Haul Road Emissions**

It may appear that haul roads would not create substantial amounts of air pollution, but emissions from haul roads can account for a significant portion (5-25%) of the total particulate matter (PM<sub>10</sub>) emissions. When a facility calculates their potential emissions to determine their permitting status, they must include fugitive emissions or emissions from nonpoint sources such as roads, storage piles, or evaporative loss from tanks. If it is determined that a facility is a major source for the PSD or operating permit programs, fugitive emissions must be included and addressed in their permit. In addition, if modeling conducted for a minor source indicates that the haul roads are contributing to an ambient air violation, a minor source will have to address fugitive emissions in their permit and institute some level of emission control.

A facility may be required to conduct silt sampling to verify that the silt loading factor used in the computer model is appropriate. The permit may also require the facility to enforce speed limits, conduct frequent sweeping of the roads, or apply water or chemical surfactants to the roads to minimize dust emissions. Some facilities may also elect to conduct a site specific emission factor study that would adequately reflect the haul road emissions from their facility.

## **Other Permitting and Compliance Issues**

One of the situations that NDEQ comes across frequently is when a facility builds the plant differently than they had originally intended and their construction permit does not coincide with the actual plant's emission points. These situations can cause unnecessary confusion for permitting and compliance staff, may be a permit violation, and may require a permit modification. The facility must install the equipment that has been approved in their permit and if there are changes, submit those to NDEQ immediately. Also, a facility must begin continuous construction of the permitted emission unit(s) within 18 months of permit issuance or the permit is no longer valid.

Most violations at ethanol plants result from not reading and understanding the conditions in the construction or operating permit. Once the permit is finalized, the plant representatives will be responsible for compliance with the permit conditions. It is very important for plant staff and managers to understand these requirements to prevent permit violations. Although not required, it is helpful for plants to have at least one full-time person dedicated to maintaining compliance with the environmental regulations and permits.

Some of the common violations include failure to perform testing, testing late, exceeding emission or production limits, failure to keep adequate records, failure to submit required reports on time, and failure to conduct and keep records of control equipment maintenance.

There are a few simple tips that can help a facility maintain compliance:

- Read and reread your permit on a routine basis.
- Understand your permit requirements.
- Keep your records in one place and in a logical order.
- Properly operate and maintain control equipment.
- Designate an "environmental manager" and train a backup.
- Ask the NDEQ questions to avoid misunderstandings and mistakes.
- Plan ahead!

# Nebraska's Ethanol Plants

Nebraska is ranked third in the United States in ethanol production capacity, producing an estimated 20.4% of the nation's ethanol. In 2001, ethanol production in Nebraska totaled approximately 360,750,000 gallons; this was an increase of 12.2% over ethanol produced in 2000. In 2002, ethanol production is projected to reach 374,000,000 gallons. This projection would equate to 229 million bushels of corn or grain processed by the ethanol industry in 2002.<sup>8</sup> Table 1 lists ethanol production information for each ethanol plant in Nebraska.<sup>9</sup>

There are seven existing ethanol plants in Nebraska; one of those is not currently operating. An eighth plant is under construction in Plainview. Figure 4 illustrates the current plant locations.

The increasing demand for ethanol and the incentives made available for ethanol producers has increased the attractiveness of building new ethanol plants. NDEQ is aware of several potential ethanol projects, has received a few construction permit applications for new plants, and has met with prospective plant owners to discuss their construction plans and permitting requirements.

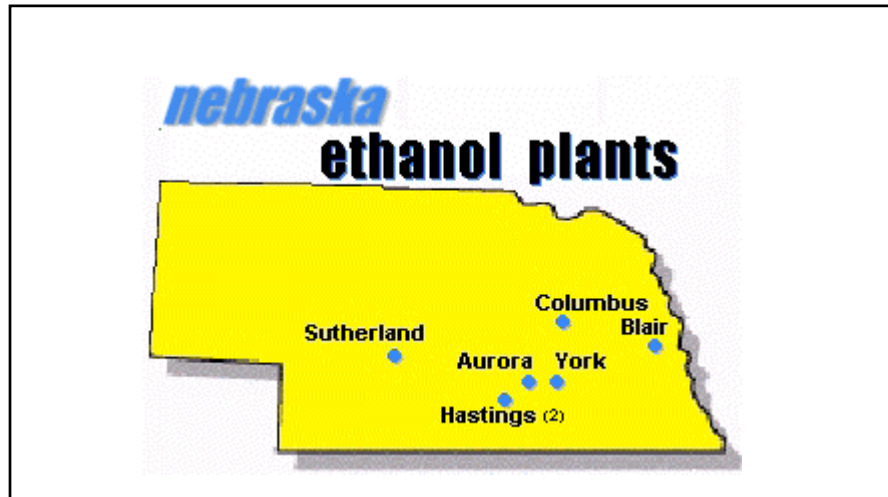


Figure 4

Nebraska Ethanol Board

**Table 1 – Nebraska Ethanol Plants**

<b>Plant Name</b>	<b>Location</b>	<b>Estimated Capacity (gallons/year)</b>	<b>Mill Process</b>	<b>Feedstock</b>	<b>Estimated Annual Grind (bushels/year)</b>	<b>Permanent Employees</b>
Chief Ethanol	Hastings	65 million	Dry	Corn & milo	26 million	65
Ag Processing	Hastings	45 million	Dry	Corn & milo	18 million	60
Minnesota Corn Processers	Columbus	80 million	Wet	Corn	80 million	275
High Plains	York	50 million	Dry	Corn & milo	20 million	60
Cargill	Blair	85 million	Wet	Corn	65 million	275
Nebraska Energy LLC	Aurora	35 million	Dry	Corn & milo	14 million	60
Sutherland Ethanol Co. LLC (not operating)	Sutherland	15 million	Dry	Corn	6 million	Currently none
Husker Ag Processing (under construction)	Plainview	25 million	Dry	Corn & milo	9 million	NA

Nebraska Ethanol Board

## Conclusion

This document is intended to pull the pieces of the air quality “permitting puzzle” together and provide assistance to ethanol plants regarding the permitting process. Knowledge of the regulatory processes and requirements is the foundation for environmental compliance.

This document also provides information regarding the ethanol plant processes and air emissions to the public and state and local government officials. An integral part of the permitting process is to provide opportunities for the public to understand and comment on activities that affect their environment.

As the nation becomes more dependent on renewable fuels, such as ethanol, the ethanol industry, the public, and local and state governments must have the knowledge that will prepare them for the future. The public health, welfare, and environment will be protected and economic development will continue if everyone communicates effectively and works together.

For questions and assistance with the air quality regulations, contact the NDEQ Air Quality Division at (402) 471-2189. For general environmental assistance, contact the Environmental Assistance Division at (402) 471-8697. The air quality regulations, permit applications, and other helpful air quality fact sheets and guidance documents can be located on the agency website at [www.deq.state.ne.us](http://www.deq.state.ne.us).

**“Good  
Communication is the  
key to a successful  
permitting process.”**

## APPENDIX A - Citations

- <sup>1</sup> Ethanol Production in Minnesota Minnesota Pollution Control Agency. May 2002. <<http://www.pca.state.mn.us/air/publications/aq1-20.pdf>> June 17, 2002.
- <sup>2</sup> Region VII Ethanol Team Workgroup. *Ethanol Production in EPA Region VII* (April 2001).
- <sup>3</sup> Ethanol Industry Outlook 2002 Renewable Fuels Association. February 2002. <<http://www.ethanolrfa.org/outlook2002.html>> June 19, 2002.
- <sup>4</sup> Senate Passes Energy Bill Including Renewable Fuels Standard and Small Ethanol Producer Tax Credit Modifications Renewable Fuels Association. April 25, 2002. <<http://www.ethanolrfa.org/pr020425b.html>> June 19, 2002.
- <sup>5</sup> Trinity Consultants. *Introduction to Air Quality Regulations*. Presentation Materials (April 2001).
- <sup>6</sup> Aspen Law & Business. *Clean Air Act Step-by-Step Compliance*. Aspen Publishers, Inc. (2002)
- <sup>7</sup> Air Emissions from Ethanol Plants: Recent Findings Minnesota Pollution Control Agency. May 2002. <<http://www.pca.state.mn.us/air/publications/aq1-21.pdf>> June 17, 2002.
- <sup>8</sup> Ethanol-Blended Fuel Consumption, Nebraska, 1978-2001 Nebraska Energy Office. <<http://www.state.ne.us/home/NEO/statshtml/65a.html>> June 25, 2002.
- <sup>9</sup> Nebraska Ethanol Plants Nebraska Ethanol Board. April 2002. <<http://ethanol.state.ne.us/plant.htm>> June 25, 2002.

## APPENDIX B - Available Resources

### Nebraska Department of Environmental Quality

PO Box 98922 • 1200 'N' St., Atrium, Suite 400 • Lincoln, NE 68509-8922

Phone: (402) 471-2186

Fax: (402) 471-2909

Air Quality Division – (402) 471-2189

Environmental Assistance Division – (402) 471-6974

Waste Management Division – (402) 471-4210 or 471-3388

Water Quality Division – (402) 471-3098 or 471-4287

[www.deq.state.ne.us](http://www.deq.state.ne.us)

### Nebraska Ethanol Board

301 Centennial Mall South • P.O. Box 94922 • Lincoln, NE 68509

Phone: (402) 471-2941

Fax: (402) 471-2470

[ethanol.state.ne.us](http://ethanol.state.ne.us)

### Nebraska Department of Economic Development

301 Centennial Mall South • P.O. Box 94666 • Lincoln, NE 68509-4666

Phone: (800) 426-6505

Fax: (402) 471-3778

[www.neded.org](http://www.neded.org)

### Environmental Protection Agency - Region VII

901 N. 5<sup>th</sup> Street • Kansas City, KS 66101

Air, RCRA, & Toxics Division – (913) 551-7020

[www.epa.gov](http://www.epa.gov)

[www.epa.gov/ttn](http://www.epa.gov/ttn) - Technology Transfer Center

### Renewable Fuels Association

One Massachusetts Ave. • Suite 820 • Washington D.C. 20001

Phone: (202) 289-3835

Fax: (202) 289-7519

[www.ethanolrfa.org](http://www.ethanolrfa.org)

### Nebraska Corn Growers Association

1327 H Street • Suite 305 • Lincoln, NE 68508

Phone: (402) 438-6459 Toll Free: 888-CORNGRW

Fax: (402) 438-7241

[www.necga.org](http://www.necga.org)

### National Corn Growers Association

1000 Executive Parkway • Suite 105 • St. Louis, MO 63141

Phone: (314) 275-9915

Fax: (314) 275-7061

[www.ncga.com](http://www.ncga.com)

### Minnesota Pollution Control Agency

520 Layfettete Road North • St. Paul, MN 55155-4194

Phone: (651) 296-6300

[www.pca.state.mn.us](http://www.pca.state.mn.us)

## **Air Quality Documents Available**

The following is a list of available Air Quality fact sheets, guidance documents, applications, forms, and reports that are located on NDEQ's website or may be obtained by contacting the NDEQ Air Quality Division.

### Fact Sheets

Acceptable Pre-construction Dirt Work  
Air Pollutant Information  
Air Quality Acronyms and Abbreviations  
Air Quality Models  
Bake-off Ovens  
Compliance Assurance Monitoring  
Construction Permit Application Tips  
Construction Permits  
Deviations  
Disposal of Construction and Demolition Waste  
Dust  
General Asbestos Information  
Inspection Tips From NDEQ's Air Quality Division  
Maintaining Good Air Quality Through the Increment Rules of the PSD Program  
Nebraska's Low Emitter Rule  
Odor  
Open Burning  
Operating Permits  
Redesignation of Air Quality Control Regions  
Secondary Aluminum Production NESHAP

### Guidance Documents

Air Quality Requirements for Secondary Aluminum Sweat Furnaces  
Annual Certification of Compliance and Semi-Annual Report of Deviations  
Atmospheric Dispersion Modeling Guidance for Permits  
Demolition, Renovation and the Asbestos Regulations  
Fire Training Policies and Guidelines Related to Asbestos  
How to Calculate Yearly and Rolling Totals and Rolling Averages  
Tax Refund Guidelines for Air and Water Pollution Control Projects

### Forms and Applications

Air Emission Inventory Forms  
Construction and Operating Permit Applications  
Low Emitter Forms  
Relocation Notice  
Open Burning Permit Applications  
Asbestos Notifications

### Reports

Air Quality and Ethanol Production  
Nebraska Air Quality 2000  
Regional Haze Report  
Technical Basis for Total Reduced Sulfur

# APPENDIX C – Document Acronyms & Abbreviations

<b>BACT</b>	Best Available Control Technology
<b>CFR</b>	Code of Federal Regulations
<b>CO</b>	Carbon Monoxide
<b>DDGS</b>	Dried Distillers Grain Solids
<b>EPA</b>	Environmental Protection Agency
<b>H<sub>2</sub>S</b>	Hydrogen Sulfide
<b>HAP</b>	Hazardous Air Pollutant
<b>MACT</b>	Maximum Achievable Control Technology
<b>MmBtu/hr</b>	Million Btu per hour
<b>MTBE</b>	Methyl Tertiary Butyl Ether
<b>NAAQS</b>	National Ambient Air Quality Standards
<b>NAICS</b>	North American Industry Classification System
<b>NDEQ</b>	Nebraska Department of Environmental Quality
<b>NESHAPs</b>	National Emission Standards for Hazardous Air Pollutants
<b>NO<sub>2</sub></b>	Nitrogen Dioxide
<b>NO<sub>x</sub></b>	Nitrogen Oxides
<b>NSPS</b>	New Source Performance Standards
<b>Pb</b>	Lead
<b>PM</b>	Particulate Matter
<b>PM<sub>10</sub></b>	Particulate Matter with an aerodynamic diameter less than 10 microns
<b>PSD</b>	Prevention of Significant Deterioration
<b>PTE</b>	Potential to Emit
<b>SIC</b>	Standard Industrial Classification
<b>SO<sub>2</sub></b>	Sulfur Dioxide
<b>SO<sub>3</sub></b>	Sulfate
<b>SOCMI</b>	Synthetic Organic Chemical Manufacturing Industry
<b>SO<sub>x</sub></b>	Sulfur Oxides
<b>tpy</b>	Tons per Year
<b>TRS</b>	Total Reduced Sulfur
<b>TSP</b>	Total Suspended Particulate
<b>VOC</b>	Volatile Organic Compound
<b>WDGS</b>	Wet Distillers Grain Solids