PSD

Workbook

A Practical Guide to Prevention of Significant Deterioration

DEQ

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Michigan Department of Environmental Quality
Air Quality Division

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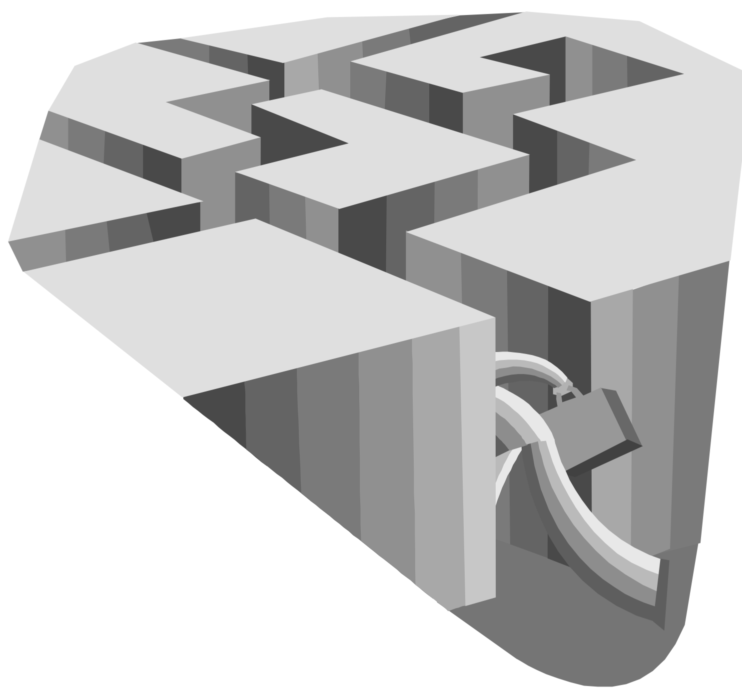
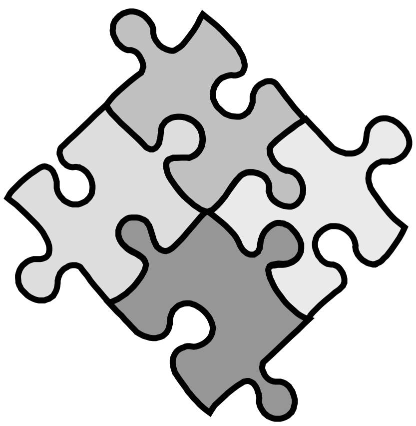


CHAPTER 1: OVERVIEW OF PSD

Major stationary sources and major modifications to major stationary sources are required by the Clean Air Act to undergo a new source review and obtain a permit before construction. This federal NSR program affects major sources and major modifications in areas designated as nonattainment, attainment, or unclassifiable. In attainment and unclassifiable areas the federal NSR program is implemented under the Prevention of Significant Deterioration (PSD) program as found in 40 CFR 52.21. Nonattainment areas are covered under Michigan's Rule 220.

The basic goals of the PSD program are: (1) to ensure that economic growth can continue while simultaneously preserving existing air quality (i.e., prevent degradation of an attainment area into a nonattainment area); and (2) to preserve and protect the air quality in areas of special natural recreational, scenic, or historic value, such as national parks and wilderness areas (i.e., Class I areas). The primary provisions of the PSD regulations require that new major stationary sources and major modifications be carefully reviewed prior to construction to ensure compliance with the NAAQS, the applicable PSD increment concentrations, and the requirement to apply BACT on the project's emissions of air pollutants.



On December 31, 2002, the United States Environmental Protection Agency (USEPA) substantially reformed the PSD program. The reformed program modified PSD as it had been implemented pursuant to the1977 Clean Air Act mandates and 1980 federal court decisions. The December regulations became effective in the State Of Michigan on March 3, 2003. The Michigan Department of Environmental Quality (MDEQ) implements the PSD program in the state under a delegation of authority from USEPA.

The requirements of the PSD program apply to new major stationary sources and major modifications to existing major stationary sources. A "major stationary source" is any source type belonging to a list of 28 source categories which emits or has the potential to emit 100 tons per year or more of any NSR pollutant, or any other source type which emits or has the potential to emit any NSR pollutant in amounts equal to or greater than 250 tons per year. A stationary source generally includes all pollutant-emitting activities which belong to the same industrial grouping, are located on contiguous or adjacent properties, and are under common control.

A major modification is generally a physical change or a change in the method of operation of an existing major stationary source which would result in both a significant emissions increase and a significant net emissions increase of any NSR pollutant. In determining if a specific project would become subject to the PSD program, the modification must be determined to result in both a significant emissions increase and a significant net emissions increase.

Important Terms

One key to PSD is to understand the terms and acronyms that are used in the program. The following are some of the key terms used in PSD permitting.

National Ambient Air Quality Standards (NAAQS)
PSD Increment Concentrations
Regulated NSR Pollutants (formerly Criteria Pollutants)
Project
Attainment Areas
Non-Attainment Areas
Unclassifiable Areas
Class I Areas
Best Available Control Technology (BACT)
Potential to Emit
Allowable Emissions
Actual Emissions
Major Stationary Source
Significant Thresholds
Major Modification

National Ambient Air Quality Standards

The Clean Air Act requires the USEPA to establish maximum allowable pollutant concentrations in the ambient air that may cause harm to the public health or welfare. In response to this charge, the USEPA has developed the National Ambient Air Quality Standards (NAAQS). The NAAQS falls into two categories, primary and secondary standards. Primary standards are generally protective of public health. Secondary standards are generally protective of the public welfare (i.e., soils, vegetation and structures).

National standards have been established for particulate matter (PM10 and PM2.5), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxides (NO_X), lead (Pb), and ozone. Ozone is formed in the ambient air by the reaction of volatile organic compounds (VOCs) and NO_X under certain atmospheric conditions (i.e., primarily hot and sunny). Ozone is therefore, regulated through its precursors (NO_X and VOCs).

The following table identifies the current NAAQS:

National Ambient Air Quality Standards (NAAQS)

Pollutant	Value	Averaging Period	Type
Sulfur Dioxide	**1300 µg/m^3**	**3-hour**	**Secondary Standard**
	365 µg/m^3	**24-hour**	**Primary Standard**
	80 µg/m^3	**Annual**	**Primary Standard**
Nitrogen Oxides	**100 µg/m^3**	**Annual**	**Both**
Carbon Monoxide	**40,000 µg/m^3**	**1-hour**	**Primary Standard**
	10,000 µg/m^3	**8-hour**	**Primary Standard**
Ozone	**235 µg/m^3**	**1-hour**	**Both**
	157 µg/m^3	**8-hour**	**Both**
PM10	**150 µg/m^3**	**24-hour**	**Both**
	50 µg/m^3	**Annual**	**Both**
PM2.5	**65 µg/m^3**	**24-hour**	**Both**
	15 µg/m^3	**Annual**	**Both**

<u>PSD Increment Concentrations</u>

Unlike the NAAQS, which act as ceiling concentrations, the PSD Increment Concentrations represent the maximum allowable increase in pollutant concentrations from any individual source. The net effect of emissions from all sources in an area is compared against the NAAQS. Each individual new source or major modification is compared against acceptable PSD Increment Concentrations. In Michigan, no new source or major modification is allowed to consume more than 80 percent of the available PSD Increment.

<u>Regulated NSR Pollutants</u>

Prior to the 2003 reforms, PSD applied only to those pollutants for which a NAAQS had been developed. Since the reforms, PSD applies to all regulated NSR pollutants. Regulated NSR pollutants are defined as:

- Any pollutant for which a NAAQS has been developed;
- Any pollutant regulated under a New Source Performance Standard;
- Any material identified as contributing to the depletion of stratospheric ozone; or
- Any other material regulated under the Clean Air Act except for Hazardous Air Pollutants.

In general, this list is limited to substances for which a NAAQS has been developed. Some notable exceptions include; ozone depleting substances and hydrogen sulfide, total reduced sulfur compounds and municipal waste combustor emissions.

Project

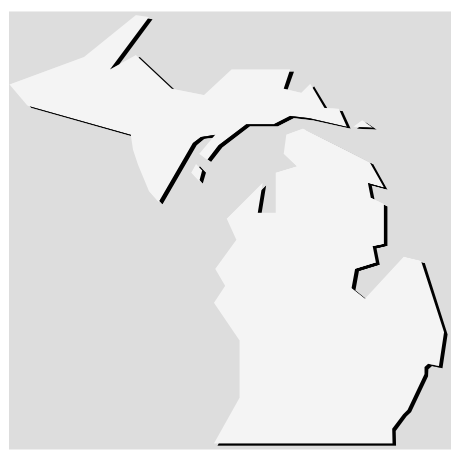
A project is defined as a physical change in, or change in the method of operation of an existing major source. A project may affect one or more emission units. Each affected emission unit must be included in the applicability determination for that project.

Attainment Areas

Regions of the country in which the measured air quality is cleaner (i.e., having lower pollutant concentrations) than the NAAQS are referred to as attaining the NAAQS, or being in attainment. In these Attainment Areas, PSD attempts to prevent the degradation of air quality. To achieve this goal, PSD requires new major sources and major modifications at existing sources to implement stringent controls and to limit the impacts on ambient air quality to less than the NAAQS or PSD Increment Concentrations. In so doing, the program attempts to minimize the impact of new major sources and major modifications – to prevent significant deterioration of the already clean air quality. All counties in Michigan are currently designated as Attainment Areas.

Nonattainment Areas

Regions of the country in which the measured air quality is dirtier (i.e., having higher pollutant concentrations) than the NAAQS are referred to as not attaining the NAAQS, or being in nonattainment. PSD does not apply in these Nonattainment Areas. The federal NSR regulations require more stringent measures in these areas because the goal in a Nonattainment Area is to improve the air quality rather than preventing degradation. Currently Michigan has not counties designated as Nonattainment Areas.



Unclassifiable Area

Regions of the country in which the air quality is unknown with respect to the NAAQS are referred to as Unclassifiable Areas. A region may be unclassifiable due to an absence or insufficient quantity of monitored air quality data. Remote regions of the country having little or no industrial development are often Unclassifiable Areas due to the impracticality of maintaining air quality monitors in such locations. Unclassifiable Areas are subject to the PSD program as if they were Attainment Areas. Currently Michigan has no counties located in Unclassifiable Areas.

Class I Area

Areas of special natural recreational, scenic, or historic value, such as national parks and wilderness areas are designated as Class I areas. Class I areas receive special attention under the PSD regulations. New sources and major modifications subject to the PSD program that may impact a Class I Area are required to conduct additional environmental reviews for any such impacts. Michigan currently contains two Class I areas – Seney National Wildlife Refuge and Isle Royale National Park.

Best Available Control Technology

A Best Available Control Technology (BACT) analysis is conducted in a top-down manner on a case-by-case basis for each project subject to PSD. A BACT analysis is designed to identify the best control technology for each specific project. In a BACT analysis all possible control technologies are identified. Technically infeasible control options are excluded and the remaining control options are ranked according to their control efficiency. The energy, environmental, and economic impacts of the remaining options are evaluated and the top control option is selected as BACT. This process requires a significant amount of documentation and technical evaluations, and can be the most time consuming evaluation when obtaining a PSD permit.

Potential to Emit

A source's potential to emit is defined as the maximum capacity of the source to emit a pollutant under its physical and operational design. Physical or operational limits on the source's capacity, including the use of air pollution control equipment or operational restrictions must be enforceable in a timely and practical matter in order to be credited as limiting the source's potential to emit.

A source is classified as either a major source or minor source with respect to PSD based upon its potential to emit. The applicability of PSD will depend on whether a source is classified as a major or minor source. New major sources will be subject to PSD, as is any change at an existing major source greater than a specified significant threshold (less than the major source threshold). Minor sources must first become major sources (or make a change that by itself is a major source) before becoming subject to PSD.

Major Stationary Source

The requirements of the PSD program apply to new major stationary sources and major modifications (as described below) to existing major stationary sources. A major stationary source is any source type belonging to the following list of 28 source categories which emits or has the potential to emit 100 tons per year or more of any regulated NSR pollutant, or any other source type which emits or has the potential to emit any regulated NSR pollutant in amounts equal to or greater than 250 tons per year. A stationary source generally includes all pollutant-emitting activities which belong to the same industrial grouping, are located on contiguous or adjacent properties, and are under common control.

1. Coal Cleaning Plants (with thermal dryers)
2. Kraft Pulp Mills
3. Portland Cement Plants
4. Primary Zinc Smelters
5. Iron and Steel Mills
6. Primary Aluminum Ore Reduction Plants
7. Primary Copper Smelters
8. Municipal Incinerators capable of charging more than 250 tons per day of refuse
9. Hydrofluoric Acid Plants
10 Sulfuric Acid Plants
11. Nitric Acid Plants
12. Petroleum Refineries
13. Lime Plants
14. Phosphate Rock Processing Plants
15. Coke Oven Batteries
16. Sulfur Recovery Plants
17. Carbon Black Plants (furnace process)
18. Primary Lead Smelters
19. Fuel Conversion Plants
20. Sintering Plants
21. Secondary Metal Production Plants
22. Chemical Process Plants
23. Fossil-Fuel Boilers (or combinations thereof) > 250 million Btu per hour heat input
24. Petroleum Storage and Transfer Units with a total storage capacity > 300,000 barrels
25. Taconite Ore Processing Plants
26. Glass Fiber Processing Plants
27. Charcoal Production Plants
28. Fossil Fuel-Fired Steam Electric Plants > 250 million Btu per hour

Significant Thresholds

The significant threshold for each regulated NSR pollutant, presented in the following table, are established by the regulations as the levels above which a project at an existing major source will become subject to PSD. Before becoming subject to PSD the specific project must be found to result in both a significant emissions increase and a significant net emissions increase.

In other words, if a specific project will result in an emissions increase greater than the significant amount, then that project may be subject to PSD. But, it is not the emissions increase from the specific project alone that determines PSD applicability. Once the project has been determined to result in a significant emissions increase, the increase may be combined with other emissions increases and decreases made at the facility contemporaneously with the specific project. If the net result is greater than the significant amount, the specific project is determined to result in a significant net emissions increase and is subject to PSD. If the first step does not result in a significant emissions increase, then it is not necessary to determine the net emissions increase.

Significant Thresholds

Pollutant	Quantity (TPY)
Sulfur Dioxide	40
Nitrogen Oxides	40
Carbon Monoxide	100
Particulate Matter (PM)	25
PM10	15
Volatile Organic Compounds (VOCs)	40
Lead (Pb)	0.6
Asbestos	0.007
Beryllium	0.0004
Mercury	0.1
Vinyl Chloride	1.0
Fluorides	3.0
Sulfuric Acid Mist	7.0
Hydrogen Sulfide (H_2S)	10
Total Reduced Sulfur (including H_2S)	10
Municipal Waste Combustor Organics	15
Municipal Waste Combustor Acid Gases	40
Municipal Solid Waste Landfill NMOC	50

Allowable Emissions

Allowable emissions are the level of emissions allowed to a source under the terms of its permit. This level is typically enforceable and therefore, becomes the source's potential to emit. By selecting an optimal level of allowable emissions, a source may maximize its operational flexibility and minimize the number or type of regulatory requirements that apply – avoid becoming subject to PSD.

Actual Emissions

Actual emissions are the level of emissions actually emitted to the air from a source. By regulatory definition, actual emissions as of a specific date are equal to the source's average emissions over the two most recent 12-month periods preceding the specific date. Actual emissions are used to determine the magnitude of certain changes made at a source subject to PSD. The magnitude of these changes help determine whether or not a specific project at the source will be subject to PSD.

Baseline Actual Emissions

Baseline actual emissions are defined as the level of emissions from a source that actually occurred over any consecutive 24-month period during a previous period immediately prior to a specific project at a source. Baseline actual emissions are used as the starting point for determining the magnitude of changes in order to determine whether or not the change will be subject to PSD.

Projected Actual Emissions

Projected actual emissions are the maximum level of emissions associated with the level and type of business activity projected to occur in any one of the next 5 or 10 years following a specific project at a source subject to PSD. Projected actual emissions are used in conjunction with baseline actual emissions to determine the magnitude of a specific project and whether or not the project will be subject to PSD.

Major Modification

A major modification is generally a physical change or a change in the method of operation of an existing major stationary source which would result in both a significant emissions increase and a significant net emissions increase of any regulated NSR pollutant. In determining whether a specific project would become subject to the PSD program, the modification must be determined to result in both a significant emissions increase and a significant net emissions increase.

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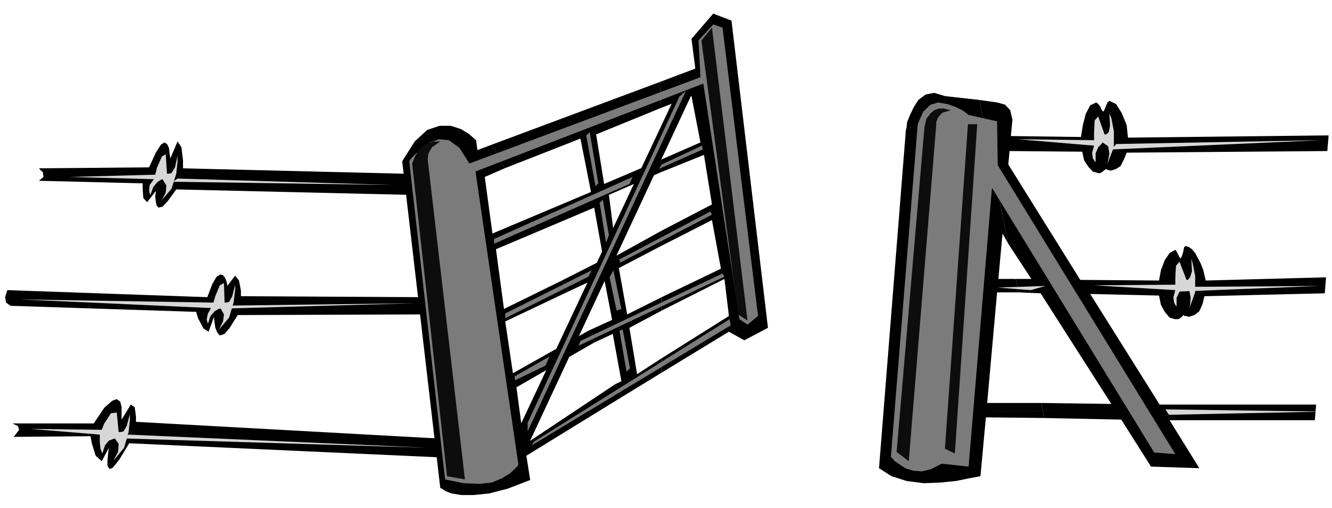
CHAPTER 2
PSD APPLICABILITY

In this Chapter:

- Stationary Source
- Major and Minor Sources
- New and Existing Sources
- Modifications
- Applicability Thresholds
- Magnitude of a Change
- Net Change in Emissions
- Changes Not Subject to Thresholds



CHAPTER 2: PSD APPLICABILITY

Perhaps the most complicated and frustrating aspect of PSD is determining applicability. For years, PSD applicability determinations have confused and angered many in the regulated community. In the past, applicability resulted from changes that allowed a facility to utilize emissions that were already permitted. On its face, this would have seemed to be very simple – if they were already permitted, then why would a change that allowed their use have to go through a PSD permitting review? Often, a simple, small, change would be compared with the total unused level of permitted emissions at the facility – making the small change appear quite large, on paper. PSD applicability was based on this seemingly large emissions increase. No provision existed to base PSD applicability solely on the emissions increase that would result from the small change. Under the NSR reforms, this difficulty has been addressed.

In principle, PSD applicability is not very complicated. The difficulties arise in practice. As with so many things in life, the devil's in the details.

A simple statement of PSD applicability could be as follows:

> **If a proposed new source or change at an existing source is greater than the appropriate applicability threshold, it will be subject to PSD.**

The difficulty with PSD applicability is that each term in the above statement can involve a detailed evaluation.

Source

Before applicability can be determined, the stationary source must be defined. A stationary source generally includes all pollutant-emitting activities which belong to the same industrial classification, are located on contiguous or adjacent properties, and are under common control.

Some industrial complexes involve more than one stationary source. For example, let's consider a facility that includes an electric generating station, a steel mill, plus a variety of automotive manufacturing and assembly operations. Based on the Standard Industrial Classification (SIC) for each of these operations, this facility will consist of three stationary sources. The SIC system designates the electric generating station under one major classification (No. 49), the steel mill under another major classification (No. 33), and the automobile manufacturing and assembly operations under a third major classification (No. 37). Even though these three operations are located at the same site and are operated under common control, they do not belong to the same industrial classification and therefore, each constitutes a separate stationary source.

The same would be true if all three operations were classified under the same industrial grouping by the SIC system, but were not located on contiguous or adjacent properties. Also if they were under the same SIC grouping, located on contiguous or adjacent properties, but operated by three separate entities, they would likewise be considered three separate stationary sources. In order to be grouped together as a single stationary source, all three criteria must be met.

Naturally, there is an exception to this rule. When one or more of the operations act as a support facility for one of the other operations, they will be considered part of the same stationary source. In this example, if the electric generating station provides more than 50 percent of its output to the steel mill and automotive operations, then it is considered a support facility and cannot be separated from the automotive operations. Likewise, the steel mill may act as a support facility in this example if it provides more than 50 percent of its output to the automotive operations. The key feature of a support facility is that it either provides more than 50 percent of its output to the other operations, or it receives more than 50 percent of its raw materials from the other operations.

Major and Minor Sources

Now that the stationary source has been identified and distinguished from any others that might exist at the site, it must be determined whether or not it is a major stationary source. To be a major stationary source, it must have the potential to emit (or permitted, allowable emissions) greater than 100 tons per year if it is one of the 28 listed source types, or 250 tons per year if it is not one of the 28 listed source types. The listed 28 source types are identified in Chapter 1.

New and Existing Sources

We have been talking about existing sources without defining what we mean by that term. According to 40 CFR 52.21(b)(7), an existing source is one that has operated for more than 24 consecutive months since the date of its initial operation. Any facility that is proposed, under construction, or that has not been operational for 24 months since its date of initial operation, is considered a new source. The distinction between new and existing sources is important because it will affect the PSD applicability threshold for specific future projects.

Michigan's Rule 701 also defines a new source. However, the Rule 701 definition serves only to identify what sources are subject to its companion Rule 702. These two Michigan-only rules cover only VOC emitting sources and should not be confused with the PSD definition of a new source.

Remember our simple statement of PSD applicability?

If a proposed new source or change at an existing source is greater than the appropriate applicability threshold, it will be subject to PSD.

We've only worked our way through the first five words so far – we can identify the specific source that we are dealing with, we can determine if it is a new or an existing source and we can determine if it is a major source or not.

Next we will consider what constitutes a change at an existing source.

Modifications vs. Excluded Changes and Projects

According to 40 CFR 52.21(b)(2), a modification is any physical change, or change in the method of operation of an existing major stationary source. Neither USEPA nor the regulations define a physical change or a change in the method of operation. The regulations specifically exclude certain changes (physical and operational) from being considered modifications. USEPA says that if a particular change is not specifically excluded, it is included as a modification. Therefore, except for the following specific exclusions, any physical change or change in the method of operation is considered a modification.

Specific exclusions:

- Routine maintenance, repair, and replacement (40 CFR 52.21(b)(2)(iii)(a));
- Use of alternative fuels (under certain circumstances) (40 CFR 52.21(b)(2)(iii)(b) – (e));
- An increase in operating hours or production rate, unless either are prohibited by permit condition (40 CFR 52.21(b)(2)(iii)(f));
- Any change in ownership (40 CFR 52.21(b)(2)(iii)(g));
- The addition, replacement, or use of a Pollution Control Project (40 CFR 52.21(b)(2)(iii)(h)); and,
- Certain qualifying clean coal projects (40 CFR 52.21(b)(2)(iii)(i) – (k)).

Whenever a change is occurring at an existing major stationary source, the possibility exists for more than one emission unit to be affected. The scope of the projected (i.e., the list of affected emission units) must always be clearly identified right at the beginning of the applicability determination. This is the most common and most serious error made by applicants when evaluating a change for PSD applicability.

Remember, whenever a change is occurring, it is possible for more than one emission unit to be affected.

Applicability Thresholds

Determining whether or not PSD will apply to a new source depends on whether the new source will generate emissions greater than the major source thresholds. Determining whether or not PSD will apply at an existing source depends on whether a specific project (i.e., modification or change) will generate both a significant emissions increase by itself and a significant net emissions increase at the facility. The following table will help summarize PSD applicability thresholds.

To use the following table, you must first identify which type of facility is under consideration. The facility must be either a proposed new source or an existing source and either major or minor. Once you know which quadrant the facility falls into, you can identify the PSD applicability thresholds for that facility.

	New	**Existing**
Minor	**No PSD** **But may require a minor source Permit to Install (PTI)**	**PSD for modifications that <u>by themselves</u> exceed the major source threshold based on potential to emit (i.e., modifications that are new major sources)**
Major	**PSD for each NSR pollutant emitted at levels greater than the significant levels**	**PSD for modifications that result in significant and significant net emission increases**

Determining the Magnitude of a Change

We have established that the appropriate PSD applicability threshold may be either the major source thresholds or the significant thresholds (see definitions of these terms in Chapter 1), depending on whether the facility is new or existing, major or minor. The question remains as to how the magnitude of a change is determined. In other words, “What must be compared to the appropriate PSD applicability threshold?”

There are four different ways of determining the magnitude of a change:

1. For a project (i.e., proposed modification or proposed new source) that involves only the installation of new emission units, the Actual to Potential test is used. This applicability test involves comparing the post-change potential emissions of the new emission units to the Baseline Actual Emissions from these units. Baseline Actual Emissions are determined as described in Chapter 3. If the difference is greater than the appropriate PSD applicability limit, then the project will be subject to PSD.

For projects located at existing major sources, the appropriate PSD applicability limit is the significant amount for each regulated NSR pollutant. In order to be subject to PSD at such a source, a project must not only result in a significant emissions increase (an increase greater than the significant amount), but must also result in a significant net emissions increase. Netting is discussed in Chapter 3.

2. For a project that involves only the modification of existing emission units, the Actual to Projected Actual test is used. This applicability test involves comparing the post-change projected actual emissions of the modified emission units to the Baseline Actual Emissions from these units. Baseline Actual Emissions are determined as described in Chapter 3. If the difference is greater than the appropriate PSD applicability limit, then the project will be subject to PSD.

   For projects located at existing major sources, the appropriate PSD applicability limit is the significant amount for each regulated NSR pollutant. In order to be subject to PSD at such a source, a project must not only result in a significant emissions increase (an increase greater than the significant amount), but must also result in a significant net emissions increase. Netting is discussed in Chapter 3.

3. For a project that involves only a Clean Unit, the Clean Unit test is used. Any modification to a Clean Unit that will not cause the emission unit to lose its Clean Unit designation is deemed to result in no emissions increase. Clean Units are discussed in Chapter 5.

4. For a project that involves combinations of new emission units, existing emission units and Clean Units, the Hybrid Test is used. This applicability test involves using the appropriate applicability test as described above for each type of emission unit and then adding together the emissions increases. If the sum of the increases is greater than the appropriate PSD applicability limit, then the project will be subject to PSD unless the net emissions increase at the entire facility is below the appropriate PSD applicability limit.

   For projects located at existing major sources, the appropriate PSD applicability limit is the significant amount for each regulated NSR pollutant. In order to be subject to PSD at such a source, a project must not only result in a significant emissions increase (an increase greater than the significant amount), but must also result in a significant net emissions increase. Netting is discussed below.

SUMMARY

Three types of Emission Units:

- New
- Existing
- Clean.

Four ways to determine emissions changes:

- Actual to Potential
- Actual to Projected Actual
- Clean Unit Test
- Hybrid Test

Determining the Net Emissions Change

As stated above, in order to be subject to PSD, a project at an existing major source must result in both a significant emissions increase and a significant net emissions increase. The four methods described above allow determination of the significant emissions increase, which is the first step in determining PSD applicability. The second step in determining PSD applicability is determining the net emissions change. The net emissions change involves emissions increases and decreases that have occurred throughout the entire facility – not merely the emission units affected by the proposed project.

Once a proposed project at an existing major source has been determined to result in a significant emissions increase, all other emissions increases and decreases for that pollutant that have occurred at the facility within the contemporaneous period are combined with the emissions increase from the proposed project. If the net result is an emissions increase less than the significant amount for each regulated NSR pollutant, then the facility has successfully "netted out" of PSD applicability. If the end result remains greater than the significant amount for any regulated NSR pollutant, then the proposed project will result in both a significant emissions increase and a significant net emissions increase for that pollutant and will be subject to PSD.

There are restrictions on which emissions increases and decreases may be included in a netting analysis. There are also specific methodologies for determining the magnitude of any emissions increases or decreases. These restrictions and methodologies include definitions of the contemporaneous period and which increases or decreases are creditable. The appropriate procedures for conducting a netting analysis are discussed in Chapter 3.

Changes not Subject to Applicability Thresholds

PSD applicability, as discussed above, depends on a new source or a change to an existing source resulting in emissions increases above certain applicability thresholds. There are some projects that are not subject to applicability thresholds. Proposed projects that qualify as Pollution Control Projects (PCPs) and proposed projects at a facility with a Plantwide Applicability Limit (PAL) are not subject to the applicability determination procedures described above. PCPs are discussed in Chapter 7. Any proposed project that qualifies as a PCP is specifically excluded from PSD applicability. Likewise, any proposed project at a PAL facility is excluded from PSD applicability unless it would result in an emissions increase above the level of the PAL. PALs are discussed in Chapter 6.

Returning to our PSD applicability statement one final time:

If a proposed new source or change at an existing source is greater than the appropriate applicability threshold, it will be subject to PSD.

We have covered the terms of this statement, and have seen how a simple statement of applicability turns into a complicated series of analyses. We have identified, but not yet described the methodologies for:

- Calculating Baseline Actual Emissions,
- Conducting Netting Analyses,
- Determining Projected Actual Emissions,
- Qualifying as a Clean Unit,
- Establishing Plantwide Applicability Limits, or
- Identifying Pollution Control Projects.

These will be covered in the following chapters of this workbook in addition to the technical and environmental reviews that must be conducted once a project is determined to be subject to PSD, including:

- Pre-construction Air Quality Monitoring,
- Best Available Control Technology (BACT),
- Determining Ambient Air Quality Impacts, and
- Additional Required Impact Assessments.

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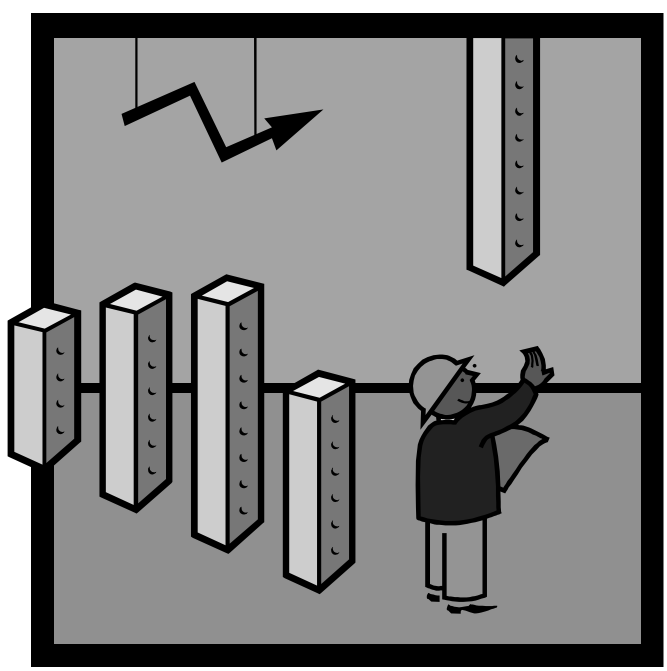
CHAPTER 3
BASELINE EMISSIONS AND NETTING

In This Chapter:

- New and Existing Emission Units
- Baseline Emissions for EUSGUs
- Baseline Emissions for Non-EUSGUs
- Netting
- Contemporaneous Period
- Creditable Changes
- Baseline Emissions for Creditable Changes
- Post-Change Potential Emissions
- Determining the Net Emissions Change
- Examples



CHAPTER 3: BASELINE ACTUAL EMISSIONS AND NETTING

Baseline Actual Emissions (BAE) is the starting point for all PSD applicability determinations. They represent the benchmark from which the magnitude of emission changes at existing facilities is determined. Prior to the March 3, 2003 reforms, the method for determining BAE was not defined in the PSD regulations. This chapter will describe the methodology for determining BAE.

BAE have been established for three specific purposes:

- For modifications, to determine a modified emission unit's pre-change emissions as part of a PSD applicability determination.

- For netting, to determine the pre-change actual emissions of an emission unit that underwent an emissions increase or decrease during the contemporaneous period for a specific project.

- For Plant wide Applicability Limits (PAL), to establish the level of a PAL.

For each of these three purposes, BAE are calculated on an emission unit-specific basis. For different types of emission units there are minor differences in the methodology. USEPA has established two different methods for determining BAE for two different emission unit types – one for Electric Utility Steam Generating Units (EUSGU's), and another method for all other types of emission units. The method of determining BAE for EUSGU's will be covered first, followed by the method for all other source types. Finally, this chapter will conclude with a discussion of BAE used in netting and will cover the methodology for conducting a netting analysis.

Electric Utility Steam Generating Unit

Any steam electric generating unit that is constructed for the purpose of supplying more than one-third of its potential electric output capacity and more than 25 MW electrical output to any utility power distribution system for sale. Any steam supplied to a steam distribution system for the purpose of providing steam to a steam-electric generator that would produce electrical energy for sale is also considered in determining the electrical energy output capacity of the affected facility.

40 CFR 52.21(b)(31)

New and Existing Emission Units in BAE

A new emission unit is defined as a unit that is newly constructed and that has existed for less than two years from the date it first operated. An existing emission unit is defined as a unit that is not a new emission unit. New emission units have not had an opportunity to develop a pattern of actual operations on which to establish baseline emissions. Therefore, the amount of emissions from a new emission unit to include in BAE is defined by regulation.

New emission units that have not yet begun normal operation (i.e., are still under construction or are conducting initial shakedown operations), are included in the BAE at zero emissions. New emission units that have begun normal operation are included in the BAE at their potential to emit.

BAE for EUSGUs (Used for PSD Applicability and Setting a PAL)

Baseline Actual Emissions are the average actual emissions calculated over two consecutive years (i.e., 24 consecutive months) of actual operation. Electric Utility Steam Generating Units (EUSGUs) must identify actual emissions that occurred during any consecutive 24-month period during the five years immediately preceding the date on which construction actually begins for a specific project. Because PSD is a pre-construction requirement, BAE must be determined prior to beginning construction. This makes identification of the specific date on which construction actually begins an estimated date. As such, it is possible that future delays in the start of construction could require a re-evaluation of PSD applicability.

For example, if a facility selects the 24-month period beginning exactly five years prior to the expected start of construction date, and the start of construction is delayed several months, the baseline period emissions will no longer be valid – they will lie outside of the specified five-year period. However, the permitting authority (MDEQ) may exercise discretion in allowing an alternative 24-month period as the baseline period on the basis that the alternative period is more representative of normal facility operation.

Helpful Hint:

A facility's annual MAERs reports may be a good starting point.

In order to use a selected 24-month period, the facility must possess adequate documentation to allow the calculation of actual emissions throughout the selected period. The documentation must also allow the calculation of any required adjustments to actual emissions as discussed below. If documentation is missing or incomplete for any part of the selected 24-month period, a different 24-month period must be selected.

When a proposed project involves, or affects, multiple emission units, only one 24-month period can be selected for the combination of all affected emission units. When a proposed project involves more than one regulated NSR pollutant, a different 24-month period may be selected for each pollutant. This may result in the selection of a 24-month period that does not include emissions from all affected emission units. That is, some affected emission units may have been installed after the selected 24-month period. When a facility selects its 24-month period, this must be one of the considerations made. Emission units installed after the selected 24-month period will have BAE of zero, unless the emission unit is a new emission unit that has begun normal operation, as described above.

Helpful Hint:

Be sure to carefully define the project. Identify ALL affected emission units.

Any emissions during the selected 24-month period that resulted from facility operation in excess of any applicable emission limit must not be included in the BAE. Calculating the amount of emissions in excess of an applicable emission limit can be a complicated matter. For many EUSGU's short-term emission limits are specified in terms of pollutant concentration in the exhaust gas (i.e., ppmv). Conversion of excess emissions from short-term concentration to annual mass must be done prior to establishing the BAE.

Allowable fugitive emissions, if they can be quantified, must be included in the BAE. This will not usually result in additional emission calculations because PSD sources for which fugitive emissions are quantifiable are already required to consider fugitive emissions. Typically, such sources are already required to maintain records and emission calculations to track fugitive emissions. Also, for EUSGU's, fugitive emissions are not typically a concern, unless outdoor solid fuel storage (i.e., coal piles) is conducted.

Also, emissions resulting from startup, shutdown and malfunctions must be included in the BAE. During startup, shutdown and malfunctioning periods, EUSGU's experience emission rates much higher than during periods of normal operation. Many EUSGU's also utilize continuous emissions monitoring systems (CEMS) to track emissions. Such systems will already be providing emission estimates for periods of startup, shutdown and malfunction. Therefore, separate calculations will not always be necessary. These emissions will already be included in the emission records for the facility.

To summarize, for EUSGU's, BAE are determined by:

1. Identifying the proper look back period for a particular project. For EUSGU's this is the five year period immediately proceeding the date on which construction actually begins.

2. Selecting a 24-month period that meets all of the necessary criteria:

   - Common to all affected emission units;
   - May be different for each pollutant; and
   - Sufficient documentation exists to calculate actual emissions and any adjustments to actual emissions that are necessary.

3. Calculating the annual average emission rate based on the actual emissions from all affected emission units during the selected 24-month period.

4. Adjusting the calculated emissions for non-compliant emissions, quantifiable fugitive emissions, startup, shutdown and malfunction emissions.

BAE for Non-EUSGUs (Used for PSD Applicability and Setting a PAL)

As with EUSGU's Baseline Actual Emissions are the average actual emissions calculated over two consecutive years (i.e., 24 consecutive months) of actual operation. Non-EUSGU's must identify actual emissions that occurred during any consecutive 24-month period during the ten years immediately preceding the date on which construction actually begins for a specific project or the date on which a complete permit application was submitted for that project. The regulations preclude the use of any baseline period prior to November 15, 1990. Because PSD is a pre-construction requirement, and construction waivers are not allowed, BAE will almost always be determined from the complete application date.

As with EUSGU's, in order to use a selected 24-month period, the facility must possess adequate documentation to allow the calculation of actual emissions throughout the selected period. The documentation must also allow the calculation of any required adjustments to actual emissions as discussed below. If documentation is missing or incomplete for any part of the selected 24-month period, a different 24-month period must be selected.

When a proposed project involves, or affects, multiple emission units, only one 24-month period can be selected for the combination of all affected emission units. When a proposed project involves more than one regulated NSR pollutant, a different 24-month period may be selected for each pollutant. This may result in the selection of a 24-month period that does not include emissions from all affected emission units. That is, some affected emission units may have been installed after the selected 24-month period. When a facility selects its 24-month period, this must be one of the considerations made. Emission units installed after the selected 24-month period will have BAE of zero, unless the emission unit is a new emission unit that has begun normal operation, as described above.

Example:

A natural gas fired peaking turbine (non-EUSGU) that operates only during the summer months is subject to Rule 801 which requires a NO_X emissions reduction from its 0.40 pounds per million Btu emission rate to 0.25 pounds per million Btu beginning April 1, 2004.

The baseline actual emissions for this unit averaged 350 tons per year during 1998-1999. Since Rule 801 applies to this emission unit, the 350 tons per year must be reduced as follows:

$$350 \text{ ton/yr} \times 0.25/0.40 = 218.75 \text{ ton/yr}$$

Any emissions during the selected 24-month period that resulted from facility operation in excess of any applicable emission limit must not be included in the BAE. Calculating the amount of emissions in excess of an applicable emission limit can become involved. For example, most coating sources must comply with short-term (i.e., daily) emission limits in terms of coating content (lb VOC/gallon). Conversion of excess emissions from short-term pounds per gallon to annual mass must be done prior to establishing the BAE.

Unlike EUSGU's, BAE for non-EUSGU's must be further adjusted downward to exclude any emissions that would have exceeded an emission limit with which the facility must currently comply. Even though the limitation did not exist during the selected 24-month period, the actual emissions during that period must be adjusted as if the limit did exist. Limits with which the facility must currently comply include final regulations with a future compliance date. Final regulations are applicable requirements for a facility even if the compliance date has not yet passed. The fact that the compliance date has not yet arrived doesn't matter, the required reductions are certain. In Michigan, reductions in BAE are not necessary for MACT standards, because the MACT standards have not been relied upon by MDEQ to make an attainment demonstration or maintenance plan.

Allowable fugitive emissions, if they can be quantified, must be included in the BAE. This will not usually result in additional emission calculations because PSD sources for which fugitive emissions are quantifiable are already required to consider fugitive emissions. Typically, such sources are already required to maintain records and emission calculations to track fugitive emissions. If fugitive emissions are not a concern for a particular facility, or if they are already included due to the nature of the emissions calculations (e.g., VOC calculations based on mass balance), then separate calculations will not be necessary.

Also, emissions resulting from startup, shutdown and malfunctions must be included in the BAE. For non-EUSGU's, startup and shutdown emissions are not typically higher than emissions during periods of normal operation. When this is the case, separate calculations to determine startup and shutdown emissions will not be required. In the absence of a CEMS, emissions during malfunctioning periods may be very difficult to quantify. These emissions must be handled on a case-by-case basis.

To summarize, for non-EUSGU's, BAE are determined by:

1. Identifying the proper look back period for a particular project. For non-EUSGU's this is the ten year period immediately preceding the earlier of the date on which construction actually begins or when a complete application is submitted.

2. Selecting a 24-month period that meets all of the necessary criteria:

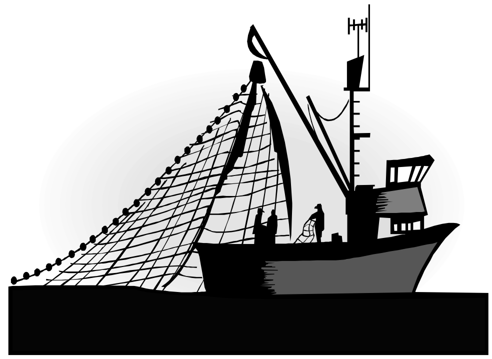
    - Common to all affected emission units;
    - May be different for each pollutant; and
    - Sufficient documentation exists to calculate actual emissions and any adjustments to actual emissions that are necessary.

3. Calculating the annual average emission rate based on the actual emissions from all affected emission units during the selected 24-month period.

4. Adjusting the calculated emissions for non-compliant emissions, quantifiable fugitive emissions, startup, shutdown and malfunction emissions, and for regulations with which the facility must currently comply.

NETTING

PSD applicability for modifications at existing sources depends on the modification (i.e., project) resulting in both a significant emission increase by itself and a significant net emissions increase at the whole facility. If a proposed project does not result in a significant emissions increase, then netting is not required. The process of evaluating the net emissions increase at the whole facility involves evaluating all recent (i.e., contemporaneous) increases and decreases in actual emissions at the entire facility and determining if they are creditable. These contemporaneous, creditable emissions changes must be unrelated to the specific project. If they are related to the project, then their emissions must be included in the determination of its emissions increase, not the net emissions increase. If the analysis demonstrates that net emissions will increase less than the significant amount above BAE for any regulated NSR pollutant, the proposed project will not be subject to PSD for that pollutant. Whenever netting is used in a PSD applicability determination, the permit will be subject to the public participation procedures discussed in Chapter 11.



In some cases, a facility may choose to skip the netting analysis and base PSD applicability on the emissions increase from the proposed project alone. In other cases, there will be no contemporaneous changes to use in a netting analysis so PSD applicability will be forced to rely solely on the emissions increase from the proposed project.

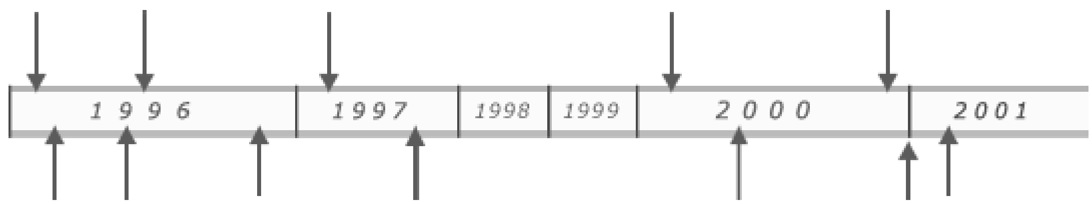
The steps involved in conducting a netting analysis are as follows:

1. Identify the contemporaneous period
2. List each physical change, or change in the method of operation that occurred, or will occur, during the contemporaneous period with a corresponding increase or decrease in actual emissions (include the date of each change)
3. Evaluate each change on the list to identify only those changes that are creditable
4. List each remaining creditable, contemporaneous change (including the date of each change)
5. Separately calculate the BAE for each creditable, contemporaneous change
6. Identify the post-change potential emissions for each emission unit affected by each creditable, contemporaneous change
7. Calculate the emissions increase or decrease for each emission unit as post-change potential minus BAE
8. Sum all emission increase and decreases with the significant emissions increase from the original proposed project

As with many aspects of PSD, a simple statement or stepwise approach can hide some complicated evaluations. This eight-step approach to netting also hides a great deal of complexity. The following discussion describes the details of each of the eight steps listed above. After this discussion, an example will be used to illustrate a netting analysis.

Contemporaneous Period

The regulations define the contemporaneous period as beginning five years prior to the start of construction on the proposed project and ending when the project begins operation. This time frame covers an approximate 5-year span, but is expanded to allow inclusion of changes that occur simultaneous with the proposed project. Therefore, to be considered in a netting analysis, a change must have occurred within 5 years of the beginning of construction on the proposed project or after the beginning of construction and before the initial operation of the proposed project. For the purposes of the contemporaneous period, the initial operation of the project includes an initial shakedown period, not to exceed six months.



Creditable Changes

There are further restrictions regarding which contemporaneous changes can be credited in determining net emissions increases and decreases. To be creditable, a contemporaneous emissions decrease must be federally enforceable on and after the date that construction begins on the proposed project. The emissions decrease must take place prior to the emissions increase (from the project) with which it is being netted. Any emissions decrease must be permanent (continuing). To assure this, the facility must demonstrate that either: the decrease was federally enforceable at the time it occurred; or that the decrease has continued from the time it occurred and will continue until it can be made federally enforceable. An emissions reduction cannot occur at, and therefore, cannot be credited from an emission unit that was never constructed or operated, including units that received a PSD permit.

If an emissions increase or decrease has previously been relied upon in the issuance of a PSD permit then it is not creditable. Additionally, if an emissions increase or decrease (except for VOCs) does not otherwise affect the available PSD Increment Concentrations, it is not creditable (i.e., a change must affect the available PSD Increment Concentration to be creditable). A brief description of PSD Increment Concentrations is found in Chapter 1. A more detailed discussion of PSD Increment Concentrations is found in Chapter 10.

Emission increases and decreases that occur at Clean Units are not creditable unless the reduction occurs prior to, or after expiration of, the effective date of the Clean Unit designation, except as follows. Reductions at Clean Units, or from implementation of a Pollution Control Project (PCP), may be creditable to the extent that the reductions exceed the level of reduction on which the Clean Unit designation, or PCP exclusion, was granted and the reductions are surplus, quantifiable, permanent and enforceable as a practical matter.

BAE for Creditable Changes

As described above, BAE are taken as the calculated annual average emission rate based on the actual emissions from the affected emission units determined over a consecutive 24-month period during the most recent five year period (for EUSGU's), or ten year period (for non-EUSGUS's). The five or ten year look back period begins at the date of each contemporaneous emissions change. Adequate documentation must exist to calculate actual emissions and any necessary adjustments to actual emissions. The emission rate must be adjusted for non-compliant emissions, quantifiable fugitive emissions, startup, shutdown and malfunction emissions, and emission unit shutdown emissions. For non-EUSGU's, the emission rate must be further adjusted for regulations with which the facility must currently comply. Unlike baseline actual emissions used for determining significant emissions increases, BAE creditable, contemporaneous emission changes are not required to use a single 24-month period when multiple emission units are affected.

Post-Change Potential Emissions for Creditable Change

Most creditable emissions changes result from either a physical change or a change in the method of operation of one or more emission units. In Michigan, most of these changes are required to be permitted through the Permit to Install (PTI) program. The PTI's for these changes define the potential emissions from each emission unit after the change. Potential emissions for changes that were not required to obtain a PTI are often defined by the regulation which specifies the conditions for PTI exemption, or by other applicable regulations. If not defined by regulation or permit limit, then the emission unit's true potential to emit is used.

Determining the Magnitude of Each Creditable Change

The magnitude of a creditable change is determined based on the difference between the post-change potential emissions and the pre-change baseline actual emissions for the change. Using this methodology, any change where the post-change potential emissions exceed the BAE for the change will result in a creditable emissions increase. When the post-change potential emissions are less than the BAE for the change a creditable emissions decrease has occurred.

Determining the Net Emissions Change

When conducting a netting analysis, ALL creditable contemporaneous emissions increases and decreases for the specific pollutant must be used. A netting analysis cannot be based on the decreases alone. Neither can a netting analysis be based on a partial set of increases and decreases. Therefore, in order to determine the net emissions change, the emission changes from each and every creditable, contemporaneous change must be added together with the emissions increase from the project for which the netting analysis is being conducted. If the resulting emission change is less than the significant amount for any regulated NSR pollutant, then that pollutant will not be subject to PSD.

EXAMPLE

Coatings-R-Us (CRU) operates a manufacturing facility in an area which is in attainment for all regulated NSR pollutants. CRU is a major stationary source and coats and assembles a large number of metal and plastic parts. CRU proposes to install a second finishing booth on one of its existing metal parts coating lines, Coating Line C. The application for the new booth was received January 2, 2003 and additional information was requested on February 11, 2003. The facility also proposes to increase emissions from its plastic parts coating line, Coating Line D, in order to accommodate the increased production rate at Coating Line C.

The proposed project (i.e., new booth on Line C and increased production on Line D) has been determined to result in a VOC emissions increase of 120 tons per year. In order to determine whether or not this project is subject to NSR, the net emissions increase must be determined.

The following data has been provided by the facility:

- Construction is projected to begin January 1, 2004
- Powder coating replaced solvent-based coatings on Coating Line B (existing metal parts coating line) on January 1, 2000
- An RTO was installed on Coating Line A and began operation March 5, 2003 – this installation was designated as a Clean Unit
- A touch up and maintenance booth was removed August 15, 1998
- A small parts prime coating process was permitted on December 1, 2002, and has not yet begun operation – it is limited by permit condition to VOC emissions of
  10 tons per year
- No netting exercise has been performed at the facility in the past 12 years.

Year	**'91**	**'92**	**'93**	**'94**	**'95**	**'96**	**'97**	**'98**	**'99**	**'00**	**'01**	**'02**
Coating Line A	32	28	20	29	19	16	14	18	18	16	15	16
Coating Line B	160	144	119	145	118	74	48	105	103	1	1	1
Coating Line C	103	88	59	90	58	44	32	58	58	44	41	43
Small Parts Prime	-	-	-	-	-	-	-	-	-	-	-	0
Touchup	59	48	40	50	20	39	27	20	-	-	-	-
Total	354	308	238	314	215	173	111	201	179	61	57	60

Step 1 - Identify the contemporaneous period

The contemporaneous period covers the five years prior to the start of construction and includes the period from construction to initial operation, when it ends. Construction on the new booth for Coating Line C is projected to begin January 1, 2004. The contemporaneous period therefore, begins January 1, 1999.

Example continued:

Step 2 – List all Emissions Changes During the Contemporaneous Period

- Powder coating installed on Coating Line B – January 1, 2000
- RTO installed on Coating Line A – began operation March 5, 2003
- Small parts prime coating process permitted – December 1, 2002

The maintenance booth removal in August 1998 occurred prior to the start of the contemporaneous period and cannot be included in the netting analysis.

Step 3 – Identify Creditable Changes

<u>Powder Coating</u>

The facility did not obtain a Permit to Install when it replaced the use of solvent based coatings with powder coatings on Coating Line B. Michigan's regulations exempt the installation of powder coatings from such requirements. In spite of not being permitted, the emissions reduction is still federally enforceable because the criteria necessary to qualify and maintain exemption from the Permit to Install requirements effectively limit emissions from the powder coating operations. The emission reductions on Coating Line B will continue until the netting exercise becomes incorporated into a permit for the proposed project. Therefore, this replacement of solvent based coatings with powder coatings is a creditable change.

<u>RTO Installation</u>

The installation of an RTO on Coating Line A was designated as a Clean Unit. Emission reductions at Clean Units cannot be used in a netting analysis unless the reduction occurs prior to, or after expiration of, the effective date for the Clean Unit designation. This reduction on Coating Line A occurred simultaneous with the Clean Unit designation. Therefore, this RTO installation is not a creditable change.

<u>Small Parts Prime</u>

The installation of a small parts prime coating process was permitted at only ten tons per year. It did not go through PSD permitting because it was not a major modification. Therefore, it is a creditable change.

Step 4 – List the Creditable, Contemporaneous Changes

The previous step identified that there are two creditable changes at this facility – Coating Line B powder coating and small parts prime.

Step 5 – Establish BAE for Creditable Changes

Both of the creditable, contemporaneous changes are for non-EUSGU's, therefore, BAE is determined by:

Example Continued:

1. Identifying the proper look back period for each affected emission unit. For netting purposes, for non-EUSGU's this is the ten year period immediately preceding the earlier of the date on which construction actually begins or when a complete application is submitted, but cannot include any period prior to November 15, 1990.
2. Selecting a 24-month period that meets all of the necessary criteria:
   - May be different for each affected emission unit;
   - May be different for each pollutant; and
   - Sufficient documentation exists to calculate actual emissions and any adjustments
3. Calculating the annual average emission rate based on the actual emissions from all affected emission units during the selected 24-month period.
4. Adjusting the calculated emissions for non-compliant emissions, quantifiable fugitive emissions, startup, shutdown and malfunction emissions, and for regulations with which the facility must currently comply.

Powder Coating

The replacement of solvent based coatings with powder coatings on Coating Line B occurred January 1, 2000. The ten year look back period for this change begins on November 15, 1990. Because the full ten years would include periods prior to this date, the look back period for this change must be cut short at that date.

Based on the historical emissions data provided above, the two year period 1991-1992 will be selected. Since only one emission unit and one regulated NSR pollutant are involved in this creditable change, only one 24-month period is needed. Sufficient documentation exists for these two years only on a calendar year basis. Therefore, the 24-month period is chosen to coincide with the calendar years (i.e., January through December).

Since fugitive emissions are already included in the documented emissions data for the 1991-1992 period, no adjustments for fugitive emissions are necessary. Also, since the coating line was previously uncontrolled and the 1991-1992 emissions data is based on mass balance calculations (i.e., emissions equal usage), startup, shutdown and malfunction emissions are already included in the documented emissions data. No further adjustments are necessary for Coating Line B, since no new requirements became applicable after the selected 24-month period.

Based on the acceptable 24-month period of 1991-1992, the BAE for the creditable, contemporary emissions change at Coating Line B is (160 + 144)/2 = 152 tons per year.

Small Parts Prime

The small parts prime operations are a new emission unit as defined in the regulations (40 CFR 52.21(b)(7)). Based on this definition and the fact that the process has been permitted and is under construction, the baseline is zero as defined in the regulations (40 CFR 52.21(b)(48)(iii)).

Step 6 – Identify the Potential to Emit

Powder Coating

In many cases the operation of a powder coating operation results in zero VOC emissions. However, there are cases when the theoretical worst-case emissions are based on exclusive use of powders that contain a very small percentage of residual VOC. Therefore, the calculated potential to emit for Coating Line B, using powder coatings is one ton per year. In the absence of any permit or regulatory limit which further restricts the potential to emit (i.e., allowable emissions), the true potential to emit is used.

Small Parts Prime

The small parts prime operation was recently issued a Permit to Install that limits the potential to emit to ten tons per year.

Step 7 – Calculate the Magnitude of each Change

	Powder Coating	Small Parts Prime
Potential to Emit	1	10
Baseline Actual Emissions	- 152	- 0
Emissions Change	- 151	10

Step 8 – Sum All Changes with the Proposed Project

	Emissions Change
Proposed Project	120
Powder Coating	- 151
Small Parts Prime	+ 10
Net Emissions Change	- 21

The net emissions increase is less than the significant value for VOCs (i.e., 40 tons per year), therefore, the project is not a major modification and is not subject to PSD.

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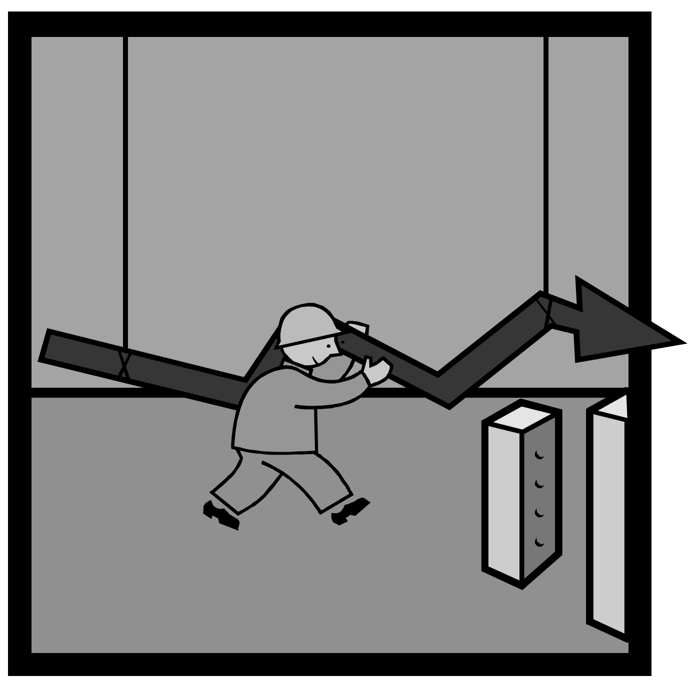
CHAPTER 4
APPLICABILITY TESTS BASED ON EMISSIONS CHANGES

In This Chapter:

- Actual to Potential Test
- Actual to Projected Test
- Recordkeeping and Reporting Requirements
- Permit Content
- Examples



CHAPTER 4: APPLICABILITY TESTS BASED ON EMISSIONS CHANGES

Having established the methodology for determining Baseline Actual Emissions in Chapter 3, we are ready to take on the two most common PSD applicability determinations – the Actual to Potential Emissions Test (A2P) and the Actual to Projected Actual Emissions Test (A2A).

Other applicability tests exist for special categories of sources. The Clean Unit test applies to changes at emission units that have been designated as Clean Units. Clean Units will be covered in Chapter 5. For facilities operating under a Plantwide Applicability Limit (PAL) PSD does not apply at all unless the facility wishes to increase its emissions above the PAL. PAL's will be covered in Chapter 6.

As outlined in Chapter 2, PSD applicability for changes that involve only new emission units is determined using the A2P. For changes that involve only existing emission units, PSD applicability is determined using either the A2A or the A2P. PSD applicability for changes that involve some new and some existing emission units is determined using the hybrid test. We will cover these three applicability tests in order – Actual to Potential (A2P), Actual to Projected Actual (A2A) and Hybrid.

<u>Actual to Potential Emissions Test</u>

The Actual to Potential Emissions Test (A2P) can be used for projects involving new or existing emission units. For new emission units, it is mandated as the only method for determining PSD applicability. The A2P involves comparing the potential to emit of each emission unit affected by a project to its BAE. The A2P is used to determine the emissions increase from the proposed project – not the net emission increase. It is only used for the first half of the two-step PSD applicability determination.

> **<u>Helpful Hint:</u>**
>
> *Be sure to carefully define the project. Identify ALL affected emission units.*

Potential to emit is defined in 40 CFR 52.21 (b)(4) as:

> The maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.

According to this definition, an emission unit's permit-limited emissions (i.e., allowable emissions) after the proposed project represent its potential to emit. Therefore, many facilities choose to accept permit limits in order to avoid becoming subject to PSD. Permit limits that accomplish this process of limiting out of PSD are called "Synthetic Minor" limits. Projects that are limited out of PSD applicability are also referred to as

"Synthetic Minor." Future changes to a Synthetic Minor source or project may result in a re-evaluation of the original PSD applicability determination.

If the sum of the post-project potential emissions for all affected emission units exceeds the BAE by greater than the appropriate PSD applicability threshold, the proposed project may be subject to PSD depending on the magnitude of the net emissions increase. If the potential emissions of all affected emission units after the proposed project exceed the BAE by less than the appropriate applicability threshold, no further evaluation is necessary – the project is not subject to PSD.

The A2P is the traditional applicability determination method used by all sources prior to the March 3, 2003 NSR reforms. This method, when applied to existing emission units tends to overstate the magnitude of the emission increase associated with a particular project. The permitted, allowable emissions after a project do not always represent the emissions increase that results from that change. It often represents the increase from that change plus any production capacity that was not being used during the baseline period.

For example, consider a natural gas fired boiler that emits nitrogen oxides (NO_X) at 75 pounds per hour and has consistently operated 7200 hours per year. This boiler will generate NO_X emissions of 270 tons per year. The boiler's permit limits emissions to the equivalent of 8760 hours per year, or 328.5 tons per year. If a project were undertaken that would increase the boiler's emission rate from 75 to 80 pounds per hour, the potential emissions would increase from 328.5 to 350.4 tons per year.

For this project, the A2P would measure the increase as 350.4 tons per year (potential) minus 270 tons per year (BAE) or 80.4 tons per year. However, because the increase in hourly emissions will not automatically result in an increased boiler utilization, most of the calculated difference between potential emissions and BAE result from unused capacity utilization (i.e., operation beyond 7200 hours per year).

This aspect of the A2P has frustrated industry for many years. Even small changes can be counted as major modifications and subject to PSD. Therefore, in its reforms to NSR, USEPA has developed another applicability test - the Actual to Projected Actual Emissions Test (A2A).

Actual to Projected Actual Emissions Test

Do not Forget:

To properly define the project. Identify ALL affected emission units.

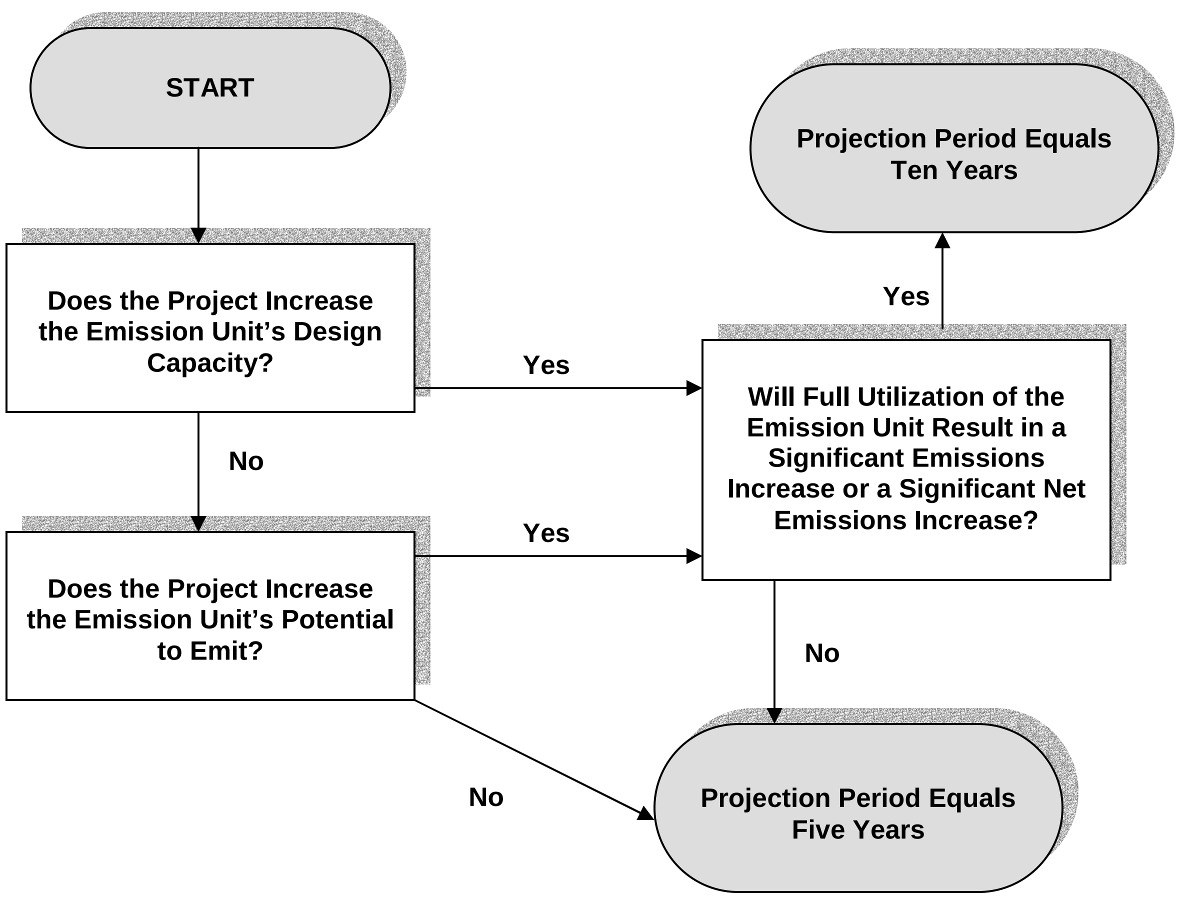
The Actual to Projected Actual Emissions Test (A2A) is a more complicated evaluation than the A2P. The A2A was developed in an effort to evaluate PSD applicability based only on the emission increases that are attributable to a proposed project. Other increases, such as emission increases due to changes in business demand (i.e., capacity utilization) unrelated to the proposed project, are not counted. However, increases in capacity utilization that will result from the proposed project are counted. For example, when a proposed project is necessary in order to handle a projected increase in business demand, then the emissions associated with that increased capacity utilization are attributed to the project.

The A2A involves comparing projected actual emissions from all affected emission units with the BAE from the affected emission units. The A2A cannot be used with new emission units. Because this applicability test involves estimates of future business activity, it requires a substantial amount of documentation. The future estimates must be available in public documents, or confidential business information, on which the facility is basing its business decisions. Future estimates generated for the purposes of the applicability test are not acceptable.

The procedures for determining projected actual emissions are set forth in the PSD regulations under 40 CFR 52.21 (b)(41).

Step 1 – Determine the projection period

The projection period begins on the date the affected emission unit resumes regular operation after completion of the proposed project. Typically, the projection period must encompass the first <u>five</u> years after resuming regular operation. Under certain circumstances, the projection period will encompass the first <u>ten</u> years after resuming regular operations. The following flow chart outlines the decision-making process to determine whether the projection period will be five or ten years:



Resuming regular operation means that construction and initial shakedown of the modified emission unit has been completed. The PSD regulations, in general, allow 180 days to be counted as the initial shakedown period.

Step 2 – Develop an initial projection

The actual annual emissions associated with the projected level of business activity in each year of the projection period must be determined. The projected level of business activity must be based on existing, available information as described above. Documentation must be made available to the MDEQ to support any projection.

Projections may be based on:

- Historical operating data (i.e., trends). Documentation must be provided to support the projected continuation of any trend throughout the projection period.
- The company's own representations. Existing available documentation must be provided demonstrating that the company has made such representations to the public, to its shareholders, to its board or to its parent company.
- The company's expected business activity and the company's highest projections of business activity. As before, existing available documentation must be provided demonstrating that the company has established such expectations and made such projections for business purposes.
- The company's filings with state and federal regulatory authorities. Copies of such filings must be provided.
- Any other enforceable documentation that may include projections of business activity during the projection period (e.g., compliance plans).

The projection is an estimate of business activity. Once established, the actual annual emissions that correspond to that level of business activity must be calculated. The absence of adequate documentation will nullify the projection. In such a situation, the A2A will not be allowed and the facility must use the A2P.

Step 3 – Adjustments to the initial projection

Fugitive emissions, if they can be quantified, must be included in the projected actual emissions. Additionally, emissions associated with startups, shutdowns and malfunctions must be included in the projected actual emissions.

Step 4 – Excluded emissions

Emissions increases that are not related to the specific proposed project may be excluded from the projected actual emissions. These emissions can be identified as those that:

> **Could have been accommodated during the selected 24-month baseline period by the pre-modified emission units**
>
> **And**
>
> **Are not related to the proposed project**

Emissions that could have been accommodated are not the baseline period allowable emissions for the affected emission units. They are the level of emissions from the pre-modified emission units operating at the projected level of business activity. Any permit or regulatory restrictions on the operation of the affected emission units must be taken into consideration when determining excludable emissions.

Determining whether certain emissions increases are related to the proposed project will be a case-by-case determination. For example, if a widget manufacturing process is being modified to accommodate the production of gadgets as well as widgets, then any projected emissions that will result from the continued manufacture of widgets are not related to the modification – they would have occurred anyway.

Step 5 – Determine projected emissions increase

Projections must be developed for each year, not necessarily a calendar year, during the projection period. Each of these projected levels of actual annual emissions must be compared with the greater of: the excludable emissions; or, the BAE to determine the magnitude of the resulting emissions increase. PSD applicability will be based on the highest emissions increase calculated in this way (i.e., the highest projected increase).

> **Reminder:**
>
> **A2P = Actual to Potential applicability test**
> **A2A = Actual to Projected Actual applicability test**

A2A Recordkeeping and Reporting Requirements

Prior to beginning actual construction on a proposed project, a facility must record the following information:

- A description of the project;
- Identification of each affected emission unit;
- A description of the applicability test used; including,
    - The BAE;
    - The projected actual emissions;
    - The amount of excluded emissions;
    - The reason for excluding that amount; and,
    - Any netting calculations, if applicable.

The PSD regulations (i.e. 40 CFR 52.21(r)(6)) only require this information to be recorded if there is a “reasonable possibility” that the project may result in a significant emissions increase. Further, the PSD regulations only require this information to be submitted to the MDEQ for EUSGUs. However, the MDEQ’s minor source permitting program – Rule 201 – requires this information to be submitted for all sources as part of a complete Permit to Install application before beginning actual construction on the proposed project.

After resuming normal operation following completion of the project, the PSD regulations also require the facility to monitor the emissions of any regulated NSR pollutant that could increase as a result of the project and that are emitted by any of the affected emission units. In addition, annual emissions, in tons per year, are required to be calculated at the end of each year following the date that normal operation resumes after completion of the project. These monitoring and emission calculation requirements shall continue for each year of the projection period.

For EUSGU’s, a report of each affected emission unit’s annual emissions must be submitted to the MDEQ within 60 days after the end of each year of the projection period. For non-EUSGU’s, a report is only required for those years in which actual annual emissions exceed the BAE by more than the significance threshold and differ from the pre-construction projected emissions. Such a report for non-EUSGU’s must include:

- The name, address and telephone number of the facility;
- The calculated annual emissions; and,
- Any other information the owner or operator wishes to include in the report (e.g., an explanation why the emissions differ from the projection).

All such information, whether it is required to be submitted to the MDEQ or not, is required to be maintained on site and made available for review upon request, by the MDEQ.

The circumstances that lead to the submittal of this report (i.e., actual emissions exceed BAE by more than the significant threshold and differ from the projection) do not automatically constitute a violation of PSD. There are many legitimate circumstances under which this could occur. The most obvious is that business growth exceeds the projected growth rate. In this case, the fact that business turns out to be better than expected is not a violation of PSD. The growth, if it had been accurately projected, would have resulted in excluded emissions and the conclusions of the original PSD applicability determination would not have changed. The submittal of this report will only trigger an evaluation of the circumstances to determine if a PSD violation may have occurred.

Permit Content

Facilities using the A2A will be required by permit conditions to conduct the monitoring and emission calculations, and to keep and maintain the records described above. The projected actual emissions will not be instituted as an enforceable permit requirement. However, it will likely find its way into the permit for informational purposes only.

EXAMPLES:

Following are several examples to help clarify the A2A. These examples are built on the boiler example used above to illustrate the A2P. The boiler emits NO_X at 75 pounds per hour and has consistently operated very near 7200 hours per year throughout the ten-year baseline look back period. The BAE is: 7200 hr/yr x 75 lb/hr x 1 ton/2000 lb = 270 tons/yr.

The proposed project will increase the hourly emission rate from 75 to 80 pounds per hour.

For all of the following examples, the first step, determining the projection period is the same. The proposed project increases the emission unit's potential to emit from 75 to 80 pounds per hour. Using the A2P, operation of the emission unit for the allowed 8760 hours per year would represent an emissions increase greater than the 40 ton per year significant threshold:

$$
\begin{array}{rl}
8760 \text{ hr/yr} \times 80 \text{ lb/hr} \times 1 \text{ ton/2000 lb} = & 350.4 \text{ tons/yr} \\
- \; 7200 \text{ hr/yr} \times 75 \text{ lb/hr} \times 1 \text{ ton/2000 lb} = & 270.0 \text{ tons/yr} \\
\hline
= & 80.4 \text{ tons/yr}
\end{array}
$$

Because the potential emissions increase and full utilization would result in a significant emissions increase, the projection period must be ten years.

Example 1:

Step 2 – Develop an initial projection

The company utilizes the consistent historical operating trend to project a continued boiler utilization, after the project, of 7200 hours per year. Documentation is provided showing, in addition to the past trend, that future natural gas contracts indicate the company is not intending any significant increases in boiler utilization. Further, internal company correspondence with its corporate headquarters demonstrates no growth is

Example 1 continued:

projected. Therefore, the initial projected actual emissions are:

7200 hr/yr x 80 lb/hr x 1 ton/2000 lb = 288.0 tons/yr

Step 3 – Adjustments to the initial projection

Continuous NO_X emission monitor records demonstrate that the emission unit does not generate any excess emissions during the few startups and shutdowns it undergoes each year. Further, no malfunctions have occurred in any of the past ten years. Therefore, no adjustments to the initial projected emissions are necessary.

Step 4 – Excluded emissions

Excluded emissions are those that are unrelated to the modification and were capable of being accommodated by the pre-modified emission unit. These are, generally, the level of emissions that would have been emitted anyway – without the modification. This boiler was capable of accommodating emissions of 75 pounds per hour. For this boiler, the first 75 pounds per hour at the projected level of capacity utilization are unrelated to the modification. Therefore, there are excludable emissions in the amount of:

7200 hr/yr x 75 lb/hr x 1 ton/2000 lb = 270.0 tons/yr

In this situation, the excludable emissions are the same as the BAE. In the examples to follow, this will not always be true.

Step 5 – Determine projected emissions increase

Since the excludable emissions equal the BAE, the projected increase is determined by:

288.0 tons/yr - 270.0 tons/yr = 18 tons/yr

In this case, the proposed modification is less than the significant threshold and is not subject to PSD – netting is not required.

Example 2:

Step 2 – Develop an initial projection

In this scenario, the company projects that their business will grow a total of five percent over the next ten years. They document their projection with copies of an internal report provided to their parent company and their parent company's stockholder prospectus,

Example 2 continued:

both showing a five percent growth over the next ten years for this division of the company.

The projected level of emissions is equal to:

7200 hr/yr x 1.05 = 7560 hr/yr

7560 hr/yr x 80 lb/hr x 1 ton/2000 lb = 302.4 tons/yr

Step 3 – Adjustments to the initial projection

Continuous NO_X emission monitor records demonstrate that the emission unit does not generate any excess emissions during the few startups and shutdowns it undergoes each year. Further, no malfunctions have occurred in any of the past ten years. Therefore, no adjustments to the initial projected emissions are necessary.

Step 4 – Excluded emissions

Excluded emissions are those that are unrelated to the modification and were capable of being accommodated by the pre-modified emission unit. These are, generally, the level of emissions that would have been emitted anyway – without the modification. This boiler was capable of accommodating emissions of 75 pounds per hour. For this boiler, the first 75 pounds per hour at the projected level of capacity utilization are unrelated to the modification. Therefore, there are excludable emissions in the amount of:

7560 hr/yr x 75 lb/hr x 1 ton/2000 lb = 283.5 tons/yr

In this situation, the excludable emissions are greater than the BAE.

Step 5 – Determine projected emissions increase

Since the excludable emissions are greater than the BAE, the projected increase is determined by:

302.4 tons/yr - 283.5 tons/yr = 18.9 tons/yr

In this case, the proposed modification is less than the significant threshold and is not subject to PSD – netting is not required.

Example 3:

Step 2 – Develop an initial projection

In this scenario, the company projects that their business will grow a total of ten percent over the next ten years. They document their projection with copies of an internal report provided to their parent company and their parent company's stockholder prospectus,

Example 3 continued:

both showing a ten percent growth over the next ten years for this division of the company. The documentation also shows that the expected growth is due to the introduction of a new product. The manufacture of the new product is the reason the boiler is being modified.

The projected level of emissions is equal to:

7200 hr/yr x 1.10 = 7920 hr/yr

7920 hr/yr x 80 lb/hr x 1 ton/2000 lb = 316.8 tons/yr

Step 3 – Adjustments to the initial projection

Continuous NO_X emission monitor records demonstrate that the emission unit does not generate any excess emissions during the few startups and shutdowns it undergoes each year. Further, no malfunctions have occurred in any of the past ten years. Therefore, no adjustments to the initial projected emissions are necessary.

Step 4 – Excluded emissions

Excluded emissions are those that are unrelated to the modification and were capable of being accommodated by the pre-modified emission unit. These are, generally, the level of emissions that would have been emitted anyway – without the modification. Because the increased utilization rate is due to the modification, it cannot be excluded. Therefore, the excludable emissions are equal to the BAE in the amount of:

7200 hr/yr x 75 lb/hr x 1 ton/2000 lb = 270.0 tons/yr

In this situation, the excludable emissions are equal to the BAE.

Step 5 – Determine projected emissions increase

Since the excludable emissions are equal to the BAE, the projected increase is determined by:

316.8 tons/yr - 270.0 tons/yr = 46.8 tons/yr

In this case, the proposed modification results in a significant emissions increase. A netting analysis must be conducted to determine if it also results in a significant net emissions increase before determining whether or not it is subject to PSD.

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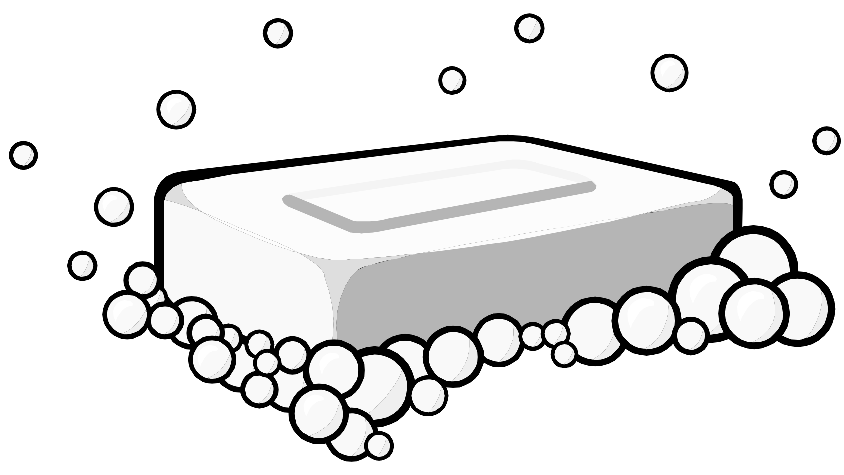
CHAPTER 5
CLEAN UNIT TEST

In This Chapter:

- Overview
- Qualifying for Clean Unit Designation
- Equivalent Technology
- Clearinghouse Demonstration
- Case-specific Demonstration
- Clean Unit Designation in ROPs
- Maintaining Clean Unit Designation
- Re-qualifying



CHAPTER 5: CLEAN UNIT TEST

When small physical changes are made at facilities with "state-of-the-art" pollution controls, little is gained by applying PSD. The Clean Unit Test was adopted by USEPA in an effort to encourage industries to invest in pollution control equipment by providing greater operational flexibility after the control technology is installed. In this sense, non-applicability of PSD is intended to mean operational flexibility.

The Clean Unit Test is an alternate method for determining PSD applicability. If an emission unit receives a Clean Unit Designation, then changes may be made to it without determining PSD applicability based on the A2P, A2A, or hybrid tests discussed in Chapters 2 and 4. When making changes to a Clean Unit, a permit applicant need only assess if the allowable emissions or work-practice standards that resulted in the original control technology determination will change. If the emission unit will continue to comply with these standards, then PSD does not apply. However, minor source permitting may still apply.

> **Common Question**
>
> *My facility has a Clean Unit and I am attempting to net out of PSD for a different emission unit. How do I account for the Clean Unit's emissions in the netting calculation?*
>
> Emission changes from a Clean Unit may not be used in the netting equation, unless they occurred prior to March 3, 2003 or after the expiration date of the Clean Unit Designation. Emission reductions at a Clean Unit may count towards netting, if you demonstrate that the emission reductions are greater than needed to qualify as a Clean Unit.

Any emission unit that is controlled by state-of-the-art pollution control technology is eligible for a Clean Unit Designation. State-of-the-art means that the control technology has been determined to be equivalent to Best Available Control Technology (BACT) within the past ten years. Control technology is defined as any technology used to reduce air pollutant emissions from the process, including pollution prevention activities or work practice standards. Clean Unit Designations are pollutant specific. This means that in order to receive a Clean Unit Designation for a given pollutant, the source must have invested in technology for controlling that pollutant. If the source has invested in technology for controlling multiple pollutants, then it may receive multiple Clean Unit Designations. Sources that received a BACT determination are not eligible for a Clean Unit Designation, if the determination resulted in no requirement to reduce emissions below the level of a standard, uncontrolled, new emission unit of the same type.

The Clean Unit Test is simpler and quicker than a traditional PSD applicability determination. When modifying an emission unit with a Clean Unit Designation, the source need only demonstrate that the unit will continue to function within its existing permitted emission limits and work practice standards. No additional quantifications or demonstrations are necessary. This is especially advantageous for maintenance and repair projects. The Clean Unit Test may only be utilized for equipment with a Clean

Unit Designation. Many sources will have some emission units with Clean Unit Designations as well as other emission units. If a project affects Clean Units and other emission units, then the Clean Unit Test may only be applied to the Clean Units. PSD applicability for any other emission units must be determined using the other methods specified in Chapters 2 and 4.

Qualifying for Clean Unit Designation

There are two ways in which an emission unit may qualify for a Clean Unit Designation:

1. Any emission unit that has received a PSD BACT determination within the previous 10 years automatically qualifies as a clean unit. The Clean Unit designation is effective for 10 years from the earlier of; the date the control equipment began operating or three years after the PSD permit was issued. However, the Clean Unit Test may only be used for changes made after the March 3, 2003. For instance, an emission unit that received a PSD permit in 1996 (and the permit required the installation of control equipment), and began operating on April 1, 1997, would be eligible to use the Clean Unit Test from March 3, 2003 through April 1, 2007.

2. An emission unit with pollution control technology may also qualify for clean unit status, if it satisfies certain requirements:

    a) The control technology is substantially equivalent to BACT.

    b) A demonstration must be made showing that the allowable emissions from the equipment will not cause or contribute to a violation of the NAAQS or PSD increment (or adversely impact a Class I area).

    c) A Clean Unit Designation has been issued in a PTI, which included public notice and an opportunity for public comment.

> **<u>Common Question</u>**
>
> *Can emission reduction credits for the emission trading program or offsets be generated from a Clean Unit?*
>
> In general, the emission reductions from a Clean Unit may not be used for the purpose of generating emission reduction credits or offsets, unless they occurred prior to March 3, 2003 or after the expiration date of the Clean Unit Designation. If a demonstration can be made that the emissions have been controlled to a level below that which would have qualified for the Clean Unit Designation, then a credit can be generated for the difference between the level that would have qualified and the emission unit's new emissions limit. This credit may then be used for generating emission reduction credits or offsets, if the reduction is federally enforceable.

Demonstrating that Control Technology is Substantially Equivalent to BACT

Even if an emission unit has not previously undergone a BACT determination, it may still qualify for Clean Unit Designation if an investment has been made in control technology. In this case, a permit application must be submitted to the department demonstrating two things:

1. The control technology is substantially equivalent to the technology that would be required by a BACT analysis.

2. The allowable emissions from the controlled emission unit will not cause interference with the air quality increments or NAAQS. For further discussion of the methods for demonstrating compliance with air quality increments and NAAQS, see Chapter 9.

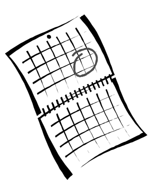
A permit to install (PTI) application form must be used to apply for an equivalent Clean Unit Designation. The application form should clearly state that the purpose of the application is to obtain Clean Unit Designation for the emission unit.

In general, the application must be submitted at the same time pollution control equipment is installed. More specifically:

- If the pollution control equipment is being installed in conjunction with a project for which a permit to install is required, then the Clean Unit Status demonstration should be included as part of the larger permit application.

- If the installation of the pollution control equipment would otherwise be exempt from the requirement to obtain a permit to install, then the Clean Unit Status demonstration must be submitted at the time that the control technology is installed.

- If the pollution control equipment was installed before March 3, 2003, then the application must be submitted by December 31, 2004.



IMPORTANT DATE: December 31, 2004 is the deadline for filing a permit application seeking a Clean Unit Designation for control equipment installed before March 3, 2003, which was not required by under either a BACT or LAER determination.

There are two methods that may be used to demonstrate that control technology is substantially equivalent to BACT:

Method 1 – RACT/BACT/LAER Clearinghouse (RBLC) Demonstration

1. The applicant must search the RBLC for all similar sources for which a BACT determination has been made within the past four years. The applicant should also take into account any known recent BACT determinations for similar sources which have yet to be entered into the RBLC.

2. The applicant must then average all the emission limitations obtained from the RBLC. If a RBLC emission limitation is not included in the average, then the applicant must demonstrate why that particular control technology would not be technically feasible for the source.

3. If the emission limitation from the proposed Clean Unit is at least as stringent as the average of the emission limitations from all similar sources from the RBLC within the past four years, then the technology will be presumed equivalent to BACT.

4. The Air Quality Division will then use its knowledge of recent BACT determinations, combined with information gathered during the public notice period, to determine if the presumption is correct.

Method 2 – Case-specific BACT analysis

In lieu of an RBLC determination, the applicant has the option of preparing a BACT analysis (see Chapter 8) for the emission unit in question. If the BACT analysis shows that the existing control technology represents current BACT, then the emission unit will receive a Clean Unit Designation. If the applicant utilizes this option then the Clean Unit designation will expire 10 years after its effective date.

Example:

On November 29, 1998, Company A installs control equipment on an emission unit.

On August 1, 2003, Company A submits an application for a PTI requesting a Clean Unit Designation for the emission unit. The application includes an analysis demonstrating that the controls meet current PSD BACT standards.

On September 1, 2003, the permit is approved granting a Clean Unit Designation for the emission unit effective on September 1, 2003. The Clean Unit Designation expiration date is September 1, 2013.

If the control technology was installed before March 3, 2003, the applicant has the option of submitting a BACT analysis demonstrating that the technology represented BACT at the time it was installed. If the applicant exercises this option, then the Clean Unit Designation will expire 10 years after the date on which the control technology was installed.

Note: In order to be valid, an application seeking a Clean Unit Designation for control equipment installed prior to March 3, 2003 must be submitted by December 31, 2004.

Example:

On *November 29, 1998*, Company A installs control equipment on an emission unit.

On *August 1, 2003*, Company A submits an application for a PTI requesting a Clean Unit Designation for the emission unit. The application includes an analysis demonstrating that the controls met PSD BACT standards in 1998.

On *September 1, 2003,* the permit is approved granting a Clean Unit Designation for the emission unit that is effective on *September 1, 2003*. The Clean Unit Designation expiration date is *November 29, 2008*.

Often permits for new equipment will not contain the effective date and expiration date, although the equipment is eligible for the Clean Unit Designation. This is because these dates cannot be determined until the equipment is installed. In permits issued after March 3, 2003, the permit will describe the event that will signify the effective date of the Clean Unit Designation and require notification to the Air Quality Division when that event occurs. This event will typically be the startup date for the control equipment.

Once an effective date and expiration date are determined, they will be added to the facility's Renewable operating Permit (ROP) at the next opportunity (i.e. amendment, modification, reopening, or renewal).

Clean Unit Designation in ROPs

After an emission unit receives a Clean Unit Designation, certain information will be included in the emission unit's portion of the facility's ROP at the next opportunity (amendment, modification, reopening, or renewal). This information includes:

- The Clean Unit Designation effective date, and expiration date.
- An indication of all emission limitations, work practice standards, and physical or operational requirements that formed the basis of the control technology determination.
- Monitoring, recordkeeping, and reporting needed to demonstrate that the equipment continues to meet the requirements that formed the basis for the control technology determination.
- Terms reflecting the owner or operator's duties to maintain the Clean Unit Designation and the consequences for failing to do so.

What if the effective date and expiration date for my Clean Unit Designation are not contained in my permit?

This will usually be the case for PTIs for new equipment. This is because the effective date and expiration date for the Clean Unit Designation cannot be determined until the equipment is installed. In PTIs issued after March 3, 2003, the permit will describe the event that will signify the effective date of the Clean Unit Designation and require notification to the Air Quality Division when that event occurs.

Once an effective date and expiration date is determined, it will then be added to the facility's ROP at the next opportunity (i.e. amendment, modification, reopening, or renewal).

Maintaining the Clean Unit Designation

The Clean Unit Designation is pollutant specific. An emission unit may be designated as a Clean Unit for particulate matter but not for VOCs. Alternatively, an emission unit with control technology for abating multiple pollutants may receive multiple Clean Unit Designations. Each pollutant-specific Clean Unit Designation will remain effective until the expiration date as long as the following criteria are met:

1. The Clean Unit must comply with the emission limits and work practice standards that were determined to be necessary as part of the control technology determination. These conditions will be designated in the PSD permit and the ROP. For Clean Unit Designations obtained through the "substantially equivalent to BACT demonstration," the conditions will be clearly designated as part of the Clean Unit Designation. For emission units that are automatically designated as Clean Units because they have undergone a BACT determination in the past 10 years, these conditions will be contained in the "emission limitations," "material usage limitations," or "process/operation limitations," and they will usually have an underlying applicable requirement citation of 40 CFR 52.21(x) or (y). For assistance in identifying permit conditions that were necessary for the Clean Unit Designation, contact the Air Quality Division Permit Section.

2. Physical changes or changes in the method of operation that cause the emission unit to operate in a manner inconsistent with the original control technology determination will cause the Clean Unit Designation to be lost.

3. Emissions from the Clean Unit must continue to be controlled using the specific air pollution control technology that was the basis for the Clean Unit Designation – replacement will cause the Clean Unit Designation to be lost.

Determining if Changes Made to the Clean Unit are Consistent with the Clean Unit Designation

Identify the permit conditions that establish the emission limitations and work practice standards tied to the Clean Unit Designation and examine the original PTI application. If the emission unit will continue to operate in compliance with the permit conditions and the design parameters of the emission unit (e.g. capture efficiency, destruction efficiency, etc.) have not changed from the PTI application, then the change is consistent with the original control technology determination and the Clean Unit Test may be used.

<u>Common Question</u>

My Clean Unit meets the requirements of PSD BACT, but it is located in an area that may soon be designated as nonattainment. Will this affect the Clean Unit Designation?

Redesignation will not affect the Clean Unit Designation. If the Clean Unit Designation is lost or expires, then after expiration, or if your Designation is lost, in order to re-quality as a Clean Unit, the control technology must meet current standards.

Permits issued prior to March 3, 2003 will not specifically identify the conditions that are tied to the Clean Unit Designation. Identifying these conditions in older permits may be difficult. For assistance in identifying permit conditions that were necessary for the Clean Unit Designation, please contact the Air Quality Division Permit Section

If the owner/operator of the Clean Unit takes action inconsistent with the Clean Unit Designation, then the Clean Unit Designation is lost and from that point forward the Clean Unit Test may not be used. If the activity, which caused the emission unit to lose its Clean Unit Designation, is a physical change or change in method of operation, then an applicability determination based on emissions changes must be performed (see Chapter 4). Regardless of whether the activity, which caused the emission unit to lose its Clean Unit Designation, is a physical change or change in method of operation, a PTI application must be submitted.

Re-qualifying for Clean Unit Designation

An emission unit that has lost its Clean Unit Designation (whether due to non-compliance, changes inconsistent with the designation, or expiration) may achieve a new Clean Unit Designation by installing new control technology that is equivalent to BACT or by demonstrating that the existing control technology meets current BACT standards. No new investment in control technology is necessary. However, the application must demonstrate that the control technology meets current BACT standards and that the allowable emissions will not cause or contribute to a violation of a NAAQS or PSD increment.

In order to re-qualify as a Clean Unit, the owner or operator must submit a PTI application requesting a new Clean Unit Designation for the emission unit. Three methods may be used for demonstrating that the emission unit meets current BACT standards:

1. A PSD permit review.

2. The RBLC method described above.

3. The Site-specific BACT Analysis described above.

In addition to demonstrating that the control technology meets current BACT standards, the applicant must also show that the allowable emissions from the proposed Clean Unit will not cause or contribute to a violation of any NAAQS or PSD increment.

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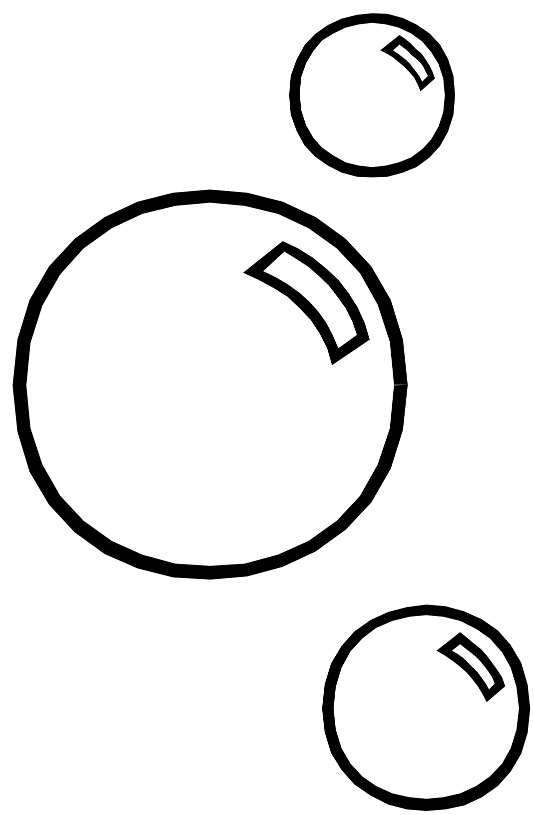
CHAPTER 6
PLANTWIDE APPLICABILITY LIMITS

In This Chapter:

- Purpose of the PAL
- Setting the PAL
- PAL Permit Application
- Increasing a PAL
- Monitoring, Recordkeeping, and Reporting
- Effective Period and Renewal

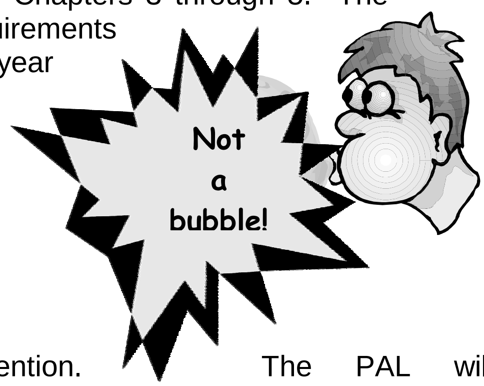


CHAPTER 6: PLANTWIDE APPLICABILITY LIMITS

Industry and regulators have, for many years, been trying to develop a workable Plantwide Applicability Limit (PAL) permit. Over the years, many different concepts have been introduced in an effort to try to get it right. So far, no PAL permit has been issued without much difficulty or that fully satisfied either the source or the regulators. In most cases, the source given up the PAL permit after a short period of time.

One concept that was introduced into early PAL permitting efforts was the idea of a bubble permit. A bubble permit established one, or very few, broadly applicable limits that were supposed to satisfy all regulatory requirements. The source thereby obtained the ultimate in operating flexibility – keep emissions under a fixed annual cap and there would be no other limitations. This concept never caught on because such few limits could not adequately stand in for all of the regulatory requirements. Many requirements ended up being overlooked. However, the idea of a bubble permit is so appealing that it has become embedded in peoples' minds as being a PAL.

The PAL provisions written into the recently reformed PSD regulations do **<u>NOT</u>** create a bubble permit. These provisions merely establish an alternative PSD applicability threshold to the methods previously described in Chapters 3 through 5. The PSD PAL leaves almost all existing permit requirements in place and adds a new facility-wide, tons per year emissions limit for a single pollutant. This facility–wide pollutant-specific limit establishes the applicability threshold for PSD. More than one PAL for more than one pollutant may be obtained.



Purpose of the PAL

The PAL is intended to encourage pollution prevention. The PAL will reward voluntary reductions in emissions with freedom from PSD applicability, as long as the PAL is not exceeded. Because a PAL is based on a facility's actual emissions, it gives constant incentive for facilities to reduce emissions from existing processes. In this way, continuing future facility changes will require the facility to self-impose emission reductions to remain below the PAL. It is believed this will yield environmental benefits while saving the industry and the regulators' time and resources.

<u>Reminder</u>
Changes require minor source permitting

A PAL permit is designed to provide a "bright-line" applicability determination for PSD. An emission unit at a PAL-permitted facility may be modified in any way, or new emission units may be installed. So long as the plant-wide emissions of the PAL pollutant remain below the PAL, PSD will not apply. Instead, a state minor source permit will be required. None of the time delays or administrative burden associated with applying for and obtaining a PSD permit will be encountered. Where changes do not require alteration of any existing permit requirements, this is especially advantageous. In such circumstances, even a state minor source permit may not be required. This possibility of increased operational flexibility is designed to create incentive for facilities to seek their own emissions decreases to make room under the PAL for projected increases. This self-motivation is intended to result in voluntary emission reductions that would not otherwise occur.

OBTAINING A PAL

To obtain a PAL permit, a number of analyses must be performed. The magnitude of the PAL must be calculated, a monitoring, recordkeeping, and reporting plan must be developed, and a permit must be obtained that has undergone public participation consistent with the procedures outlined in Chapter 11.

Setting the PAL

Because the PAL provisions added to the PSD program establish an "actuals PAL," the level of the PAL is based on the facility's baseline actual emissions (see Chapter 3). Several differences are included, but the baseline actual emissions methodology is the starting point. The procedure can be summarized in four steps:

Step 1: Calculate the facility's baseline actual emissions for the PAL pollutant consistent with the procedures outlined in Chapter 3.

Step 2: To the baseline actual emissions, add the permitted allowable emissions for each emission unit that began actual construction after the selected 24-month baseline period. These will be emission units whose emissions were not included in the baseline actual emissions level. For any emission unit that does not have a permit limit, its potential to emit should be used. Remember when calculating potential to emit to include any effective limit or restriction on the emission unit's ability to emit the PAL pollutant, including regulations, design restrictions, etc…

Step 3: From this adjusted emissions level, subtract the emissions from any emission unit that was permanently shut down after the selected 24-month baseline period.

Step 4: To this level of emissions, add an amount equal to the significant emissions level defined in Chapter 1 for the PAL pollutant.

The resulting level of emissions is the PAL. If there are any regulations that will become effective during the 10-year life of the PAL, their affect on the PAL must be accounted for. The PAL emissions level must be set to decline accordingly on the future effective date of such regulations.

Reminder
Changes require minor source permitting

During its effective period, the PAL is the emissions threshold that determines, for the PAL pollutant, PSD applicability. Any changes in the method of operation or physical changes to any emission unit at the facility, which do not result in an emissions increase above the PAL, will not be subject to PSD.

PAL Permit Application

The permit application to obtain a PAL permit must include:

- A list of all emission units at the source designated as small, significant, or major based on their potential to emit. This designation must follow the procedures outlined below under Increasing the Level of the PAL, Step 2.
- The identity of which federal or State applicable requirements, emission limitations or work practices apply to each emission unit.
- Calculations of the baseline actual emissions (with supporting documentation). Baseline actual emissions must include emissions associated with operation of each emission unit, but also emissions associated with startup, shutdown, and malfunction.
- The calculation procedures that the source proposes to use to convert the monitoring system data to monthly emissions and annual emissions based on a 12-month rolling total for each month. These procedures should follow the outline for How to Develop the PAL Monitoring, Recordkeeping and Reporting Plan discussed below.

Increasing the Level of the PAL

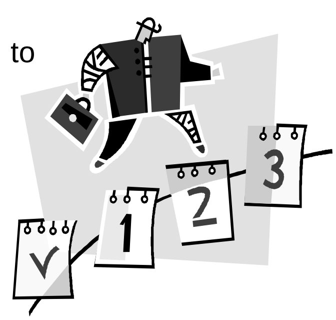
Before a source can increase the level of its PAL, it must meet several stringent criteria. It must first categorize each emission unit at the facility according to the following:

Step 1: Identify every emission unit at the facility and quantify its potential to emit.

Step 2: Sort each of the emission units into the following categories:

Small: Emission units with potential to emit less than the significant threshold for the PAL pollutant.
Significant: Emission units with potential to emit greater than the significant threshold for the PAL pollutant.
Major: Emission units with potential to emit greater than the major source threshold for the PAL pollutant.

Step 3: Identify each emission unit that is causing the facility to exceed the PAL (i.e., each new and modified emission unit).



Step 4: Subject each emission unit identified in Step 3 to PSD and identify the allowable emissions for each. PSD applies regardless of the magnitude of the emissions increase associated with each new or modified emission unit. By causing an increase above the PAL, these emission units are causing an increase above baseline actual emissions by an amount greater than the significant emissions threshold.

Step 5: Perform a BACT analysis for each significant or major emission unit that has not undergone a BACT or LAER analysis within the previous 10 years. The BACT or LAER determinations that have been conducted within the previous 10 years will be accepted as current.

Step 6: Calculate the baseline actual emissions for all small emission units.

Step 7: Calculate the baseline actual emissions for all significant and major emission units and adjust for the application of BACT, as necessary (consistent with Step 4), on each of these emission units.

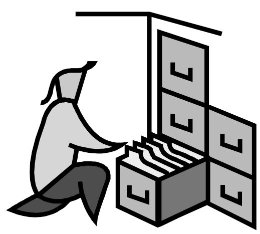
Step 8: Calculate the sum of the allowable emissions identified in Step 4.

Step 9: Demonstrate that the sum of the emissions from Steps 6 through 8 exceeds the current PAL.

Step 10: Set the new PAL equal to the sum of the emissions from Steps 6 through 8.

How to Develop the PAL Monitoring, Recordkeeping, and Reporting Plan

Developing a PAL monitoring, recordkeeping and reporting (MRR) plan involves identifying the MRR requirements specified in the Renewable Operating Permit (ROP) for each emission unit or consistent with ROP MRR requirements as laid out in Michigan Air Pollution Control Rule 213. Next, a method must be developed to convert the ROP compliance data into monthly mass emissions of the PAL pollutant.



As an alternative to converting the ROP compliance data, a new MRR plan may be proposed that will allow the determination monthly emissions of the PAL pollutant from the emission unit. PAL compliance verification procedures must be based upon sound science and meet generally acceptable scientific procedures for data quality and manipulation. The procedures may use any or all of the following monitoring methods:

- Continuous Emissions Monitoring Systems
- Continuous Parameter Monitoring Systems
- Predictive Emissions Monitoring Systems
- Mass Balance Calculations (for activities using coatings or solvents)
- Emission factors. (Note: Emission factors used for PAL compliance purposes for emission units classified as “significant” or “major” must be verified with emissions testing within six months of PAL permit issuance.)

Next, all sources of the PAL pollutant must be identified for which the ROP does not contain monitoring, recordkeeping, or reporting requirements. Compliance verification procedures must be proposed for these emission units. Alternatively, the monthly potential to emit from these emission units may be used for the purpose of demonstrating compliance with the PAL.

PAL Effective Period and Renewal

Each PAL permit will have an effective period of 10 years. The effective date of the PAL permit will be determined consistent with the procedures outlined in Chapter 11 – the permit will become effective 33 days after its issuance. This delayed effective date is a result of the regulatory provisions for certain parties to appeal the permit if they believe their comments or concerns regarding the permit raised during the comment period have not been adequately addressed by MDEQ's response to comments. The PAL expiration date will be exactly 10 years after its effective date, unless it is temporarily extended in order to allow completion of processing the renewal application.

In order to renew the PAL, the applicant must submit a timely application for renewal. A timely application is one that is submitted between 18 months and 6 months prior to the PAL expiration date. The application for renewal must contain a demonstration and recalculation of the PAL level taking into account newly applicable requirements and the current potential to emit for the facility. During renewal, the MDEQ will re-evaluate the level of the PAL. The MDEQ's reconsideration will establish the PAL based on a number of criteria (see "PAL RENEWAL CRITERIA" box). The rationale for setting the new PAL level must be set forth in writing for public review and comment.

PAL RENEWAL CRITERIA:

The PAL will be renewed at a level determined to be more representative of the source's baseline actual emissions or at a level determined to be appropriate considering:

- **Air quality needs,**
- **Advances in control technology, anticipated economic growth in the area,**
- **The MDEQ's desire to reward or encourage the source's voluntary emission reductions or cost effective emission control alternatives.**

As a default, the PAL can be renewed at its current level without consideration of other factors if the updated baseline actual emissions plus the PAL pollutant significant threshold is greater than 80 percent of the current PAL. If this value is greater than 80 percent of the current PAL and greater than the facility's potential to emit, the revised PAL cannot exceed the facility's potential to emit.

If the PAL expires without renewal, then the PAL will become the new allowable emissions for the facility. The applicant must submit an application with a proposed apportionment of these allowable emissions among all the emission units that are sources of the PAL pollutant. A new permit will then be issued with individual emission limits for each emission unit according to the applicant's apportionment of its allowable PAL emissions.

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CHAPTER 7
POLLUTION CONTROL PROJECTS

In This Chapter:

- History
- Key Changes
- Qualifying Projects
  - Listed PCPs
  - Unlisted PCPs
- Listed Project Types
- Environmental Benefit
- Air Quality Impacts
- Implementation
- Summary

CHAPTER 7: POLLUTION CONTROL PROJECTS

In Chapters 3 and 4, we covered PSD applicability for new major sources and significant changes at existing sources. Applicability in such circumstances is based on the magnitude of the emissions or emissions increases associated with the projects. In Chapter 5 we looked at Clean Units – how an emission unit becomes a Clean Unit, and what is the significance of being designated as a Clean Unit with regard to PSD applicability. PSD applicability for Clean Units is not dependent on the magnitude of emissions, but on maintaining state of the art controls.

In this chapter we will look at changes to existing facilities that are exempt from PSD applicability due to their emission-reducing nature. Without this exemption, these changes would be required to evaluate PSD applicability using one of the three previously described applicability methods.

Pollution Control Projects

A Pollution Control Project (PCP) is an activity, set of work practices, or project at an existing emission unit that reduces emissions of air pollution from the emission unit. Qualifying activities or projects can include the replacement or upgrade of existing emissions control technology with more effective controls. The PCP exclusion allows the installation of certain projects that result in a net overall environmental benefit to avoid becoming subject to PSD for their collateral emissions increases. A collateral emissions increase is identified as an increase in a non-targeted pollutant. The PCP exclusion is defined at 40 CFR 52.21(z). Although PCPs are excluded from the federal PSD requirements, they are not automatically exempt from MDEQ's PTI permitting program.

History of the PCP exemptions

USEPA adopted revisions to the PSD regulations for the addition, replacement or use, at an existing facility, of any system or device whose primary function is the reduction of air pollutants. This has been referred to as the "primary purpose" test. In its 1992 "WEPCO" rulemaking, USEPA amended the PSD regulations, as they pertain to utilities, by adding certain PCPs to the list of activities specifically excluded from the definition of physical or operational changes. In Chapter 2 we identified that any physical or operational change was considered a modification unless it was specifically excluded in the rules.

<u>HISTORY of PCP EXEMPTION</u>

First a federal rule for electric utilities

Then a federal policy for non-utilities

Now a federal rule for all source types

On July 1, 1994 in a guidance memo, USEPA expanded this exclusion to other industries (besides electric utilities) as long as certain safeguards were in place. These safeguards included an environmentally beneficial test; a demonstration that the project would not violate the NAAQS, PSD increments or adversely affect any Air Quality Related Value (AQRV) in a Class I area. All collateral impacts had to be identified, minimized and mitigated, where appropriate. In addition, a determination had to be obtained from the permitting authority that the project qualified as a PCP. The permitting authority would then afford the public an opportunity to review and comment on its determination. Finally, the project had to otherwise comply with all applicable requirements of the State Implementation Plan (SIP), including minor source permitting.

The reforms to NSR, which became effective in Michigan on March 3, 2003, replaced both the WEPCO PCP Exclusion and the July 1, 1994 policy guidance memo with a single, comprehensive rule. The rule establishes methods for identifying all types of qualifying PCPs, including add-on controls, switching to less polluting fuels, work practices, and pollution prevention projects.

Key Changes in the PCP Exclusion

The PCP exclusion has a number of differences from previous rules and guidelines, including the following:

- Eliminates the "primary purpose" requirement;
- Expands the list of presumptively environmentally beneficial projects to include additional control technologies and strategies;
- Provides a "notice-and-go" approach;
- Enables projects that otherwise are PCPs but result in utilization increases to qualify for the exclusion;
- Uses an actual-to-projected-actual format for determining emissions changes for all source categories to demonstrate net environmental benefit supplemented by air quality analysis under certain circumstances, regardless of their projected emissions increases resulting from utilization;
- Clarifies that the replacement, reconstruction, or modification of an existing emissions control technology could qualify for the exclusion;
- Details the calculations for determining whether a switch to a different Ozone Depleting Substance (ODS) is environmentally beneficial;
- Changes the visibility component of the air quality analysis to "an air quality related value (AQRV) that has been identified for a Federal Class I area by a Federal Land Manager (FLM), and for which information is available to the general public;"
- Identifies which fuel switches are presumed "inherently less polluting;"
- Enables work practice standards to qualify for the exclusion;
- Clarifies that modeling for air quality impacts may use projected actual emissions;
- Details proper noticing requirements for listed projects to use this exclusion;
- Describes in detail the process for granting the PCP;
- Allows the exclusion for non-listed control technologies and pollution prevention strategies;
- Disqualifies projects that cannot secure acceptable offsetting emissions reductions or SIP measures for PCPs resulting in a significant net increase of a non-attainment pollutant;
- Disallows generation of netting and offset credits from the initial application of PCPs that qualify for this exclusion; and
- Clarifies that non-air pollution impacts will not be considered in the "environmentally beneficial" determination.

One other difference in the rule is that while the PCP exclusion may apply to rebuilt or upgraded control devices provided the device is more effective, it may also apply if the replacement control device is more efficient. An example of this would be a conversion from a thermal oxidizer to a catalytic oxidizer. The two oxidizers may achieve the same pollution control, but the catalytic unit would do so at reduced energy consumption.

What Does the PCP Exclusion Do?

A project that qualifies as a PCP is excluded from PSD. The PCP exclusion allows the installation of certain projects that result in a net overall environmental benefit to avoid PSD for collateral emissions increases, even if the increase exceeds the significance threshold. The PCP exclusion only applies at existing emission units. Addition of new emission units do not qualify for the exclusion.

Qualifying Projects

Any project, activity, work practice, or pollution prevention technique that reduces emissions from an emission unit can be considered a PCP. A common example of such a project is the installation of a thermal incinerator, which forms NO_X as a collateral pollutant while reducing VOC emissions. There are two ways to qualify as a PCP. These include:

1. Listed PCPs – Listed PCPs are presumed to be environmentally beneficial and are identified in the regulations. The overall net impact of installing and operating a listed add-on control system is presumed to be environmentally beneficial. Such practices are desirable from an environmental perspective. Listed PCPs include controls that have historically been applied to many different kinds of sources to reduce emissions. They have been consistently used because it is generally understood that, from an overall environmental perspective, these controls are effective in reducing emissions when they are applied to existing plants in a manner consistent with standard and reasonable practices. As long as the project is on the list, the technology has been properly applied, and site-specific factors do not indicate that their application would be environmentally harmful, the project would qualify as a PCP. Listed projects have been demonstrated in practice and are installed and operated consistent with proper industry, engineering and reasonable practices.

2. Unlisted PCPs – These are case-specific PCP exclusion determinations. An environmental benefit demonstration is required. This is a more rigorous process in which site specific factors must first be considered to determine whether the non-listed project results in a net environmental benefit. Following this evaluation, the proposed exemption from PSD applicability must undergo public review and comment. The MDEQ must respond to the comments received before approving the project as a PCP.

What are the "listed" project types?

The list consists of predefined qualifying projects that have been determined by USEPA to be environmentally beneficial. These projects are identified in 40 CFR 52.21(b)(32) as follows:

Pollutant	Control Device/PCP
SO_2	Conventional & advanced flue gas desulfurization Sorbent injection
Particulates and other Pollutants	Electrostatic precipitators Bag houses High efficiency multiclones Scrubbers
NO_X	Flue gas recirculation Low-NO_X burners or combustors Selective non-catalytic reduction Selective catalytic reduction Low emission combustion (for internal combustion engines) Oxidation/absorption catalyst (e.g., $SCONO_X^{TM}$)
VOC and HAP	Regenerative thermal oxidizers Catalytic oxidizers Thermal incinerators Hydrocarbon combustion flares Condensers Absorbers & adsorbers Biofiltration Floating roofs (for storage vessels)

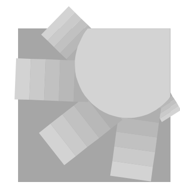
Other "listed" presumed environmentally beneficial PCPs include:

1. Activities or projects undertaken to accommodate any of the following fuel switches:

   a. Switching from a heavier grade of fuel oil to a lighter fuel oil, or any grade of oil to 0.05% sulfur diesel;
   b. Switching from coal, oil, or any solid fuel to natural gas, propane or gasified coal;
   c. Switching from coal to wood (excluding construction or demolition waste, chemical or pesticide treated wood, and other forms of "unclean" wood);
   d. Switching from coal to #2 fuel oil (0.5% maximum sulfur content);
   e. Switching from high sulfur coal to low sulfur coal (maximum 1.2% sulfur content).

2. Activities or projects undertaken to accommodate switching from the use of one ODS to the use of a substance with a lower ODS potential.

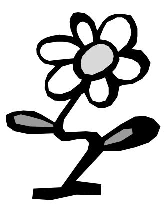
Environmental Benefit Demonstration



A demonstration must be made showing that the benefits of the emissions decrease outweigh the impact of the emissions increase. The evaluation is limited to air quality considerations. Specifically, the air quality benefits resulting from the reduction of the primary pollutant must outweigh any detrimental effects from collateral pollutant emissions increases when comparing the unit's post-change emissions to its pre-change baseline actual emissions. Future applications of the same control technology must independently undergo the same case specific determination. For example, determining that the implementation of a certain work practice qualifies as a PCP for Line 1 does not guarantee that implementing the same work practice will qualify as a PCP for Line 2.

As stated previously, the environmental benefit from an emissions reduction must outweigh the environmental detriment from any collateral emissions increase. If a PCP is on the list, a statement that a technology from the "list" is being used shall be presumed to satisfy this requirement. If a PCP is not on the list, it may still qualify as a PCP, however, proof must be provided that the project is environmentally beneficial. To do this, a demonstration must be submitted to the MDEQ.

This demonstration must include the emissions increases and decreases resulting from the project. In order to calculate emissions increases and decreases for the primary and collateral pollutants, the actual to projected actual applicability test (A2A) must be used. Use of the A2A was described in Chapter 3. Any collateral pollutant increases must be minimized within the physical configuration and operational standards usually associated with the emissions control device or strategy. An air quality analysis as well as a demonstration that emission increases will not violate the NAAQS, PSD increment or any Class I AQRV are critical components of an environmental benefit demonstration.



Air Quality Impacts

<u>The "Cause-or-Contribute Test"</u>

Emissions from a PCP cannot cause or contribute to a violation of any NAAQS or PSD increment, or adversely impact a Class I AQRV, such as visibility. An air quality analysis is required; however, a modeling exercise is not necessarily warranted in all cases. Although not necessarily warranted, the MDEQ may determine in certain circumstances that it is needed. Sufficient information must be provided to allow the determination that the new levels of emissions will not cause or contribute to an adverse air quality impact.

<u>Other Considerations</u>

The emission reductions initially achieved by the PCP are integral to the "environmentally beneficial" demonstration necessary to qualify for the PCP exclusion. In effect, the emissions reductions are traded for the significant emissions increase of the collateral pollutants and for the benefits of being excluded from PSD. To then re-use the reductions would weaken the PCP exclusion and would not ensure appropriate environmental protection. Therefore, any emission reductions for the purposes of qualifying as a PCP cannot be used as offsets, for netting, or for generation of Emission Reduction Credits (ERCs). However, after obtaining the PCP exclusion, if changes are made that further reduce emissions, these further reductions may be used as offsets, for netting or for generation of ERCs.

Other considerations to account for include compliance with state only regulations such as air toxics, VOC BACT (i.e., Rule 702), sulfur in fuel limits, odor impacts and the minor source permitting requirements. In the case of Michigan's air toxics program, a toxic air contaminant review is necessary for any toxic that is being increased.

Implementation

What administrative procedures are required?

Obtaining a PCP exclusion will follow one of two different paths depending on whether the proposed project is "listed" or "non-listed" as environmentally beneficial. For listed projects, a PCP can follow either a "notice-and-go" approach or the permit to install process depending on the applicability of Michigan's PTI permitting program. For non-listed or case-specific PCPs, a permit application must be submitted in order to determine that the project qualifies as a PCP; to assure that all necessary safeguards are in place; and to accommodate the appropriate public review and comment.

Listed PCPs

Before actual construction of the PCP begins, the applicant must submit notice to the reviewing authority. This submittal should be in the form of a permit application unless, based on the specifics of the PCP, it is exempt from Michigan's PTI permitting program under Rules 278 through 290. If the notice-and-go process is followed, it must include the following information:

Notice-and-Go

Project description
Environmental benefit analysis
Emissions increases and decreases
Air quality demonstration
Description of the monitoring, reporting and recordkeeping
Certification of proper design and operation

What are MDEQ's responsibilities?

In both a listed and case-specific PCP the reviewing authority will evaluate the emissions increases and decreases, evaluate the environmental benefit analysis, the proposed monitoring, recordkeeping and reporting requirements and any air quality demonstration (i.e., modeling). In the case of a listed PCP, the environmental benefit analysis consists of verification that the project is on the list. The remainder of the review will consist of verification of the impact the PCP has on the NAAQS, PSD Increments and any Class I areas, evaluation of the appropriate monitoring, recordkeeping, and reporting, and that proper design and operation have been certified.

In the case of a non listed PCP, the submitted environmental benefit analysis will be reviewed and a determination made regarding whether or not the project qualifies as a PCP. All emissions increases and decreases will be reviewed and verified. The air quality modeling will be reviewed as will the proposed monitoring, reporting and recordkeeping. Finally the MDEQ's decision will be made available for public review and comment.

Public participation requirements

Public participation is a requirement for a non-listed PCP. Public participation includes providing an opportunity for the public and USEPA to review and comment on the environmental benefit analysis, the air quality impacts assessment and the MDEQ's decision to grant the PCP exclusion. The public comment period is held pursuant to the procedures specified in 40 CFR 124 which are covered later in Chapter 11. Public participation documents are prepared including a notice of hearing, fact sheet and draft permit conditions. These documents are then made available for a period of 30 days for review and comment. An opportunity for a public hearing is also provided. Upon completion of the public participation process all comments are reviewed and considered prior to a final decision.

Summary

The PCP exclusion process is a mechanism for bypassing PSD applicability for projects that are deemed environmentally beneficial. The PCP exclusion removes PSD as a regulatory hurdle to companies seeking to develop and implement pollution control and prevention strategies. However, a state minor source permit may still be required. If the necessary steps are not followed to qualify for, and obtain, the PCP exclusion, a project may become subject to PSD.

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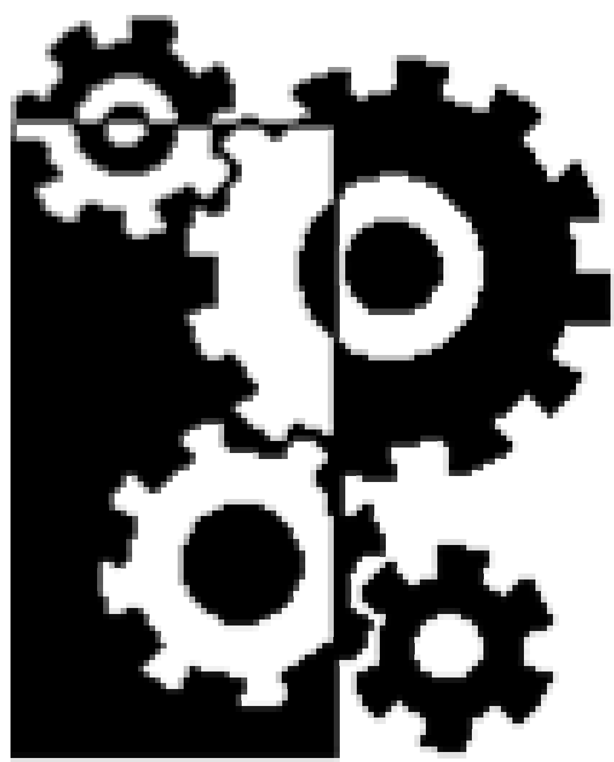
CHAPTER 8

BEST AVAILABLE CONTROL TECHNOLOGY

In This Chapter:

- Top-Down BACT
- Identify Control Technologies
- Eliminate Technically Infeasible Options
- Evaluate The Most Effective Controls
- Rank Remaining Technologies
  - Energy Impacts
  - Environmental Impacts
  - Economic Impacts
- Select BACT
- Examples



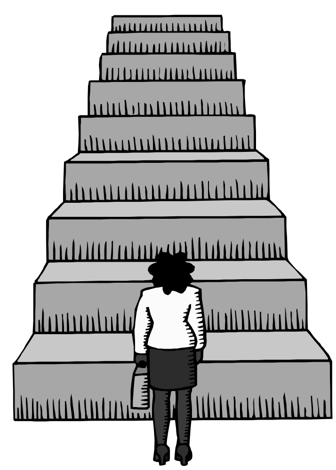
CHAPTER 8: BEST AVAILABLE CONTROL TECHNOLOGY

We have spent quite a lot of time discussing what is PSD, how to determine whether a project is subject to PSD, and how a project may be excluded from PSD. We now turn our attention to what PSD actually requires. The first PSD technical review we will discuss is the Best Available Control Technology (BACT) analysis. The BACT analysis is designed to ensure that high quality controls are implemented in order to minimize the impact of any significant emissions increase. It is also designed to put upward pressure on the level of required controls so that, over time, more effective controls will be required.

Top-Down BACT

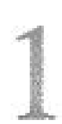
Any major stationary source or major modification subject to the PSD must conduct an analysis to ensure the application of BACT pursuant to paragraph (j) of the PSD regulations (40 CFR 52.21 (j)). BACT is an emission limit based on a review of all appropriate control options. Possible control options include add-on control equipment, lower-emitting processes, alternate materials or work practices, or a combination thereof. A “top-down” approach must be used, where all available control technologies are ranked in order of descending control effectiveness.

In a top-down BACT analysis, the applicant must start with the top choice and proceed down the list, eliminating any options that are proven infeasible. The applicant can eliminate a control alternative by demonstrating to the satisfaction of MDEQ that, in this instance, it is not technically feasible (i.e., cannot be successfully installed and operated) or that energy, environmental, or economic impacts are unfavorable. A separate BACT analysis is performed on a case-by-case basis for each pollutant subject to the PSD regulations. In no instance can BACT result in an exceedance of the NAAQS or PSD increments, or result in non-compliance with any applicable state or federal regulation.



There are five steps in the “top-down” BACT approach. Each step is listed below along with a brief description. A PSD application is expected to include all of the information, assumptions, analyses, and calculations used to complete these five steps.

STEP 1: Identify All Control Technologies



The first step in a BACT analysis is to identify all available control options for each emission unit or for logical combinations of emission units and for each pollutant subject to PSD. Available control options are control technologies or techniques that can be realistically installed or utilized on the process and that have the potential to reduce the pollutant under review.

Potential control options include: lower emitting processes or work practices, such as the use of materials that result in lower emissions; add-on controls, such as scrubbers or fabric filters; or a combination of the above. All demonstrated and potentially applicable control options must be identified. To develop the list of all available control technologies or techniques for the source, the applicant can review USEPA's BACT/LAER Clearinghouse (at http://www.epa.gov/ttn/catc/) or can gather information from State agencies, environmental consultants or control technology vendors.

It is important to note that the purpose of a BACT review is not to redefine the project subject to the regulations. For example, an applicant requesting to install a coal-fired boiler, is not required to consider using a natural gas-fired turbine even though the turbine may be less polluting per unit of electricity generated. However, some instances may arise where the permitting authority may consider an alternate process in the BACT analysis. This is done on a case specific basis and at the discretion of the MDEQ. If such considerations are identified early enough, the MDEQ will let the applicant know that alternative processes should be evaluated.

STEP 2: Eliminate Technically Infeasible Options

The next step in the analysis is to determine the technical feasibility of each control option identified in Step 1. Each option that has been installed and successfully operated at a similar source is considered to be feasible. For a control option that has not been demonstrated, the applicant must determine the availability and applicability of using that control at the facility under review. For an option to be considered available, the applicant must be able to obtain it through commercial channels. An available technology is one that can be realistically installed and operated on the process in question and must be at least in the licensing and commercial demonstration stage of development. A commercially available control option is considered applicable if it can be reasonably installed on the facility under consideration. It may also be considered applicable if it will soon be installed on the source type or a similar source type. The applicability analysis includes an evaluation and comparison of the characteristics of the source under review with similar sources having the same control technology already installed.

The applicant can determine that a control option is not technically feasible by demonstrating to the satisfaction of MDEQ that it is not commercially available and/or unusual circumstances exist with applying the technology to the source in question. The applicant must have physical, chemical, or engineering data that proves the technology would not work successfully at the facility under review. If modifications are needed to make the control compatible with the emission unit, it does not mean it is technically infeasible. However, additional costs for such modifications may be considered in the economic portion of the BACT analysis discussed in Step 4 below.

The purpose of this step is not to list and evaluate a redundantly large number of control options. The applicant is not required to review control options with negligible differences and the same environmental impacts. Judgment should be used when deciding what to evaluate when it comparing several types of control that achieve similar emission reductions.

STEP 3: Rank Remaining Control Technologies

3

The third step involves ranking control options remaining after Step 2. The control options are ranked from the most to the least effective in terms of emission reduction potential. Common units of measure should be used to compare performance levels of all options on the list. For example, control effectiveness in terms of percent of pollutant removed should not be compared with control effectiveness in terms of pounds per hour of emissions. Technologies can be ranked according to percent efficiency or as pollutant emission per unit of product produced or processed (e.g., pounds NO_X per million Btu heat input). Some control technologies have a wide range of performance levels. In this case, the applicant should use the most recent BACT decision and performance data for similar sources. A lower level of control can be used if the applicant can demonstrate that there are source-specific factors or technical, economic, energy or environmental issues that make the highest performance level unacceptable or unachievable. A control technology that has adverse impacts at its highest performance may be acceptable at a somewhat lower level of performance.

After listing all feasible control technologies from most effective to least effective, the applicant should also display the expected emission rate, the performance level (percentage or emissions per unit product), and expected emissions reduction (tons per year) for each control option on the list. This should be done for each emission unit and each pollutant subject to PSD.

STEP 4: Evaluate The Most Effective Controls

4

This step in the “top-down” BACT analysis involves an analysis of all energy, environmental and economic impacts associated with the list of available controls technologies. Both beneficial and adverse impacts should be discussed and quantified. If the top option is selected as BACT, and there are no significant environmental impacts, then the BACT review ends. However, if the applicant can provide proper justification that adverse energy, environmental or economic impacts exist, then the control option is eliminated and the applicant continues down the list until a control option can no longer be eliminated. At this stage in the analysis, elimination of a control alternative involves demonstrating that there are unique circumstances where environmental, energy or economic consequences exist, making the control option impractical at the particular facility under review.

Energy Impacts

BACT SUMMARY
Step 1 – ID all available control options
Step 2 – Eliminate infeasible options
Step 3 – Rank remaining options
Step 4 – Evaluate most effective option
Step 5 – Select BACT

The applicant should determine any energy penalties or benefits that result from using each control technology. Penalties could include extra fuel or electricity required to power a control option. All penalties and benefits should be quantified. This is usually done in terms of cost. Any extra costs associated with energy penalties at a source should be included in the economic impact analysis. Only direct energy impacts should be considered in the energy analysis. Direct impacts are those that are completely associated with the addition of control, such as energy consumption to operate the control. Alternatively, indirect impacts such as the energy required to create the control device should not be included. The applicant can also consider concerns over using a scarce fuel with the control option. A scarce fuel is one that is in short supply locally or not available to the source.

Environmental Impacts

Environmental impacts are impacts other than those on air quality standards (NAAQS, PSD increment, AQD health based-screening levels). Examples include solid or hazardous waste generation, discharges of polluted water, visibility impacts, or emissions of non-NSR or odor-causing pollutants. If reduction of the pollutant under review is small compared to the collateral increase in another regulated or non-NSR pollutant, the control option may be eliminated for having adverse environmental impacts. However, the fact that a control could create a waste that must be disposed of, does not necessarily warrant elimination. The applicant must show that there are unusual site-specific characteristics why such waste disposal or pollutant emissions are unreasonable and create greater problems at the site under review than at other sites where the control is used. The review of environmental impacts must be performed even if the most stringent option is selected as BACT. The quality and quantity of water and/or solid waste should be analyzed and compliance with applicable environmental rules should be determined. The applicant should also consider whether or not a control option may result in irreversible environmental damages (use of scarce water resources). Other impacts that should be considered in this analysis are noise levels, radiant heat, or local air quality impacts from secondary pollutant emissions. Examples of the latter include control for carbon monoxide, which causes an increase in the amount of nitrogen oxide (NO_X) in a NO_X nonattainment area. A control technology could also result in emissions of toxic air contaminants that do not comply with Michigan's health-based screening levels. This may result in the elimination of the most stringent control device. Generally, secondary emissions do not significantly effect BACT decisions; however, they should still be evaluated and quantified.

Economic Impacts

The economic impact review involves evaluating the cost to control the pollutant at this particular facility as compared with the cost to control the pollutant at other similar facilities. It does not involve evaluating a source's ability to absorb such costs. The company's economic health is not a valid reason to forgo installing controls. The cost to control the pollutant, or cost effectiveness is measured in dollars per ton of pollutant reduced. If a control technology has been successfully applied at similar sources, the applicant must show a significant cost difference at the facility under review before the control option may be eliminated on economic grounds. In other words, if the cost of control is in the range of the BACT costs being borne by other similar facilities, it is economically feasible.

The control cost analysis combines the annualized capital cost of the controls with its annual operating expenses. This annual control cost is divided by the quantity of pollutant that the control technology will reduce to arrive at the dollars per ton value that is used for comparisons. Quantifying the cost of control includes identifying the design parameters such as pressure drops, temperatures, residence times, catalyst life and making sure these parameters are consistent with emissions used in modeling and permit limits. Vendor data should be used to define design parameters when applicable. Actual performance test data from the source under review or a similar source may also be used. The cost of the control technology including associated equipment (i.e., ductwork, raw materials, utilities, etc…) and the basis for each should be determined. The entire cost analysis should be compared to the OAQPS Control Cost Manual (EPA 453/B-96-001) for consistency with other BACT analyses performed across the country. The applicant should document and substantiate any deviations from the manual. Cost data should be accurate by +/- 30 percent and the most accurate site-specific data should be used (e.g., cost of raw materials, labor…). If the top BACT option is selected, there is no need for an economic evaluation. The cost effectiveness is calculated in two ways: average cost and incremental cost.

The average cost is the total annualized cost for the control technology divided by the annual emissions reduced by the control technology, or

$$\text{Average Cost} = \frac{\text{Annualized Control Cost}}{(\text{Uncontrolled Emissions} - \text{Controlled Emissions})}$$

Uncontrolled emissions are established using realistic upper boundary operating assumptions. NSPS or NESHAP requirements or added controls are not considered in the uncontrolled emissions calculation. Realistic physical or operational constraints are considered. For example, carbon monoxide emissions from a combustion turbine vary with ambient temperature. Thus, it is appropriate to use emissions at the annual average ambient temperature of the area instead of the maximum worst-case temperature. This represents a more realistic operating scenario for the turbine. The applicant can also use verified historical operating data for the source such as the number of shifts per day or limited capacity. If a source projects certain operating parameters lower than the standard practice for its industry; has specific design parameters that limit the operation; and/or such physical or operational parameters have a deciding role in the BACT determination; they should be included in an enforceable permit. Whatever the physical or operational parameters of the source may be, the

BACT comparison should be done with other facilities that have similar operating and physical limitations as the source under review.

The incremental cost analysis should be analyzed in conjunction with the average cost. The incremental cost is the difference between two control options or,

$$\text{Incremental Cost} = \frac{\text{(Annualized Cost of Option 1)} - \text{(Total annualized cost of option 2)}}{\text{(Emissions Reduced by Option 2)} - \text{(Emission Reduced by Option 1)}}$$

This equation should be used to analyze the difference between the dominant control options. The dominant controls are those that will buy the most emission reductions for the least cost. Incremental cost is especially useful when evaluating control options with a range of control efficiencies. It is important to note again that the incremental cost analysis is used in combination with the average cost. A technology should not be eliminated based on incremental cost alone.

In order to eliminate a control option on the basis of economic infeasibility, the applicant must demonstrate that the control technology is significantly more costly than the control costs being borne by other similar sources. This should include all significant site-specific differences.

The average cost gives a picture of the costs to control emissions using a particular control technology. The incremental cost helps to identify differences in control costs between different control technologies. For example, Control Technology A may have an average cost of $5,000 per ton to control 100 tons per year. Control Technology B may have an average cost of $5,200 per ton to control 102 tons per year. Using only the average cost, it would appear that there are no significant differences between the two control options. However, the incremental cost shows a dramatic difference.

Control Technology A carries an annual cost of $500,000 (i.e., $5,000 x 100). Control Technology B carries an annual cost of $530,400 (i.e., $5,200 x 102). The incremental cost for Control Technology B over Control Technology A is $15,200 per ton (i.e., $30,400 / 2). This means that while Control Technology B controls two more tons of pollutant than does Control Technology A, it costs, incrementally, $15,200 per ton for each of those two tons. Based on this incremental cost analysis, it would not be cost effective to select Control Technology B.

STEP 5: SELECT BACT

5

BACT will be the most effective control technology not eliminated during Steps 1 through 4. The required BACT limit(s) and associated control requirements will be incorporated into the PSD permit. The permit issuance requires a public comment period to allow for any new information to be considered. The public comment period will follow the procedures outlined in Chapter 11. The applicant's sole responsibility during the public comment period is to provide the agency with sufficient information to make the BACT determination. It may be helpful to meet with MDEQ prior to submitting a BACT analysis to ensure completeness.

To this point, the BACT discussion has been primarily about the evaluation of applicable control options. However, it is also important to note that BACT is an emission limit for each emission unit and pollutant subject to the PSD regulations. The BACT emission limit must be met at all times, contain appropriate averaging time periods, and have proper compliance procedures and recordkeeping for the averaging period. Some situations arise where the BACT limit cannot be met at all times. For example, a boiler may contain an emission limit that cannot be met during startup when conditions are not steady state and emissions can change sporadically. In this case, it is appropriate to develop a separate BACT limit during startup periods. Also, recall that the definition of BACT includes operating procedures or practices if it can be shown that an emission limit is not appropriate. Using the same boiler example, it may be difficult to measure pollutant emissions during startup since most compliance methods do not work effectively outside of steady-state conditions. Therefore, the agency may limit the amount of startups or the amount of time the boiler takes to startup. An emission limit is not federally enforceable if a compliance method cannot be determined. Therefore, compliance with the emission limit or operating practice must be determined at all periods of time the emission unit is operating. Compliance methods may consist of stack testing, continuous emissions monitoring, or parametric monitoring (measuring times of operation or fuel use to calculate the emissions). The compliance method must be able to measure or calculate emissions consistent with the emission limit's averaging time period (e.g., 3-hr average, 1-hr max, 24-hr average, etc…).

EXAMPLE - COMBINED-CYCLE GAS TURBINE FIRING NATURAL GAS

Parameter	Design Value
Number Of Emission Units	**4**
Emission Unit Identification	**Natural gas fired combustion turbine with dry low-NO_X burners; each turbine is equipped with a heat recovery steam generator and natural gas-fired duct burners**
Gas Turbine Output	**163 Megawatts**
Steam Turbine Output (No Emissions)	**424 Megawatts**
Turbine Heat Input	**1,685 million Btu/hr**
Duct Burner Heat Input	**245 million Btu/hr**
Exhaust Temperature	**209 °F**
Turbine Hours Of Operation	**8,760 hr/yr**
Duct Burner Hours Of Operation	**4,000 hr/yr**
Uncontrolled Emissions (per turbine/duct burner)	**NO_X 200.7 tpy** **CO 262.5 tpy** **SO_2 9.3 tpy** **VOC 108.1 tpy** **PM 61.8 tpy**

In this example, emissions of NO_X, CO, VOC, and PM are subject to PSD BACT since CO emissions make this a new major source and emissions of the other pollutants are above their respective significant thresholds level. This example will focus on a BACT analysis for NO_X.

*Note – the data used in this example is for instructive purposes only and does not represent actual vendor data for the controls.

STEP 1—IDENTIFY ALL CONTROL TECHNOLOGIES

In this step, all available control technologies are listed:

- SCONOX^{TM}
- Selective catalytic reduction system (SCR)
- SCR with water or steam injection
- Selective non-catalytic reduction system (SNCR)
- Water/steam injection

Example continued:

STEP 2—ELIMINATE TECHNICALLY INFEASIBLE OPTIONS

From the list above, remove the technically infeasible options and explain why the option is not feasible:
SNCR can be eliminated as technically infeasible because the system requires a flue gas temperature of 1300 to 2100 °F, which is much higher than the temperature of the turbine exhaust.

STEP 3—RANK REMAINING CONTROL TECHNOLOGIES

The technically feasible (i.e., remaining) control options are ranked from the most to the least effective in terms of emission reduction potential. Also included is the expected emission rate, the performance level, and expected emission reduction for each control option:

Control Option	Performance Level (% Efficiency)	Emission Reduction (tpy)	Expected Emission Rate (ppm)
SCONOX™	**98**	**196.7**	**1-2**
SCR	**95**	**190.7**	**1-3**
SCR w/water or steam injection	**90**	**180.6**	**6-9**
Water/steam injection	**80**	**160.6**	**25-42**

STEP 4—EVALUTE THE MOST EFFECTIVE CONTROLS

Starting with the top BACT choice in the above table, evaluate the energy, environmental and economic impacts. If there is proper justification that adverse energy, environmental or economic impacts exist, then the control option may be eliminated and the next option evaluated. This continues until a control option can no longer be eliminated.

Top choice—SCONOX™

There is little operational experience with this technology on turbines greater than 32 megawatts. There have been many technical concerns raised about its operation on large turbines. Other impacts associated with this technology include the increased use of natural gas, reduced power output for the turbine, an increase in water use, and additional wastewater generation. Although SCONOX™ can achieve slightly better emission levels than SCR, it is much more costly than SCR equipment (about 3 times greater). This choice can be eliminated since it is economically infeasible.

Example continued:

2nd choice—SCR

SCR is a demonstrated and proven technology that has been applied safely and effectively on hundreds of combined-cycle turbines nationwide. This system uses ammonia to react with NO_X in the presence of a catalyst to create nitrogen and water. Any non-reacted ammonia is emitted to the air. The collateral environmental impact from ammonia emissions is around 5-10 ppm while NO_X reductions are on the order of about 95 percent. The increases in ammonia emissions are much lower than the NO_X reduction. Therefore, the environmental impacts are not considered adverse or a cause for elimination of the SCR system. There may also be an increase in particulate emissions while using an SCR system due to the potential formation of ammonia sulfates. However, this increase is minimal when compared to the decrease in NO_X emissions. The cost analyses for SCR and SCONOX™ are listed below.

	SCONOX™	**SCR**
Direct capital cost	**$15,000,000**	**$4,000,000**
Indirect capital cost	**$2,400,000**	**$800,000**
Total capital investment	**$17,400,000**	**$4,800,000**
Direct annual cost	**$3,680,000**	**$1,000,000**
Indirect annual cost	**$1,500,000**	**$500,000**
Total annual cost	**$5,180,000**	**$1,500,000**
Tons NO_X reduced	**196.7**	**190.7**
$/ton reduced	**$26,335**	**$7,866/ton**

The analysis can stop here since it is shown that SCR is the best choice for BACT. It is not worth looking at less efficient control options for NO_X since the SCR system is the most feasible. Therefore, BACT for the turbine project is determined to be the SCR system with a NO_X limit in the range of 1-3 ppm. The specific permit limit will be based on the most recent BACT determinations with which this determination can be compared.

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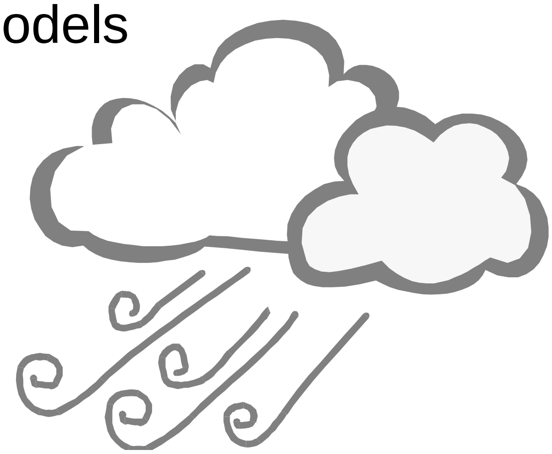
CHAPTER 9
AIR QUALITY DISPERSION MODELING

In This Chapter:

- MDEQ Air Quality Models
  - Model Suitability
  - Levels of Model Sophistication
- MDEQ Preferred Screening Models
  - SCREEN3 Model
  - AERSCREEN Model
- MDEQ Preferred Refined Models
  - ISC Models
  - ISC-PRIME
  - AERMOD
  - CALPUFF

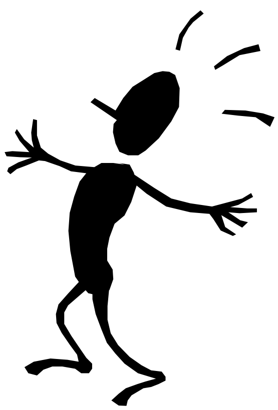


- Modeling Data Elements
- Ambient Air Receptor Grid
- Meteorology Data
- Fumigation Consideration
- Stack Design
- PSD Modeling for Criteria Pollutants
  - Source Impact Analysis
  - Increment Analysis
  - NAAQS Analysis
  - Emissions Inventory & Background Concentrations
- Modeling Protocol Submittal
- Modeling Submittal

CHAPTER 9: AIR QUALITY DISPERSION MODELING

Air dispersion modeling is the primary regulatory tool for predicting source impacts through computer simulation. Modeling results are routinely used to design the permit conditions that affect emission units. Other purposes for modeling include the response to complaints concerning odors or risk assessments for toxic compounds. In addition, the state is sometimes required to use air dispersion modeling to show compliance with various state and federal ambient air quality standards.

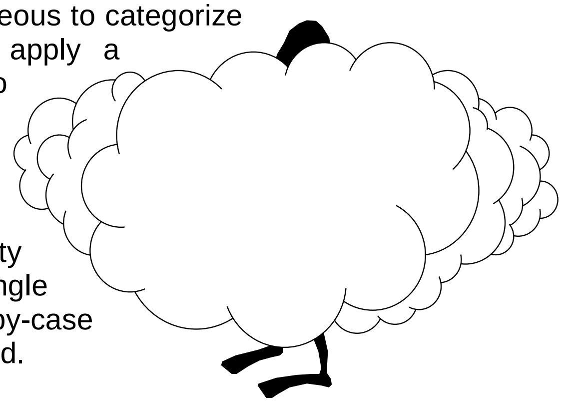
When emissions could cause violations of a federal or state ambient air quality standard, modeling may be required as part of an air use permit application. When an applicant is subject to PSD, modeling is always required. Air quality dispersion models provide estimates of the relationship between emissions and the pollutant concentration levels at any given point downwind.



The concentration of an air pollutant released from a source is affected by physical dispersion, dilution and decay. Models attempt to simulate conditions which determine these factors. Such scenarios include emission and flow rates, angle of release, exhaust temperature, wind speed, wind direction, ambient temperature, atmospheric stability, chemical transformation rates, and physical removal rates. The resultant ground level concentration is then compared to the NAAQS or PSD Increments.

In the 1977 Clean Air Act, Congress mandated such reviews and encouraged the standardization of model applications, ensuring that air quality control agencies and the general public have a common basis for estimating pollutant concentrations, assessing control strategies and specifying emission limits.

One might believe that it would be advantageous to categorize the various emission source types and apply a designated model to each. However, due to the variations in source configurations and operating characteristics, it is not always possible to dictate a strict modeling "cookbook". Meteorological phenomena associated with threats to air quality standards are rarely amenable to a single mathematical treatment; thus, case-by-case analysis and judgment are always required.



MDEQ Air Quality Models

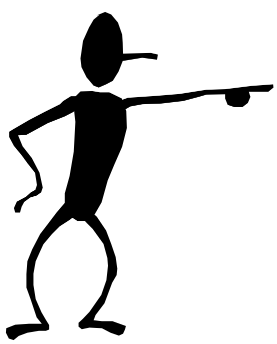
If modeling is required as part of a minor source permit review, the applicant has two choices. The first choice is to have the MDEQ air dispersion modelers perform the modeling for your permit application. In this case, the applicant must include adequate data required for the modeling study when the application is submitted to the MDEQ. The MDEQ will not, however, examine in depth the possible engineering changes needed to bring the proposed equipment into compliance with the air quality standards should the analysis fail initial review.

The alternative is to submit a modeling analysis with the application. A permit application, which includes successful modeling, can often proceed through the review process more quickly than one which requires modeling by the MDEQ. The MDEQ recommends having the modeling section of a permit application completed by an experienced professional such as an environmental consultant.

For PSD permit applications, modeling must be included in order for the application to be considered complete. The MDEQ air dispersion modelers will review and verify PSD modeling conducted by an applicant, or by a consultant on behalf of an applicant, but will not perform the modeling themselves.

Model Suitability

The extent to which a specific air quality model is suitable for the evaluation of source impact depends upon several factors:



1. Meteorological and topographic complexities of the area source configuration;
2. Level of detail and accuracy needed for the analysis;
3. Technical competence of those undertaking such modeling;
4. Available resources; and
5. Detail and accuracy of the database emissions inventory, meteorological data and air quality data

Computer models are highly specialized tools. A model applied improperly, or with inappropriately chosen data, can lead to serious misjudgments regarding the source impact or the effectiveness of a control strategy. In general, the more parameters a model includes, the more accurately the result will represent the real situation.

If the parameters necessary for a particular model are unknown, that model should not be used. As modeling efforts become more complex, it is increasingly important that they be directed by highly competent individuals with a broad range of experience and knowledge in air quality meteorology. The procedures and techniques for determining the acceptability of a model for an individual case are contained in the document entitled Interim *Procedures for Evaluating Air Quality Models,* EPA 450/4-84-023 or NTIS document PB84-106060, and is also discussed in Michigan Air Pollution Control Rule 240 entitled "Required Air Quality Models."

Models sanctioned by USEPA are promulgated in the *Guideline on Air Quality Models* (Guideline) (Appendix W of 40 CFR 51). The Guideline addresses the regulatory application of air quality models for accessing criteria pollutants under the Clean Air Act. Appendix A of the Guideline details the USEPA's "preferred models" for refined modeling. In most cases, the MDEQ will default to the USEPA Appendix A models as the preferred models for PSD permit applications in Michigan.

Appendix B of the Guideline which lists "alternative models," is located at USEPA's Support Center for Regulatory Air Models (SCRAM) web page. Alternative models may be used for PSD reviews on a case-by-case basis with the prior approval of the MDEQ.
Web Links:

Appendix W Guideline: http://www.epa.gov/scram001/guidance/guide/appw_03.pdf
Alternative Models: (http://www.epa.gov/scram001/tt22.htm#altmod

Levels of Model Sophistication

The methods for PSD air quality dispersion modeling should be considered in two levels:

1. Screening techniques; and
2. Refined dispersion models

Screening techniques are relatively simple calculations that provide conservative estimates of the air quality impact from a specific source. The purpose of screening is to eliminate the need for further detailed modeling for sources that clearly will not cause or contribute to ambient concentrations in excess of specific air quality criteria. If the predicted maximum impact from the screening model exceeds the specified criteria, more sophisticated models may be applied.

Refined models consist of analytical techniques that provide more detailed treatment of physical and chemical atmospheric processes. These complex models require more detailed and precise input data, and provide more specialized concentration estimates. Theoretically, refined models give a more accurate estimate of source impact and the effectiveness of control strategies. These models can also be used to evaluate engineering changes (e.g., stack height or location) that may bring the source into compliance.

The MDEQ highly recommends meeting to discuss modeling methods in advance of performing a complex modeling analysis. The USEPA's *Air Quality Analysis Checklist* provides details for PSD modeling concerns. An environmental professional should be contacted if PSD regulations are a concern for a new or modified source to obtain an air permit.

Web Link:

USEPA Modeling Checklist: http://www.epa.gov/scram001/guidance/guide/checklist.pdf

MDEQ Preferred Screening Models

SCREEN3 Model

SCREEN3 is a relatively simple interactive program which can quickly perform single stack, short-term calculations. The SCREEN3 model includes:

- Estimated ground-level concentrations resulting from point, area, or volume sources of emissions;
- Estimated maximum ground-level concentrations and the distance to the maximum;
- Incorporated effects of building downwash on the maximum concentrations for both the near-wake and far-wake regions;
- Estimated concentrations in the cavity recirculation zone;
- Estimated concentrations due to inversion break-up and shoreline fumigation; and
- Determining plume rise for flare releases

SCREEN3 can also incorporate the effects of simple, elevated terrain on maximum concentrations, and can estimate 24-hour average concentrations due to plume impaction in complex terrain. However, SCREEN3 cannot explicitly determine maximum impacts from multiple sources. Sources that emit the same pollutant from several stacks with similar parameters that are within close proximity of each other may be analyzed by treating all of the emissions as coming from a single representative stack.

Averaging Time	Multiplication Factor
3-hr	0.9
8-hr	0.7
24-hr	0.4
Annual	0.08

With the exception of the 24-hour estimate for complex terrain impacts, the results of SCREEN3 are estimated maximum 1-hour concentrations. To estimate ambient impacts associated with longer period averages, the following multiplication factors should be applied to the predicted 1-hour concentration:

NOTICE: Due to the 2003 expected promulgation of new generation dispersion models, SCREEN3 is expected to be phased out of "preferred model" status during 2004. At that time, it will be considered an "alternative model" and would be used only for case-by-case applications as approved by the MDEQ.

Note that while SCREEN3 is simple to use, it is designed to produce conservative results. Also, it is the only USEPA screening model, to consider cavities and flares. Due to its conservative nature, modeled warrant the use of a more refined model.

Web Links:

Model: http://www.epa.gov/scram001/models/screen/screen3.zip
Users Guide: http://www.epa.gov/scram001/userg/screen/screen3d.pdf

AERSCREEN Model

AERSCREEN will be phased in during 2004 as the new generation "preferred" screening model. The AERSCREEN model will retain many of the simplicities of SCREEN3 while including many of the more sophisticated features found in USEPA's new generation refined model, AERMOD. AERSCREEN will be a relatively simple interactive program which can quickly perform single source, short-term calculations, including:

- Single point source calculations;
- Choice of English or Metric units for input parameters;
- Building wake effects for either attached or detached stacks;
- Incorporate the effects of building downwash on the maximum concentrations for both the near wake and far wake regions;
- Site specific meteorology based on surrounding surface characteristics;
- Site specific terrain elevations based on 1-degree Digital Elevation Maps;
- Overall maximum impact as a function of distance; and
- Automatic scaled impacts for 3-hour, 8-hour, 24-hour and annual averages

At present, AERSCREEN cannot explicitly determine maximum impacts from multiple stacks but it is expected to have this capacity in the future. Similar to SCREEN3, sources that emit the same pollutant from several stacks with similar parameters that are within near proximity of each other may be analyzed by treating all of the emissions as coming from a single representative stack.

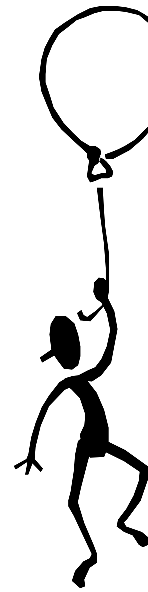
The initial version of AERSCREEN will be limited to point sources and will be upgraded to include area and volume sources. AERSCREEN is currently being tested and is not yet available for public use. It is scheduled to be available when AERMOD becomes mandated as USEPA's "preferred" refined model during the summer of 2004.

MDEQ Preferred Refined Models

<u>Industrial Source Complex (ISC) Models</u>

The Industrial Source Complex Short Term version 3 (ISCST3) has been the workhorse model for the USEPA and MDEQ for many years. It is currently the USEPA's Appendix A "preferred model" for criteria pollutants and the MDEQ preferred model for all refined applications. ISCST3 is a steady-state Gaussian plume model which can be used to assess pollutant concentrations from a wide variety of sources associated with an industrial complex. This model can account for the following:

- Settling and dry deposition of particles;
- Building wake effects (excluding cavity region impacts);
- Point, area, line, and volume sources;
- Plume rise as a function of downwind distance;
- Multiple point, area, line, or volume sources;
- Limited terrain adjustment;
- Long-term and short-term averaging modes;
- Rural or urban modes;
- Variable receptor grid density; and
- Actual hourly meteorology data



ISCST3 is appropriate for sources located in both simple terrain, where the terrain features are all lower in elevation than the top of the stack of the source, and in complex terrain, where terrain elevations rise to heights above the stack top.

The meteorological data required to run ISCST3 includes mixing heights, wind direction, wind velocity, temperature, atmospheric stability and anemometer height. Five years of data is usually required for major source PSD applications. For minor source applications, the most recent year of available data is usually acceptable. To maintain data consistency, the MDEQ provides meteorological data to permit applicants. More information regarding meteorological data can be accessed on the MDEQ internet web page.

The ISCST3 model provides direction specific building wake effects to determine the "downwash" of air currents from different directions as they pass around and over structures near the stack. The downwash effect has the tendency to draw down stack emissions toward the ground and cause elevated impacts just downwind of the structure. Generally, a building is considered to cause downwash if it is located within 5 times the building height of the emitting stack *and* the emitting stack height is less than 2.5 times the building height. The USEPA's *Building Profile Input Program* (BPIP) should be used to determine the appropriate building dimensions to be put into the ISC3 model.

The ISCST3 model, as provided by the USEPA, does not perform cavity region impacts in the near-wake zone of a structure (i.e. 3 times the height of the building downwind). Since MDEQ requires cavity region impacts to be addressed as part of any PSD modeling review, a MDEQ modification to the ISCST3 code is allowed to approximate impacts in the cavity region using far-wake zone algorithms. Implementation of this code modification requires either direct contact with the MDEQ modelers or a modified version available from some third-party vendors. Since this modification provides only an approximation of, and may not accurately represent, impact in the cavity region, applicants should consider the use of ISC-PRIME building downwash algorithms discussed below as an alternative.

NOTICE: Due to the 2003 expected promulgation of new generation dispersion models, ISCST3 is expected to be phased out of "preferred model" regulatory NSR use during 2004. At that time, it will be considered an "alternative model" and will be used only for case-by-case applications as approved by the MDEQ.

Web Links:

Met Data: http://www.michigan.gov/deq/0,1607,7-135-3310_4104_4198-11663--,00.html
Model & User Guides: http://www.epa.gov/scram001/tt22.htm#isc
BPIP Program: http://www.epa.gov/scram001/tt22.htm#relatedprograms

ISC3 with Plume Rise Model Enhancements - (ISC-PRIME)

As discussed above, the Appendix A "preferred" ISCST3 model contains limited wake effects capability which, specifically, excludes cavity region (i.e. near-wake) impacts. To provide scientifically sound near-wake and far-wake downwash impacts, PRIME (Plume RIse Model Enhancements) algorithms were developed and evaluated as the next generation model for building downwash. This set of algorithms has been incorporated into the latest version of the ISCST3 model and named ISC-PRIME. The remainder of the ISC-PRIME program is identical to the ISCST3 model.

The USEPA's *Building Profile Input Program* (BPIP), which is recommended to generate necessary downwash parameters, has been upgraded to BPIP-PRM to account for the additional building dimension parameters required by the ISC-PRIME model.

Although not yet mandated in Appendix A of the USEPA's Guideline, use of PRIME algorithms is recommended if building wake effects are expected. The predicted impacts resulting from ISC-PRIME are more accurate and therefore defensible, when controversial applications are under review. Additionally, downwash inclusion will become the standard in the upcoming AERMOD model.

Web Links:

Model, User Guide, & BPIP-PRM: http://www.epa.gov/scram001/tt26.htm#iscprime

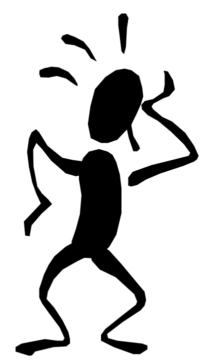
AMS/EPA Regulatory Model - (AERMOD)

Several years ago, AERMIC (American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee) was formed to introduce state-of-the-art modeling concepts into the USEPA's air quality models. The resulting model, AERMOD, is a steady-state plume dispersion model for assessment of pollutant concentrations from a variety of sources. AERMOD simulates transport and dispersion from multiple points, area, or volume sources based on an up-to-date characterization of the atmospheric boundary layer. Sources may be located in rural or urban areas, and receptors may be located in simple or complex terrain. AERMOD accounts for building near-wake and far-wake effects (i.e., plume downwash) using the PRIME wake effect model. The AERMOD model employs hourly sequential meteorological data to estimate concentrations for averaging times ranging from one hour to one year.

AERMOD is applicable to continuous releases of primary air toxic and hazardous waste pollutants. Chemical transformation is treated by simple exponential decay. Settling and deposition are not yet simulated by AERMOD but will be added in a future version.

AERMOD requires the use of two pre-processor modules to develop necessary components of the model:

- AERMET (AERMOD Meteorological Preprocessor): The AERMET module is the meteorological preprocessor for the AERMOD program. Input data can come from hourly cloud cover observations, surface meteorological observations and twice-a-day upper air soundings. Output includes surface meteorological observations and parameters and vertical profiles of several atmospheric parameters. AERMET is a general purpose meteorological preprocessor for organizing available meteorological data into a format suitable for use by the AERMOD air quality dispersion model. The user's guide provides instructions for setting up and running the AERMET preprocessor. National Weather Service (NWS) hourly surface observations, twice-daily upper air soundings and on-site meteorological data can be processed in AERMET.

  There are three stages to processing AERMET data:

  1. Stage 1 extracts meteorological data from archived data files and processes the data through various quality assessment checks;
  2. Stage 2 merges all data available for 24-hour periods (NWS and on-site data) and stores these data together in a single file; and
  3. Stage 3 reads the merged meteorological data and estimates the necessary boundary layer parameters for use by AERMOD

  Two files are written by AERMET:

  1. A file of hourly boundary layer profile estimates; and
  2. A file of multiple-level observations of wind speed and direction, temperature, and standard deviation of the fluctuating components of the wind

- AERMAP (AERMOD Terrain Preprocessor): The AERMAP module is a terrain preprocessor designed to simplify and standardize the input of terrain elevation data for the AERMOD program.

  AERMAP raw input terrain data is the Digital Elevation Model (DEM) data obtained from the United States Geological Survey (USGS). DEM data can be obtained from the USGS in either 7.5-minute or 1-degree resolutions. Currently AERMAP supports both the 7.5-minute and 1-degree DEM data files. DEM files are readily available through the United States Geological Services (USGS) - (edcftp.cr.usgs.gov) and various third party commercial vendors.

The 7.5 minute DEM format has a resolution of approximately 30 meters by 30 meters and is the preferred choice for use in PSD modeling. Available data may be incomplete in some areas requiring the use of 1-degree DEM data.

Each 1-degree DEM data file covers an area of 1-degree by 1-degree which corresponds to the east or west half of 1:250,000 scale USGS topographic quadrangle map series. The data resolution in each 1-degree DEM file is approximately 100 meters by 30 meters. These data are complete and available for the entire contiguous United States, Hawaii, and portions of Alaska, Puerto Rico and the Virgin Islands.

Output from AERMAP includes, for each receptor, location and height scale, which are elevations used for the computation of air flow around hills and other terrain features.

NOTICE: AERMOD is expected to be released during the summer of 2003. The modeling community will have a 1-year transition period to phase from ISC models to AERMOD. At the end of the 1-year transition period (i.e. summer of 2004), AERMOD will become the Appendix A, “preferred model” for regulatory use. ISC models will be considered “alternative models” and would be used only for case-by-case applications as approved by the MDEQ.

Web Links:

AERMOD related programs - http://www.epa.gov/scram001/tt26.htm#aermod
AERMET Raw Meteorology Data: http://www.webmet.com/
AERMAP Raw DEM Data (7.5 minute & 1-Degree): http://edc.usgs.gov/geodata/

CALPUFF

CALPUFF is an advanced non-steady-state meteorological and air quality modeling system that simulates pollution releases as a continuous series of puffs. The model has been adopted by the U.S. Environmental Protection Agency (USEPA) in its Guideline as the Appendix A "preferred" model for assessing the following:

1. Long range transport of pollutants and their impacts on Federal Class I areas; and
2. Case-by-case basis for certain near-field applications involving complex meteorological conditions

The modeling system consists of three main components and a set of preprocessing and post-processing programs. The three main components of the modeling system include:

1. CALMET (a diagnostic 3-dimensional meteorological model);
2. CALPUFF (an air quality dispersion model); and
3. CALPOST (a post-processing package)

Each of these programs has a graphical user interface (GUI). In addition to these components, there are numerous other processors that may be used to prepare geophysical (i.e., land use and terrain) data, meteorological data (surface, upper air, precipitation, and buoy data), and interfaces to other models such as the Penn State/NCAR Mesoscale Model (MM5), the National Centers for Environmental Prediction (NCEP) ETA model, and the RAMS meteorological model.

Some examples of applications for which CALPUFF may be suitable include:

- Near-field impacts in complex flow or dispersion situations;
  - complex terrain;
  - stagnation, inversion, recirculation, and fumigation conditions;
  - overwater transport and coastal conditions; and
  - light wind speed and calm wind conditions
- Long range transport;
- Visibility assessments and Class I area impact studies;
- Criteria pollutant modeling, including application to State Implementation Plan (SIP) development;
- Secondary pollutant formation and particulate matter modeling; and
- Buoyant area and line sources (e.g., forest fires and aluminum reduction facilities)

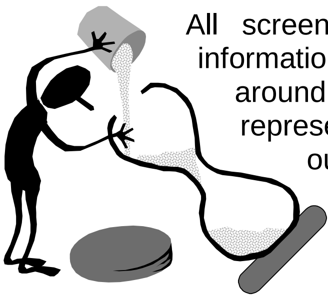
The MDEQ-AQD recommends the use of CALPUFF for predicted impacts greater than 50 km from the release point or for impacts in regions where complex terrain wind channeling can significant effect overall dispersion.

NOTICE: CALPUFF was promulgated as an Appendix A "preferred model" in the April 15, 2003 Federal Register. The modeling community has a one year transition period to phase in the CALPUFF model. On April 15, 2004, CALPUFF will become the mandatory model for long range or complex wind scenarios.

Web Links:

CALPUFF and related programs - http://www.epa.gov/scram001/tt22.htm#calpuff

Modeling Data Elements



All screening and refined modeling analyses require certain basic information regarding the nature of the emissions release, wind flow around nearby structures, surrounding terrain heights, and representative meteorological conditions. This section is intended to outline the basic elements necessary to construct a modeling analysis. The following modeling elements are necessary for any air dispersion modeling demonstration submitted to the MDEQ.

Stack Information

To estimate the downwind dispersion of a plume release, the manner of a pollutant release must be provided to the dispersion model via the following parameters:

- Stack Emission Rate;
- Stack Location;
- Stack Elevation;
- Stack Height;
- Stack Diameter;
- Stack Gas Temperature;
- Stack Gas Exit Velocity; and
- Stack Orientation

If a plume is not discharged vertically and unobstructed, the following modifications must be made to the stack parameters to address the reduced dispersive nature of the release:

Horizontal and Rain Cap Releases
- Stack Gas Exit Velocity – 0.001 m/s

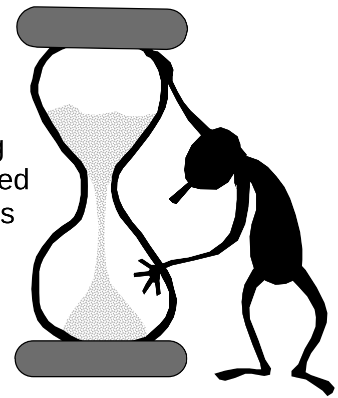
Goose Neck Down Releases
- Stack Gas Exit Velocity – 0.001m/s
- Stack Gas Temperature – 294 K

Rain Sleeve Release

- Stack Height – Height of rain sleeve;
- Stack Diameter – Diameter of inner flue; and
- Stack Gas Exit Velocity – Velocity of inner flue

Nearby Building Dimensions

As wind currents pass over and around nearby structures, eddies occur which can “draw-down” emission plumes to the ground. This can cause greatly increased impacts on the downwind side of an influencing structure. To account for “building downwash” using the previously mentioned BPIP/BPIP-PRM programs, the following information is required:



- Number of Influencing Buildings;
- Number and coordinates of Stack(s);
- Corner coordinates (relative to stacks) of all Influencing Buildings and Related Tiers;
- Height of all Buildings and Tiers

Web Links:

BPIP Program: http://www.epa.gov/scram001/tt22.htm#relatedprograms
BPIP-PRM & User Guide: http://www.epa.gov/scram001/tt26.htm#iscprime

Ambient Air Receptor Grid

In any modeling demonstration, it is important that the receptor grid (i.e. specific coordinates where the model predicts downwind concentrations) is sufficiently dense to ensure that the point of maximum ambient impact is identified. Ambient is defined as anywhere public access is not precluded, including unsecured property, railroad tracks, waterways, and roadways.

While each modeling demonstration is unique, grid intervals of 50 meters are generally sufficient to identify the point of maximum impact (i.e. short distance impacts may require an even smaller interval). Polar grids can be used, but the MDEQ generally prefers Cartesian grids since polar grids become less dense farther away from the origin. Discrete receptors should also be placed along secured property lines and at any school, hospital, or house where there is a need to determine pollutant impacts. In some instances, it may be necessary to employ "flagpole" (above the ground) receptors to ascertain the pollutant concentrations at air intakes on buildings, etc.

Secured Ambient Air Boundary

In areas where public access is precluded by security measures ambient impacts generally do not need to be addressed. In such cases, the nearest impact receptors will be along a “secured ambient air boundary”. The "secured ambient air boundary" is defined as a boundary which reasonably prevents general public access to property owned by a facility, such as one or more of the following:

- The existence of a physical barrier such as a fence, wall, or berm;
- A body of water, such as a ditch, of sufficient size to preclude public access to the property. The body of water must not be available for recreational activities such as boating, fishing or swimming;
- Regular patrols by staff who are responsible for not allowing unauthorized personnel onto the property. The patrol must be conducted at least several times a day;
- Continuous monitoring by surveillance cameras where staff are assigned to view video monitors and report any unauthorized access; and
- Any other security measure approved by the MDEQ

Note that facility’s legal property boundary line does not automatically qualify as a “secured ambient air boundary”. Receptor intervals along the “secured ambient air boundary” is recommended to not exceed 25 meters.

Urban/Rural Classification

The selection of either rural or urban dispersion coefficients in a specific application should follow one of the procedures described below.

Land Use Procedure:

- Classify the land use within the total area (Ao) circumscribed by a 3 km radius circle around the source using the meteorological land use typing scheme proposed by Auer (1978).
- If land use types 11, 12, C1, R2 and R3 account for 50 percent or more of Ao, use urban dispersion coefficients; otherwise, use appropriate rural dispersion coefficients.

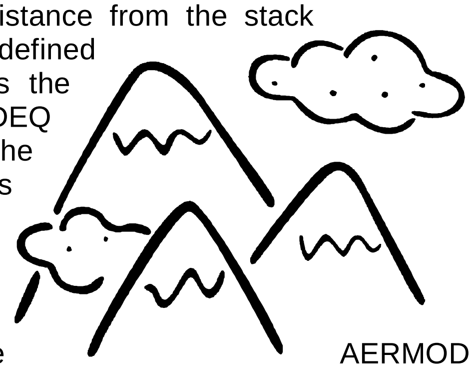
Population Density Procedure:

- Compute the average population density (p) per square kilometer with Ao as defined above;
- If p is greater than 750 people/km^2, use urban dispersion coefficients; otherwise use appropriate rural dispersion coefficients

Of the two methods, the land use procedure is considered more definitive. Population density should be used with caution. It should not be applied to highly industrialized areas where the population density may be low and thus a rural classification would be indicated, but the area is sufficiently built-up so that the urban land use criteria would be satisfied. For analyses of urban complexes, the entire area should be modeled as an urban region if the majority of the sources are located in areas classified as urban.

From a practical standpoint, most areas in Michigan can be classified as rural. While there may be isolated areas elsewhere, the only large areas that can be classified as urban are found in Wayne and Kent Counties.

Terrain Elevations



In general, modeled impacts decrease as the distance from the stack increases. If terrain elevations increase within the defined receptor grid, modeled impacts can increase as the distance from the stack increases. Therefore, MDEQ guidance requires terrain height elevations in the modeling analysis if the surrounding terrain deviates more than 25% of the shortest stack height. As the modeler is required to determine the terrain height for each receptor point, this task can be very tedious and prone to error if attempted manually. The AERMAP component of the AERMOD program described above was designed to perform this task digitally using elevation data available on the internet.

Web Links:

AERMOD/AERMAP programs - http://www.epa.gov/scram001/tt26.htm#aermod
Digital Elevation Data (7.5 minute & 1-Degree): http://edc.usgs.gov/geodata/

Meteorology Data

ISC Meteorology Data

The meteorological data used to run the ISC models includes mixing heights, wind velocity, temperature, atmospheric stability and anemometer height. Five years of representative data is usually required for major source PSD applications unless one year of on-site data is available. Only the last year of available data is usually required for minor source applications. The MDEQ provides validated meteorological data to permit applicants using hourly data collected from full-time National Weather Service (NWS) stations. Meteorology other than that provided by the MDEQ must be approved on a case-by-case basis.

Web Links:

AQD Data: http://www.michigan.gov/deq/0,1607,7-135-3310_4104_4198-66831--,00.html

AERMOD Meteorology Data

From the modeler's perspective, the primary difference between the ISC models and AERMOD model will be the format of hourly meteorology data. Use of the AERMOD meteorological pre-processor program, AERMET, used to develop appropriate hourly data sets is discussed above.

To generate an hourly data set as site-specific as possible, the user must be knowledgeable of some basic surface characteristics required by AERMET

- Surface Roughness – A value related to the height of obstacles to the wind flow and is, in principle, the height at which the mean horizontal wind speed is zero;
- Bowen Ratio – An indicator of surface moisture;
- Albedo – The fraction of solar radiation reflected by the surface back into space without absorption

AERMET allows the user to define surface characteristics by wind flow sector and by season. Tables are provided in the AERMET documentation to assist the modeler in the determination of proper surface characteristic values. As predicted impacts can vary significantly by modifying AERMET surface characteristics, each modeling analysis will need to include a defense of the choice of values to prevent "engineering" desired impacts.

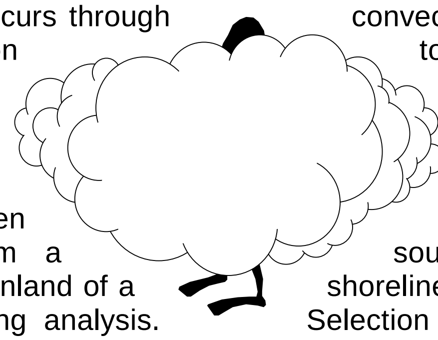
Meteorology data, necessary to run the AERMET pre-processor, can be freely downloaded from internet sites. To maintain data consistency, the MDEQ may provide, at a future time, pre-processed data similar to the ISC data availability.

Web Links:

AERMOD related programs - http://www.epa.gov/scram001/tt26.htm#aermod
Raw Meteorology Data for AERMET Processing: http://www.webmet.com/

Fumigation Consideration

Fumigation is an important phenomenon on and near shorelines. Fumigation occurs when a plume is emitted into a stable layer of air and that layer is subsequently mixed to the ground. Mixing occurs through convective transfer of heat from the surface or by advection to less stable surrounding air layers. Fumigation may cause excessively high concentrations but is usually rather short-lived at any given receptor. This can affect both individual plumes and area-wide emissions. When fumigation conditions are expected to occur from a source or sources with tall stacks located on or just inland of a shoreline, this should be addressed in the air quality modeling analysis. Selection of the appropriate model for applications where shoreline fumigation is of concern should be determined in consultation with the MDEQ.



Good Engineering Practice (GEP) Stack Design Consideration

In general, the taller the stack, the lower the maximum impact (i.e., downwind concentration). Any portion of stack's height that is in excess of the GEP height is generally not creditable when conducting modeling demonstrations. GEP stack is defined in Part 1 of the Michigan Air Pollution Control Rules as follows:

> **Good Engineering Practice design** means, with respect to stack heights, the height necessary to ensure that emissions from the stack result in acceptable concentrations of air contaminants in the immediate vicinity of the stationary source as a result of atmospheric downwash, eddies, and wakes which may be created by the stationary source itself, nearby structures, or nearby terrain obstacles and shall not exceed the greatest of the following limits:
>
> (i) Two hundred and thirteen feet (65 meters).
> (ii) Two and one-half times the height of the structure or nearby structure for those stacks for which construction or modification commended on or before January 12, 1979, if the owner or operator produces evidence that this relationship was actually relied upon in designing the stack to ensure protection against downwash.
> (iii) The sum of the height of the structure or nearby structure plus 1.5 times the lesser of the height or width of the structure or nearby structure for those stacks for which construction or modification commenced after January 12, 1979.
> (iv) Such height as an owner or operator of a stationary source demonstrates, to the satisfaction of the commission, is necessary through the use of field studies or fluid models after notice and opportunity for public hearing.

Prevention of Significant Deterioration (PSD) Modeling for Criteria Pollutants

An applicant for a PSD permit is required to conduct an air quality analysis of the ambient impacts associated with the construction and operation of the proposed new stationary source or modification. The main purpose of the air quality analysis is to demonstrate that new emissions emitted from a proposed or modified source, in conjunction with other applicable emissions increases and decreases from existing sources, will not cause or contribute to a violation of any applicable PSD Increments or NAAQS.

Pollutants for which there exists a NAAQS are referred to as “criteria” pollutants. Criteria pollutants include:

- Particulate matter less than 10 microns: PM-10
- Sulfur Dioxide: SO_2
- Oxides of Nitrogen: NO_X
- Ozone: O_3
- Carbon Monoxide: CO
- Lead: Pb
- Mercury: Hg
- Beryllium: Be

If a criteria pollutant modeling analysis is required, the applicant must demonstrate that a proposed source will:

1. Not cause or significantly contribute to the deterioration of air quality greater than the specified allowed PSD Increments; and
2. Not cause a violation of the NAAQS

Each modeling analysis will be unique due to the variety of sources and meteorological and topographical conditions that may be involved. Nevertheless, the air quality analysis must be accomplished in a manner consistent with the requirements set forth in the PSD regulations. Considerable guidance is contained in USEPA's *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* and *Guideline on Air Quality Models (Revised)*..

Proposed New or Modified Source Impact Analysis

To determine the level of analysis required for each applicable pollutant, predicted impacts from the proposed source, only, should be determined. If the predicted impact is less than PSD defined S*ignificant Impact Levels*, then emissions of that pollutant will not be considered to cause or contribute to any violation of federal criteria pollutant standards. Federal significant impact levels are defined as follows:

Averaging Period	Significant Level
3-Hour	**25 ug/m3**
24-Hour	**5 ug/m3**
Annual	**1 ug/m3**
1-Hour (CO)	**2,000 ug/m3**
8-Hour (CO)	**500 ug/m3**

Pollutants with predicted impacts greater than the Significant Impact Levels require further analysis. If predicted impacts are less than significant impact levels, no further modeling analysis is required for that pollutant.

PSD Increment Analysis

A PSD Increment is the maximum allowable increase in concentration that is allowed to occur above a baseline concentration for a criteria pollutant. A baseline concentration is defined for each pollutant (along with a relevant averaging period) and, in general, is the ambient concentration existing at the time that the first complete PSD permit application affecting the area is submitted. Significant deterioration is said to occur when the amount of new pollution would result in ambient pollutant concentrations above the baseline concentration by an amount greater than the PSD Increment. It is important to note, however, that the air quality cannot deteriorate beyond the concentration allowed by the applicable NAAQS, even if not all of the PSD Increment is consumed.

The Clean Air Act of 1977 established pollutant increments for the prevention of significant deterioration of ambient air. Currently, increments exist for SO_2, NO_X, and PM-10. When modeling for compliance with the PSD increments, it is necessary to demonstrate that the impact of the proposed source *plus* the cumulative impact of all other sources in the area installed since the baseline date is less than the allowed increment. To allow for continued growth potential, it has been MDEQ's policy to allow no single facility to consume more than 80% of the remaining available increment.

If a PSD Increment consumption analysis is needed, the following modeling elements are required to complete the review for each applicable pollutant:

- Proposed maximum new emissions; and
- Emissions of existing on-site and off-site increment consuming sources which have a significant impact within the receptor grid

All new sources (major and minor) installed after the applicable baseline date are increment consuming sources. Emissions from units that pre-existed the baseline date, but have been permanently removed within the past 5 years, may be considered to “free up” increment and may be “netted-out” as negative emissions during the increment analysis (i.e., modeled as a negative emission rate). The MDEQ maintains all statewide baseline dates as part of their internet web page service. Emissions inventories of off-site sources are available, upon request, from the MDEQ.

The 1-hr, 3-hr, 8-hr, and 24-hr increments for all criteria pollutants, other than PM-10, are deterministic standards. In other words, they cannot be exceeded more than once per calendar year. For example, when conducting a major source PSD modeling analysis for SO_2, the highest of the second highest concentrations (non-annual) predicted for any of the five calendar years modeled should be used as the estimate. Annual NO_X, SO_2, or PM-10 increments can never be exceeded. When conducting five-year modeling for the 24-hr PM-10 increment, the 6th highest value at any receptor should be used.

For minor sources which consume increment, the highest concentration predicted from one year of modeling should be used for all averaging times.

<u>NAAQS Analysis</u>

Modeling to demonstrate compliance with the NAAQS is conducted in the same manner as is PSD Increment modeling, but with two important differences. The first difference is that compliance with the NAAQS is based upon the *total* modeled air quality impact - there is no baseline date. In other words, the emissions of all sources in the area that have a significant impact must be evaluated regardless of the date the facility was constructed. The second difference is that an ambient background based on monitored air quality data must be added to the modeled impact. Therefore, if a NAAQS analysis is needed, the following additional modeling elements are required to complete the review for each applicable pollutant:

- Proposed maximum new emissions;
- Emissions of all existing sources which have a significant impact within the receptor grid; and
- Background concentrations based on representative monitoring data

Background concentrations and emissions inventories of off-site sources are available, upon request, from the MDEQ.

Similar to PSD Increments, the 1-hr, 3-hr, 8-hr, and 24-hr NAAQS for all criteria pollutants, other than PM-10, are deterministic standards. That is, they cannot be exceeded more than once per calendar year. For example, when conducting a NAAQS major source modeling analysis for SO_2, the highest of the second-high concentrations (non-annual) predicted for any of the five calendar years modeled should be used as the estimate. Annual NO_X, SO_2, or PM-10 NAAQS can never be exceeded. When conducting five-year modeling for the 24-hr PM-10 NAAQS, the 6^{th} highest value at any receptor should be used.

Emissions Inventory & Background Concentrations

An emissions inventory of nearby sources can be requested from MDEQ. Available information includes a list of company's names, permitted emissions (or actual emissions if no permit exists), permit numbers, UTM coordinates, and stack parameters. To obtain this information, provide the following complete detailed information in an e-mail letter:

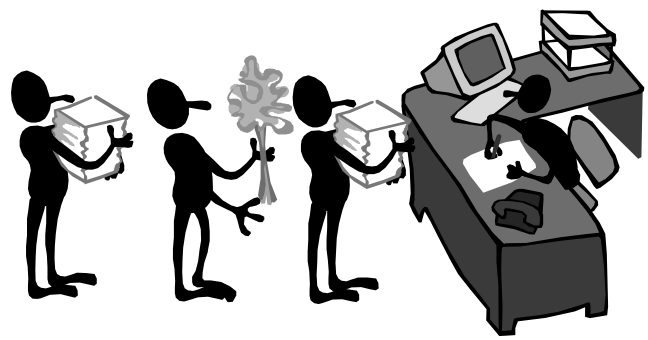
- The company's name, address, and phone number;
- Plant name, address, county, and UTM coordinates;
- List of pollutants;
- Significant Impact Radius; and
- Other relevant details

Send information to: Jim Haywood (haywoojg@michigan.com) or call 517-241-7478.

Background concentrations for inclusion in modeling analyses are also available by request. Suggested background concentrations for criteria pollutants for each Air Quality Control Region (AQCR) have been published beginning with the Michigan 2002 Air Quality Report. In areas where there is a large number of monitors (e.g., southeast Michigan), the applicant can request monitoring data which is the most representative of the proposed source location.

Modeling Protocol Submittal

Because of the complex character of the air quality analysis and the site-specific nature of the modeling techniques involved, applicants for PSD permits are advised to review the details of their proposed modeling analysis with the MDEQ before a PSD application is submitted. This is best done using a modeling protocol. The modeling protocol should be submitted to the MDEQ for review and approval prior to commencing any extensive analysis. The protocol should, at a minimum, contain the following:



- The proposed model, including version date;
- Proposed meteorological data location and dates;
- Proposed receptor locations;
- All sources to be modeled;
- Use of any special non-default options; and
- Scaled plot plans clearly denoting north, property lines, building dimensions and stack locations

Modeling Submittal

The following items must be included with each modeling submittal or it will be deemed administratively incomplete. The modeling review will not begin until the submittal is complete.

A. Brief discussion describing how modeling was performed.
- Model used and version;
- Assumptions; and
- Meteorological data

B. Stack Parameters
- Stack emission rate per pollutant;
- Stack height;
- Stack diameter;
- Stack exhaust temperature;
- Stack flow rate; and
- Stack coordinates

C. Modeling Results
- Summary table of all maximum predicted impacts with comparison to applicable criteria or air toxic thresholds;
- Model output pages containing input parameters and impact summary; and
- CD-ROM or 3.5” disk with all model input files including BPIP

D. Scaled Site Plan

- Diagram of all facility structures with associated building tier heights and dimensions;
- Location of all stacks with identification;
- Defined ambient air boundary (if applicable);
- Property boundary; and
- Accurate scale

References:

- *Michigan Air Use Permit Technical Manual*
- *New Source Review Workshop Manual* (Draft 1990)
- *Michigan Air Pollution Control Rules*
- *Guideline on Air Quality Models* (Appendix W of 40 CFR Part 51)
- USEPA's *Ambient Monitoring Guidelines for Prevention of Significant Deterioration*

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Michigan Department of Environmental Quality

CHAPTER 10
ADDITIONAL IMPACT ANALYSIS

In This Chapter:

- Overview
- Growth Analysis
- Soils and Vegetation
- Visibility
- Class I Areas Impact Analysis
- Air Toxics Modeling
- Odor Modeling

CHAPTER 10: ADDITIONAL IMPACT ANALYSES

All PSD permit applicants must prepare an additional impacts analysis for each pollutant subject to PSD (i.e., emitted at greater than their significant emissions threshold). This analysis assesses the impacts of air, ground and water pollution on soils, vegetation, and visibility caused by any increase in emissions of a regulated NSR pollutant from the source or modification under review. In most cases, emissions increases will not have adverse impacts on soils, vegetation, or visibility. However, the additional impacts analysis still must be performed.

Although each applicant for a PSD permit must perform an additional impacts analysis, the depth of the analysis generally will depend on existing air quality, the quantity of emissions, and the sensitivity of local soils, vegetation, and visibility in the source's impact area. It is important that the analysis fully document all sources of information, underlying assumptions, and any agreements made as a part of the analysis.

The additional impacts analysis generally has three parts, as follows:

1. Growth;
2. Soil and vegetation impacts; and
3. Visibility impairment

Growth Analysis

The elements of a growth analysis include:

- A projection of the associated industrial, commercial, and residential growth that will occur in the area due to the proposed project; and
- An estimate of the air emissions generated by the growth

Soils and Vegetation

The analysis of impacts on soils and vegetation should be based on an inventory of the soil and vegetation types found in the impact area. This inventory should include all vegetation with any commercial or recreational value and may be available from several sources (i.e. conservation groups and/or universities). For most types of soil and vegetation, ambient concentrations of criteria pollutants below the NAAQS will not result in harmful effects. However, there are sensitive vegetation species, which may be harmed by long-term exposure to low concentrations of pollutants

for which are no NAAQS. Good references for applicants and reviewers alike include:

- *USEPA's Air Quality Criteria Documents*,
- *Impacts of Coal-Fired Plants on Fish, Wildlife, and Their Habitats* (U.S. Department of the Interior)
- *A Screening Procedure to Evaluate Air Pollution Effects on ClassIWilderness Areas* (US Forest Service)
- *Air Quality in the National Parks* (National Park Service)

Visibility

In the visibility impairment analysis, the applicant is especially concerned with impacts that occur within the area affected by applicable emissions. Note that the visibility analysis required here is distinct from the Class I area visibility analysis requirement. The suggested components of a good visibility impairment analysis are:

- A determination of the visual quality of the area;
- An initial screening of emission sources to assess the possibility of visibility impairment; and
- If warranted, a more in-depth analysis involving computer models

To successfully complete a visibility impairments analysis, the applicant is referred to an USEPA document entitled *Workbook for Estimating Visibility Impairment* or its projected replacement, the *Workbook for Plume Visual Impact Screening and Analysis*. The workbook outlines a screening procedure designed to expedite the analysis of emissions impacts on the visual quality of an area. The workbook was designed for Class I area impacts, but the outlined procedures are generally applicable to other areas.

Class I Areas Impact Analysis

Class I areas are areas of special national or regional natural, scenic, recreational, or historic value for which the PSD regulations provide special protection. Michigan contains two Class I areas:

1. Seney National Wildlife Refuge; and
2. Isle Royale National Park

One way in which air quality degradation is limited in all Class I areas is by more stringent limits defined by the PSD Class I increment thresholds. As described in Chapter 9, increments are the maximum increases in ambient pollutant concentrations allowed over baseline concentrations. The Class I Increments more stringently limit increases in ambient pollutant concentrations caused by new major sources or major modifications than do the Class II Increments discussed previously. Similar to PSD Increment analyses elsewhere in the state, increment consumption modeling for Class I areas should include not only emissions from the proposed source, but also other sources that may consume increment in the Class I area.

Visibility is singled out in the regulations for special protection and enhancement in accordance with the national goals of preventing any future visibility impairment and improving any existing visibility impairment in Class I areas caused by man-made air pollution.

The visibility regulations, 40 CFR 51.307 and 52.27, require visibility impact analysis in PSD areas for major new sources or major modifications that have the potential to impair visibility in any Federal Class I area. Information on screening models available for visibility analysis can be found in the manual "Workbook for Plume Visual Impact Screening and Analysis," EPA-450/4-88-015 (9/88).

Air Toxics Modeling

Air toxics collectively refer to any chemical or compound emitted to the air other than criteria pollutants. Any proposed new or modified process, which emits a toxic air contaminant (TAC), is required to comply with the pollutant-specific Initial Threshold Screening Levels (ITSL) or the Initial Risk Screening Levels (IRSL). The ITSL and IRSL are maximum ambient pollutant concentrations developed according to procedures set forth in Michigan Air Pollution Control Rules 224 through 230.

The list of screening thresholds is updated periodically as more compounds are evaluated and additional toxicity research information becomes available. The screening levels are based on industrial, governmental, and academic toxicological research. ITSL are developed for toxic non-carcinogenic compounds and are the ambient air concentrations that are not expected to result in adverse health effects in humans. Maximum predicted impacts at or beyond the ambient air boundary that result from the proposed project, are not allowed to exceed the ITSL.

Screening levels for cancer-causing compounds (i.e. carcinogens) are risk based. An IRSL is based on an increased lifetime cancer risk of one in a million (1×10^{-6}) occurring in a population in which all individuals are continuously exposed over a lifetime. Maximum predicted impacts at or beyond the ambient air boundary, which result from the proposed project, are not allowed to exceed the IRSL.

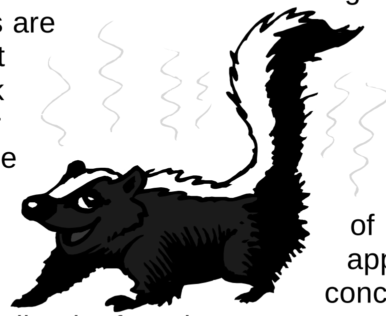
In addition, Secondary Risk Screening Levels (SRSL) have been developed. SRSL are based on an increased lifetime cancer risk of one in one hundred thousand (1×10^{-5}) occurring in a population in which all individuals are continuously exposed over a lifetime. Maximum predicted impacts at or beyond the ambient air boundary, which result from *all* facility emissions, are not allowed to exceed the SRSL.

Web Link:

Screening Levels: http://www.deq.state.mi.us/documents/deq-aqd-toxics-itslalph.pdf

Odor Modeling

Dispersion modeling may be required to gauge if a project will produce nuisance odors. This analysis is also used to help remedy known odor problems at existing facilities. The MDEQ recommends that odor modeling be conducted with a preferred USEPA model. Since odors are dependent on very short-term ambient concentrations, MDEQ requires a 10-minute peak concentration be estimated from the 1-hour average concentrations usually generated by the computer models. By multiplying the predicted 1-hour average concentration by a factor of 2.0, the 10-minute peak concentration can be approximate d. References for published "odor threshold concentrations" can be found in documents such as *the Handbook of Environment Data on Organic Chemicals*. Other modeling methodologies and threshold concentrations may be acceptable and will be reviewed by the MDEQ on a case-by-case basis.



In many cases, a range of odor thresholds is published which can vary up to two orders of magnitude. This is due to the subjective nature of odor perception and sensitivity from person to person. As such, the published odor threshold data should be used as a basis for making engineering assumptions regarding odor impacts, not as definitive thresholds at which odors will occur.

Prepared by: James G. Haywood
Air Quality Division
Michigan Department of Environmental Quality

CHAPTER 11

DECISION-MAKING AND PUBLIC PARTICIPATION

In This Chapter

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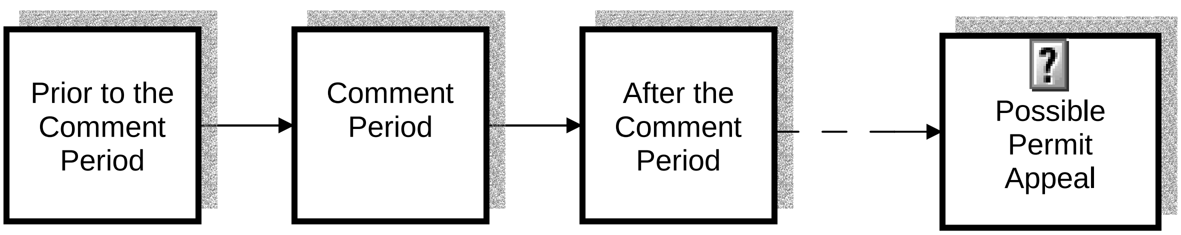
CHAPTER 11: DECISION-MAKING AND PUBLIC PARTICIPATION

40 CFR, Part 124, Procedures for Decision-Making, must be followed for PSD permits issued by USEPA or its delegated authority. The procedures are very prescriptive on what must occur prior to the public comment period, during the public comment period, at the point of permit decision, and possibly following the decision. The roles and obligations of the permitting agency, the public, and the USEPA are identified. The State of Michigan regulations found in Act 451, Part 55, provide some very specific requirements with regard to public notice and public hearings. The Air Quality Division (AQD) public participation process is based upon these state and federal requirements, as outlined below.

Decision-Making Process for PSD Permits



Prior to the Public Comment Period

> In preparation for the public participation portion of the decision-making process, the following documents are developed by AQD Staff:
> - Draft Conditions
> - Fact Sheet

<u>Draft Conditions</u>

Once an application is both administratively and technically complete and the technical review is concluded, a draft permit is developed. The draft contains permit conditions necessary to assure the process or process equipment operates in compliance with all applicable state and federal requirements. The draft conditions are shared with the applicant for concurrence. Typically, there is an agreement on the draft conditions between the applicant and the AQD before proceeding with the decision-making process. The draft permit conditions are the focal point of the public participation process, as all comments received are to be based upon this draft permit.

Fact Sheet

A Fact Sheet must be prepared by the AQD for each PSD draft permit. The Fact Sheet provides a description of the process, the issues considered in preparing the draft permit, and other items of interest. Information that must be included consists of the following:

- a brief description of the type of facility or activity which is the subject of the draft permit;
- the type and quantity of emissions;
- the degree of PSD increment consumption;
- a brief summary of the basis for the draft permit conditions including references to the state and federal requirements;
- the reasons why any requested variances or alternatives to the required standards do or do not appear justified; and
- the description of the process for reaching a final decision on the draft permit, including the beginning and ending date of the comment period, procedures for requesting a hearing, any other procedures by which the public may participate in the final decision; and the name and telephone number of a contact person.

For more complex draft permits, the AQD may provide a more detailed report on the applicant's proposal, the AQD's technical review, and the draft permit conditions. In addition, the permit application file containing the applicant's information and the AQD staff's analysis is always available for review in the Lansing office or the appropriate District office.

Public Input

The key step in the decision-making process is obtaining public input. The following are the components of the public input portion of the decision-making process:

- Public Comment Period
- Public Hearing
- Public Notice
- Notification
- Receipt of Public Comments
- Informational Meetings

Public Comment Period
The public is provided the opportunity to present its input on the proposed draft permit in writing during the public comment period or verbally at a public hearing. All comments received during the comment period or at the hearing are considered by the Department of Environmental Quality's (DEQ's) Decision-Maker for the permit action.

A public comment period lasts a minimum of 30 days. This time-frame may be extended due to the complexity of the source, a request for a hearing, or the timing of the close of the comment period or hearing (i.e., if the 30th day falls on a Saturday, the comment period would end on the following Monday). All comments must be received by the AQD prior to the close of the comment period.

Public Hearings

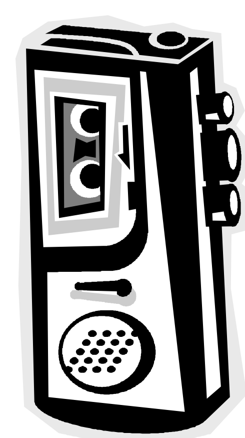
Public hearings provide the public with the opportunity to submit verbal testimony directly to the Decision-Maker. 40 CFR, Part 124, requires that a public hearing on a proposed permit action be held whenever the AQD finds "on the basis of requests, a significant degree of public interest in a draft permit" or "such a hearing might clarify one or more issues involved in the permit decision." In practice, the AQD will hold a public hearing whenever a written request for a hearing is provided or there exists a known public controversy.

A minimum of 30 days notice is required for a public hearing. Whenever there is a known public controversy, the AQD will announce the date and time of the public hearing at the same time the comment period is announced. However, for the majority of the draft permits requiring public participation, the public hearing is announced with the phrase "if requested by [specific date]" and is held only if a written request is received. In these cases, the hearing date is typically two or more days after the noticed close of the public comment period. This extension allows all interested parties to learn if a hearing request is received and if a hearing will be held. In instances where a hearing is held, the public comment period is automatically extended to the close of the public hearing.

The location for a public hearing is selected based upon many factors including the proximity to the facility, the size of the auditorium or room, and accessibility.

A presiding officer conducts the hearing. Per state requirements, a presiding officer must be a disinterested and technically qualified person. The presiding officer is usually a DEQ employee of another Division or AQD staff from another District or Section. The Decision-Maker for the permit is also in attendance.

At the public hearing, any person may submit oral or written statements and data concerning the draft permit. The AQD asks each person attending the hearing to fill out an attendance card. The purpose of the card is two-fold: it is used to develop the mailing list of interested parties and to identify anyone who wishes to make a verbal statement on the record. Before the hearing, AQD staff is available to answer questions regarding the proposed permit, the facility, air impacts, etc. Depending on the proposal, representatives from other divisions within the DEQ or other state and local agencies are may also be in attendance. During the hearing, individuals are called by name and initially limited to five minutes for public comment. The time limit is used to ensure everyone who wishes to speak has the opportunity. Once all the individuals have had the opportunity to place public comments on the record, the individuals who need more than the five minutes are allowed to continue their testimony. The public hearing is not closed until all individuals in attendance who wish to place public comment on the record have done so.



All public hearings are recorded. The tape is kept on file and a copy may be made if requested. There are instances when a written transcript of the hearing is obtained. An example would be for a complicated or lengthy hearing to assure that all significant comments are identified.

Content of a Public Notice

The AQD combines the notice of the proposed action, the public comment period, and the public hearing. This is an efficient way of distributing the necessary information as well as being more cost effective than separate notices. The public notice must include the following information:

- name and address of the office processing the permit action;
- name and address of the permit applicant and, if different, of the facility;
- a brief description of the activity described in the permit application;
- name, address, and telephone number of a person from whom interested persons may obtain further information, including copies of the draft permit, Fact Sheet, and application;
- a brief description of the comment procedures and the time and place of any hearing that will be held, including a statement of procedures to request a hearing (unless a hearing has already been scheduled) and other procedures by which the public may participate in the final permit decision; and
- a brief description of the nature and purpose of the hearing.

Notification

Effectively notifying all interested parties of a public comment period and the opportunity for a hearing is a key component of public participation. The specific federal and state requirements are followed. In addition, other methods are used to contact interested parties.

The AQD is required to provide legal notice of the proposed permit action in a local paper of general circulation. Typically, the AQD will publish in a local daily as well as a local weekly paper to assure the greatest area coverage. In addition, electronic communication is used. Copies of all the public participation documents are placed on the AQD web page. A notice of the pending permit action is placed in the DEQ calendar, which is sent to a large distribution list on a bi-weekly basis.

A list of all applications under review at any given time is available by electronic query at the AQD web site http://www.deq.state.mi.us/aps/PendApps.asp. In addition, the list is sent monthly to each board of County Commissioners.

Direct mail continues to be the most effective way of contacting interested parties. The public participation documents are sent to persons on general and area mailing lists.

These mailing lists include those who have been involved in previous public comment periods for sources in the area, local and state officials, the Environmental Protection Agency, and depending upon the location of the facility, Canadian, Illinois, Indiana, Ohio, and/or Wisconsin officials.

Public Comments

The federal procedures for decision-making state that "[a]ll persons, including applicants, who believe any condition of a draft permit is inappropriate or that the Director's tentative decision to deny an application, terminate a permit, or prepare a draft permit is inappropriate, must raise all reasonable ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period." All interested parties are encouraged to provide their comments during the comment period. It is vitally important that the Decision-Maker be presented with all the facts in order to make an informed decision.

Informational Meetings

Often for complicated permits, an Informational Meeting will be held. This meeting is designed to provide all interested parties with the opportunity to ask questions of the AQD staff. Questions can range from the toxicological effects of the emissions to the how often the company will be required to submit records to the AQD. The Informational Meeting may be held immediately preceding the hearing or the week before depending upon the interest of the local community. The format can be a panel question and answer session or an open house format where the AQD staff is readily available. Notice of the Informational Meeting is provided when the public comment period is announced.

Decision-Making

After the closing of the comment period, the following three steps remain for the Department's Decision-Maker and AQD Staff:

- Review all comments received
- Develop and distribute a Response to Comments Document
- Final permit action and the its effective date

Comment Review

After the close of the public comment period, the Decision-Maker reviews all of the written and verbal comments received. All significant air quality-related comments must be considered. The comments may generate additional questions for the applicant, technical review by staff, and/or additional requirements. The Decision-Maker may deny the permit, approve the permit, or approve the permit with modifications.

The Decision-Maker may also order the public comment period be reopened. This would occur if it could expedite the decision-making process. The reopened comment period lasts 60 days. Written comments filed in response to another's comments are then accepted for the following 20 days.

Responding to Comments Received

At the time a final permit decision is made, a Response to Comments document is also issued. The response must specify which provisions, if any, of the draft permit have been changed in the final permit and the reason(s) for the change. The Response to Comments document must also briefly describe and respond to all significant comments raised during the public comment period and any hearing.

Permit Action and the Effective Date

After the close of the public comment period and public hearing, if applicable, and the review of all comments received, a final permit decision is made by the Decision-Maker. As stated earlier, the Decision-Maker may deny the permit, approve as drafted, or approve with amendments. In all three scenarios, all interested parties, including everyone who was on the original mailing list, anyone who provided comments during the public comment period, and anyone who attended the public hearing, are directly notified of the decision. Included in the mailing is the letter from the Decision-Maker regarding the decision, the response to comments document, and if applicable, the approved permit. The letter from the Decision-Maker must include reference to the procedures for appealing the decision. Appeals will be discussed in the next section.

State requirements (R336.1207) make permit denials effective immediately.

For approvals where no comments were submitted requesting a change in the draft permit, the final permit decision is effective immediately.

In those instances where comments were received, the permit is issued, but is not effective for at least 33 days after the issuance date. The delay in the effective date provides the opportunity for an appeal of the final permit action. The 33-day time frame results from a requirement of 30 days after the interested parties are notified and 3 days for mailing. It is important to note that if the 33rd day ends on a weekend or a holiday, the delayed effective date extends to the next working day.

Appeals

In Michigan, a decision on a PSD permit may be appealed to the United States Environmental Protection Agency's Environmental Appeals Board (EAB). The following section describes the EAB, the EAB's review, the filing of an appeal, final agency action on the permit, permit stays, appeal petition requirements, the two stage appeal process, remands of permit decisions, and timing.

Environmental Appeals Board

Several states, including Michigan, do not have a state PSD program. In these areas, the federal PSD program is delegated to the state or local permitting agency. In 1992, the United States Environmental Protection Agency created the Environmental Appeals Board (EAB) as the final Agency Decision-Maker on administrative appeals under all major environmental statutes that the Agency or a delegated state administers, including PSD. The EAB is an impartial four-member body that is independent of all USEPA except the Office of the Administrator. The EAB sits on matters before it in three member panels and each matter is decided in a majority vote. Many of the EAB's cases are appeals from administrative enforcement decisions and appeals from permit decisions.

EAB Review

The EAB has the right to review permits issued pursuant to Michigan's PSD delegation. However, when a permit combines PSD requirements and non-PSD requirements, only the PSD part of the permit is open to review by the EAB. Appeal of the non-PSD requirements must follow the state appeal process, which includes judicial action.

Filing an Appeal

Within 30 days after a final decision has been issued, the decision may be appealed to the EAB. The portion of the permit that may be appealed is dependent upon the person's involvement in the public participation process associated with the permit. Any person who filed comments on the draft permit or who participated in the public hearing may file a petition and appeal any condition of the permit decision. Anyone who failed to file comments or failed to participate in the public hearing on the draft permit may petition for review of only the changes from the draft to the final permit decision.

Final Agency Action

If an appeal has been filed, final agency action occurs when:

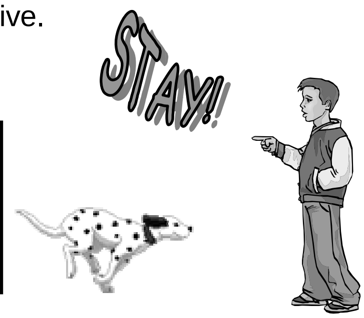
- the EAB has issued a final decision denying review;
- the EAB has issued a final decision on the merits of the appeal and the decision does not include a remand; or
- the EAB has issued a decision remanding the permit, and there has been a final permit decision by the Decision-Maker following the remand.

Permit Stays

If an appeal is filed, the permit is stayed and cannot become effective until final agency action. For those permits where the effective date is delayed, a special condition is added specifying the delay. Construction and/or operation under the issued permit cannot begin until the permit is made effective.

Question: What is a "stay"?

A stay is a postponement or delay in a legal proceeding.



Appeal Petition Requirements

The petition must specifically identify the disputed permit conditions and provide a demonstration why review of the permit decision is warranted. The petition must meet a minimum standard of specificity and cannot simply repeat the objections made during the comment period. The petitioner must demonstrate why the AQD's response to the objections raised warrants further review. The issues raised in the petition must have been previously raised, either by the petitioner or another commenter, during the public comment period provided that they were "reasonably ascertainable" at the time. The AQD must have had the opportunity to hear and respond to objections.

It is important to note that placing a petition for review into the mail does not constitute filing with the EAB for the purposes of meeting filing deadlines. The petition must be received at the EAB's office prior to 4:30 pm on the day before the issued permit's effective date.

Additional details regarding filing an appeal can be found at the EAB's website at www.epa.gov/eab.

Appeals Procedure (2 stage process)

First stage – Once a petition for appeal is received, the EAB sends a letter to the AQD requesting them to review the petition and respond to the contentions. In addition, the AQD is provided the opportunity to state why the petition does not satisfy the requirements for obtaining review, such as the issues were not raised previously or the petition was submitted untimely. A certified index of all documents in the administrative record for the permit as well as copies of those parts of the record directly related to the matters raised must also be submitted. The EAB tries to resolve as many appeals as possible in this first stage by obtaining this information.

Based upon EAB's review of the petition and the information provided, they will then issue a decision either granting or declining review. As stated previously, if the review is declined and no remand is identified, then the appeals process is concluded and the permit becomes effective. If the EAB grants review, the second stage of the process begins.

Second stage – The EAB develops a briefing schedule; briefs are submitted by the petitioner and any interested party, including the AQD; the EAB reviews the briefs; and a decision is issued. The decision may include reaffirmation of the permit and the permitting process or a remand of the permit back to AQD to address deficiencies. There is the opportunity for the petitioner to file a motion for reconsideration or clarification, although these are not typically granted.

Remands of Permit Decisions

After a thorough review of the issue, the EAB may identify a deficiency and remand the permit back to AQD to correct the deficiency. The remand directive may be from a broad spectrum of requirements from addressing a minor administrative deficiency and issuing the permit, to completing additional research, re-evaluating the project, holding additional public participation opportunities, and returning to the EAB for final action.

Timing

Once an appeal is filed, the timing of the submittals, review, and decision are at the discretion of the EAB. The EAB does acknowledge the urgency of the PSD permit issues and gives them the highest priority. Based upon the AQD's experience, it will take three to six months from the date the permit is issued until it is effective if an appeal is filed and dismissed at the first stage. This time frame is extended another six months to over a year for those permits involving a second stage determination.

Notice of Hearing Example:

NOTICE OF AIR POLLUTION COMMENT PERIOD AND PUBLIC HEARING

The Michigan Department of Environmental Quality is holding a public comment period until October 8, 2003, and a public hearing, if requested, on October 15, 2003, on Louisiana-Pacific Corporation (LP) Sagola plant's proposed replacement of the existing pulverizing hammer mill with two new pulverizing hammer mills. The public comment period and hearing, if requested, are to allow all interested parties the opportunity to comment on the Department's proposed conditional approval of an application for a Permit to Install. Additionally, the hammer mill replacement project will require revisions to Renewable Operating Permit No. 199600177. This public comment period meets the public participation requirements for a future administrative amendment to the renewable operating permit. LP is located at N 8504 Highway M-95, Sagola, Michigan. It has been preliminarily determined that the hammer mill replacement project will not violate any of the Department's rules nor the National Ambient Air Quality Standards.

This proposal is subject to the federal Prevention of Significant Deterioration rules and regulations for a modification to an existing major stationary source based on the emissions of PM-10. The proposed modification will consume only insignificant amounts of the federal Prevention of Significant Deterioration Air Quality increments for PM-10, sulfur dioxide, and nitrogen dioxide.

Copies of the Department staff's analysis and proposed permit conditions are available for inspection at the following locations, or you may request a copy be mailed to you by calling 517-241-7469. Please reference Permit to Install Application Number 41-03.

AQD Internet Home Page - http://www.michigan.gov/deq

UPPER PENINSULA DISTRICT OFFICE: Air Quality Division, KI Sawyer International Airport & Business Center, 420 Fifth Street, Gwinn
(PHONE 906-346-8503)

LANSING: Air Quality Division, Department of Environmental Quality, Constitution Hall, 3rd Floor, 525 West Allegan (Phone: 517-373-2856)

The public is encouraged to present its written views on the proposed permit action. Written comments should be sent to the Department of Environmental Quality, Air Quality Division, P.O. Box 30260, Lansing, Michigan, 48909, to the attention of the Permit Section Supervisor. All statements received by October 8, 2003 will be considered by the decision-maker prior to final permit action. If a hearing is requested, the comment period will be extended until the close of the hearing.

If a public hearing is requested in writing by October 8, 2003, it will be held on October 15, 2003 starting at 9 AM in the Hatcher Conference Room, Air Quality Division, 3rd Floor North, Constitution Hall, 525 West Allegan Street, Lansing, Michigan. Those interested may contact the Air Quality Division at 517-241-7469 on October 9, 2003, to determine if a hearing was requested and will be held. The sole purpose of a public hearing is to take testimony on the record. Staff will not be responding to questions during testimony at the hearing.

Individuals needing accommodations for effective participation at the hearing should contact Barb Wilcox at 517-373-2856 a week in advance to request mobility, visual, hearing, or other assistance.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

____

Lynn Fiedler, Supervisor, Permit Section

September 8, 2003

Fact Sheet Example

STATE OF MICHIGAN
Jennifer M. Granholm, Governor

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
Steven E. Chester, **Director**

AIR QUALITY DIVISION
CONSTITUTION HALL, 525 W ALLEGAN STREET, PO BOX 30260, LANSING MI 48909
INTERNET: http://www.michigan.gov

PUBLIC PARTICIPATION DOCUMENTS

For

Louisiana-Pacific Corporation
Sagola, Michigan

PERMIT APPLICATION NUMBERS

41-03

September 8, 2003

September 8, 2003

Purpose and Summary

The Michigan Department of Environmental Quality (DEQ), Air Quality Division (AQD) is proposing to act on Permit Application No. 41-03 from the Louisiana-Pacific Corporation (LP), Sagola facility. The permit application is for the replacement of one hammer mill with two new pulverizing hammer mills. The proposed project is subject to permitting requirements of the federal Prevention of Significant Deterioration (PSD) Regulations. Prior to acting on this application, AQD is holding a 30-day public comment period and a public hearing, if requested, to allow all interested parties the opportunity to comment on the proposed Permit to Install. All relevant information received during the comment period and hearing, if requested, will be considered by the decision-maker prior to taking final action on the application.

Background Information

The LP facility in Sagola, Michigan is an orientated strand board (OSB) manufacturing mill that produces structural panels used for various construction applications. The mill purchases small diameter logs that are debarked and fed to a waferizer. The wet flakes go through a rotary dryer, which reduces the flake moisture content from about 50 percent to 5 percent. The flakes are then captured by a cyclone and exhaust gas passes through a wet electrostatic precipitator followed by a regenerative thermal oxidizer (RTO).

The flakes collected by the primary cyclone drop into a rotary screen, which separates usable flakes and small wood fines. Wax and resin are mixed with the usable flakes in the blenders. Formers evenly distribute the resinated flakes creating a continuous mat that is separated into press size segments and sent to the press. The emissions from the pressing process are captured and routed to an RTO. The boards are unloaded from the press and cut into 4' x 8' panels.

The suspension burners on the flake dryers use the wood fuel derived from the saw lines, rotary screens, and trim saws. The wastewood from the operations is directed through one of two hammer mills that process the wood waste into a diameter between 5/64" to 7/64". The processed wastewood is then stored in either an inside fuel bin or the outside fuel (Laidig) bin. These pieces of equipment are controlled with four baghouses.

Project Description

LP is proposing to modify the existing waste wood fuel handling system to allow the three flake dryers' suspension burners to burn the wood fuel more efficiently.

The proposed modification consists of replacing one of the current hammer mills with two new pulverizing hammer mills (finishing mills), allowing the wood fuel to be processed into a smaller diameter (2/64"-5/64"). The wood fuel will be routed from either the primary hammer mill or the sander baghouses to the Laidig bin via a cyclone. From the Laidig bin, the wood fuel will be sent through the new finishing mills. Fuel from the finishing mills will be conveyed through a system that will allow air to be separated from the wood fuel stream so the wood fuel can be conveyed mechanically to the inside fuel bin.

LP proposes to install two new baghouses to control particulate emissions from the Laidig bin and the finishing mills. A baghouse for the Laidig bin will be necessary because there will be a 10 percent increase in airflow due to the wood fuel deposition by the cyclone. The other 90 percent of the air from the cyclone will be routed through the finishing mills, which, along with the particulate generated by the finishing mills, will be controlled by the other new baghouse.

Key Permit Review Issues

- LP Sagola is an existing major stationary source pursuant to the federal Prevention of Significant Deterioration (PSD) regulations (40 CFR 52.21). Therefore, any physical change or change in the method of operation that results in a significant emissions increase of any PSD pollutant is required to go through a review for a major PSD modification. This modification results in a significant increase for PM-10.

- Dispersion modeling was performed for emissions of NOx, CO, and PM-10. Impacts are all below the applicable National Ambient Air Quality Standards and PSD increment. Modeling for toxic air contaminant (TAC) and hazardous air pollutant (HAP) emissions from the facility shows impacts less than the applicable health based screening levels.

- LP is not requesting a change to the current permitted emission limits and will continue to comply with all applicable state and federal rules and regulations.

- LP will be required to modify the existing Renewable Operating Permit (ROP No. 199600018).

- LP performed a best available control technology (BACT) analysis for PM-10 pursuant to the federal PSD regulations. The USEPA's RACT/BACT/LAER Clearinghouse (RBLC) database, control equipment manufacturer data, and information gathered from other states were used to compare emission limits and control options with recent BACT determinations. The analysis is based on this comparison. BACT is determined to be a baghouse with a concentration limit of 0.01 pounds PM-10 per 1000 pounds exhaust gas, calculated on a dry gas basis.

Key Aspects of Draft Permit Conditions

The draft permit contains conditions for the entire LP facility. However, only the equipment involved with the dry fuel project, including the hammermills, Table Number F-4 FGFINISHMILLS, and the Laidig bin, Table Number F-3 FGLAIDIG, are affected by this permit modification. A PM-10 limit was also placed on the baghouse associated with the electrostatic filter bed gravel cleaner (EGGRAVEL). No other changes were made to the existing conditions for the rest of the facility. The following changes were made to the permit conditions relating to the dry fuel project:

- Emission limits for PM-10 and opacity
- Testing to verify compliance with the PM-10 emission limits

Conclusion

Based on the analysis conducted to date, staff concludes that the proposed installation would comply with all Michigan Department of Environmental Quality, Air Quality Division regulations based on the applicant's proposed emission limitations. It is also staff's conclusion that this source, as proposed, would not violate the federal National Ambient Air Quality Standards and federal PSD increments. Based on these conclusions, staff has developed draft permit conditions attached to this staff report, which would assure that the proposed facility design and operation are enforceable and that sufficient monitoring, recordkeeping and reporting would be performed by the applicant to determine compliance with these terms and conditions. If the permit application is deemed approvable, the delegated decision maker may determine a need for additional or revised conditions to address issues raised during the public participation process.

FACT SHEET
STATE AND FEDERAL AIR REGULATIONS

State Rule	Description of State Air Regulations
R 336.1201	Requires an Air Use Permit for new or modified equipment that emits, or could emit, an air pollutant. However, there are other rules that allow smaller emission sources to be installed without a permit (see Rules 336.1279 through 336.1290 below). Rule 336.1201 also states that the Department can add conditions to a permit to assure the air laws are met.
R 336.1224	New or modified equipment that emits toxic air contaminants must use the Best Available Control Technology for Toxics (T-BACT). The T-BACT review determines what control technology must be applied to the equipment. A T-BACT review considers energy needs, environmental and economic impacts, and other costs. T-BACT may include a change in the raw materials used, the design of the process, or add-on air pollution control equipment. This rule also includes a list of instances where other regulations apply and T-BACT is not required.
R 336.1225 to R 336.1232	The concentration of each toxic air contaminant present in the outdoor air must be less than specified levels. These levels, called the initial risk screening level (IRSL) for cancer causing air contaminants and the initial threshold screening level (ITSL) for non-cancer causing air contaminants, are health-based standards. Air Quality Division Toxicologists develop these standards following the methods in the rules. The standards are designed to protect all humans, including the most sensitive populations such as the young, elderly, and ill.
R336.1279 to R 336.1290	These rules list equipment or processes that have very low emissions and do not need to get an Air Use permit. However, these sources must meet all requirements identified in the specific rule and other rules that apply.
R 336.1301	Limits how air emissions are allowed to look at the end of a stack. The color and intensity of the color of the emissions is called opacity.
R336.1331	The particulate emission limits for certain sources are listed. These limits apply to both new and existing equipment.
R336.1370	Material collected by air pollution control equipment, such as dust, must be disposed of in a manner, which does not cause more air emissions.
R336.1401 and 336.1402	Limit the sulfur dioxide emissions from power plants and other fuel burning equipment.
R336.1601 to R336.1651	Volatile organic compounds (VOCs) are a group of chemicals found in such things as paint solvents, degreasing materials, and gasoline. VOCs contribute to the formation of smog. The rules set VOC limits or work practice standards for existing equipment. The limits are based upon Reasonably Available Control Technology or RACT. RACT is required for all equipment listed in the Rules 336.1601 through 336.1651.
R336.1702	New equipment that emits VOCs is required to install the Best Available Control Technology (BACT). The technology is reviewed on a case-by-case basis. The VOC limits and/or work practice standards set for a particular piece of new equipment cannot be less restrictive than the RACT limits for existing

	equipment outlined in R336.1601 through 336.1651.
R336.1801	Nitrogen oxide emissions limits for larger boilers and stationary internal combustion engines are listed.
R336.1901	Prohibits the emission of an air contaminant in quantities that cause injurious effects to human health and welfare, or prevent the comfortable enjoyment of life and property. As an example, a violation may be cited if excessive amounts of odor emissions were found to be preventing residents from enjoying outdoor activities.
R336.1910	Air pollution control equipment must be installed, maintained, and operated properly.
R336.1911	When requested by the Department, a facility must develop and submit a malfunction abatement plan (MAP). This plan is to prevent, detect, and correct malfunctions and equipment failures.
R336.1912	A facility is required to notify the Department if a condition arises which causes emissions that exceed the allowable emission rate in a rule and/or permit.
336.2001 to 336.2060	Allow the Department to request that a facility test its emissions and to approve the protocol used for these tests.

FACT SHEET
STATE AND FEDERAL AIR REGULATIONS

Citation	Description of Federal Air Regulations or Requirements
Section 109 of the Clean Air Act – National Ambient Air Quality Standards (NAAQS)	The United States Environmental Protection Agency has set maximum permissible levels for six pollutants. These National Ambient Air Quality Standards (NAAQS) are designed to protect the public health of everyone, including the most susceptible individuals, the children, elderly, and those with chronic respiratory ailments. The six pollutants, called the criteria pollutants, are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter less than 10 microns, and sulfur dioxide. All areas in Michigan are meeting the NAAQS. Further, in Michigan, State Rules 336.1225 to 336.1232 are used to ensure the public health is protected from other compounds.
40 CFR 52.21 – Prevention of Significant Deterioration (PSD) Regulations **Best Available Control Technology (BACT)**	The Prevention of Significant Deterioration (PSD) regulations allow the installation and operation of large new sources and the modification of existing large sources in areas that are meeting the NAAQS. The regulations define what is considered a large or significant source, or modification. In order to assure that the area will continue to meet the NAAQS, the permit applicant must demonstrate that it is installing the best available control technology or BACT. By law, BACT must consider the economic, environmental, and energy impacts of each installation on a case-by-case basis. As a result, BACT can be different for similar facilities. In its permit application, the applicant identifies all air pollution control options available, the feasibility of these options, the effectiveness of each option, and why the option proposed represents BACT. As part of its evaluation, the Air Quality Division verifies the applicant's determination and reviews BACT determinations made for similar facilities in Michigan and throughout the nation.
Section 112 of the Clean Air Act **Maximum Achievable Control Technology (MACT)**	In the Clean Air Act, Congress listed 189 compounds as Hazardous Air Pollutants (HAPS). For facilities which emits, or could emit, HAPS above a certain level, one of the following two requirements must be met: 1). The United States Environmental Protection Agency has established standards for specific types of sources. These Maximum Achievable Control Technology (MACT) standards are based upon the best-demonstrated control technology or practices found in similar sources. 2). For sources where a MACT standard has not been established, the level of

Section 112g	control technology required is determined on a case-by-case basis.

Notes:
An "Air Use Permit," sometimes called a "Permit to Install," provides permission to emit air contaminants up to certain specified levels. These levels are set by state and federal law, and are set to protect public health and welfare. By staying within the levels set by the permit a facility is operating lawfully, and public health and air quality are protected.

The Air Quality Division does not have the authority to regulate noise, local zoning, property values, truck traffic, or lighting.

These tables list the most frequently applied state and federal regulations. All regulations listed may not be applicable in each case. In addition, there may be other regulations that must be met. Please refer to the draft permit conditions provided to determine which regulations apply.

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