TECHNICAL FACT SHEET

October 10, 2024

Purpose and Summary

The Michigan Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD), is proposing to act on Permit to Install (PTI) application No. APP-2024-0005 from Smiths Creek Landfill (Smiths Creek). The permit application is for the permitting and operation of an existing open flare. Operation of the open flare minimizes landfill odors. The proposed project is subject to permitting requirements of the Department's Rules for Air Pollution Control. Before acting on this application, the AQD is holding a public comment period and a virtual public hearing to allow all interested parties the opportunity to comment on the proposed PTI. All relevant information received during the comment period and the virtual public hearing will be considered by the decision maker before taking final action on the application.

Background Information

Smiths Creek Landfill is located at 6779 Smiths Creek Road near the village of Smiths Creek, St. Clair County, Michigan. The existing landfill is used for the disposal of municipal solid waste, construction and demolition debris, asbestos-containing materials, foundry sand, low-level contaminated soils, and coal fly ash. The waste is placed into active portions of the landfill, or "cells" and is covered with soil or other approved materials daily. When a cell is full, a cover system and pipes are installed to collect the landfill gas created as the waste breaks down. The collected landfill gas is piped to the blower station. The gas is then sent to an open flare or to the Blue Water Renewables facility (considered to be part of the same, single stationary source as Smiths Creek).

Figure 1: Location of Smiths Creek Landfill

In November 2023, Smiths Creek installed a small, temporary open flare on the south side (Cell 8) of the landfill (please see Figure 2 below), under a permit exemption. However, gas sampling showed the sulfur content of the landfill gas was increasing and was no longer able to meet the exemption criteria. This increase triggered the need for further evaluation and an air permit. The temporary open flare was replaced by a larger open flare (the existing open flare involved in this application) in April 2024. The AQD cited violations against Smiths Creek because of the increase in the sulfur content, and the open flare's operation without an air permit. Part of Smiths Creek's plan to return to compliance is applying to permit the open flare installed in April 2024.

The open flare has a rated design capacity of 1,300 cubic feet per minute (cfm) of landfill gas, but Smiths Creek applied for only 1,000 cfm as an allowed usage. Therefore, the proposed draft conditions restrict the allowed usage to only 1,000 cfm at 54% methane as it was the basis for the technical review. The purpose of the open flare is to provide additional supplemental gas and odor control to the south side of the landfill (Cell 8) by producing an additional vacuum for pulling landfill gas; reducing the escape of untreated high-odor gas.

Figure 2: Site Plan of Landfill

During the technical review process, Smiths Creek proposed to add a hydrogen sulfide (H_2S) scrubber, called a Vacuum Adsorption Vessel. The scrubber works by directing collected landfill gas through physical media designed to remove sulfur from the gas. Treated landfill gas would then be sent to the open flare. Smiths Creek has also recently made improvements to their landfill gas collection system. This will ensure more gas is being collected and sent to the H_2S scrubber before the open flare. Removing sulfur from the gas, along with the gas collection improvements, will reduce sulfur being burned in the open flare. The open flare also reduces odors and sulfur dioxide (SO_2) emissions coming from Smiths Creek. Below is a process flow diagram of the system:

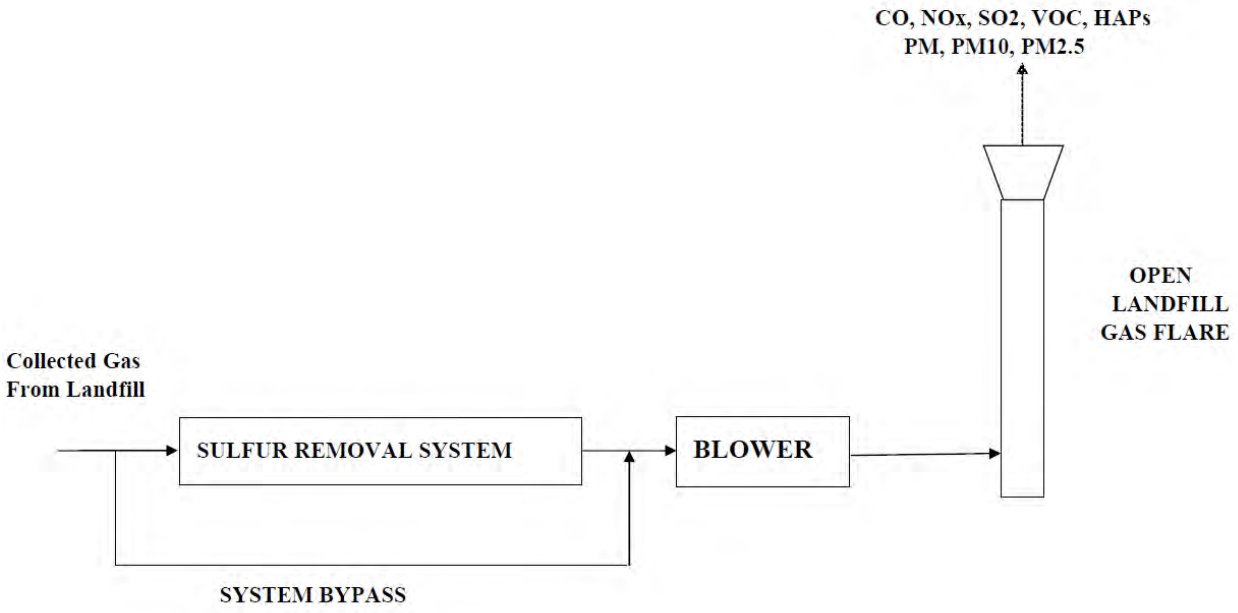

Figure 3: Process Flow Diagram

Present Air Quality

Smiths Creek is located in St. Clair County which is in attainment for all of the National Ambient Air Quality Standards (NAAQS) set by the United States Environmental Protection Agency (USEPA) except for SO_2. The air quality standards are for particulate matter less than or equal to 10 microns in diameter (PM10), particulate matter less than or equal to 2.5 microns in diameter (PM2.5), carbon monoxide (CO), nitrogen dioxide (NO_2), SO_2, ozone, and lead. The NAAQS are set at levels designed to protect public health, including sensitive populations.

The AQD operates two air monitoring stations in St. Clair County. The Port Huron station measures ozone, PM2.5, and SO_2. The Port Huron-Rural Street station measures metals. The purpose of the air monitoring stations is to assess the regional or area-wide air quality and is not used to determine if a specific source complies with their air permit.

Pollutant Emissions

The following table provides the estimated potential emissions for each criteria pollutant from the open flare and proposed Vacuum Adsorption Vessel:

Table 1: Emission Summary

Pollutant	Estimated Emissions (tpy*)	Significant Emission Rate (SER)
Particulate Matter (PM)	2.41	NA
PM10	2.41	15
PM2.5	2.41	10
SO_2	10.95	40
CO	39.99	100
Nitrogen Oxides (NO_x)	9.77	40
Volatile Organic Compounds (VOCs)	0.7	40

*tpy = tons per year

Key Permit Review Issues

Staff evaluated the proposed project to identify all state rules and federal regulations which are, or may be, applicable. The tables in Appendix 1 summarize these rules and regulations.

- **Minor/Major Modification Determination for Attainment Pollutants**
  Smiths Creek is an existing synthetic minor source under the Prevention of Significant Deterioration (PSD) rules with a facility-wide CO emission limit of 225 tons per year (tpy).

  Smiths Creek is located in St. Clair County, which is currently in attainment for all regulated pollutants, except for SO_2. As summarized in Table 1 above, the emissions associated with the proposed project are less than the SER for each regulated pollutant, so the project is not subject to PSD for any regulated pollutant.

- **Minor/Major Modification Determination for Nonattainment Pollutants**
  The facility is located in St. Clair County which is currently in nonattainment for SO_2. An increase in emissions above the SER would result in the change being subject to Nonattainment New Source Review (NNSR) for SO_2 if it is already an existing nonattainment major source. Currently, the facility is a nonattainment minor source for SO_2. The proposed emission increase of SO_2 from the facility is 10.95 tons per year which is less than the major source threshold. As such, the proposed SO_2 increase is not subject to major source NNSR.

- **Federal NESHAP Regulations**
  National Emission Standards for Hazardous Air Pollutants (NESHAP) were established under 40 CFR Part 61 or Part 63. The existing open flare is subject to the NESHAP for Municipal Solid Waste Landfills, 40 CFR Part 63 Subpart AAAA. The specific requirements of this NESHAP are included in the facility's current Renewable Operating Permit (ROP). They will not be affected by this application.

- **Federal NSPS Requirements**
  The open flare is also subject to the New Source Performance Standards (NSPS) for Municipal Solid Waste Landfills in Part 62 Subpart OOO (Federal Plan). The stationary source is considered a legacy landfill under the Federal Plan. The specific requirements of this plan are included in the facility's current ROP. They will not be affected by this application.

- **Rule 224 TBACT Analysis**
  State of Michigan Rule 224 requires that emissions of toxic air contaminants or TACs do not exceed the maximum allowable emission rate that results from the application of Best Available Control Technology for Toxics (T-BACT). The requirements of Rule 224 do not apply to hazardous air pollutant (HAP) emissions from any process subject to a federal NESHAP or for any emission units that emits VOCs which are in compliance with Rule 702 VOC BACT.

  The open flare itself is a control device for the VOC-based toxics, which would be the primary type of TACs emitted. In addition, the open flare is subject to NESHAP AAAA, therefore is not subject to TBACT.

- **Rule 225 Toxics Analysis**
  EGLE Rules for Air Pollution Control require the ambient air concentration of TACs to be compared against health-based screening levels. AQD staff reviewed Smiths Creek's air quality modeling and evaluation of TAC impacts. TAC emission rates were determined by using the highest emission factors between USEPA publication AP-42 Chapter 2.4 finalized in 1998 and USEPA publication AP-42 Chapter 2.4 drafted in 2008. Any TACs found in one but not the other (for example, present in the 2008 version, but not the 1998 version) were also included in the analysis. The review found that all TACs show impacts less than their health-based screening levels and will comply with the requirements of Rule 225. The following is a summary of the review:

    - The AQD Toxics Unit determined several non-cancer causing TACs had worst-case emission rates less 0.14 pounds per hour (lb/hr) and less than 10 lb/month. Due to their environmental characteristics and low emission rates, those TACs will meet the criteria in Rule 226(a).

    - Four TACs (cis-1,3-dichloropropene, trans-1,3-dichloropropene, trichloromethane [chloroform], and vinyl acetate) did not have health-based screening levels established by the AQD. The emission rates of those pollutants underwent dispersion modeling to determine the highest ambient air concentration of each TAC over each timeframe (hourly, 8-hour, 24-hr, annually). Those concentrations were reviewed by the AQD Toxics Unit to determine if their Predicted Ambient Impact (PAI) would inhibit public health. The AQD Toxics Unit's review determined that the TACs would not impede public health or the environment.

    - The remaining TACs were compared to their respective applicable Air Emission Rates (AERs) specified in Rule 227(1)(a). Acrylonitrile (CAS 107131) was the only TAC with an existing screening level that did not pass Rule 227(1)(a). It passed TAC modeling (Rule 227(1)(c)) at less than 1% of the respective ITSL and IRSL.

- **Rule 702 VOC Emissions**
  This rule requires an evaluation of the following four items to determine what will result in the lowest maximum allowable emission rate of VOCs:

  a. BACT or a limit listed by the department on its own initiative

  b. New Source Performance Standards (NSPS)

  c. VOC emission rate specified in another permit

  d. VOC emission rate specified in the Part 6 rules for existing sources

  An evaluation of these four items determined that VOC BACT, pursuant to Rule 702(a), would be the proper operation and maintenance of the open flare. The open flare operates as a high-efficiency emission control device for the VOCs contained in the landfill gas. Also, the open flare emits less than 0.7 tpy of VOCs, therefore, additional control would not be economically feasible. The proper operation and maintenance of the open flare will be maintained through a required Malfunction Abatement Plan (MAP).

- **Criteria Pollutants Modeling Analysis**
  Smiths Creek conducted, and the AQD verified, computer dispersion modeling to predict the impacts of air emissions of CO, NO_x, SO_2, PM10, and PM2.5 from the existing open flare. NOx refers specifically to nitrogen oxide and NO_2, with the larger portion being NO_2. NO_2 is a highly reactive gas and is the pollutant for which the USEPA established a NAAQS.

  Emissions from the existing open flare were evaluated against both the NAAQS and the PSD increments. The NAAQS are intended to protect human health and the environment. The PSD increments are intended to allow industrial growth in an area while ensuring that the area will continue to meet the NAAQS.

  The first step in this evaluation is to determine the predicted pollutant impacts from the proposed project. After the impacts are determined, they are compared to the applicable Significant Impact Levels (SIL). For pollutants with impacts less than the SIL, the emissions are presumed to comply with both the NAAQS and the PSD Increments, and no further review is required.

  As shown in Table 2, the predicted impacts for all pollutants and all averaging times are under their respective SILs.

Table 2: Preliminary Modeling Impacts from the Existing Open Flare

Pollutant	Averaging Time	Significant Impact Level (SIL) (µg/m^3)	Predicted Impact (µg/m^3)	% of SIL	Additional Modeling Needed?
PM10	Annual	1	0.03	3.2%	No
PM10	24-hr	5	0.61	12.3%	No
PM2.5	Annual	0.13	0.03	20.5%	No
PM2.5	24-hr	1.2	0.37	31.1%	No
SO_2	Annual	1	0.15	14.8%	No
SO_2	24-hr	5	2.79	55.7%	No
SO_2	3-hr	25	5.58	22.3%	No
SO_2	1-hr	7.8	6.38	81.8%	No
CO	8-hr	500	17.14	3.4%	No

Pollutant	Averaging Time	Significant Impact Level (SIL) (µg/m³)	Predicted Impact (µg/m³)	% of SIL	Additional Modeling Needed?
CO	1-hr	2,000	27.40	1.4%	No
NO_2	Annual	1	0.13	13.2%	No
NO_2	1-hr	7.5	5.69	75.9%	No

Because the modeling passed the SIL, modeling against the NAAQS and PSD Increment was not required or performed.

Key Aspects of Draft Permit Conditions

- **Emission Limits (By Pollutant)**
  The proposed permit includes CO, SO_2, and visible emission limits.

- **Usage Limits**
  The proposed permit includes:
  - An annual limit on the amount, in million standard cubic feet per year (MMscf/yr), of landfill gas that may be burned in the open flare.
  - A maximum flowrate of landfill gas sent to the open flare, in standard cubic feet per minute (scfm).

- **Process/Operational Restrictions**
  The proposed permit includes:
  - The landfill gas to be controlled with an H_2S scrubber to reduce SO_2 emissions emitted from the open flare.
  - A Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) must be developed, implemented, and followed for the existing open flare and the proposed H_2S scrubber. The purpose of a PM/MAP is to prevent, detect, and correct future potential malfunctions or equipment failures resulting in emissions exceedances.
  - A requirement to operate the open flare to maintain a minimum suction (vacuum) on the gas collection system. This will confirm that it is working properly.

- **Federal Regulations**
  - The open flare is subject to the Federal Plan Requirements for Municipal Solid Waste Landfills in Part 62 Subparts A and OOO. The draft conditions specify that Smiths Creek must comply with all the requirements of the subpart as it applies to the open flare. The specific requirements of this plan are included in the facility's current ROP. They will not be affected by this application.
  - The proposed open flare is subject to the NESHAP for Municipal Solid Waste Landfills, 40 CFR Part 63 Subparts A and AAAA. The specific requirements of this NESHAP are included in the facility's current ROP. They will not be affected by this application.

- **Emission Control Device Requirements**
  The proposed permit includes emission control device requirements via the PM/MAP. The existing open flare is required to control SO_2 emissions through proper operation and maintenance of the H_2S scrubber.

- **Testing & Monitoring Requirements**
  The proposed permit includes requirements to verify H_2S, or total reduced sulfur (TRS) content of the landfill gas burned, at a minimum, on a weekly basis. If the results show that the H_2S concentration is above the permit limit, the sampling frequency will be required to increase to daily until the concentration returns to below the limit. This will ensure that the H_2S scrubber is working properly.

Conclusion

Based on the analyses conducted, the proposed project would comply with all applicable state and federal air quality requirements. This project, as proposed, would not violate the federal NAAQS or the state and federal requirements.

Based on these analyses, AQD staff have developed proposed permit terms and conditions to ensure the facility process design and operation are enforceable. Additionally, Smiths Creek would perform sufficient monitoring, recordkeeping, and reporting 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.

If you would like additional information about this proposal, please contact Vrajesh Patel, AQD, at 517-582-3909 or PatelV@Michigan.gov.

Appendix 1
STATE 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 or contaminant. 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 336.1205	Outlines the permit conditions that are required by the federal Prevention of Significant Deterioration (PSD) Regulations and/or Section 112 of the Clean Air Act. Also, the same types of conditions are added to their permit when a plant is limiting their air emissions to legally avoid these federal requirements. (See the Federal Regulations table for more details on PSD.)
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 ambient air concentration of each toxic air contaminant emitted from the project must not exceed health-based screening levels. Initial Risk Screening Levels (IRSL) apply to cancer-causing effects of air contaminants and Initial Threshold Screening Levels (ITSL) apply to non-cancer effects of air contaminants. These screening levels, designed to protect public health and the environment, are developed by Air Quality Division toxicologists following methods in the rules and U.S. EPA risk assessment guidance.
R 336.1279 to R 336.1291	These rules list equipment to 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.
R 336.1331	The particulate emission limits for certain sources are listed. These limits apply to both new and existing equipment.
R 336.1370	Material collected by air pollution control equipment, such as dust, must be disposed of in a manner, which does not cause more air emissions.
R 336.1401 and R 336.1402	Limit the sulfur dioxide emissions from power plants and other fuel burning equipment.
R 336.1601 to R 336.1651	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 (RACT). RACT is required for all equipment listed in Rules 336.1601 through 336.1651.
R 336.1702	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 Reasonably Available Control Technology limits for existing equipment outlined in Rules 336.1601 through 336.1651.
R 336.1801	Nitrogen oxide emission limits for larger boilers and stationary internal combustion engines are listed.
R 336.1901	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.
R 336.1910	Air pollution control equipment must be installed, maintained, and operated properly.

State Rule	Description of State Air Regulations
R 336.1911	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.
R 336.1912	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.
R 336.2001 to R 336.2060	Allow the Department to request that a facility test its emissions and to approve the protocol used for these tests.
R 336.2801 to R 336.2804 Prevention of Significant Deterioration (PSD) Regulations **Best Available Control Technology (BACT)**	The PSD rules allow the installation and operation of large, new sources and the modification of existing large sources in areas that are meeting the National Ambient Air Quality Standards (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 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.
R 336.2901 to R 336.2903 and R 336.2908	Applies to new "major stationary sources" and "major modifications" as defined in R 336.2901. These rules contain the permitting requirements for sources located in nonattainment areas that have the potential to emit large amounts of air pollutants. To help the area meet the NAAQS, the applicant must install equipment that achieves the Lowest Achievable Emission Rate (LAER). LAER is the lowest emission rate required by a federal rule, state rule, or by a previously issued construction permit. The applicant must also provide emission offsets, which means the applicant must remove more pollutants from the air than the proposed equipment will emit. This can be done by reducing emissions at other existing facilities. As part of its evaluation, the AQD verifies that no other similar equipment throughout the nation is required to meet a lower emission rate and verifies that proposed emission offsets are permanent and enforceable.

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 seven pollutants. These NAAQS are designed to protect the public health of everyone, including the most susceptible individuals, children, the elderly, and those with chronic respiratory ailments. The seven pollutants, called the criteria pollutants, are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), and sulfur dioxide (SO_2). Portions of Michigan are currently non-attainment for either ozone or SO_2. Further, in Michigan, State Rules 336.1225 to 336.1232 are used to ensure the public health is protected from other compounds.

Citation	Description of Federal Air Regulations or Requirements
40 CFR 52.21 – Prevention of Significant Deterioration (PSD) Regulations **Best Available Control Technology (BACT)**	The 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 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.
40 CFR 60 – New Source Performance Standards (NSPS)	The United States Environmental Protection Agency has set national standards for specific sources of pollutants. These New Source Performance Standards (NSPS) apply to new or modified equipment in a particular industrial category. These NSPS set emission limits or work practice standards for over 60 categories of sources.
40 CFR 62 – Approval and Promulgation of State Plans for Designated Facilities and Pollutants	40 CFR part 62 describes the process for approval and promulgation of state plans and federal plans under Clean Air Act sections 111(d) and 129.
40 CFR 63— National Emissions Standards for Hazardous Air Pollutants (NESHAP)	The United States Environmental Protection Agency has set national standards for specific sources of pollutants. The National Emissions Standards for Hazardous Air Pollutants (NESHAP) (a.k.a. Maximum Achievable Control Technology (MACT) standards) apply to new or modified equipment in a particular industrial category. These NESHAPs set emission limits or work practice standards for over 100 categories of sources.
Section 112 of the Clean Air Act **Maximum Achievable Control Technology (MACT)** **Section 112g**	In the Clean Air Act, Congress listed 189 compounds as Hazardous Air Pollutants (HAPS). For facilities which emit, 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 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 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, off-site truck traffic, or lighting.

These tables list the most frequently applied state and federal regulations. Not all regulations listed may be applicable in each case. Please refer to the draft permit conditions provided to determine which regulations apply.