## TECHNICAL FACT SHEET

July 1, 2021

#### 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-2021-0019 from Ajax Materials Corporation (Ajax). The permit application is a request to install a new Hot Mix Asphalt (HMA) plant. The proposed HMA plant location is at 5088 Energy Drive in Flint, Michigan. The location is shown in the diagram below:



The proposed plant will use a counter-flow drum mixer/dryer process. HMA paving materials are a mixture of aggregates and heated asphalt cement. Recycled asphalt pavement (RAP) may be used to reduce the quantity of virgin aggregates used in the mix. This reuses a waste material and reduces the amount of liquid asphalt cement that must be added, which in-turn reduces potential volatile organic compound (VOC) emissions.

In a counter-flow drum mixer, the aggregates are moved through a rotating drum in the opposite direction of fuel combustion products. This increases the destruction of VOC emissions and their associated odors. The drum is inclined with the aggregate feed chute located at the top and the burner located at the bottom. When used, RAP is added at the approximate midpoint of the dryer drum. Asphalt cement is introduced in the lower end of the drum where rotation of the drum causes it to coat the aggregates. The asphalt cement-mixing zone is located behind the burner flame zone to prevent direct contact with the flame. A generic diagram of an asphalt plant is found below.



The proposed process includes capturing and controlling emissions from the exhaust of the mixing drum, the loadout area under the silos, and the top of the silos. Control measures to reduce fugitive dust from the plant itself, the plant yard, and material handling operations will also be put in place.

Prior to 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 hearing will be considered by the decision maker prior to taking final action on the application.

## Present Air Quality

The Ajax plant is proposed to be located in Genesee County, which is currently meeting all National Ambient Air Quality Standards (NAAQS). The AQD operates one monitoring station in the City of Flint at Whaley Park. That station measures ozone and particulate matter equal to or less than 2.5 microns in diameter (PM2.5). The figures in **Appendix 1** compare the recent monitoring data from Flint for ozone and PM2.5 against the respective NAAQS.

#### **Pollutant Emissions**

The following table provides the estimated total maximum potential emissions for each regulated pollutant from the proposed HMA plant:

Pollutant	Potential Emissions (tpy)			
Particulate Matter (PM)	30.9			
PM10	34.3			
PM2.5	30.4			
Sulfur Dioxide (SO <sub>2</sub> )	78.1			
Carbon Monoxide (CO)	89.9			
Nitrogen Oxides (NO <sub>X</sub> )	53.4			
Volatile Organic Compounds (VOCs)	35.1			
Lead	0.01			

Table 1: Emissions Summary

The proposed HMA plant is considered a minor source under Title 40 of the Code of Federal Regulations (CFR), Part 70, because its potential to emit (PTE) is less than 100 tons per year for each criteria pollutant and is less than major thresholds for hazardous air pollutants (HAPs). The major threshold for HAPs is 10 tons per year (tpy) of any individual HAPs or 25 tpy of total combined HAPs.

## Odor Concerns

Asphalt plants, in general, have historically been a source of odor complaints. EGLE has developed requirements for asphalt plants that have reduced potential odor emissions from them. These requirements include the use of a counter-flow design and emission capture and control requirements. The proposed permit contains these requirements which will reduce potential odors from the facility.

Odors are regulated by Michigan Air Pollution Rule 901, which prohibits the emissions air contaminants that causes an unreasonable interference with the comfortable enjoyment of life and property. AQD district inspector, Mr. Dan McGeen can be contacted at 517-833-0342 concerning any potential odor issues with the proposed HMA plant.

## Key Permit Review Issues

Staff evaluated the facility to identify all state rules and federal regulations which are, or may be, applicable. The tables in **Appendix 2** summarize those rules and regulations.

## • Federal NSPS Regulations

New Source Performance Standards (NSPS) were established under Title 40 of the Code of Federal Regulations (40 CFR) Part 60. The boiler portion of the proposed plant is subject to the NSPS for HMA Facilities, 40 CFR Part 60 Subpart I. These regulations apply to all HMA plants constructed or modified after June 11, 1973. The main requirements of the subpart are a PM emission limit and associated stack testing. These requirements are included in the proposed permit conditions.

## • Rule 224 T-BACT Analysis

Michigan Air Pollution Control Rule R 336.1224 requires Best Available Control Technology (BACT) for toxic air contaminants (TACs). However, the requirements of Rule 224 do not apply to TACs that are VOCs and are in compliance with VOC BACT.

The particulate toxics from the mixing drum will be controlled by the use of a fabric filter system also known as a "baghouse". The particulate emissions from the top of the silos and the loadout areas will also be captured and either routed back to the mixing drum to ultimately be controlled by the baghouse or sent to a dedicated filter. The asphalt tanks will be equipped with a vapor condensation and recovery system to reduce toxics emissions. These emission controls are considered T-BACT for HMA plants.

## • Rule 225 Toxics Analysis

EGLE Rules for Air Pollution Control require that the ambient air concentration of TACs be compared against their respective allowed health-based screening levels. These screening levels are defined as concentrations measured in micrograms per cubic meter ( $\mu$ g/m<sup>3</sup>). AQD staff reviewed Ajax's air quality modeling and evaluation of TAC impacts. The review found that all TACs will meet their respective allowed health based screening levels and thus comply with the requirements of Rule 225.

The following table lists all TACs where at least one of its predicted impacts are greater than 10% of its respective allowed screening levels.

				Allowed		
			Screening	Screening	Predicted	% of
		Averaging	Level	Level	Impact	Screening
CAS No.	TAC	Time	Type*	(µg/m³)	(µg/m³)	Level
19540 20 0		Annual	ITSL	0.1	0.0000267	0.03%
10040-29-9	Chromium IV	Annual	IRSL	0.000083	0.0000267	32.2%
50.00.0	FO 00 0 Formaldabuda		ITSL	30	1.11	3.7%
50-00-0	Formaldenyde	Annual	IRSL	0.08	0.0179	22.4%
7440-02-0	Nickel	Annual	IRSL	0.006	0.0009	14.8%
7440-38-2	Arsenic	Annual	IRSL	0.0002	0.000027	13.3%
7440 49 4	Cabalt	8-hr	ITSL	0.2	0.014	7.0%
7440-46-4	Cobait	Annual	IRSL	0.00013	0.00011	82.0%
		Annual	ITSL	3	0.009	0.3%
91-20-3	Naphthalene	8-hr	ITSL	520	0.24	0.05%
		Annual	IRSL	0.08	0.009	11.3%

 Table 2: Select TAC Impacts

\* ITSL = Initial Threshold Screening Level (health-based screening level for non-carcinogens) IRSL = Initial Risk Screening Level (health-based screening level for carcinogens)

## • 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) NSPS
- c) VOC emission rate specified in another permit
- d) VOC emission rate specified in the Part 6 rules for existing sources

The VOC emissions from the proposed HMA plant will be controlled/restricted by:

- The use of a counterflow drum design;
- Restricting the types of fuels that can be burned;
- Proposed permit limits on the annual material throughput;
- A requirement to keep the burners properly tuned;
- Operate a vapor condensation and recovery system on the asphalt tanks;
- The use of emission capture and control on the top of the silos and in the loadout area.

These emission controls are considered Best Available Control Technology (BACT) for HMA plants. They will also reduce the emissions of toxics and potential odors from the proposed HMA plant.

## • Criteria Pollutants Modeling Analysis

Computer dispersion modeling was performed to predict the impacts of air emissions from  $NO_x$ , CO, PM10, PM2.5, and SO<sub>2</sub>.  $NO_x$  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 proposed facility were evaluated against both the NAAQS and the PSD Increments. The NAAQS are intended to protect public health, including the health of sensitive groups like those with heart or lung conditions. The PSD Increments are intended to allow industrial growth in an area, while ensuring the area will continue to meet the NAAQS. To determine predicted impacts, the dispersion modeling compared the worst-case impact for each criteria pollutant, for each averaging time, to the maximum levels allowed.

The first step in this evaluation is to determine the predicted impacts from the proposed project. After impacts are determined, they are compared to the applicable PSD Significant Impact Levels (SILs). If the project impacts are less than the SIL, then no further review is required. The following table considers the potential emissions from the proposed project for  $NO_x$ , CO, PM10, PM2.5, and SO<sub>2</sub> and compares them to their respective SILs.

Pollutant	Averaging Period	SIL (µg/m³)	Total Maximum Impact (µg/m <sup>3</sup> )	Below SIL?
NO <sub>2</sub>	1-Hour	7.5	52.48	No
	Annual	1	1.29	No
SO <sub>2</sub>	1-Hour	7.8	77.70	No
	3-Hour	25	63.22	No
	24-Hour	5	24.61	No
	Annual	1	1.90	No
PM10	24-Hour	5	28.48	No

Table 3: Significant Impact Levels (SIL)

Pollutant	Averaging Period	SIL (µg/m³)	Total Maximum Impact (µg/m <sup>3</sup> )	Below SIL?
	Annual	1	4.13	No
	24-Hour	1.2	8.44	No
PIVIZ.3	Annual	0.2	0.94	No

The PSD Increments are compared against the total facility impact plus other increment consuming facilities nearby. In the NAAQS analysis, total facility impact includes additional nearby facilities, or offsite sources. The total facility impact and the background concentrations, which is data from ambient air monitors, are summed and compared to the NAAQS.

As the following tables show, emissions of NO<sub>2</sub>, SO<sub>2</sub>, PM10, and PM2.5 from the proposed project will meet their respective PSD Increments and NAAQS.

Pollutant	Averaging Time	PSD Increment (µg/m <sup>3</sup> )	Maximum Predicted Impact (µg/m <sup>3</sup> )	Percent of Increment (%)
SO <sub>2</sub>	3-hr	512	63.22	12%
SO <sub>2</sub>	24-hr	91	24.61	27%
SO <sub>2</sub>	Annual	20	1.90	10%
NO <sub>2</sub>	Annual	25	1.29	5.1%
PM10	24-hr	30	28.48	95%
PM10	Annual	17	4.13	24%
PM2.5	24-hr	9	8.44	94%
PM2.5	Annual	4	0.94	23%

#### Table 4: PSD Increment Modeling Impacts

Please note, there is not a PSD increment for NO<sub>2</sub> 1-hour average.

## Table 5: NAAQS Modeling Impacts

Pollutant	Averaging Time	NAAQS (µg/m³)	Existing Background (µg/m <sup>3</sup> )	Maximum Predicted* (μg/m³)	Percent of NAAQS (%)
SO <sub>2</sub>	1-hr	196	10.7	88.40	45.10%
SO <sub>2</sub>	3-hr	1,300	10.2	73.42	5.65%
NO <sub>2</sub>	1-hr	188	69.2	121.68	64.72%
NO <sub>2</sub>	Annual	100	12.2	13.49	13.49%
PM10	24-hr	150	35.0	63.48	42.32%
PM2.5	24-hr	35	17.1	25.54	72.98%
PM2.5	Annual	12	7.1	8.04	67.0%

Please note, there is not a NAAQS for  $SO_2$  24-hour average.

\*Includes background data.

## Key Aspects of Draft Permit Conditions

• Emission Limits (By Pollutant)

The proposed permit includes total facility-wide emission limits for the following pollutants:

- Each Individual HAP
- Aggregate HAPs (this means the total of all HAPs emitted from the facility)
- **CO**
- o **SO**<sub>2</sub>

The proposed permit also includes emission limits for the main portion of the HMA plant for the following pollutants:

- o PM
- o PM10
- o PM2.5
- o CO
- o **SO**<sub>2</sub>
- o NO<sub>x</sub>
- o Lead
- Eleven Different TACs

The proposed permit also limits visible emissions from truck and loader traffic to a maximum of 5% opacity and allows no visible emissions from material storages piles unless the pile is being actively worked or wind speeds are greater than 12 miles per hour.

## • Usage Limits

The proposed permit contains the following restrictions:

- Limits on the types of fuels that may be burned.
- Limits on the percentage of RAP that may be used.
- A prohibition on the use of asbestos containing materials.
- A production limit of 500 tons of asphalt produced per hour.
- A production limit of 876,322 tons of asphalt produced per 12-month rolling time period.

## • Process/Operational Restrictions

The proposed permit includes the following process/operational requirements:

- That the efficiency of the burners be maintained through fine tuning at the startup of the season and every 500 hours thereafter.
- That a Fugitive Dust Control Plan, a Preventative Maintenance Program, a Compliance Monitoring Plan for Recycled Used Oil (RUO), and an Emission Abatement Plan for startups, shutdowns, and malfunctions all be developed, implemented, and followed. The fugitive dust plan includes requirements to use best practices for reducing fugitive emissions from roadways and material storage and handling.
- That all roadways on which asphalt and aggregate haul trucks travel on must be paved.

## • Design/Equipment Parameters

The proposed permit requires the use of following emission controls:

- A fabric filter dust collector (baghouse) on the main portion of the HMA plant.
- A vapor condensation and recovery system on each liquid asphalt cement storage tank.
- An emissions capture system on the top of each HMA paving material storage silo.
- A capture and control system on the HMA paving material loadout process.

## • Testing/Sampling

The proposed permit includes the following testing/sampling requirements:

o Stack testing to measure PM emissions as required by NSPS Subpart I.

- Within 60 days after achieving the maximum production rate but not later than 180 days after the beginning of trial operation. stack testing to measure PM10, PM2.5, CO, NOx, SO2, and lead emissions.
- Upon request of the AQD District, stack testing for to measure TAC emissions and/or odors.
- Monitoring of CO emissions with a handheld CO monitor upon start-up of each paving season, upon a malfunction of the drum dryer or its associated burner, and upon every 500 hours of operation.

## • Recordkeeping Requirements

The proposed permit includes the following recordkeeping to demonstrate compliance with all of the other restrictions:

- The amount of asphalt produced on an hourly, monthly, and 12-month rolling time period basis.
- The virgin aggregate and RAP usage rates on a continuous basis.
- The amount and types of fuels burned on a monthly basis.
- o Documentation of maintenance performed and updates made to the plant.
- PM, PM10, PM2.5, CO, SO<sub>2</sub>, and NO<sub>x</sub> emissions calculations on a monthly and 12-month rolling time period basis.
- The pressure drop across the fabric filter dust collector (baghouse) on a continuous basis.
- Documentation of all fugitive dust suppression materials, including water, applied to the plant yard, the plant roadways, and the storage piles.

## **Conclusion**

Based on the analyses conducted to date, AQD staff concludes that the proposed project would comply with all applicable state and federal air quality requirements.

Based on these conclusions, AQD staff has developed proposed permit terms and conditions that would ensure the proposed requirements 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. If you would like additional information about this please proposal. contact Ms. Ambrosia Brown, AQD, 517-648-6216 at or BrownA39@Michigan.gov.

#### Appendix 1 Flint Area Monitoring Data





Figure 2: Annual average of PM2.5 concentrations







## Appendix 2 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 336.1910	Air pollution control equipment must be installed, maintained, and operated properly.
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.

State Rule	Description of State Air Regulations
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	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.
Deterioration (PSD) Regulations	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.
Best Available Control Technology (BACT)	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.
	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 <sub>2</sub> ). Portions of Michigan are currently non-attainment for either ozone or SO <sub>2</sub> . 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	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.
Best Available Control Technology (BACT)	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.

Citation	Description of Federal Air Regulations or Requirements
40 CFR 60 –	The United States Environmental Protection Agency has set national standards for
New Source	specific sources of pollutants. These New Source Performance Standards (NSPS)
Performance	apply to new or modified equipment in a particular industrial category. These NSPS set
Standards (NSPS)	emission limits or work practice standards for over 60 categories of sources.
40 CFR 63—	The United States Environmental Protection Agency has set national standards for
National	specific sources of pollutants. The National Emissions Standards for Hazardous Air
Emissions	Pollutants (NESHAP) (a.k.a. Maximum Achievable Control Technology (MACT)
Standards for	standards) apply to new or modified equipment in a particular industrial category. These
Hazardous Air	NESHAPs set emission limits or work practice standards for over 100 categories of
Pollutants	sources.
(NESHAP)	
Section 112 of the	In the Clean Air Act, Congress listed 189 compounds as Hazardous Air Pollutants
Clean Air Act	(HAPS). For facilities which emit, or could emit, HAPS above a certain level, one of the
	following two requirements must be met:
Maximum	1) The United States Environmental Protection Agency has established standards for
Achievable	specific types of sources. These Maximum Achievable Control Technology
Control	(MACT) standards are based upon the best-demonstrated control technology or
Technology	nractices found in similar sources
(MACT)	
	2) For sources where a MACT standard has not been established, the level of control
Section 112g	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.