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PUBLIC COMMENT RECORD

This document contains the emails and letters received by Township staff after the Planning Commission meeting and serves as an official record of public comment for the February 7, 2022 Township Board of Trustees meeting.

Please note that comments received after the meeting packet was finalized on Feb. 2, 2022 at 12pm are not included in this record but will be added to the project case file.

SUPERVISOR

Bill Rogers

CLERK

Paulette A. Skolarus

TREASURER

Robin L. Hunt

TRUSTEES

Jean W. Ledford
H. James Mortensen
Terry Croft
Diana Lowe

MANAGER

Michael C. Archinal

From: [Mary Christina Beyers](#)
To: [Amy Ruthig](#)
Subject: Proposed rezoning
Date: Sunday, November 28, 2021 7:55:45 PM

Hi Amy,

Jeff and I are in Georgia and cannot attend the December 6th board meeting. Could you please take our input against this asphalt plant being in the proposed area. We are worried about the prevailing west winds bring the odor/pollution to our springs fed natural and beautiful Lake Chemung.

Thank you in advance for your help in this matter,

Jeffrey and Mary Christina Beyers
5373 Wildwood Dr.
Howell, MI 48843
7347886976

Sent from my iPad

Kelly VanMarter

From: Hubert Mortensen <jmortens1@aol.com>
Sent: Wednesday, December 1, 2021 3:24 PM
To: Kelly VanMarter
Subject: Fwd: Asphalt Plant

Follow Up Flag: Follow up
Flag Status: Flagged

Sent from my iPhone

Begin forwarded message:

From: Jim Mortensen <jmortens1@aol.com>
Date: December 1, 2021 at 11:39:10 AM EST
To: Kelly@genoa.org
Subject: Fwd: Asphalt Plant
Reply-To: Jim Mortensen <jmortens1@aol.com>

-----Original Message-----

From: Pamela Beach <pamelabeach1@sbcglobal.net>
To: jim@genoa.org <jim@genoa.org>
Sent: Tue, Nov 30, 2021 6:11 pm
Subject: Asphalt Plant

Good Evening Jim,

I was very alarmed to hear that you wanted to put an asphalt plant North off I96 and west of Latson Rd. This is too close to people. You have people: families and children. This will have an adverse effect on their lives and their health. The asphalt emits harmful cancer causing agents and toxins that will affect their health and quality of life. It would need to be built where it will not harm people. I am against this.

Sincerely,
Pamela Beach
A Howell resident

From: [Dawn](#)
To: [Bill Rogers](#); [Polly](#); [Robin Hunt](#); [Jean Ledford](#); [Jim Mortensen](#); [Terry Croft](#); [Diana Lowe](#); [Kelly VanMarter](#)
Cc: [Macey Bruce](#)
Subject: December 6th Meeting_Capital Gas
Date: Tuesday, November 30, 2021 8:59:44 AM
Attachments: [04-15-21_Proposed_Rezoning_and_Construction_of_a_Hot-Mix_Aspphalt+Plant_An_Overview_of+Relevant_Risks_v1.0.pdf](#)

Good morning,

I am president of our HOA Board for Rolling Ridge I, a resident as well as owning another home (both residences within 1.5-2 miles of this proposed location.) I as well as some of our residents will be in attendance for the December 6th meeting, however wanted to have this research report recorded. I do understand we are further along in the process than Tyrone was at the completion of their report but the documentation and effects remain the same. As it was completed less than a year ago, within our county and Capital Gas was also the proposed site occupier, the research and information were completed by environmental consultants in the asphalt industry, toxicologists and engineers.

Livingston County already has several asphalt plants operating at less than 50% capacity. The demand does not warrant another location within the county, especially our township. If you have passed by their location in Lansing in warm months, you are very aware of the odors emitted. The difference between Lansing and our location is that it is in an industrial area near an auto plant. This asphalt plant can decrease our home values, create toxic fumes as well as increase the traffic in an area already that already has several accidents.

Unfortunately, during the planning meeting, my kids contracted Covid and I could not attend, I obviously deeply regret this after seeing it was approved. I am concerned that this was approved without extreme research into the effects of running such a plant. Hopefully after reading the attached report, you will understand negative effects allowing Capital to move into our township. While I understand the existing business technically isn't any better for our community, they are not emitting toxic fumes endangering our residents/families.



Thank you for taking the time to read my correspondence as well as the research report.

Regards,

Dawn Condon

3466 Snowden Lane

Howell, MI 48843



Proposed Rezoning and Construction of a Hot-Mix Asphalt Plant: An Overview of Relevant Risks

Residents for Community Preservation

APRIL 15, 2021

Presented to Tyrone Township Board
& Tyrone Township Planning Commission

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Versioning History

Version #	Date	Author(s)	Notes
1.0	4/13/2021	Residents for Community Preservation	Original Document. (Please note that the document's file name does not indicate any version number.)
2.0	4/14/2021	Residents for Community Preservation	Minor spelling corrections; revisions to Part 6.

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Statement of Purpose

The purpose of the information presented herein is to provide a brief and easy-to-read ‘fact sheet’ that highlights potential risks associated with granting a rezone request for 124 acres of residential farmland to become M2 heavy industrial space within our residential community, and the subsequent construction of an asphalt plant. This document was developed with the intent to assist the Tyrone Township Planning Commission & Board in becoming as informed as possible prior to making a decision as to how to proceed with the aforementioned request for rezone.

Please note: The contents of this ‘fact sheet’ are a compilation of relevant information as prepared by several residents who have professional training and expertise in the areas of Education, Exposure Assessment, Toxicology, Environmental Studies & Consultation, Health & Safety Regulation, Environmental Law, Engineering and Epidemiology. These individuals collectively have decades of work experience in industry, including the asphalt industry, and academia and are willing to provide any assistance you may need to assist with the decision-making process both now and over the coming weeks. As with information provided that may be attributed to works from federal and state agencies, links to abstracts of peer-reviewed papers published in scientific journals have been included. If interested in reviewing full manuscripts, please don’t hesitate to request copies.

Our hope is that you carefully consider the information presented with the weight it deserves in your decision-making process, and further make an ethical decision that protects the people and community whose logo states an aim to live “In harmony with nature”.

Part 1:
Potential Impact of a Reclassification to M2
- Heavy Industrial

1. Summary of Request

The seller has requested for rezoning of 124 acres, including 2 parcels of land that is currently zoned farming/residential land. Only 30 acres of that space pertain to the special land use request for the proposed construction of an asphalt plant. While information is provided relative to the known human health and environmental hazards associated with the hotmix asphalt industry, there is concern over the use of remaining land and potential additive/cumulative effects of pollutants emitted from those facilities as the remaining land would then be zoned heavy industrial. Industries included in this classification include, but are not limited to, petroleum processing, chemical production plants, leather product manufacture, dry cleaning, hazardous substance handling and disposal, and food animal processing facilities (slaughterhouses).

Upon critical review of the published Master Plan or Plan for Future Land Use, the Master Plan requires new construction/industry to develop permitted areas to be consistent with a “campus like setting” and PIRO type zoning that is more in line with a Planned Unit Development. It is intended to seamlessly fit within our existing community, the surrounding environment, and to do so in a way that does not create a nuisance to our residents. Rezoning 124 acres to M2-Heavy Industrial, in part or in its entirety, is in stark conflict to the vision of this community.

Part 2: Characteristic Emissions from Hot Mix Asphalt Plants

1. Background

Hazards associated with multi-media emissions (air, water, waste) of characteristic pollutants from asphalt plants are well known. The Center for Disease Control's (CDC) Agency for Toxic Substances and Disease Registry (ATSDR), whose mission it is to 'prevent or mitigate the adverse human health effects and diminished quality of life that result from exposure to hazardous substances in the environment' has conducted multiple investigations focused on communities in close-proximity to hot mix asphalt plants since 1999. These investigations were performed in response to concerns by community members and were focused on airborne emissions of pollutants known to be associated with adverse human health effects and nuisance odors. The Environmental Protection Agency (EPA) has also published a [report](#)¹ which focuses on emissions from these facilities.

In an attempt to combine human health impacts and an indicator of economic viability in communities surrounding industrial facilities emitting 'toxic' pollutants, [Currie et al. \(2015\)](#)² published a study in which they evaluated change in housing values coupled with environmental health risks in response to the opening and closing of 1600 plants across 5 states, including Michigan, known to emit 'toxic' pollutants. Investigators report a decline in housing values of 11% for homes located within a ½ mile radius of the facility and an increase in the probability of low birthweight (an indicator of impact on human-health) within a 1-mile radius of a facility. Interestingly, authors note that housing values did not increase after plant closure due to concerns over reopening, 'persistent visual disamenities and concerns about local contamination'.

Please note that the information provided below is limited to ambient (environmental) release and exposures to characteristic pollutants associated with hot mix asphalt plants. Workplace exposures to chemicals specific to these facilities have been studied extensively with adverse health outcomes in workers published in the medical literature. The Occupational Safety and Health Administration (OSHA) has established specific exposure limits for chemicals involved in asphalt manufacture and working with hot melt asphalt (road paving, roofing, other construction activity, etc.), and the National Institute for Occupational Safety and Health (NIOSH), the research arm of OSHA, conducts ongoing investigations aimed at providing recommendations for meaningful exposure mitigation strategies that are readily implementable in the workplace environment. If township officials are interested in learning about workplace exposures associated with the asphalt industry, please click on this [link](#)³ as a starting point to obtain additional information.

2. Atmospheric Release of Pollutants

Pollutants may be released into the atmosphere via natural (e.g., volcano, forest fire) and man-made means (e.g., industrial pollutant release via point source (stacks),

¹ <https://www3.epa.gov/ttnchie1/ap42/ch11/related/ea-report.pdf>

² <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4847734/>

³ <https://www.cdc.gov/niosh/topics/asphalt/default.html>

vehicle emissions (mobile source, etc.). These contaminants may be released directly into air and water, and potentially via waste streams through use of inadequate disposal practices. Pollutants may settle onto ground surfaces and subsequently be washed into stormwater reservoirs during rain events, barriers of which have the potential to be breached resulting in release to surrounding lands and waterways.

It is important to recognize that, depending on the pollutant of interest, important exposures may be additive in nature, such that while an individual company may be in compliance with permitted emission limits (e.g., Capital Asphalt permitted to release 320 tons/year), additive or aggregate emissions from multiple entities (multiple pollutant emitting facilities in a given area, consider existing and future industry) in concert with unrecognized/non-quantified emissions (e.g., fugitive emissions) as well as mobile source emissions (e.g., vehicle exhaust, roadway dusts) have the potential to negatively impact the surrounding community. Similar examples can be made of the impact of stormwater runoff on surrounding waterways and residential water sources (wells).

3. Air Emissions

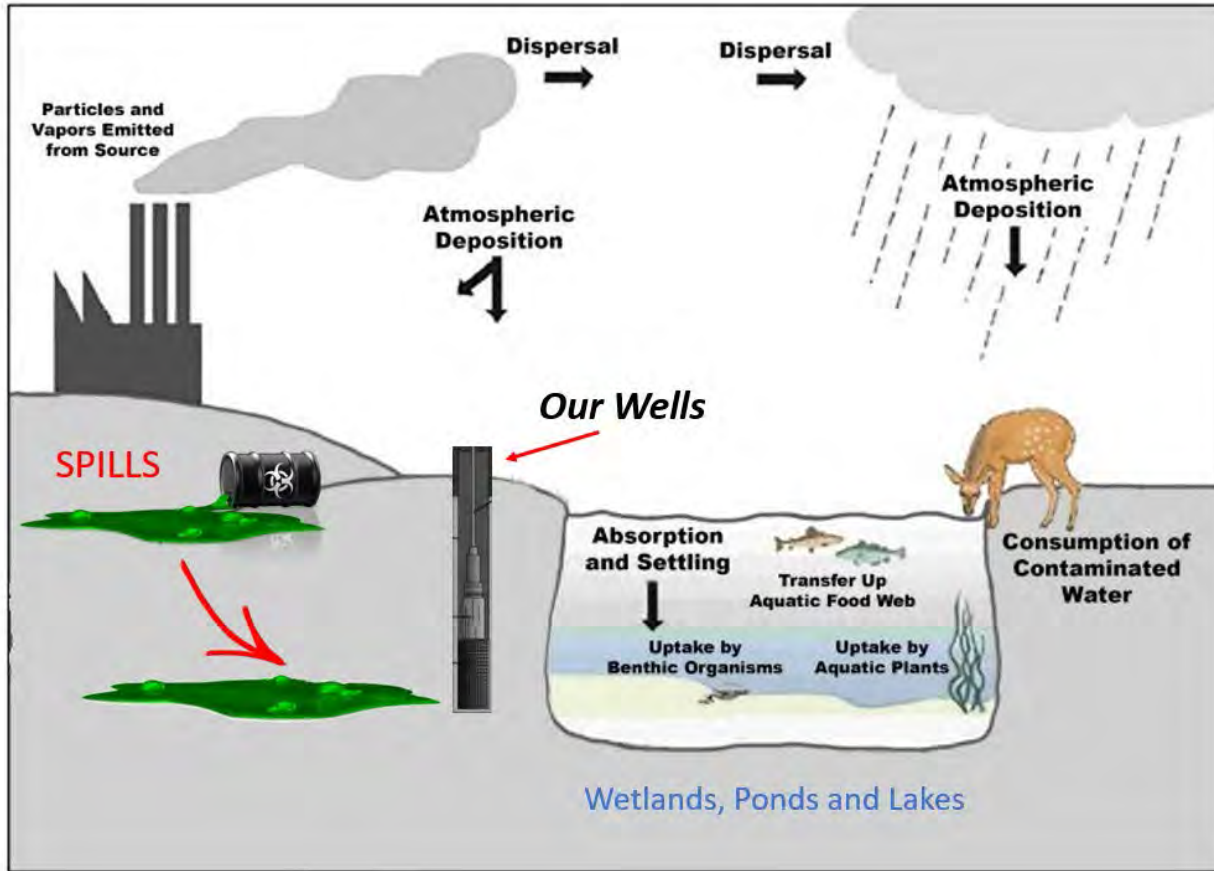
As mentioned previously, there are known and permitted releases to air from hot mix asphalt plants. These pollutants may be grouped into major categories, including but not limited to particulate matter (PM), Sulfur Oxides (SO_x), Nitrogen Oxides (NO_x), and Hazardous Air Pollutants (HAPs), including Polycyclic Aromatic Hydrocarbons (PAHs) and metals. Upon review of [individual emission components](#)⁴, many are readily recognized as irritants, some as neurotoxins and others as carcinogens, each with its own unique mechanism of action. Even at lower concentrations following plumes of pollutants transported well beyond the property lines of the facility, adverse effects of exposures to these chemicals have been recognized.

[Particulate matter](#)⁵ (PM) in the context of emissions from industrial facilities are those in the size-range(s) not visible to the naked-eye. Classified as having very small aerodynamic diameters, particles are generally grouped into two size categories: PM₁₀ (particulates 10 microns in diameter and smaller) and PM_{2.5} (particulates 2.5 microns in diameter and smaller). As a point of reference, a single red blood cell is roughly 4 microns in diameter. ‘Larger’ particles (PM₁₀) tend to get trapped in the conducting airways, akin to ductwork in a ventilation system, while ‘smaller’ particles (PM_{2.5}) have the potential to travel deep into the lungs into what’s termed the ‘gas exchange region’ and can even cross into the bloodstream and affect multiple organ systems. It is well-known that increases in exposure to environmental PM in the size ranges emitted from industrial facilities have been [linked](#)⁶ to adverse respiratory and cardiovascular effects, worsening of pre-existing lung disease (e.g., COPD, asthma), premature birth, lost school and workdays, increases in hospital admissions, and depending on composition, environmental PM has been linked to cognitive impairments and other morbidities.

⁴ <https://www3.epa.gov/ttnchie1/ap42/ch11/related/ea-report.pdf>

⁵ <https://www3.epa.gov/ttnchie1/ap42/ch11/related/ea-report.pdf>

⁶ <https://pubmed.ncbi.nlm.nih.gov/31774324/>



Chemicals and other substrates utilized in the production of asphalt are heated, and with mechanical action or by volatilization become airborne. Process exhaust systems capture these contaminants and direct them through treatment technologies before dispersing into the atmosphere through a ‘stack’. The types of pollutants listed above are those that have the potential to bypass emission control technologies in whole or in-part and are [recognized](#)⁷ as pollutants released into the atmosphere by hot mix asphalt plants. Deposition of these pollutants on surfaces, up to several miles from the source due to prevailing winds, occurs as a result of cooling, impaction and capture (e.g., rain event) (see Figure 1). and once ‘settled’ have the potential for ‘re-uptake’ into soils, plants, residential wells and runoff into waterways.

⁷ <https://www3.epa.gov/ttnchie1/ap42/ch11/related/ea-report.pdf>

4. Permitted Emissions and Testing

- As previously stated, Capital Asphalt – a facility referred to as similar to what is proposed – is permitted to emit 320 tons of pollutants per year.
- The Michigan Department of Environment, Great Lakes and Energy (EGLE) does not monitor emissions daily, rather industries are required to report emissions annually per provisions of air permits, or more frequently in the event of emissions control failures.
- Daily emission tracking is a standard requirement of air emission permits but are not submitted to the Air Quality Department unless requested. As mentioned above, this typically happens once per year or once per 3 years dependent on the industry and permit parameters.
- Alternate emission sources from hot mix asphalt (HMA) operations include the recognizable “blue smoke” from the loading of HMA trucks, that which escapes from silos, particulate and diesel exhaust emissions from truck traffic, front-end loaders, dusts from storage piles, etc.
- Pollution controls. Baghouse filtration systems are designed to capture particulate matter and are specific to particle size. Particulates that escape the filtration system agglomerate quickly once leaving the stack. These systems do not filter out volatilized material. System efficiencies are dependent upon rigorous preventative maintenance programs.

5. Nuisance Odors

- HMA plants in Michigan are not required to monitor odors daily. Compounding this issue is the highly variable nature of personal sensitivity to odors. Particularly to chemicals that have exceedingly low odor thresholds (e.g., hydrogen sulfide gas).
- If nuisance orders are reported to EGLE, it is highly unlikely that an immediate (same day) response/investigation is possible. As such, and due to highly variable weather conditions, odors may not be recognizable at the location initially indicated. It often takes multiple reports and several visits, and often odor complaints go unresolved but remain a persistent issue.

6. Truck Traffic and Road Conditions

- The addition of an asphalt plant at the proposed location increases traffic in the area by as many as 75 additional asphalt trucks per day. This amounts to a truck arriving every at the location every 7.2 (seven-point-two) minutes. This calculation does NOT include delivery of raw materials, worker traffic, etc.
- Construction of the proposed facility will result in increased truck traffic on Old US-23, Clyde Road, Center Road, White Lake Road and Runyan Lake Road. These

include very heavy trucks that will increase deterioration of roadways and result in traffic jams.

7. Noise Pollution

- The Township will be responsible to address complaints specific to noise pollution.

Sources of noise include open/closing of transfer gates, rotating drums, beeping trucks, truck engines, conveyor belts, crushing asphalt remnants during the recycling process, dropping loads into haul trucks, PA Systems, etc.

8. Contamination

Over time, and often after only a few years, control systems fail and result in contamination of the surrounding environment. Please see: **Part 3: Demonstration of Potential for Environmental Contamination.**

9. Summary

The proposed request for rezone blatantly defies our Master Plan and jeopardizes residents' ability to live "In harmony with nature" as our Tyrone Township logo proudly states.



Figure 1: Township Logo "In harmony with nature"

Heavy industrial development comes with a cost far greater than potential revenue. There are certainly more marketable, and responsible ways to develop land in the area that would have long lasting economic benefits without the potential for devastating consequences.

The Residents for Community Preservation are not against asphalt plants as a rule. However, consideration for construction of these facilities in appropriate locations must be the main consideration in addition to need.

The Residents for Community Preservation would like to stress their concern that voting in favor of this proposal has the potential to be detrimental to the health, safety, and well-being of our residents, the community in which we reside, and our surrounding environment.

Part 3:
Demonstration of Potential for
Environmental Contamination

1. Case Study

ENVIRONMENTAL CONTAMINATION RISK CASE STUDY - CAPITAL ASPHALT, LLC & ASPHALT REAL ESTATE, LLC 3888 S. CANAL STREET, LANSING, MICHIGAN

On January 16, 2019, Asphalt Real Estate, LLC and Capital Asphalt, LLC requested that AKT Peerless Environmental Services conduct a Baseline Environmental Assessment (BEA) in anticipation of the company purchasing the operations, equipment, and land from Superior Asphalt, Inc. located at 3888 S. Canal Street, Eaton County, in the City of Lansing, Michigan. This is per Part 201 of the Natural Resources & Environmental Protection Act (NREPA) of 1994, as amended. The purpose of utilizing this regulation is to exempt the new owner of liability from previous environmental contamination that occurred on a property prior to a new purchase.

Synopsis:

1. AKT Peerless conducted a Phase I Environmental Site Assessment (ESA) on December 20, 2018.
2. Through their investigation of the property, research of available records on the property, site reconnaissance and other professional inquiry they found two Recognized Environmental Concerns (REC).
3. Those concerns were:
 - a. Superior Asphalt, Inc. owned and operated a hot mix asphalt facility at this location from 2012 until the pending sale in January 2019. Note: Prior to Superior Asphalt purchasing the property. Superior Asphalt conducted a Phase I ESA on the property in March 2011 prior to them purchasing and operating the HMA plant. There were no previous environmental liens on the property.
 - b. The adjoining property to the south was a salvage yard. Historically speaking, salvage yards have the potential to contaminate soil and ground water due to the nature of their operations.
4. This prompted a Phase II Environmental Site Assessment to conduct subsurface ground water and soil sampling to determine if contaminants were present. On January 4, 2019, AKT Peerless conducted a Phase II ESA site investigation to determine the nature, extent, magnitude and materiality of the RECs in question.
5. Six soil borings were conducted along with 1 temporary installation of a groundwater monitoring well. The samples were tested for Volatile Organic Compounds (VOC), Polynuclear Aromatic Hydrocarbons (PNA) and the 10 Michigan Metals in soils. The ground water sample was tested for PNA and VOC.

6. The samples showed exceedances of the Michigan GSIP (Groundwater Surface Interface Pathway) Criteria in 2 soil samples and one groundwater sample. The contaminants were Chromium, Selenium found in soils and Benzo(k)fluoranthene found in the groundwater.
7. Other metals such as Arsenic, Barium, Cadmium, Zinc, Lead, Mercury, and Copper were found in soil samples but not above the Michigan GSIP Criteria.
8. Four samples were taken around the perimeter of the property. Two were taken toward the interior of the property. Every sample had some level of contamination found whether that was PNA, VOC or metals or a combination of all three categories.
9. Due to the contamination found on the property during the AKT Peerless investigations, the property was classified as a “facility” under Part 201 NREPA 1994, as amended. On January 16, 2019, Mr. Jon Sawyer signed the documents for the Part 201 documents to be filed with Michigan EGLE.
10. Capital Asphalt has owned and operated the HMA plant located at 3888 S. Canal Street ever since.

The following 2 pages (Figure 2 and Figure 3) represent a letter from the Michigan Department of Environmental Quality (Michigan EGLE) confirming they had received and recorded the results of this Baseline Environmental Assessment for the Lansing plant property at the time of purchase by Mr. Jon Sawyer.

A complete copy of the BEA referenced here will be provided to the Tyrone Township Supervisor, Mike Cunningham.



GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



LIESL EICHLER CLARK
DIRECTOR

February 4, 2019

**ACKNOWLEDGEMENT OF RECEIPT OF A BASELINE ENVIRONMENTAL
ASSESSMENT**

BEA ID: 23001074-BEA-1

Legal Entity: Asphalt Real Estate LLC, 3888 South Canal Road, Lansing,
Michigan 48917

Property Address: 3888 South Canal Road, Lansing, Eaton County

On February 1, 2019, the Department of Environmental Quality (DEQ) received a Baseline Environmental Assessment (BEA) dated January 16, 2019, for the above legal entity and property. This letter is your acknowledgement that the DEQ has received and recorded the BEA. The DEQ maintains an administrative record of each BEA as received.

This BEA was submitted pursuant to Section 20126(1)(c) of Part 201, Environmental Remediation, and/or Section 21323a(1)(b) of Part 213, Leaking Underground Storage Tanks, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A BEA is submitted for the purpose of establishing an exemption to liability for a new owner or operator of property that has been demonstrated to be a facility or property as defined by Section 20101(1)(s) of Part 201, Environmental Remediation, and/or property as defined by Section 21303(d) of Part 213, Leaking Underground Storage Tanks, of the NREPA. Pursuant to Sections 20126(1)(c) and 21323a(1)(b), the conditions of this exemption require the legal entity to disclose the BEA to a subsequent purchaser or transferee of the property.

The BEA is only for the legal entity and property identified in the BEA and on the BEA Submittal Form. Each new legal entity that becomes the owner or operator of this facility must submit their own BEA.

The DEQ is not making any findings about the adequacy of the submittal or whether the submitter is liable or is eligible to submit. The submitted BEA does not alter liability with regard to a subsequent release, threat of release, or exacerbation of existing conditions that is the responsibility of the legal entity submitting the BEA.

The legal entity, as the owner and/or operator of a facility or property, may have Due Care responsibilities under Section 20107a of Part 201, Environmental Remediation, and/or Section 21304c of Part 213, Leaking Underground Storage Tanks, of the NREPA.

CONSTITUTION HALL • 525 WEST ALLEGAN STREET • P.O. BOX 30242 • LANSING, MICHIGAN 48909-7742
www.michigan.gov/deq • (517) 284-6651

Figure 2: Page 1 of 2, Baseline Environmental Assessment

Asphalt Real Estate LLC

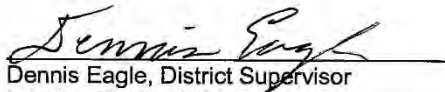
2

February 4, 2019

The legal entity may also have responsibility under applicable state and federal laws, including, but not limited to, Part 201, Environmental Remediation; Part 111, Hazardous Waste Management; Part 211, Underground Storage Tank Regulations; Part 213, Leaking Underground Storage Tanks; Part 615, Supervisor of Wells, of the NREPA; and the Michigan Fire Prevention Code, 1941 PA 207, as amended.

Pursuant to Section 20112a(6) of Part 201, Environmental Remediation, the property(s) identified in the BEA will be placed on the inventory of facilities, which is updated daily and posted on the DEQ's website: <https://secure1.state.mi.us/FacilitiesInventoryQueries>.

Authorized signature:



Dennis Eagle, District Supervisor
Lansing District Office
Remediation and Redevelopment Division
Department of Environmental Quality
525 West Allegan Street
P.O. Box 30242
Lansing, Michigan 48909
517-614-8544
eagled@michigan.gov

Enclosure
cc: AKT Peerless Environmental Services

Revision 05/28/2014

Figure 3: Page 2 of 2, of Baseline Environmental Assessment

Part 4:
Asphalt Plants in Proximity to Tyrone
Township

1. Assessing Demand - Asphalt Plants Near Tyrone Township

The following table demonstrates that we have several operational asphalt plants serving Tyrone Township, and furthermore, those asphalt plants are operating at well below half of their permitting capacity. Our needs are already easily being met with existing facilities.

Proposed Rezoning and Construction of a Hot-Mix Asphalt Plant: An Overview of Relevant Risks

Table 1: Asphalt Plants Near Tyrone Township

Company Name	Address	County	Permitted Annual Tonnage	Actual Tonnage Produced in 2018	Actual Tonnage Produced in 2019	Actual Tonnage Produced in 2020	Distance to Tyrone Township Proposed Asphalt Plant	Comments
Ace Asphalt	16255 Tindall Rd. Davisburg, MI 48374	Oakland	985,000	255,562	293,450	320,725	17 miles Northeast	
Ace Asphalt	4190 Jimbo Dr. Burton, MI 48529	Genesee	800,000	258,427	291,388	301,844	22 miles North	
Cadillac Asphalt	4751 White Lake Rd. Clarkston, MI 48346	Oakland	895,000	304,507	392,531	387,091	18 miles East	
Cadillac Asphalt	51777 W. 12 Mile Rd. Wixom, MI 48393	Oakland	895,000	351,562	408,093	329,824	27 miles Southeast	
Ajax Materials Corp.	5792 Kensington Rd. Brighton, MI 48114	Livingston	895,000	277,738	317,311	320,000	17 miles South	
Proposed New Plant	Genesee Township Flint, MI	Genesee	895,000 estimated	NA	NA	NA	33 miles North	This plant is supposed to be operational by April 1, 2022
Yaeger Asphalt	Saginaw, MI	Saginaw	500,000	59,655	70,480	79,000 estimate	55 miles North	Yaeger Asphalt advertises that they can deliver Hot Mix Asphalt to Fenton
Notes: There were also several other plants in the area that have shut down in recent years due to overlapping territories and lack of jobs. This includes a plant in Milford and one in Whitmore Lake off Old US 23. These plants have been decommissioned.								

Part 5: Inaccurate Statements

1. Addressing Inaccurate Responses to Questions by the Panel

The following table addresses inaccuracies presented as they pertain to the application for Special Land Use Permit for an asphalt mixing plant.

Table 2: Air Emissions

Air Emissions	
Inaccurate responses to panel questions, as addressed by John Sawyer and Abby Cooper at the Township meeting on 2/9/2021.	Facts
<i>“Air Quality Department requires that there is no pollution emitted out of the production of the hot mix asphalt.”</i>	<p>Asphalt Plants apply for a permit when opening that specifies estimates of production and emission output. This becomes the threshold by which emissions are measured. They have to demonstrate that they can operate under that threshold of air emissions in order to be granted a permit for operation.</p> <p>The fact that this permitting process is in place, is proof that air emissions are present.</p> <p>The Lansing location of Capital Asphalt is currently permitted for 320 tons of airborne pollutants (heavy metals & known carcinogens) per year!</p>
<i>“The State of Michigan, they have an Air Quality Division that monitors the emissions on an almost daily basis.”</i>	<p>EGLE Air Quality Division does not monitor emissions on a daily basis. Emissions are tested at the startup of the plant after construction is complete, typically within the first 6 months of production. This is called a stack test and is required by the permit.</p>

Air Emissions	
Inaccurate responses to panel questions, as addressed by John Sawyer and Abby Cooper at the Township meeting on 2/9/2021.	Facts
<i>“...There are daily reports submitted to the Air Quality Department that require that there is no pollution emitted out of the production of the hot mix asphalt, “Nothing coming out of the baghouse except air and steam.”</i>	<p>Daily reporting is a requirement of the permit, but it is not submitted to the Air Quality Department unless they request it. This typically happens once per year or once per 3 years. The records do not prove that “no” pollution is emitted. In fact, it proves that there are daily emissions of pollutants. This is calculated in a pound of pollutant per ton of asphalt mix produced. (Ex: CO is calculated at .20 lbs./ton, that gets multiplied by the number of tons produced and that is your daily emissions for that particular pollutant.</p> <p>The baghouse filter only filters particulate. There are other pollutants that exit the stack (CO, Nitrogen Oxides, Sulfur Dioxides, Lead, Benzene, Ethylbenzene Toluene, Xylene, Naphthalene, Metals, and Hydrogen Chloride to name a few).</p>
<i>“The only exhaust out of that stack is the all hot air that goes through the filtered baghouse. There’s nothing released from that stack that doesn’t go through the bag house that takes out any particulate dust or contaminant before the exhaust.” Anything that goes up that stack is subject to the State of Michigan air quality subject to inspection.”</i>	<p>The emissions generated in the mixing drum do go through the baghouse, this is considered inherent to the process. However, there are other emission sources from the plant including the “blue smoke” from the loading of HMA trucks, the blue smoke that escapes from the top of the silos, particulate emissions from truck traffic, the front-end loader, the storage piles, etc. The State is also requiring emission capture systems on these pieces of equipment, but they are largely ineffective at capturing 100% of the emissions. This is a common source of odors.</p>

Table 3: Odors

Odors	
<p>Inaccurate responses to panel questions, as addressed by John Sawyer and Abby Cooper at the Township meeting on 2/9/2021.</p>	<p>Facts</p>
<p><i>“The main concern for the neighbors, in my opinion, would be the air quality and that is “severely regulated by the State of MI”. They have a department that handles all asphalt plants and they are very receptive to any violation that might occur or might not be in compliance with their rules and regulations.”</i></p> <p><i>“They have a daily report to monitor.”</i></p>	<p>No HMA plant in Michigan is required to monitor odors daily. EGLE will get complaints called in, it will take a day or two to figure out what District Office should handle the complaint and who the assigned inspector is for the plant. Then it could take up to several weeks for the department to come out and try to verify the odors. By then the odors could be gone, moved, shifted, or lack an intensity that the Department thinks is sufficient for a violation. The residents have no leg to stand on. Typically, these odor investigations are like trying to hunt down a child lost at Disney.</p> <p>Rarely do odor investigations result in Letters of Violation, but if they do, they hardly ever result in any escalated enforcement.</p>

Table 4: Hazardous Materials & Waste

Hazardous Materials & Waste	
<p>Inaccurate responses to panel questions, as addressed by John Sawyer and Abby Cooper at the Township meeting on 2/9/2021.</p>	<p>Facts</p>
<p><i>"...if there's any waste that there would be there would be normal that would go into a regular dumpster and normal waste disposal container. Those products are really limited like any other business, the papers, the trash, the pop cans and newspaper, those items are removed on a regular basis."</i></p>	<p>Waste is a part of this process and cannot be denied. In other documents we have outlined the potential and typical types of wastes generated at an HMA plant.</p>
<p><i>"No hazardous materials on site."</i></p>	<p>Liquid Asphalt Cement (typically in large above ground steel storage tanks and the biggest volume of product stored).</p> <p>Heat Transfer Oil (contained in a closed loop piping system that heats the liquid asphalt cement).</p> <p>Motor oils, lubricants, hydraulic oils.</p> <p>Off road No. 2 diesel fuel (to fuel the front-end loader that transfers sand and stone to bins).</p> <p>On road No. 2 diesel fuel (for paving crew equipment that goes out to job sites).</p> <p>Asphalt Emulsion (this product is used on the paving jobs to adhere one layer of asphalt to another).</p> <p>Quality control laboratory chemicals (solvents).</p> <p>*The above-named hazardous materials require specific foam and hazardous fire teams to address hazardous events.</p>

Table 5: Dust

Dust	
Inaccurate responses to panel questions, as addressed by John Sawyer and Abby Cooper at the Township meeting on 2/9/2021.	Facts
<p><i>“If you park in our yard there would be no dust on your vehicle in our yard unless there was wind blowing excessively from the gravel pile. The gravel pile and the sand pile if you had excessive wind and you parked next to the gravel pile your car might be dusty when you went home at night.” Bill Wood wanted clarification if there would be any dust from that stack. Jon Sawyer replied, “none, none whatsoever.”</i></p>	<p>Absolutely not true. There will be plenty of dust.</p> <p>There is a limit to the amount of fugitive dust that can be generated on site from truck traffic, HMA haul vehicles, front end loaders, etc. The limit is 20% opacity, in general.</p> <p>Employees on site are supposed to be trained on how to spot fugitive dust and there must be a monitoring plan. This is a plan that is SELF-POLICED!</p>

PART 6: Conclusion

1. Conclusion

Knowing all these risks, having predisposed knowledge of the consequences for our health and safety, makes you, our Tyrone Township officials, responsible for making an ethical decision on the request to rezone 124 acres to heavy industrial space within a residential community. The future of our community rests on the Township Board and Planning Commission's full understanding of the risks at stake. For this reason, we entrust that you share this document at minimum, with the Township Board, Trustees, and Planning Commission.

We sincerely hope our efforts put forth in this document contribute to establishing a body of knowledge that enables you to be more informed on these complex issues. Furthermore, we invite you to ask questions about our work, and request any further studies relevant to the cause that we can provide.

It is our collective, professional opinion that granting approval of this request will undoubtedly bring irreparable harm to the health and safety of our residents, and the surrounding environment. Our community is closely watching and counting on you as our leaders to make a decision that is in the best interest of the residents.

Appendix 1: Abbreviations

Table 6: Abbreviations

Abbreviation	Definition
ATSDR	Agency for Toxic Substances and Disease Registry
BEA	Baseline Environmental Assessment
CDC	Center for Disease Control
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
GSIP	Groundwater Surface Interface Pathway
HAPS	Hazardous Air Pollutants
HHS	Health and Human Services
HMA	Hot Mix Asphalt
Michigan EGLE	Michigan Department of Environment, Great Lakes and Energy
NIOSH	National Institute for Occupational Safety and Health
NOx	Nitrogen Oxides
NREPA	Natural Resources & Environmental Protection Act
OSHA	Occupational Safety and Health Administration
PAHs	Polycyclic Aromatic Hydrocarbons
PM	Particular matter
PNA	Polynuclear Aromatic Hydrocarbons
REC	Recognized Environmental Concerns
SOx	Sulfur Oxides
VOC	Volatile Organic Compounds

From: [Sandy Dixon](#)
To: [Amy Ruthig](#)
Subject: Asphalt plant
Date: Tuesday, November 30, 2021 11:42:14 AM

Ms Ruthig:

As a resident of Genoa Twp I would like to express my many concerns regarding the asphalt facility being considered in the area. Over the last 10 years the township has encouraged growth with homesteads, companies and restaurants. They have done a great job of maintaining growth and still keeping the area feel like a small town. Please help keep the air, noise and traffic as clean as you can. We can't have it all. If you want people to move here we need to not encourage industrial pollution near their homes. Please consider the many concerns that residents have regarding this facility. Thank you!

Sandy Dixon

Sent from my iPhone

From: [Anika Domanico](#)
To: [Mike Archinal](#)
Subject: Proposed re-zoning to build the asphalt facility
Date: Wednesday, December 1, 2021 12:53:13 AM

To whom it may concern at Genoa Township,

My family and I are residents of Genoa Township. I am emailing to voice not only my concerns but my opposition in the proposed re-zoning to build the asphalt facility. To keep this to the point my concerns are as follows;

The industrial emissions of harmful carcinogenic toxins that will be released as a result that will compromise the integrity of the quality of the air that we will be breathing for not only human being but all that residents of the surrounding areas, effecting creatures and the delicate ecosystems of the many lakes near by. This will have severe environmental consequences and be hazardous and detrimental to public health and safety.

I feel Allocation of this new zoning can hinder future growth. the re-zoning of this plot of land that's proposed to be used in this intended manner, surely does not promote the highest and best use for the land that is on the doorstep of the immediate residential area and is currently residential and itself. It is my understanding that the purpose of zoning is to segregate land uses that might be incompatible. It is my belief that in this specific location if re-zoning is granted and this intended plant is built that it would in deed be incompatible.

Furthermore, a study performed by blue Ridge Environmental Defense league was brought to my attention and shows that having an asphalt plant nearby negatively affects property values by 56% As property owner, plummeting values would be a financial hardship to myself and others to endure, not to mention a burden to live near.

In additions to these concerns I would like to know with the increase of traffic and large truck that will be frequently transporting materials to and from this facility and combined with increased commuting traffic, How will the influx and flow of traffic will be resolved and mitigated as a result if this re-zoning is approved?

Thank you for taking the time to read my concerns and I am looking forward to your response addressing my concerns and questions.

Sincerely,
Anika Domanico

[Sent from Yahoo Mail for iPhone](#)

Rezoning Proposal near Toddiem/Victory Drive

Janine Iyer <janine4freedom@gmail.com>

Sun 11/28/2021 6:07 PM

To: Bill Rogers <Bill@genoa.org>; Polly <pskolarus@genoa.org>; Robin Hunt <Robin@genoa.org>; Jean Ledford <Jean@genoa.org>; Jim Mortensen <Jim@genoa.org>; Terry Croft <Terry@genoa.org>; Diana Lowe <diana@genoa.org>;

Dear Genoa trustees,

I understand that Net Lease Associates of Saginaw MI has petitioned the board of trustees to rezone (IND to PID) an area in Genoa Township east of Victory Drive at Toddiem Drive for the industrial development of an asphalt plant and that this rezoning will be considered at the next board meeting on Dec. 6th.

As a resident of Genoa Township living within 5 miles of this site, I oppose the rezoning and development and operation of an asphalt plant on this site. The smokestack emissions are toxic or carcinogenic to humans and atmospheric deposition will poison the surrounding environment. As a cancer survivor, I chose to live in Genoa Township near state land and away from industrial areas to greatly decrease my exposure to carcinogenic emissions. Residents like myself who chose to reside in the natural setting of our township call on you to protect the rural and residential character of our area. Besides the obvious health risks to residents, the operation of an asphalt plant will also certainly decrease the home values in the area. If this rezoning is approved, my family would certainly move out of Genoa Township. Please oppose the rezoning and industrial development of this land.

Thank you for your consideration and service to the community.

Sincerely,

Janine V. Iyer
Genoa Township resident
2396 Brighton Rd.
Howell, MI 48843

WIND:
West to East

Kelly VanMarter

From: Seth Melrose <sethmelrose@gmail.com>
Sent: Thursday, December 2, 2021 10:57 AM
To: Kelly VanMarter; Diana Lowe; Terry Croft; Jim Mortensen; Jean Ledford; Robin Hunt; Bill Rogers; Polly
Subject: Long term negative economic effects of asphalt plants -
Attachments: 2021.09.21_flint_group_comments_ajax_pti_permit (1).pdf

Short term economic growth from an asphalt plant opening soon near to valuable homes and businesses will be a disaster nearly immediately.

Declining property values (in some cases up to 56 percent) will lead to a sharp decline in tax revenue coming into the counties and townships. The added stress on infrastructure will also be a cost passed on to the tax payers. It will be an economic catastrophe which will likely lead to an unrecoverable decline for the entire area.

The cities that are often home to asphalt plants are not bastions of economic growth, they're quite the opposite.

On top of the economic impacts that the surrounding area will suffer are long term and short term pollution that are unavoidable.

The city of Flint fought a proposal for AMC to build an asphalt plant in their town and put together an extremely compelling case for why asphalt plants shouldn't be near the homes of people, many with children. Please take the time to read this important document.



September 22, 2021

Submitted via Email: EGLE-AQD-PTIPublicComments@michigan.gov

Re: Ajax Materials Corporation Permit to Install Application No. APP-2021-0019

To Whom It May Concern:

The following comment is in regard to a Permit to Install (PTI) application submitted by Ajax Materials Corporation. The corporation seeks to construct a hot mix asphalt plant on a proposed site located at 5088 Energy Drive, Flint, Michigan. Before the Department of Environment, Great Lakes, and Energy (EGLE) grants a PTI request, members of the public must have the opportunity to submit written comments on the application. EGLE must consider all public comments received in determining whether to grant a PTI.

The Great Lakes Environmental Law Center and Earthjustice submit this comment on behalf of their clients: Flint Rising, the Environmental Transformation Movement of Flint, and the St. Francis Prayer Center. We urge EGLE to deny the permit for the reasons explained in the attached comment.

Sincerely,

/s/ Andrew Bashi

Andrew Bashi
Nick Leonard
Great Lakes Environmental Law Center
Attorney for Flint Rising
and the Environmental Transformation
Movement of Flint
4444 Second Avenue
Detroit, MI 48201
313-782-3372
andrew.bashi@glelc.org

/s/ Debbie Chizewer

Debbie Chizewer
Earthjustice
Attorney for St. Francis Prayer Center
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I. INTRODUCTION

Nowhere in the state are cumulative risk assessments more necessary for protecting the health of residents than for proposed actions in our largest, poorest, and most segregated cities. Simultaneously, more so than any other city, the name of one has become a universal synonym for “environmental injustice.” Flint.

Renowned biologist Eugene Odum once succinctly described environmental degradation from cumulative effects as “the tyranny of small decisions.”¹ Seemingly independent small decisions, when viewed in their totality, create large-scale ill effects over time. Forty years after Odum’s observations were published, evidence that some of the most egregious health effects of air pollution result not merely from the direct effects of one large action continues to mount. Instead, it is often the combination of a multitude of comparatively minor actions, further inflamed by societal inequalities, that pose significant risks to vulnerable communities.² The United States Environmental Protection Agency (EPA) calls these “combined risks from aggregate exposures to multiple agents or stressors” *cumulative risks*.³

¹ William E. Odum, Environmental Degradation and the Tyranny of Small Decisions, *BioScience*, Volume 32, Issue 9, October 1982, Pages 728–729, <https://doi.org/10.2307/1308718>

² E.g. Chen, Edith et al. “Chronic traffic-related air pollution and stress interact to predict biologic and clinical outcomes in asthma.” *Environmental health perspectives* vol. 116,7 (2008): 970-5.

doi:10.1289/ehp.11076; Morello-Frosch, Rachel et al. “Understanding the cumulative impacts of inequalities in environmental health: implications for policy.” *Health affairs (Project Hope)* vol. 30,5 (2011): 879-87. doi:10.1377/hlthaff.2011.0153; Solomon, Gina M et al. “Cumulative Environmental Impacts: Science and Policy to Protect Communities.” *Annual review of public health* vol. 37 (2016): 83-96.

doi:10.1146/annurev-publhealth-032315-021807; Briggs, David. “Environmental pollution and the global burden of disease.” *British medical bulletin* vol. 68 (2003): 1-24. doi:10.1093/bmb/ldg019; Clougherty, Jane E et al. “Synergistic effects of traffic-related air pollution and exposure to violence on urban asthma etiology.” *Environmental health perspectives* vol. 115,8 (2007): 1140-6. doi:10.1289/ehp.9863

doi:10.1146/annurev-publhealth-032315-021807; Briggs, David. “Environmental pollution and the global burden of disease.” *British medical bulletin* vol. 68 (2003): 1-24. doi:10.1093/bmb/ldg019; Clougherty, Jane E et al. “Synergistic effects of traffic-related air pollution and exposure to violence on urban asthma etiology.” *Environmental health perspectives* vol. 115,8 (2007): 1140-6. doi:10.1289/ehp.9863

³ U.S. EPA. Framework for Cumulative Risk Assessment. U.S. Environmental Protection Agency, Office of Research and Development, Center for Public Health and Environmental Assessment (CPHEA), formerly known as the National Center for Environmental Assessment (NCEA), Washington Office, Washington, DC, EPA/600/P-02/001F, 2003, available at <https://www.epa.gov/risk/framework-cumulative-risk-assessment>.

Traditional assessments of human health risks associated with air pollution are extraordinarily narrow in scope, “focus[ing] on single cause-effect pathways that involve a single chemical and single identified adverse effect,” and “limiting their applicability to the ‘real world.’”⁴ Where air pollution standards are based solely on the adverse health effects of one pollutant and monitoring often focuses on the emissions of one pollutant from a single source, they ignore the reality that combined emissions often work to amplify deleterious effects.⁵ This methodology allows areas to exist where air quality is technically in compliance with each pollutant’s respective standards even though their impact, when taken cumulatively, results in overall low air quality.⁶

The EPA, in its risk characterization policy and guidance, suggests that risk assessments should instead “address or provide descriptions of [risk to]... important subgroups of the population, such as highly exposed or highly susceptible groups.”⁷ The EPA’s guidance on planning and scoping for cumulative risk assessments recognizes the potential importance of other social, economic, behavioral, or psychological stressors that may contribute to adverse health effects, stressing the importance of “defining the characteristics of the population at risk, which include individuals or sensitive subgroups....”⁸ It is this more holistic and accurate approach to risk assessment that has made cumulative effects analysis critical to the attainment of environmental justice.

The EPA’s comment letter regarding EGLE’s draft permit for the Ajax Asphalt Plant highlights “the environmental conditions already facing this community, and the

⁴ National Research Council. *Science and Decisions: Advancing Risk Assessment*. National Academy Press; Washington, DC, USA: 2009.

⁵ Dominici, Francesca et al. “Protecting human health from air pollution: shifting from a single-pollutant to a multipollutant approach.” *Epidemiology (Cambridge, Mass.)* vol. 21,2 (2010): 187-94. doi:10.1097/EDE.0b013e3181cc86e8

⁶ *Id.*

⁷ U.S. EPA. *Framework for Cumulative Risk Assessment*, *supra note 3*.

⁸ *Id.*

potential for disproportionate impacts.”⁹ As such, EPA “recommends a cumulative analysis of the projected emissions from all emission units at the proposed facility, fugitive emissions from the proposed facility, and emissions from nearby industrial facilities, to provide a more complete assessment of the ambient air impacts of the proposed facility on this community.”¹⁰ At the same time, EPA made clear that “the siting of this facility may raise civil rights concerns,” necessitating an assessment by EGLE of “its obligations under civil rights laws and policies.”¹¹

As is demonstrated in the coming pages, the rules governing Michigan’s Department of Environment, Great Lakes, and Energy (EGLE) and its air permitting programs allow for a cumulative impact analysis on a case-by-case basis. Simultaneously, federal civil rights laws demand it. Nowhere in the state are cumulative risk assessments more necessary for protecting the health of residents than for proposed actions in our largest, poorest, and most segregated cities.

EGLE’s failure to utilize its power to conduct a cumulative effects analysis perpetuates a long history of societal disenfranchisement, disinvestment, and disregard for communities of color. The confluence of environmental and social impacts, when combined, must trigger this heightened level of scrutiny applied to permit decisions for facilities near these large historically marginalized communities.

II. BACKGROUND

A. The Proposed Site

The subject of this comment is a proposed permit prepared by EGLE and made available to the public for comment. In December 2020, Ajax submitted an application

⁹ U.S. EPA, Detailed Permit Comments Ajax Materials Corporation PTI APP-2021-0019. Exhibit 1.

¹⁰ *Id.*

¹¹ *Id.*

for a permit to install (PTI), which would authorize the construction of a hot mixed asphalt plant at 5088 Energy Drive in Flint.¹²

Plant construction would include installation of:

- 500 ton per hour counter-flow drum mixer
- baghouse rated to 100,000 Cubic Feet per Minute
- recycled asphalt product feed bins
- eight storage silos
- truck load out area
- six asphalt cement tanks
- hydrocarbon gas fueled heater.

The proposed site is located on a large wooded parcel that is home to Riskin Drain, an Impaired Stream covered by the statewide Polychlorinated Biphenyls (PCBs) TMDL.¹³ Water from Riskin flows into the Flint River until it combines with the Shiawassee River, which then empties into Lake Huron.¹⁴ The DEQ, in its communications to the EPA regarding the statewide PCB TMDL, determined that “atmospheric gas phase concentration is the primary pathway for PCBs into the Michigan water bodies covered by the TMDL,” waterways that include Riskin Drain.¹⁵

As is outlined further in II.B, the site of the proposed facility is close in proximity to large residential housing developments and numerous community gathering centers. At the same time, the area is heavily populated with heavy industrial facilities, including Universal Coating Inc, Genesee Power Station, Ace-Saginaw Paving Company, Buckeye Terminals, Superior Materials, RJ Industrial Recycling, Genesee

¹² Ajax’s Permit to Install Application. Exhibit 2.

¹³ https://www.michigan.gov/documents/deq/wrd-sw-as-pcbtmdl-appA_415364_7.pdf, 040802040409-01

¹⁴ <https://www.canr.msu.edu/michiganlakes/uploads/files/Leonardi%20and%20Gruhn%202001.pdf>, 118

¹⁵ https://ofmpub.epa.gov/waters10/attains_impaired_waters.show_tmdl_document?p_tmdl_doc_blobs_id=80424, 14

Recycling, Environmental Rubber Recycling, Emterra Environmental USA, and Lake State Railway Company.

B. The Community

Surrounding these facilities are a slew of communities and the respective neighborhoods to which they belong; 2,970 people live within a 1-mile radius of the proposed site.¹⁶ Two low-income public housing buildings, River Park and Ridgecrest Village, are located directly to the south and southwest of the proposed site. Four mobile home parks are located within a 1-mile radius of the site along with three children's parks, a public beach, a county recreation area, a community garden, five churches, and an assisted living center.

The proposed plant will be located in an environmental justice community. Of the 2,970 people living within 1-mile of the proposed plant, 86% of the population identify as people of color, including 77% of the population identifying as Black and 10% of the population identifying as Hispanic.¹⁷ Forty-three percent of households have incomes of less than \$15,000 a year. The area's per capita income in 2018 was \$14,991.¹⁸

Data compiled by the EPA and accessed through its EJSCREEN tool confirms a stark contrast between the characteristics of the area around the proposed site compared to the rest of the state. The EJSCREEN report below combines demographic and environmental indicators in the area encompassed within a 1-mile radius of the proposed site to provide EJ Indexes. Each EJ Index combines demographic factors with a single environmental factor.

¹⁶ United States Environmental Protection Agency. 2020 version. EJSCREEN. Retrieved September 20, 2021, from <https://ejscreen.epa.gov/mapper/demogreportpdf.aspx?report=acs2018>. U.S. Census Bureau, American Community Survey (ACS) 2013-2017.

¹⁷ *Id.*

¹⁸ *Id.*



EJSCREEN Report (Version 2020)
1 mile Ring Centered at 43.078570, -83.668652
MICHIGAN, EPA Region 5
Approximate Population: 2,970
Input Area (sq. miles): 3.14



Selected Variables	Percentile in State
EJ Indexes	
EJ Index for Particulate Matter (PM 2.5)	94
EJ Index for Ozone	96
EJ Index for NATA* Diesel PM	89
EJ Index for NATA* Air Toxics Cancer Risk	94
EJ Index for NATA* Respiratory Hazard Index	94
EJ Index for Traffic Proximity and Volume	85
EJ Index for Lead Paint Indicator	94
EJ Index for Superfund Proximity	92
EJ Index for RMP Proximity	87
EJ Index for Hazardous Waste Proximity	94
EJ Index for Wastewater Discharge Indicator	91

An EJ Index is highest in areas with high environmental indicator values combined with large numbers of mainly low-income and minority residents. Higher percentiles indicate a confluence of a high concentration of people of color as well as a high percentile of environmental risks compared to state averages. When an area has a high EJ Index, it is a warning sign that there is likely an environmental justice community that is disproportionately subjected to elevated levels of environmental risks. The communities around the proposed site for this facility are among the highest percentiles in the state for every index, ranging from the 85th percentile to the 96th percentile compared to Michigan as a whole.

III. LEGAL BACKGROUND

The primary air pollution regulations setting the standards that must be met in emitting facility licensing actions taken by EGLE include:

- At the federal level, the Clean Air Act (CAA), as amended, and its rules.¹⁹

¹⁹ *Clean Air Act (CAA)*, 42 U.S.C. 7401 et seq.

- At the state level, Part 55 Air Pollution Control of the Michigan Natural Resources and Environmental Protection Act (NREPA), as amended, and its rules.²⁰

First passed by the United States Congress in 1970, the CAA serves as the foundation for regulating air pollution throughout the country. Under the CAA, the EPA is required to regulate the emission of pollutants that “endanger public health and welfare.”

A primary means of regulating air pollution sources through the CAA has historically been through state enforcement of emission limits in State Implementation Plans (SIPs). Each SIP is an enforceable collection of environmental regulations approved by the EPA and used by the respective state to administer air pollution control programs fulfilling the requirements of the CAA. States are not allowed to have weaker air pollution controls than those outlined in the CAA. States are, however, allowed to have pollution controls stronger than those outlined by the CAA.

In Michigan, the authority to implement the CAA is granted to EGLE’s Air Quality Division (AQD) through Part 55 (Air Pollution Control) of Michigan’s NREPA, as amended. EGLE’s Part 55 Air Rules, approved by the EPA, regulate air emissions, and require permits for major sources of pollutants. Specifically, Rule 201 of the Michigan Air Pollution Control Rules requires a person to obtain an approved Permit to Install for any potential source of air pollution unless the source is exempt from the permitting process.²¹

A. Michigan’s Air Toxic Rules

To receive a permit to install, a permit applicant must submit data demonstrating that the emissions from the process will not have an unacceptable air quality impact in

²⁰ *Natural Resources and Environmental Protection Act (NREPA)*, 1994 PA 451.

²¹ Mich. Admin. Code, R 336.1201.

relation to all federal, state, and local air quality standards.²² State air quality standards include Michigan’s Air Toxic Rules. These rules require two main things of permit applicants. First, permit applicants may not allow the emission of a toxic air contaminant from the proposed new or modified emission unit over the maximum allowable emission rate based on the best available control technology for toxics.²³ Second, the permit applicant must demonstrate that it will not cause or allow the emission of any toxic air contaminant from the proposed new or modified emission unit above the maximum allowable emission rate that will result in a predicted maximum ambient impact that is more than an initial threshold screening level or an initial risk screening level.²⁴

Importantly, EGLE is granted latitude to require even lower emission rates on a *case-by-case basis* for specific toxic air contaminants. Specifically, Rule 228 grants EGLE the authority to do so where the Department determines that the requirements specified by Best Available Control Technology for Toxics (T-BACT) or the health-based screening level may not provide adequate protection of human health or the environment in a particular instance.²⁵ “In this case, the department shall establish a maximum allowable emission rate considering relevant scientific information, such as exposure from routes other than direct inhalation, synergistic or additive effects from other toxic air contaminants, and effects on the environment.”²⁶

B. Review of Permit Decisions

Article VI, Sec 28 of the Michigan Constitution requires administrative decisions to be, at a minimum, “authorized by law; and... supported by competent, material and

²² Mich. Admin. Code, R. 336.1203(1)(h).

²³ Mich. Admin. Code, R. 336.1224(1).

²⁴ Mich. Admin. Code, R. 336.1225(1).

²⁵ Mich. Admin. Code, R 336.1228

²⁶ *Id.*

substantial evidence.”²⁷ Similarly, the Michigan Administrative Procedure Act reiterates that decisions must not be “in violation of the constitution or a statute” and must be “supported by competent, material and substantial evidence on the whole record.”²⁸ It provides further specificity by also barring administrative decisions deemed “arbitrary, capricious, or clearly an abuse or unwarranted exercise of discretion.”²⁹

C. Title VI of the Civil Rights Act of 1964

Title VI of the Civil Rights Act of 1964 (Title VI) is a federal law that prohibits any federally funded program or activity from discriminating on the basis of race, color, or national origin, and provides a statutory basis for relief for victims. Section 602 of Title VI requires agencies distributing federal funds to issue regulations implementing the prohibition of discrimination.³⁰ It also requires these agencies to create mechanisms for processing complaints of discrimination based on race, color, and national origin.

Agency regulations implementing Title VI, as well as agency authority under other laws, are subject to the environmental justice goals of Presidential Executive Order 12898, which requires each Federal agency to “make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”³¹ Federal agencies may implement policies that affect their funding activity to accomplish the goals of EO 12898.³² Agencies can use their Title VI authority, when appropriate, as well as their authority under various laws to achieve the

²⁷ Const. 1963, Art. VI, § 28, Eff. Jan. 1, 1964.

²⁸ Administrative Procedures Act of 1969, 24.306, Sec. 106.

²⁹ *Id.*

³⁰ 42 U.S.C. 2000d-1

³¹ Executive Order 12898, <https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf>.

³² U.S. EPA, “Title VI EJ Comparison” accessed July 10, 2020, <https://www.epa.gov/sites/production/files/2015-02/documents/title-vi-ej-comparison.pdf>.

Executive Order.³³ “Agency Title VI enforcement and compliance authority *includes* the authority to ensure that the activities they fund that affect human health and the environment do not discriminate based on race, color, or national origin.”³⁴

D. Title VI Implementation in the Environmental Context

For the EPA, Title VI is implemented by 40 CFR Part 7, “Nondiscrimination in Programs or Activities Receiving Federal Assistance from EPA.”³⁵ “Every EPA grant recipient, including each state environmental agency receiving financial assistance from EPA, is subject to the terms of 40 CFR Part 7.”³⁶ As a recipient of EPA financial assistance, EGGLE submitted assurance that it would comply with EPA’s Title VI implementing regulations along with its funding applications.³⁷ Accepting EPA funds also served as EGGLE’s acceptance of the obligation to comply with the agency’s Title VI implementing regulations.³⁸

Under EPA’s Title VI implementing regulations, EGGLE is prohibited from using “*criteria or methods of administering its program which have the effect of subjecting individuals to discrimination because of their race, color, [or] national origin.*” Central to the EPA’s Title VI implementing regulations is the *consequence* of agency policies and decisions, not their *intent*. As such, they include prohibitions against both intentional and unintentional discrimination by EGGLE and other EPA funded agencies.³⁹

Unintentional discrimination includes those actions that have a disproportionate adverse effect on individuals of a certain race, color, or national origin. Despite not

³³ *Id.*

³⁴ *Id.* emphasis in original.

³⁵ “40 CFR § 7.35 - Specific Prohibitions.,” LII / Legal Information Institute, accessed July 2, 2020, <https://www.law.cornell.edu/cfr/text/40/7.35>.

³⁶ U.S. EPA, “Draft Title VI Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs”, https://19january2017snapshot.epa.gov/sites/production/files/2013-09/documents/frn_t6_pub06272000.pdf

³⁷ *Id.*

³⁸ *Id.*

³⁹ “40 CFR § 7.35 - Specific Prohibitions.”

being formalized in writing, a neutral policy or decision understood as a “standard operating procedure,” a failure to act, or a failure to proactively adopt an important policy can also constitute a violation of Title VI.⁴⁰ Recipients of federal financial assistance are prohibited from utilizing criteria or methods of administration that have the effect, *even if unintentional*, of subjecting individuals to discrimination because of their race, color, or national origin, or have the effect of defeating or substantially impairing accomplishment of the program’s objectives.⁴¹

While neutral on their face, environmental laws, policies, public participation practices, and decisions can still produce unintentional discriminatory effects that violate Title VI.⁴² For this reason, EGLE’s “Title VI obligation is layered upon its separate, but related obligations under the Federal or state environmental laws governing its environmental permitting program.”⁴³ Therefore, the mere fact that a state agency such as EGLE can demonstrate their actions comply with relevant federal and state environmental laws “does not constitute per se compliance with Title VI.”⁴⁴

Similarly, the “question of whether or not individual facility operators are in violation of [environmental laws] is distinct from whether the permitting agencies’ decision to grant permits to the operators had a discriminatory impact on the affected communities.”⁴⁵

⁴⁰ See, e.g., *Maricopa Cty.*, 915 F. Supp. 2d at 1079 (disparate impact violation based on national origin properly alleged where recipient “failed to develop and implement policies and practices to ensure [limited English proficient] Latino inmates have equal access to jail services” and discriminatory conduct of detention officers was facilitated by “ broad, unfettered discretion and lack of training and oversight” resulting in denial of access to important services).

⁴¹ “40 CFR § 7.35 - Specific Prohibitions.”

⁴² <https://www.govinfo.gov/content/pkg/FR-2000-06-27/pdf/00-15673.pdf>, 39690

⁴³ Draft Title VI Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs.

⁴⁴ *Id.*

⁴⁵ *Californians v. United States EPA*, 2018 U.S. Dist. LEXIS 56105, *35

E. Permitting Decisions Under Title VI

Per 40 CFR 7.35(b), EGLE and other recipients of EPA funding are responsible for ensuring that the activities authorized by their environmental permitting decisions do not have discriminatory effects, regardless of whether the agency selects the site or location of permitted sources. The fact that the recipient, EGLE, does not select the site in a permit application does not relieve the recipient of the responsibility of ensuring that its actions in issuing permits for such facilities do not have a discriminatory effect.⁴⁶ Within the context of Title VI, the issuance of a permit by EGLE or any other recipient of EPA funding is the “necessary act that allows the operation of a source. that could give rise to adverse disparate effects on individuals.” To operate, the owners of a facility must both: 1) “comply with local zoning requirements,” and 2) “obtain the appropriate environmental permit.” An EPA funding recipient’s operation of a permitting program is independent of local government zoning activities.

IV. COMMENTS

A. EGLE Can And Must Use Its Authority To Assess Cumulative Impacts Regarding Air Emissions From The Proposed Plant As Well As Other Nearby Sources Of Air Pollution

EPA has stated that a cumulative impact analysis is relevant for considering whether a Title VI violation may be present. Yet, EGLE has neither required the Permit Applicant to perform any such analysis, nor has it performed such an analysis itself, despite the fact that Title VI demands a cumulative impact study in this case and multiple regulatory provisions support the use of this requirement.

The demographic data for the communities living in close proximity to the proposed site immediately gives rise to concerns regarding Title VI compliance: 86% of

⁴⁶ 40 CFR § 7.35(c).

individuals living in the communities within a 1-mile radius of the facility are minorities. These concerns are heightened given the results of the EJ Screen analysis discussed in section II.B above, which showed that the community within a 1-mile radius of the proposed plant were not only people of color and lower income but were also subject to disproportionately high levels of a wide variety of environmental risks when compared to state averages. Adding another source of air pollution to this community may contribute to a disproportionate adverse impact in violation of Title VI, particularly when cumulative impacts on the community are considered.

EGLE has the authority to require a cumulative impact assessment regarding any toxic air contaminant pursuant to Mich. Admin. Code R. 336.1228 (Rule 228) and Mich. Admin. Code R. 336.1901. In addition, the Michigan Environmental Policy Act, MCL 324.1705(2), requires that EGLE consider the effect of the proposed permit on the environment and should not authorize conduct that will pollute, impair or destroy the air, water or other natural resources if "there is a feasible and prudent alternative consistent with the reasonable requirements of the public health, safety, and welfare. (Rule 901). Rule 228 specifically allows the Department to "determine, on a case-by-case basis, that the maximum allowable emission rate... does not provide adequate protection of human health or the environment."⁴⁷ Rule 228 compels EGLE to require a lower emissions rate than specified in the administrative code wherever this determination is made, stating that it "shall establish a maximum allowable emission rate considering relevant scientific information."⁴⁸ It goes on to explicitly include examples of a wide array of scientific information considered relevant to the determination of the maximum allowable emission rate. They include, but are not limited to, "exposure from routes other than direct inhalation, synergistic or additive

⁴⁷ Mich. Admin. Code R. 336.1228 (Rule 228) (emphasis added)

⁴⁸ *Id.*

effects from other toxic air contaminants, and effects on the environment.”⁴⁹ In short, Rule 228 permits EGLE to conduct what the EPA defines as a cumulative risk assessment for toxic air contaminants: “An analysis, characterization, and possible quantification of the combined risks to health or the environment from multiple agents or stressors.”⁵⁰ As such, Rule 228 provides EGLE with a tool to address Title VI-related cumulative impact concerns in the context of permitting.

Rule 901(a) also provides EGLE with the authority to require a cumulative impacts analysis. Rule 901 provides—

[A] person shall not cause or permit the emission of an air contaminant or water vapor in quantities that cause, alone or in reaction with other contaminants, either of the following:

- a. injurious effects to human health or safety, animal life, plant life of significant economic value or property, or
- b. unreasonable interference with the comfortable enjoyment of life and property.⁵¹

In order to determine whether the proposed asphalt plant will comply with Rule 901(a), a permit term, EGLE must have a better understanding of how the permit will contribute to the injurious effects to human health or safety.

Residents in this community already experience disproportionately high rates of asthma and other health conditions that reflect the known high rates of exposure to air pollution. According to the Michigan Inpatient Database, the asthma hospitalization rate in the area in zip code 48505—where the proposed Plant is to be located—is 43.04

⁴⁹ *Id.*

⁵⁰ U.S. EPA. Framework for Cumulative Risk Assessment. U.S. Environmental Protection Agency, Office of Research and Development, Center for Public Health and Environmental Assessment (CPHEA), formerly known as the National Center for Environmental Assessment (NCEA), Washington Office, Washington, DC, EPA/600/P-02/001F, 2003.

⁵¹ Mich. Admin. Code R336.1901 (Rule 901).

per 10,000 people, which is over three times the state average of 12.54 per 10,000 people.⁵² A cumulative impact study is a needed step to understand how this proposed permit will contribute to the overall health effects.

As noted above, EPA's Title VI regulations prohibit both intentional and unintentional acts of discrimination. An unintentional act of discrimination can include a failure to act. In cases such as this when a Title VI issue may be present based on the demographics of the residents living nearby the proposed Plant, a cumulative impact analysis is *required* in order for EGLE to determine whether or not its decision to issue the permit will violate the EPA's Title VI regulations.

Even if the department did not have existing authority in its air quality rules for conducting a cumulative impact analysis, EGLE's Title VI obligation "exists *in addition* to the Federal or state environmental laws governing its permitting program."⁵³ However, in this case EGLE *does* have the authority to address cumulative impacts regarding toxic air contaminant emissions.

The Commenters are not the only parties concerned about cumulative impacts and a potential Title VI violation. The risk of this occurring was highlighted by the EPA itself in a recent letter to EGLE regarding the Ajax permit application. The Agency states that:

because the proposed site for the Ajax facility is in an area with identified air quality concerns in EJSCREEN, EPA recommends a cumulative analysis of the projected emissions from all emission units at the proposed facility, fugitive emissions from the proposed facility, and emissions from nearby industrial facilities, to provide a more complete assessment of the ambient air impacts of the proposed facility on this community.⁵⁴

⁵² Michigan Inpatient Data Base, 2012-2014, available at https://www.michigan.gov/documents/mdch/Michigan-and-Detroit-Asthma-Hosp-Rates_498682_7.pdf

⁵³ U.S. EPA Title VI Guidance, at 39,680. Emphasis added.

⁵⁴ U.S. EPA, Detailed Permit Comments Ajax Materials Corporation PTI APP-2021-0019

Yet, while EGLE's existing rules allow it to conduct a cumulative impact analysis via Rule 228, Rule 901, and the EPA's Title VI guidance, and while the EPA has explicitly encouraged EGLE to perform such an analysis regarding this proposed permit, it has thus far failed to do so. The permit will contribute to emissions in communities made up of some of the highest percentages of minorities in the state. The large number of minorities living within the vicinity of the proposed site immediately raises the prospect of a Title VI complaint based on disparate impact. A violation will occur if this decision, combined with cumulative impacts of the entirety of this and other facilities, results in a significant adverse effect. By abdicating its responsibility to conduct a cumulative impact assessment, EGLE is left with no means of knowing whether the cumulative impacts that include those arising from this permit will have a significant adverse effect. The agency cannot then know whether it is complying with its Title VI obligations in the process of issuing these permits.

B. EGLE's Draft Permit Fails To Prevent Violations Of Rule 901

EGLE's draft permit expressly incorporates Rule 901 of the Michigan Air Pollution Rules but fails to require sufficient measures designed to prevent the violation of Rule 901(b). Rule 901(b) requires EGLE and Ajax to ensure that emissions do not cause "unreasonable interference with the comfortable enjoyment of life and property."⁵⁵ As explained in EGLE's guidance, "Application of Rule 901(b) in the Permit to Install Review Process" ("Rule 901(b) Guidance"), the Air Quality Divisions staff and the source of pollution have the responsibility to proactively reduce the likelihood that the facility will generate a nuisance. The incorporation of Rule 901(b) in permits aims to prevent odors and fugitive dust from becoming a nuisance to the surrounding community. The Rule 901(b) Guidance expressly includes asphalt plants in the list of

⁵⁵ Mich. Admin. Code R 336.1901(b) (Rule 901).

odorous sources.⁵⁶ EGLE directs its permitting staff to identify methods that can be used to help minimize nuisance situations.

1. Odors

Despite the fact that odors are a very common complaint from residents living near asphalt plants,⁵⁷ including at Ajax's other asphalt plants,⁵⁸ EGLE's draft permit pays scant attention to the importance of odor prevention. As a preliminary matter, Ajax's permit application passingly mentions nuisance odors and dust, but fails to explain how the asphalt plant's design or operations will prevent the release of odors that will cause an unreasonable interference with comfort and enjoyment of life and property for its neighboring community. EGLE's draft permit also includes no requirement that Ajax take proactive measures to manage odors, but rather indicates that EGLE may require odor testing upon request.⁵⁹

The siting of the Ajax asphalt plant in this environmental justice community is inappropriate considering the harms that can be caused by the odor and other harmful emissions. As drafted, EGLE's draft Permit fails to proactively address the high likelihood of odor issues. This is especially problematic considering that EGLE has previously received odor complaints for Ajax's other asphalt plants in Michigan. It has also issued multiple notices of violations for odor for at least three of Ajax's Michigan plants. In response to a notice of violation for its Auburn Hills asphalt plant, Ajax indicates that it has increased its stack height from 60' to 100' and then to 120' feet as a

⁵⁶ *Id.*

⁵⁷ <http://chej.org/wp-content/uploads/Asphalt-Plants-PUB-131.pdf> look at p. 64/182

⁵⁸ See EGLE Violation Notices:

https://www.deq.state.mi.us/aps/downloads/SRN/B4138/B4138_VN_20160615.pdf.

https://www.deq.state.mi.us/aps/downloads/SRN/B1956/B1956_VN_20151207.pdf

https://www.deq.state.mi.us/aps/downloads/SRN/B1956/B1956_VN_20191202.pdf

⁵⁹ See EGLE Draft Permit, 10 (The verification and quantification of odor emissions from EUHMAPLANT, by testing at owner's expense, in accordance with Department requirements may be required for continued operation.)

proactive way to prevent odor issues.⁶⁰ Yet, in Flint, Ajax is only proposing to build a stack at a height of 80'. Nothing in the permit suggests why the 80' stack height is appropriate or will prevent odors.

EGLLE has the authority to deny a permit based on Rule 901. For instance, in the predominantly white community of Rochester Hills, Michigan, the Department of Natural Resources ("DNR") refused to issue a permit to construct a landfill based on its proximity to residential homes and the inadequacy of the proposal to control odors on the site; in upholding the DNR's permit denial, the Court deemed consideration of "the broad concerns regarding air quality enunciated under Rule 901" an appropriate exercise of regulatory discretion.⁶¹

We urge EGLLE to deny Ajax's permit application because the very nature of the asphalt plant operations make it likely to cause a nuisance for the surrounding community, considering its close proximity to the nearby homes. At the very minimum, EGLLE should require Ajax to take significant steps to reduce the potential odor issues: (1) require Ajax to raise the stack height; (2) require Ajax to install systems that will reduce the likelihood that emissions will escape the facility; and (3) require Ajax to prepare an odor mitigation plan that will detail operations and maintenance systems designed to prevent odors.

⁶⁰ See Letter from Mark Boden, Vice President, Ajax to Robert Joseph, Environmental Engineer, Air Quality Division, EGLLE (December 20, 2019),

http://www.deq.state.mi.us/Aps/downloads/SRN/B1956/B1956_RVN_20191220.pdf

⁶¹ See *Southeastern Oakland County Incinerator Authority v. Department of Natural Resources*, 440 N.W.2d 649, 653-654 (Michigan Ct. of Appeals 1989); see also *Subject: Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 Pa 451, As Amended Petition of Air Quality Division To Revoke the Permit To Install Issued To Tobian Metals, Inc., 2005 WL 996013* (upholding DEQ's decision to withdraw an air permit, based in part on Rule 901, where residents could not run air conditioning or open their windows due to odors from the nearby industrial facility).

2. Fugitive Dust Emissions Control

Ajax's Asphalt Plant and Yard will generate fugitive dust from the plant roadways, plant yard, material storage piles, silos, and material handling operations. As acknowledged by EGLE's Rule 901(b) Guidance, permits to install should include provisions designed to prevent fugitive dust from creating a nuisance. Further, under the Michigan SIP, the permit must include a fugitive dust plan.⁶²

Nothing in the draft permit demonstrates that EGLE or Ajax took adequate measures to prevent fugitive dust emissions. EGLE's draft permit's Appendix A is a very high level, one-page document that does not provide details appropriate for a fugitive dust plan. Control measures should be in place for all transfer points, transport by truck, roadways, and outdoor storage piles.⁶³ EGLE should require the following:

Transfer Points:

- Require total enclosure of materials during transfer, including for truck loading and unloading.
- For transfers of materials that cannot be enclosed, as determined by EGLE, require a water spray system either through direct application, mobile misters (appropriate for materials that should get too wet), or dry foggers (which are appropriate during freezing temperatures).
- For transfer of materials that cannot be enclosed, minimize material drop heights.
- Consider wind speeds and plan ahead and do not conduct transfer operations during wind speeds over 12 miles per hour.

Truck Transport:

⁶² MCL 324.5524; Mich. Admin. Code, R 336.1901.

⁶³ See Chicago, Control of Emissions from Handling and Storing Bulk Materials (January 2019) as a guide to some measures that can be taken to control fugitive dust.

https://www.chicago.gov/content/dam/city/depts/cdph/InspectionsandPermitting/Control_EmissionsfromHandling&StoringBulkMaterials_January2019.pdf

- All vehicles should be subject to 10 mph or less speed limit and signage should be posted.
- All outgoing material transport trucks are cleaned so no loose material is on the exterior tire surface and the removed material is collected.
- All outgoing material transport trucks go through a wheel wash station and pass over rumble strips.
- Transport trucks should not be able to access unpaved areas.
- Trucks carrying materials out of the facility should be covered.

Roadways:

- All internal roads used for transporting or moving material shall be paved or maintained so that they are not susceptible to become windborne.
- All internal roads should be swept with a street sweeper with a water spray and vacuum system multiple times per day and records of this work should be maintained.
- External truck routes within one mile of the facility should be cleaned with a street sweeper with a water spray and vacuum system at least once per day.

Outdoor storage piles:

- For any piles that EGLE determines cannot be covered or enclosed, pile heights must be limited to no more than 10 feet.
- Disturbance of outdoor storage piles must be suspended during wind conditions that exceed 12 miles per hour.
- Dust suppressant systems—including water sprayers, misters, or water trucks, or chemical stabilizers--should be in place and operable throughout the entire year.

Runoff management:

- Prevent runoff from piles onto public ways, neighboring parcels, or waterways.

- Obtain discharge permits for any runoff that will enter any stormwater collection systems.
- Grade site so that proper drainage occurs.
- Develop written plan for spills and/or migration of pollutants onsite or offsite.

C. Risk of Further PCB Contamination to Imperiled Waterway Must Be Assessed to Satisfy Rule 901

The proposed site for this permit to install is home to an Impaired Stream covered by the statewide Polychlorinated Biphenyls (PCBs) TMDL. Riskin Drain is a tributary of the Flint River, which carries waters and contaminants from Riskin to Lake Huron. Furthermore, the site is in close proximity to bodies of water with substantial surface area, including the 684-acre C.S. Mott Lake.

In its 2017 review of an MDEQ report on PCB TMDLs, the EPA assessed and agreed with the MDEQ’s assertion that “atmospheric gas phase concentration is the primary pathway for PCBs into the Michigan waterbodies covered by the TMDL.” Asphalt products are widely recognized as common sources of PCB contamination.⁶⁴ As such, EGLE must review the injurious effects or unreasonable interferences siting a hot mix asphalt plant near already impaired waterways may exacerbate.

EGLE should ensure that Ajax obtains whatever stormwater permits are needed as well as prepares the appropriate stormwater management plans.

D. The Material Limits Described in EUHMAPLANT, Condition II.5,6 Conflict with Limits Used in the Permit Application

The proposed permit limits the amount of hot mix asphalt that may be processed to 600 tons per hour. As noted below, these limits do not reflect those utilized by the Permit Applicant in its application.

⁶⁴ Hoag, George. Polychlorinated Biphenyls in Bituminous Materials. American Society of Civil Engineers., U.S. EPA. PCBs in Building Materials. May 2021 https://www.epa.gov/sites/default/files/2021-05/documents/final_pcb_buildings_fact_sheet_05-10-2021_to_upload.pdf. Daniel Cargil. PCBs from Building Materials and Other Sources in the Urban Environment. 2014.

Table 3 of the Applicant's permit application describes the estimated maximum short-term emissions and annual emissions for toxic air contaminants from the Plant's hot mix asphalt counter-flow drum dryer. These estimates were calculated using a material usage limit of 500 tons of hot mix asphalt processed per hour.⁶⁵ Likewise, the Permit Applicant determined the proposed Plant will have the potential to emit 16.2 tons per year of particulate matter.⁶⁶ In calculating the Plant's potential to emit particulate matter, the Permit Applicant assumed the Plant would be limited to processing 500 tons of HMA paving materials per hour.⁶⁷

As a result of this disconnect, the maximum short-term emissions estimates, and annual emissions estimates provided in the permit application, do not accurately reflect the proposed permit's conditions. This is particularly problematic for the maximum short-term emissions provided in the permit application. By utilizing a lower material limit of 500 tons of HMA processed per hour—as opposed to the limit of 600 tons of HMA processed per hour which is described in the proposed permit—the Permit Applicant has underestimated the maximum short-term emissions of toxic air contaminants and particulate matter from its HMA counter-flow drum dryer.

As a result of underestimating the Plant's short term toxic air contaminant emissions, the Permit Applicant has failed to comply with Rule 225. That rule requires the permit applicant to demonstrate that the toxic air contaminant emissions from its proposed Plant will not exceed health-based screening levels. The short-term emissions described in Table 3 were utilized to demonstrate compliance with the health-based screening levels in Table 12. Since Permit Condition EUHMAPLANT, II.5,6 does not reflect the assumptions relied on to calculate the estimated amount of short term and long-term toxic air contaminant emissions described in Table 3 of the permit

⁶⁵ Permit Application, Table 3, page 27.

⁶⁶ *Id.*

⁶⁷ *Id.*

application, the Permit Applicant has failed to demonstrate how its Plant will comply with Rule 225.

Similarly, by utilizing lower material usage limits in its permit application compared to the proposed permit, the Permit Applicant has failed to provide an accurate description of the proposed Plant's potential to emit particulate matter. As a result, EGLE cannot accurately determine whether the proposed Plant will interfere with the attainment or maintenance of the particulate matter national ambient air quality standard.

The Permit Applicant should be required to calculate the short term and long-term toxic air contaminant emissions and particulate matter emissions based on the actual conditions in the proposed permit and to perform a new air quality modeling analysis for toxic air contaminants based on the new short term and long-term emissions estimates. If such an analysis is performed, the Commenters request that EGLE make this information publicly available and provide at least 60 days for an additional public notice and comment period. Alternatively, the proposed permit could be amended to lower the material usage limit from 600 tons of HMA processed by hour to 500 tons of HMA processed per hour.

E. An Emissions Limit for Cobalt Should Be Required

As described in Table 12 of the permit application, the proposed Plant will emit a significant amount of cobalt which will consume 83.1% of the Initial Risk Screening Level. The Initial Risk Screening Level is the concentration of a possible, probable, or known human carcinogen in ambient air which has been calculated to produce an estimated upper-bound lifetime cancer risk of 1 in 1,000,000.⁶⁸ Cobalt has shown to cause cancer in animals who were exposed to it through the air.⁶⁹ As such, the

⁶⁸ Mich. Admin. Code, R 336.1109(c).

⁶⁹ <https://www.atsdr.cdc.gov/ToxProfiles/tp33-c1-b.pdf>

International Agency for Research on Cancer has determined that cobalt is possibly carcinogenic to humans.⁷⁰

Given that the Permit Applicant's own modeling analysis has predicted that the maximum ambient concentration of cobalt emissions from the Plant will be close to the Initial Risk Screening Level, the Commenters request that the permit include an emissions limit for cobalt as well as a requirement for the owner of the facility to regularly conduct emissions testing for cobalt at the Plant.

F. An Emission Limit for Volatile Organic Compounds Should Be Required in the EUHMAPLANT Emission Unit Conditions

The permit application states that the HMA dryer will have the potential to emit 28.4 tons of volatile organic compounds per year.⁷¹ Rule 702 requires a person who is responsible for any new source of volatile organic compound emissions shall not cause emissions in excess of the lowest maximum emissions rate established by the Rule. Here, the permit applicant determined its maximum allowable emissions rate based on the application of the best available control technology. Ajax determined that the best available control technology was "good combustion controls."⁷² The use of "good combustion practices" is inadequate here and an VOC emission limit must be imposed.

1. The Selection of Good Combustion Practices as the Best Available Control Technology for VOC Emissions has not been Adequately Supported by the Permit Applicant

EGLE's policy regarding permit to install applications states that a "Rule 702 BACT analysis is very similar to a top-down BACT analysis," which is required for permits subject to the Prevention of Significant Deterioration program.⁷³ A "top-down" approach consists of a permit applicant providing all available control technologies

⁷⁰ *Id.*

⁷¹ Permit Application, Table 1, pdf page 23.

⁷² Permit Application, pdf page 15.

⁷³ https://www.michigan.gov/documents/deq/DEQ-AOD-PTI-Admin_Comp_Inst_356118_7.pdf at 6.

ranked in order of descending control effectiveness.⁷⁴ EGLE's PSD Workbook specifies what must be included in a top-down BACT analysis. It consists of a five-step analytical methodology to identify and analyze all available options for reducing emissions.⁷⁵

The five steps in the top-down BACT analysis are as follows:⁷⁶

Step 1: Identify all available control technologies;

Step 2: Eliminate technically infeasible options;

Step 3: Rank the remaining control technologies by control effectiveness;

Step 4: Evaluate the most effective controls and document the results;

Step 5: Select the best available control technology.

A top-down BACT analysis is commonly at least a few pages long and specifically documents the permit applicant's analysis for each of the five steps described above.⁷⁷ Here, the Permit Applicant's BACT analysis consisted of a short paragraph, and it did not follow the top-down BACT analysis methodology as described in EGLE's PSD Workbook. Most significantly, it did not provide any evaluation of the most effective controls and document the results, as required by Step 4. Instead, it merely stated that there "has been significant discussion between the HMA industry and regulators regarding whether newer plant designs, such as counter-flow or dual drum, represent BACT for HMA plants," and that "[d]ata supporting such conclusions is generally subjective rather than objective and quantifiable."⁷⁸ It then went to select good combustion practices as the BACT. As noted by EGLE in its PSD

⁷⁴ PSD Workbook page 85.

⁷⁵ <http://www.deq.state.mi.us/aps/downloads/permits/PSD%20Workbook.pdf> at 85.

⁷⁶ *Id.*

⁷⁷ *See*, DTE permit application, Blue Water Energy Center

⁷⁸ Permit Application, pdf page 15.

Workbook, the evaluation of the available control technologies must include an analysis of “all energy, environmental and economic impacts associated with the list of available control technologies.” No such analysis was provided by the Permit Applicant. Since the Permit Applicant has provided an insufficient BACT analysis regarding its VOC emissions, the Commenters believe that the permit does not comply with Rule 702 and must be denied.

2. The Permit Must Contain a VOC Emissions Limit

While the Permit Applicant has failed to provide an adequate BACT analysis, the Permit also fails to provide a VOC emissions limit, which is plainly required. EGLE’s PSD Workbook defines “BACT” as “an emission limit that is determined from a case by case review of all appropriate control options.”⁷⁹ It goes on to state that while the BACT analysis is primarily about the evaluation of applicable control options, BACT “is an emission limit for each emissions unit.”⁸⁰ Indeed, the plain language of Rule 702 clarifies that a person shall not cause the emission of volatile organic compounds in excess of the “lowest maximum emission rate” determined based on the application of the best available control technology. The proposed permit contains no volatile organic compound emissions limit as plainly required by EGLE guidance and Rule 702.

G. Particulate Matter Modeling Demonstrations, Emissions Limits, and Monitoring Requirements Must Account for Condensable Particulate Matter

Rule 116 defines particulate matter as “any air contaminant existing as a finely divided liquid or solid...”⁸¹ As such, it includes both filterable and condensable particulate matter. It’s unclear from the permit application whether the applicant included condensable particulate matter in its potential to emit calculations and

⁷⁹ EGLE PSD Workbook, pdf page 90.

⁸⁰ *Id.*

⁸¹ Mich. Admin. Code R. 336.1116(c).

ambient impact modeling analysis. The Commenters believe the permit application must account for condensable particulate matter emissions from the plant in these two respects. Further, the permit's emission limits, and monitoring requirements do not clearly account for condensable particulate matter emissions. The Commenters believe this is required.

H. The Permit Applicant Has Failed to Demonstrate That the Permit Will Not Interfere with Attainment or Maintenance of any National Ambient Air Quality Standards

One of the most basic requirements of a permit to install is to ensure that emissions from a proposed facility will not interfere with the attainment or maintenance of any national ambient air quality standard. If a permit is unable to comply with this requirement, then EGLE must deny the permit.⁸²

In its permit application, the applicant notes that the predicted ambient impacts that will result from the Plant's emissions will be above the applicable significant impact levels for NO₂, SO₂, and PM_{2.5}. As such, it performed additional analyses to assess whether or not the proposed Plant will interfere with the attainment or maintenance of any NAAQS.

This additional analysis is deficient in two respects. First, the additional analysis only considered one additional source's sulfur dioxide emissions. It is unclear from the permit application and proposed permit why the Permit Applicant and EGLE decided to limit the additional analysis to only include sulfur dioxide emissions from the Genesee Power Station. There are a number of emitting sources located in the area that also contribute to local air pollution. Even the Genesee Power Station emits a significant amount of nitrogen oxides, which were not accounted for in the additional analysis conducted by the Permit Applicant. Second, the additional analysis relied on air quality data to establish background concentrations of air pollution to be used in the air quality

⁸² Mich. Admin. Code R. 336.1207(1)(b).

modeling analysis. While the PM_{2.5} data was collected by an air quality monitor in Flint, PM₁₀ and NO₂ data was collected from air quality monitors in Lansing and Grand Rapids. It is improper to utilize air quality data collected in Lansing and Grand Rapids to establish the background concentrations of air quality in the area where the proposed Plant is to be located given the far distance these monitors are from the proposed Plant and given that the proposed Plant is to be located in a multisource area. Further, ambient air quality data regarding sulfur dioxide concentrations should have been collected in the area where the proposed Plant is to be located to ensure the Plant's emissions won't interfere with maintenance of the sulfur dioxide NAAQS. In accordance with EPA guidance, since the proposed Plant is in a multisource area, air quality data used to establish background concentrations for determining whether a proposed source will interfere with the maintenance or attainment of a national ambient air quality standard must be collected within 10 kilometers of the proposed Plant or within or not farther than 1 kilometer from either the area of maximum air pollutant concentration from existing sources or the area of the combined maximum impact from existing and proposed sources.⁸³ If monitors meeting these requirements do not already exist, then the Permit Applicant must install additional monitors to gather such air quality data to establish background concentrations.

I. Opacity Testing Requirements Lack Adequate Specificity

EGLE's draft permit should be strengthened with regard to the opacity requirements. EGLE should add continuous opacity testing, including the implementation of the digital camera opacity technique to ensure frequent and more accurate testing of opacity. EPA's comment letter recommends the use of digital cameras to measure opacity, and EPA has increasingly recognized the value of digital

⁸³ U.S. EPA, Ambient Monitoring Guidelines for Prevention of Significant Deterioration, at 6-7, May 1987, available at <https://www.epa.gov/sites/default/files/2015-07/documents/monguide.pdf>

monitors.⁸⁴ While EPA regs and EGLE regs currently only require the use of Method 9 opacity testing, as set forth in 40 CFR 60.93, Method 9 is often poorly performed and is essentially an “eyeball” test.

At a minimum, the permit should prescribe a schedule—at least quarterly—and plan for opacity testing and the testing must be conducted by a trained and certified professional under a range of weather conditions to ensure coverage of representative conditions.⁸⁵ The results of this opacity testing should be made publicly available on an accessible website. In addition, the draft permit should be edited for clarity; currently, the opacity requirements are only included in the general conditions for EHUMAPLANT, in contrast to the way that the EUYARD opacity provisions are treated as part of the permit terms.

J. EGLE’s Public Participation Process Continues To Be Problematic And Raises Civil Rights Issues

EGLE has continued its history of failing to provide adequate public participation opportunities in its permitting processes. The need for EGLE to provide a more robust and accessible public participation process in the permitting of the Ajax Materials air permit is particularly concerning when the agency’s record of EPA issued Title VI violations are brought to bear. One such violation was due to EGLE’s inadequate and discriminatory public participation practices when issuing a permit for the Genesee Power Station, located on the same street, less than 700 meters from the proposed Ajax site. In a January 19, 2017, letter from EPA to EGLE’s precursor, MDEQ,

⁸⁴ See, e.g., EPA, Federal Register Vol. 80, No. 125, June 30, 2015, available at <http://www.gpo.gov/fdsys/pkg/FR-2015-06-30/pdf/2015-15038.pdf>; see also Air Force Research Laboratory, An Alternative to EPA Method 9 – Field Validation of the Digital Opacity Compliance System (DOCS), available at <https://www.serdp-estcp.org/Program-Areas/Weapons-Systems-andPlatforms/Noise-and-Emissions/Air-Emissions/WP-200119>

⁸⁵ EPA Method 9 (“The opacity of emissions from stationary sources is determined visually by a qualified observer.”), available at <https://www.epa.gov/sites/production/files/2016-06/documents/m-09.pdf>

the agency determined that EGLE violated Title VI of the Civil Rights Act through “[a] finding of discriminatory treatment of African-Americans by [EGLE] in the public participation process for the GPS (Genesee Power Station) permit considered and issued from 1992 to 1994.”⁸⁶

In the same civil rights enforcement letter, EPA provided clear actions required of EGLE to resolve the civil rights violation. These included:

(1) improving MDEQ's public participation program to reduce the risk of future disparate treatment; (2) improving MDEQ's development and implementation of a foundational non-discrimination program that establishes appropriate procedural safeguards while addressing civil rights complaints as well as policies and procedures for ensuring access for persons with disabilities and limited-English proficiency to MDEQ programs and activities; and (3) ensuring that MDEQ has an appropriate process in place for addressing environmental complaints. In addition, in this letter EPA makes specific recommendations to MDEQ regarding the GPS facility.⁸⁷

In 2019, the resolution process for two additional Title VI complaints alleging discrimination during the public participation processes of facilities permitted in Genesee County permitting polluting facilities resulted in the EPA entering into two resolution agreements—one with EGLE and one with Genesee County—to resolve the complaints.⁸⁸ In the resolution agreements, EPA called on EGLE and Genesee County to improve their respective public participation processes. The agreement between EPA and EGLE provides that, from that point forward:

⁸⁶ January 19, 2017, MDEQ Closure Letter for Administrative Complaint No. 01R-94-R5, <https://www.epa.gov/sites/default/files/2017-01/documents/final-genesee-complaint-letter-to-director-grether-1-19-2017.pdf>.

⁸⁷ *Id.* at 2.

⁸⁸ December 4, 2019 Resolution Agreement Letter for Complaint No. 17RD-I 6-R5, https://www.epa.gov/sites/default/files/2019-12/documents/resolution_letter_and_agreement_for_complaint_17rd-1-6-r5.pdf

⁸⁸ See EGLE LEP Plan, https://www.michigan.gov/documents/egle/Limited_English_Proficiency_Plan_710255_7.pdf.

EGLE will ensure its public involvement process is available to all persons regardless of race, color, national origin (including limited-English proficiency), age, disability, and sex. In addition, EGLE will ensure that the factors used to determine the appropriate time, place, location, duration, and security at public meetings are developed and applied in a nondiscriminatory manner.⁸⁹

The public participation process in the Ajax permitting process has not safeguarded against discriminatory practices. EGLE's own internal policy recognizes that their decision-making process should be "transparent, occur in steps, and in a time frame that is understood and predictable by involved parties."⁹⁰ In this case, however, EGLE did not engage the public early in the process, while also failing to identify the methods of engagement most likely to meet the needs of the community and afford them the opportunity for meaningful participation.

A community needs assessment, as stated in EGLE policy, begins with the identification of needs and services for those that are with LEP and/or disabled.⁹¹ Whether EGLE took steps to identify the needs of the community beyond listing an email address to request language interpretation or other accommodations on in a letter that not every community member received is unclear.

Flint is one of the nation's most stark examples of the growing digital divide. Roughly 40% of city residents lack access to broadband internet, double the percentage

⁸⁹ December 4, 2019 Resolution Agreement Letter for Complaint (EGLE) No. 17RD-I 6-R5, https://www.epa.gov/sites/default/files/2019-12/documents/resolution_letter_and_agreement_for_complaint_17rd-1-6-r5.pdf; December 19, 2019 Resolution Agreement Letter for Complaint (Genesee County) https://www.epa.gov/sites/default/files/2019-12/documents/19-12-19_final_resolution_letter_and_agreement_recipient_-_genesee_county_18rd-16-r5.pdf. See EGLE LEP Plan, https://www.michigan.gov/documents/egle/Limited_English_Proficiency_Plan_710255_7.pdf. In the aftermath of the EPA Title VI letters, EGLE has committed on paper to an improved public participation process and has developed a Limited English Proficiency ("LEP") plan. Note that St. Francis Prayer Center was one of the groups that signed on to collective comments on the draft LEP plan.

⁹⁰ EGLE Public Participation Policy, https://www.michigan.gov/documents/egle/EGLE_Policy_09-007_679780_7.pdf

⁹¹ *Id.*

of households lacking access statewide.⁹² Nearly 25% live in households without access to a computer.⁹³ Given the specific characteristics of the population within one mile of the proposed site, the aforementioned lack of access is likely underestimated.

This lack of access means impacted residents also lack the ability to receive electronic notification of meetings. Even where notice is achieved, virtual meetings place an unreasonably high burden on the substantial numbers of residents lacking broadband or computer access entirely. Community elders often lack the technical literacy to determine meeting locations and times or to successfully join an online meeting. At the same time, while the printed notices that successfully arrived at the mailboxes of some community members were dated July 1, 2021, they were not actually received until weeks later. In addition, EGLE did not directly send public notice information (e.g. the Project Summary) to nearly 400 River Park Apartments and Ridgcrest Townhouses families. Instead, they sent two notices – to the management of each low-income housing complex. Several community members reported learning of their right to provide comment only through concerned neighbors or by word of mouth at community demonstrations. Many other impacted residents received no notice at all. Each of these factors reduced the ability of residents to participate in a decision-making process that could impact the health of their community substantially.

EGLE's initial failure to assess the community's needs later led to conflicting messages, confusing residents attempting to understand how best to participate in public meetings and through written comments. In response to pressure from a coalition of environmental justice activists, EGLE extended the comment period and provided additional hearings to account for communication problems. However, inconsistent information was posted in the various public documents visible on the

⁹² U.S. Census Bureau, American Community Survey (ACS) and Puerto Rico Community Survey (PRCS), 5-Year Estimates.

⁹³ *Id.*

website. Documents were not updated, potentially leading some residents to see only the original August comment period deadline. Not realizing the comment period was extended, residents may have been led to believe their opportunity to provide public comment had been foreclosed.

Community members have been made to feel unheard and ignored, particularly upon the observation that some construction related activities have already begun taking place at the proposed site. One community member stated that activity around the plant site made it feel like “[EGLE and Ajax] are ready to continue no matter what we say here today.”⁹⁴ These many factors have resulted in a palatable sense of futility and uncertainty regarding the meaningfulness of their participation in the permitting process.

Ultimately, the lack of clarity within the public participation process for this site did not meet the EPA or EGLE’s own expectations that the process “promotes and seeks active participation by the public in EGLE activities.”⁹⁵

V. CONCLUSION

The Genesee Power Station, which sits just to the north of the proposed facility, was the subject of a Title VI complaint. In its investigation, the EPA concluded that African-Americans were treated less favorably in the permitting process than non-African-Americans. Decades later, EGLE faces a similar test to its DEQ predecessor. As detailed in this comment, EGLE’s decision to allow the proposed Plant to locate in an environmental justice community already heavily burdened by high levels of environmental risks and asthma hospitalizations presents serious environmental justice

⁹⁴ Dylan Goetz, “Flint Residents Unhappy With Proposed Asphalt Plant Near City’s Border”, *MLive*, August 12, 2021, <https://www.mlive.com/news/flint/2021/08/flint-residents-unhappy-with-proposed-asphalt-plant-near-citys-border.html>

⁹⁵ https://www.michigan.gov/egle/0,9429,7-135-3306_70585-381847--,00.html

and Title VI issues. For the reasons described above, we believe EGLE must deny the Permit as it currently drafted and must require a cumulative impact analysis to ensure compliance with its Title VI obligations.

**ADDITIONAL SIGN-ONS TO THE FLINT RISING, ENVIRONMENTAL
TRANSFORMATION MOVEMENT OF FLINT AND ST. FRANCIS PRAYER
CENTER COMMENT LETTER**

- Bishop Bernadel Jefferson, Citizens Advocating United Together Inform Organize for New Direction (CAUTION)
- Sandra S. Jones, Executive Director, R L Jones Community Outreach Center Campus, Greater Holy Temple Church
- Geraldine Redmond, President, Flint Housing Commission
- Arthur Woodson, Concerned Resident
- Laura M. Sager, Co-Founder, National Network for Justice
- Benjamin Pauli, Associate Professor of Social Sciences, Kettering University
- Patrick Levine Rose, Esq. (acting a public citizen), former Appointed Special Genesee County Prosecutor for the Flint Water Investigation
- Judy Alexander, Tri-Chair, Michigan Poor People Campaign
- Elena LB Hawkins, Flint resident
- Pastor Roshanda Womack, Flint Central Church of the Nazarene and The Underground
- Carma Lewis, President, Flint Neighborhoods United
- Sonyita & Dwayne Clemons, Total Life Prosperity LLC
- Mark Richardson, Esq., Former Appointed Genesee County Special Prosecutor on the Flint Water Investigation Team
- Antony Paciorek, Michigan United
- Michigan United

EXHIBIT 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

Mary Ann Dolehanty
Air Quality Division
Michigan Department of
Environment, Great Lakes and Energy
535 West Allegan Street
P.O. Box 30473
Lansing, Michigan 48909-7973

Dear Ms. Dolehanty:

This letter is in regard to Michigan Department of Environment, Great Lakes and Energy's (EGLE's) draft Permit to Install (PTI) for Ajax Materials Corporation (Ajax) – PTI Application No. 2021-0019. The PTI would allow Ajax to install and operate a new hot mix asphalt plant at 5088 Energy Drive in Genesee Township, near the Flint border. Ajax intends to accept permit limits to ensure that emissions from the proposed facility would not exceed the major source threshold. The U.S. Environmental Protection Agency (EPA) has reviewed the draft PTI and associated permit files.

EPA is committed to advancing environmental justice and incorporating equity considerations into all aspects of our work. This commitment includes improving our assessment and consideration of the impacts of permits on communities already overburdened by pollution. As described below in more detail, we appreciate that EGLE shares this commitment and has taken steps to mitigate potential impacts from the proposed facility.

The neighborhood around the proposed asphalt plant has some of the highest levels in the State of Michigan for many pollution indicators used by EPA's environmental justice screening tool, EJSCREEN. EJSCREEN is a mapping and screening tool that provides EPA with a nationally consistent dataset and approach for combining environmental and demographic indicators. It is a useful first step in understanding or highlighting locations that may have environmental justice concerns.

Like EPA, EGLE recognizes the challenges faced by this community. The Environmental Justice Index for eight of the eleven EJSCREEN indicators in the one-mile area around the proposed Ajax site exceeds the 90th percentile in the State of Michigan, including indices for

particulate matter of less than 2.5 microns in diameter, ozone, air toxics cancer risk, respiratory hazard, lead paint, Superfund proximity, hazardous waste, and wastewater discharge. The population of the people who live in the area around the proposed asphalt plant is disproportionately low income, people of color, and includes persons with limited English proficiency. The proposed Ajax site is in an area that is already heavily populated by industrial facilities along Dort highway and is in close proximity to residential housing and community centers.

EPA acknowledges the work EGLE has already undertaken on this permitting action, work that may go beyond what is usually required in Michigan for issuing a minor source air pollution control construction permit. EGLE required the applicant to conduct dispersion modeling for multiple air pollutants, including toxic cancer-causing compounds, to assess the potential impacts of this air pollution permit. EGLE has provided an extended opportunity for public comment, held both a virtual information session and hearings, and an in-person comment session, as part of its enhanced public outreach efforts to the community. EGLE also accepted comments via regular mail, voicemail, email, and in-person.

Our concerns, comments, and recommendations are included in the attachment to this letter. We highlight a few key comments here. First, because the proposed site for the Ajax facility is in an area with identified air quality concerns in EJSCREEN, EPA recommends a cumulative analysis of the projected emissions from all emission units at the proposed facility, fugitive emissions from the proposed facility, and emissions from nearby industrial facilities, to provide a more complete assessment of the ambient air impacts of the proposed facility on this community. Next we strongly encourage EGLE to assess the use of opacity cameras and other practically enforceable continuous compliance measures to assure that Ajax is meeting its permitted limits and following industry best practices. We also recommend that if the proposed asphalt plant is permitted, data regularly generated by Ajax to comply with the permit be made publicly available on an easily accessible website. The transparency of such data will promote public engagement and help build trust among all stakeholders.

Finally, because of the environmental conditions already facing this community, and the potential for disproportionate impacts, the siting of this facility may raise civil rights concerns, so it is important that EGLE assess its obligations under civil rights laws and policies. We understand that EGLE requested Ajax to consider alternative sites for this asphalt plant, but that the company declined to do so. Any of the additional analyses EPA is recommending may provide additional information in support of EGLE's evaluation of whether the proposed construction will cause adverse and disproportionate impacts for nearby residents. If so, we encourage the company, EGLE, and local authorities to consider again whether construction at an alternative site would avoid the potential for such impacts. We further encourage Ajax and EGLE to engage with the local community to address community concerns that may not be within the scope of the air permit.

Thank you again for the opportunity to work with you on this draft permit. EPA remains committed to working together with EGLE to address our shared environmental priorities,

advance equity, and reduce potential environmental and health impacts on communities such as this one.

Sincerely,

Cheryl L. Newton
Acting Regional Administrator

Enclosures

Detailed Permit Comments
Ajax Materials Corporation
PTI APP-2021-0019

EPA has reviewed the draft PTI and associated permit files, including the technical fact sheet and permit application materials made available by EGLE during the public comment period, and has the following comments and recommendations:

1. We recommend that you evaluate whether additional nearby stationary sources and fugitive sources from the proposed facility should be included as part of the air quality modeling EGLE has required for this permit. The cumulative impacts analysis only considered the impacts associated with the proposed project. Neither nearby sources nor fugitives from the proposed facility were included in the modeling. We observe that Ajax is proposing to construct in an area where other stationary sources are already located and may be impacting the local community. Additionally, the toxic air contaminant (TAC) modeling does not consider all sources of stack and fugitive emissions. We recommend this analysis include an assessment of whether the source-wide TAC emissions from both fugitive and non-fugitive sources exceed EGLE's initial threshold screening level (ITSL) or initial risk screening level (IRSL).
2. 40 CFR 60.92(a)(2) establishes an opacity requirement applicable to each hot mix asphalt facility. This opacity requirement does not appear within the draft permit. EGLE should include the necessary opacity limit in the permit and incorporate opacity testing requirements consistent with 40 CFR 60.93. To ensure ongoing compliance and practical enforceability of this limit, EGLE should also establish a periodic (at least quarterly) opacity testing requirement applicable to the affected facility.
3. EUHMAPLANT Special Condition (SC) V.2 – V.4 lists the general test methods Ajax is to use to ensure compliance with the applicable permit conditions. The current draft permit only contains general citations to the appendices containing relevant test methods for Parts 60, 61, and 63. We recommend that EGLE specify in the permit the particular test method protocols for each pollutant that Ajax will be using to ensure compliance once the facility is constructed and operating. The permit can include a provision that requires EGLE approval of the test plan submitted by the permittee prior to testing, but approval of modifications to EPA test methods, as found in the appendices to Parts 60, 61, and 63, can only be done by EPA. EPA is available to assist EGLE in determining the appropriate test methods for each pollutant in order for Ajax to ensure compliance with the permit limit conditions.
4. EUHMAPLANT SC V.5 requires particulate matter testing pursuant to 40 CFR Part 60 Subparts A and I. Although this condition incorporates the testing required by the federal requirement, permit condition SC V.5 does not require periodic testing to determine compliance with the particulate matter emission limit in 40 CFR 60.92. To ensure ongoing compliance with the emission limit and improve enforceability of the NSPS Subpart I PM limit, we request that the permit include periodic PM testing performed according to the procedures included within 40 CFR 60.93.

5. FGFACILITY SC I.3 and I.4 contains facility-wide general limits on hazardous air pollutants (HAPs) for individual and aggregate HAPs of less than 8.9 and 22.5 tons per year, respectively, on a 12-month rolling average. The monitoring and recordkeeping requirements for these conditions (FGFACILITY SC VI.2) only state that the permittee is required to use emission calculation records to ensure compliance with the limits. We request the permit specify the methodology Ajax will use to demonstrate compliance with the HAP limits, and that the permit record include an explanation of how this methodology will ensure that HAP emissions remain below the major source threshold.
6. EUHMAPLANT SC V.1 and V.2 requires the permittee to verify via stack testing carbon monoxide (CO) and toxic air pollutant emissions upon EGLE's request. This condition does not require periodic testing to determine compliance with the hourly CO emission limit established in SC I.8, nor does it require periodic testing to determine compliance with the air toxics emission limits established in SCs I.14 through I.25. We request that you require periodic testing to determine compliance with the emission limits in SCs I.8 and I.15 through I.25. Periodic testing would help ensure that the source is complying with its CO and air toxics emission limits, which improves the practical enforceability of each limit and further ensures that the local community is not subjected to emissions exceeding the corresponding limit.
7. EUHMAPLANT SC V.3 requires a one-time test to verify PM₁₀, PM_{2.5}, NO_x, and lead emissions from the plant. EUHMAPLANT SC V.4 is a similar requirement that applies when the source combusts recycled used oil (RUO) and includes testing for SO₂ emissions. It is not clear whether a one-time test ensures that each emission limit is enforceable as a practical matter, however, as it is unclear whether emissions vary over time or with the type of asphalt being produced or fuel being combusted, suggesting that periodic testing may be appropriate to ensure ongoing compliance with each limit. We request that you revise SC V.3 and V.4 to require periodic testing to better ensure that the PM₁₀, PM_{2.5}, NO_x, lead, and SO₂ emission limits are enforceable as a practical matter. For any pollutant where EGLE determines one-time testing is sufficient, we request that EGLE provide justification as part of the permit record.
8. EUYARD SC I.2 restricts all visible emissions from the pile when winds are below 12 miles per hour (mph) and limits opacity to 20% when winds exceed 12 mph. Since the modeling analysis relies on a windspeed threshold that exceeds approximately 11.50 mph,¹ we recommend that you revise this condition to apply to winds that are below 11.50 mph. Also, the draft permit does not require the permittee to perform periodic visible emissions monitoring when winds are below 12 mph nor to quantify opacity when winds are at least 12 mph. To ensure ongoing compliance with the visible emissions requirements and to ensure practical enforceability of the opacity limit, we request that you incorporate periodic visible emissions monitoring and periodic opacity monitoring to evaluate and quantify fugitive dust emissions.
9. The fugitive dust control plan in Appendix A requires the permittee to maintain piles to prevent fugitive dust consistent with EUYARD SC I.1 (see Appendix A, condition 7.b). As

¹ 5.14 m/s ≈ 11.50 mph.

written, it is unclear what fugitive dust control measures will be implemented to prevent fugitive dust emissions from the pile. EUYARD SC I.1 appears to apply to all roads and unpaved travel surfaces, not the piles. To ensure the enforceability of the fugitive dust control plan and SC III.1, we request that you specify the measures that will be employed to control fugitive dust from the mineral aggregate piles. We request that you require each material storage pile to be covered or enclosed to mitigate potential fugitive dust emissions. In addition to reducing fugitive particulate emissions, covered piles may also require less water to control fugitives, potentially reducing the amount of fuel required to dry aggregate and other materials to specification. For any uncovered piles, we request that you specify the conditions which require the application of water or other chemical wetting agents or other methods that may be required to control fugitive emissions. For active piles, we request that the fugitive dust control plan specify the measures the permittee will employ to minimize fugitive dust emissions. Once these control measures have been identified, the fugitive dust control plan should be updated to require recordkeeping to ensure any fugitive dust control measures have been implemented.

10. EUYARD SC IV.1 requires the applicant to monitor wind speeds to determine compliance with the applicable visible emissions requirement in SC I.2. However, neither the fugitive dust control plan in Appendix A nor the draft permit section EUYARD require the permittee to implement fugitive dust control measures when winds are measured at or above 12 mph. To ensure fugitive dust is minimized when winds are above 12 mph and to better ensure compliance with the opacity limit in SC I.2, we request that you require the implementation of fugitive dust control measures when measured winds exceed 12 mph. We further recommend implementing fugitive dust control measures when measured winds are near, but do not exceed, 12 mph to mitigate potential fugitive dust emissions and further ensure compliance with the opacity limit.
11. The PM₁₀ and PM_{2.5} modeling analyses consider one year of meteorological data instead of five years and considers emissions from the larger pile when winds for a particular hour exceed 5.14 m/s (approximately 11.50 mph). We are concerned that the applicant's modeling analysis may underestimate ambient particulate impacts associated with this project. We recommend reevaluating the modeling analysis to ensure that the project's ambient PM₁₀ and PM_{2.5} impacts are not underestimated.
12. EUHMAPLANT SC V.1 requires the permittee to verify and quantify odor emissions upon EGLE's request. We recommend that EGLE evaluate whether recurring odor emission testing is appropriate pursuant to R 336.2001(1)(c). Recurring odor emission testing would allow EGLE to better determine compliance with R 336.1901 and more readily address the local community's potential odor concerns.
13. We recommend that EGLE consider whether it has the authority or discretion to include in the permit a requirement that the results of recurring compliance testing be made available to the public on an easily accessible website. The public posting of, e.g., the results of odor and opacity testing, virgin aggregate/RAP continuous monitoring (required by EU HMAPLANT SC VI.2), particulate and HAP emission testing, and wind speed measurements (required by EU HMAPLANT SC VI.1), would ensure transparency for the affected community.

14. Additional justification should be provided in the permit record to support the air quality analysis and the applicant's use of wind speed thresholds as it applies to the storage pile. Although the applicant cites Wisconsin's Air Dispersion Modeling Guideline as support, we note that Wisconsin's guideline does not provide justification for the approach and is nonbinding on other air permitting authorities. EGLE, as the air permitting authority for this action, has the discretion and authority to request certain air quality analyses for minor NSR permit applications. Michigan's R 336.1241, a requirement approved into Michigan's state implementation plan, requires EGLE to follow procedures and measures listed in the *Guideline on Air Quality Models* at 40 CFR Part 51 Appendix W (Appendix W). In addition to establishing certain requirements and recommendations applicable to NAAQS compliance demonstrations, Appendix W Section 1.0 encourages the use of sound scientific judgment in an air quality analysis and considers the judgment of meteorologists, scientists, and analysts essential. For this permit action, the analysis EGLE conducted and the judgment it exercised as part of the decision-making process should be fully documented within the permit record. Should EGLE choose to allow this approach for any proposed pile, the approach should be evaluated on a case-specific basis that is well documented within the permit record.
15. For all pollutants, the dispersion modeling conducted for this permit relies on one year of National Weather Service (NWS) meteorology collected from Bishop International Airport. Appendix W Section 8.4.2(e) recommends acquiring enough meteorological data to ensure that worst case meteorological conditions are adequately represented in the model results and requires the use of 5 years of representative NWS data. We request that you conduct the criteria pollutant and TAC analysis using 5 years of meteorological data. We recognize that R 336.1241 provides EGLE discretion to allow the use of only 1 year of NWS data for nonmajor PTIs.² The PM₁₀ and PM_{2.5} analyses restrict the hours that the pile may emit fugitives based on hourly wind speeds, suggesting that a larger meteorological database may be necessary to capture worst case meteorological conditions. The TAC analysis may also be improved to capture worst case meteorological conditions that may not be present in one year of NWS data. Modeling based on 5 years of meteorological data increases the likelihood that the worst-case meteorological conditions are considered as part of this analysis and would be consistent with NAAQS analyses conducted for other regulatory purposes.
16. Dispersion modeling for particulate emissions relies on a critical wind speed threshold of approximately 11.50 mph for the purpose of considering fugitive emissions from the pile. From information included in the permit record, it appears that the applicant analyzed the daily fastest mile and daily surface friction velocity. However, it is unclear whether the analysis considers hourly wind speeds and sub-hourly gusts. It is not clear whether the modeling excludes emissions from the pile during hours where gusts exceed the critical wind speed threshold. AP-42 Section 13.2.5.2, a document cited by the applicant, suggests that "estimated emissions should be related to the gusts of the highest magnitude" and that "peak

² R 336.1241 states in relevant part that "[...] the demonstration may be based on the maximum ambient predicted concentration using the most recent calendar year of meteorological data from a representative national weather service [...] station."

winds can significantly exceed the daily fastest mile.”³ This suggests that gusts play a large role in fugitive dust emissions and should be evaluated as part of this analysis. The meteorology used in the modeling analysis is based on 1-minute National Weather Service (NWS) data, enabling an analysis of sub-hourly winds. We recommend that the applicant analyze the 1-minute data to determine whether certain hours contain sub-hourly gusts exceeding the critical wind threshold to further ensure that the analysis does not underestimate ambient PM₁₀ and PM_{2.5} impacts.

17. The applicant cites several documents suggesting that the critical wind speed threshold for the pile is 12 mph. However, it is unclear whether and to what extent the stockpiles analyzed in each document are representative of the applicant’s proposed pile. Although the information provided in each document may be helpful to estimate emissions for applicability purposes, it is less clear whether this information is sufficient to determine the critical wind threshold for the proposed stockpile. None of the documents appear to analyze asphalt plants in particular. Would the applicant’s proposed pile contain material with the same particle size distribution as that analyzed within each cited document? Are there other asphalt plant pile parameters that may affect the critical wind speed threshold that are not reflected in the cited documents, such as moisture content or how well each pile is mixed? We recommend that the applicant evaluate the composition of the proposed pile to further justify whether the comparison is adequate. Lack of a case-specific analysis of the composition of the proposed pile at the source may understate fugitive particulate emissions from the pile, potentially underestimating the modeled impacts attributed to the pile.
18. It is not clear whether the modeling considered other activities that may generate fugitive emissions from the pile. The analysis offered by the applicant appears to focus solely on wind-blown emissions without considering how working the pile may affect the generation of fugitive particulate emissions. We recommend that the applicant address potential fugitive emissions that may be generated while the source works the pile and evaluate whether the current analysis adequately evaluates emissions generated at these times. The permit does not otherwise restrict the applicant from working the pile, suggesting that fugitive emissions associated with working the pile should be included as part of the analysis.
19. The modeling analysis excludes receptors within the proposed property line. Section 6.1.3.1 of the December 21, 2020 application states that the applicant will “prevent access to the property by the general public through a combination of fencing, berms, trees, and shrubs” around the property line. Given the lack of further detail in the application, it is unclear whether this combination of measures as stated within the application would be effective in precluding access to the land by the general public. Appendix W section 9.2.2 recommends the placement of receptors throughout the modeling domain. The December 2, 2019 Revised Policy on Exclusions from Ambient Air⁴ states that receptors may be excluded over land owned or controlled by the stationary source “where the source employs measures, which may include physical barriers, that are effective in precluding access to the land by the

³ AP-42 Chapter 13.2.5 – Industrial Wind Erosion is available online at https://www.epa.gov/sites/default/files/2020-10/documents/13.2.5_industrial_wind_erosion.pdf.

⁴ The Revised Policy on Ambient Air is available online at https://www.epa.gov/sites/default/files/2019-12/documents/revised_policy_on_exclusions_from_ambient_air.pdf.

general public.” We recommend that the applicant identify where each proposed measure will be employed so that EGLE can evaluate whether the proposed measures effectively preclude the general public’s access to land owned or controlled by the proposed source.

20. The proposed fugitive dust controls described by the applicant include “the presence of berms (approximately 7 feet tall), trees on top of those berms (approximately an additional 7 feet tall when planted), and the fence next to the berm.” We support the implementation of berms and windbreaks to mitigate fugitive dust emissions from the source. However, neither the draft permit nor fugitive dust control plan requires the applicant to install and maintain berms, windbreaks, and covered piles to control fugitive dust emissions. We recommend that EGLE include enforceable permit conditions requiring the source to implement and maintain the selected fugitive dust control measures such as berms, windbreaks, and covered piles.
21. The TAC analysis uses the results of generic TAC modeling to estimate the TAC impacts in relation to the appropriate ITSL or IRSL. The generic TAC modeling result is based on modeled impacts from the drum dryer stack. Although most TAC emissions are emitted from the drum dryer stack, TACs are also emitted from the silo heater, silo filling and loadout processes, and the asphalt cement storage tank. We recommend that you consider modeling each process or emission unit that does not exhaust to the drum dryer stack to avoid underestimating TAC impacts. Dispersion characteristics may differ depending upon the process, potentially resulting in underestimated TAC impacts where a given process has worse dispersion characteristics than the drum dryer stack.
22. Although the NAAQS and PSD increment analysis considers the impact of fugitive emissions from several sources, it is unclear whether the TAC analysis considers fugitive emissions from similar sources. Are there any fugitive TAC emissions that should be considered as part of the TAC analysis? We suggest that you either revise the TAC analysis to include fugitive TACs not already considered or provide justification explaining why fugitive emissions do not need to be included in the analysis.
23. EUHMAPLANT SC II.4 limits recycled asphalt pavement (RAP) to a maximum of 50 percent on a monthly average. We recommend EGLE require compliance with this limit on a shorter-term basis than monthly (such as daily). We note that the draft permit requires the source to continuously monitor the RAP feed rate (see EUHMAPLANT SC VI.2), suggesting that the permittee would already collect data that can be used to determine compliance with the limit on a shorter-term basis. AP-42 section 11.1.1.3 suggests that RAP can be processed at ratios up to 50 percent with little or no observed effect upon emissions. AP-42 is silent with respect to emissions above the 50 percent ratio and does not differentiate between averaging times.
24. EUHMAPLANT SC I.4 through I.7 include a reference to footnote c. However, footnote c does not appear to be included within the emission limit table. We request that you specify footnote c or revise each special condition to remove the reference to this footnote.
25. EUHMAPLANT SC I.4 and I.6 each cite 40 CFR 52.21 (c) and (d) as an underlying applicable requirement. We recommend that you verify whether each special condition cites

the appropriate underlying authority. We note that Michigan has a SIP-approved version of each requirement at R 336.2803 and R 336.2804, respectively.

26. EUHMAPLANT SC II.1 allows the permittee to burn recycled used oil (RUO). We recommend that the permittee consider not using RUO as a fuel for the proposed source. Although EGLE has established requirements that apply when combusting RUO,⁵ eliminating the use of RUO as a fuel could reduce air toxics and sulfur impacts on the local community. Should the permittee choose to combust RUO as part of this process, we recommend that the permittee or EGLE analyze the additional impact combusting RUO could have on the local community over the impact of using other fuels such as natural gas.
27. EUHMAPLANT SC IV.1 requires continuous pressure drop monitoring for the proposed baghouse. We request that EGLE consider the use of a bag leak detection system (BLDS). BLDS would help verify that the fabric filters are not leaking or developing a leak. A BLDS, combined with the requirement to operate the baghouse in a satisfactory manner, would help ensure that the baghouse is operating properly, enable the permittee to react promptly to leaking bags, and further ensure compliance with the particulate matter special conditions.

⁵ See EUHMAPLANT SC II.2, SC III.4, SC V.4, and the RUO compliance monitoring plan in Appendix D.

EXHIBIT 2



PERMIT TO INSTALL APPLICATION

For authority to install, construct, reconstruct, relocate, or modify process, fuel-burning or refuse burning equipment and/or control equipment. Permits to install are required by administrative rules pursuant to Section 5505 of 1994

FOR EGLE USE
APPLICATION NUMBER

Please type or print clearly. The "Application Instructions" and "Information Required for an Administratively Complete Permit to Install Application" are available on the Air Quality Division (AQD) Permit Web Page at www.deq.state.mi.us/aps/nsr_information.shtml. Please call the AQD at 517-284-6804 if you have not been contacted within 15 days of your application submittal.

RECEIVED

DEC 28 2020

AIR QUALITY DIVISION

1. FACILITY CODES: State Registration Number (SRN) and North American Industry Classification System (NAICS)			
SRN		NAICS	3 2 4 1 2 1
2. APPLICANT NAME: (Business License Name of Corporation, Partnership, Individual Owner, Government Agency) Ajax Materials Corporation			
3. APPLICANT ADDRESS: (Number and Street) 1957 Crooks Road, Suite A			MAIL CODE:
CITY: (City, Village or Township) Troy	STATE: MI	ZIP CODE: 48084	COUNTY: Oakland
4. EQUIPMENT OR PROCESS LOCATION: (Number and Street - If different than Item 3) Northeast Corner of Carpenter Road and Energy Drive			
CITY: (City, Village or Township) Genesee Charter Township		ZIP CODE: 48505	COUNTY: Genesee
5. GENERAL NATURE OF BUSINESS: Hot mix asphalt manufacturer			
6. EQUIPMENT OR PROCESS DESCRIPTION: (A Description MUST Be Provided Here. Include Emission Unit IDs. Attach additional sheets if necessary; number and date each page of the submittal.) Ajax is proposing to install a new Hot Mix Asphalt Plant to include a 500 tph counter-flow drum mix plant, 100,000 cfm baghouse, six asphalt cement tanks with a small natural gas heater, eight HMA storage silos, RAP and aggregate feed bins.			
7. REASON FOR APPLICATION: (Check all that apply.) <input checked="" type="checkbox"/> INSTALLATION / CONSTRUCTION OF NEW EQUIPMENT OR PROCESS <input type="checkbox"/> RECONSTRUCTION / MODIFICATION / RELOCATION OF EXISTING EQUIPMENT OR PROCESS - DATE INSTALLED: <input type="checkbox"/> OTHER - DESCRIBE			
8. IF THE EQUIPMENT OR PROCESS THAT WILL BE COVERED BY THIS PERMIT TO INSTALL (PTI) IS CURRENTLY COVERED BY ANY ACTIVE PERMITS, LIST THE PTI NUMBER(S): N/A			
9. DOES THIS FACILITY HAVE AN EXISTING RENEWABLE OPERATING PERMIT (ROP)? <input checked="" type="checkbox"/> NOT APPLICABLE <input type="checkbox"/> PENDING APPLICATION <input type="checkbox"/> YES PENDING APPLICATION OR ROP NUMBER:			
10. AUTHORIZED EMPLOYEE: Mark E. Boden		TITLE: Vice President	PHONE NUMBER: (Include Area Code) 248.244.3300
SIGNATURE: 		DATE: 12/22/2020	E-MAIL ADDRESS: mboden@ajaxpaving.com
11. CONTACT: (If different than Authorized Employee. The person to contact with questions regarding this application) Stephanie A. Jarrett Kathleen T. Anderson		PHONE NUMBER: (Include Area Code) 248.324.2146 810.845.3925	
CONTACT AFFILIATION: Fishbeck Ajax Materials Corporation, In House Consultant		E-MAIL ADDRESS: sjarrett@fishbeck.com kanderson@ajaxpaving.com	
12. IS THE CONTACT PERSON AUTHORIZED TO NEGOTIATE THE TERMS AND CONDITIONS OF THE PERMIT TO INSTALL? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
FOR EGLE USE ONLY - DO NOT WRITE BELOW			
DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203:			
DATE PERMIT TO INSTALL APPROVED:		SIGNATURE:	
DATE APPLICATION / PTI VOIDED:		SIGNATURE:	
DATE APPLICATION DENIED:		SIGNATURE:	
A PERMIT CERTIFICATE WILL BE ISSUED UPON APPROVAL OF A PERMIT TO INSTALL			

**Permit to Install Application
Hot Mix Asphalt Plant**

**Ajax Materials Corporation – Genesee Township Plant
Energy Drive
Genesee Charter Township, Michigan**

**December 21, 2020
Project No. 201405**

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List of Abbreviations/Acronyms

- acfm actual cubic feet per minute
- AER allowable emission rates
- AERMET AERMOD Meteorological Preprocessor
- AERMOD American Meteorological Society/Environmental Protection Agency Regulatory Model
- AQD Air Quality Division
- AQD-22 Dispersion Modeling Guidance for Federally Regulated Pollutants
- ARM Ambient Ratio Method
- BACT Best Available Control Technology
- BPIP Prime Building Profile Input Program Prime
- Btu British thermal units
- CAA Clean Air Act
- CAIR Clean Air Interstate Rules
- cfm cubic feet per minute
- CFR Code of Federal Regulations
- CO carbon monoxide
- CO₂ carbon dioxide
- CO₂e carbon dioxide equivalent
- °F degrees Fahrenheit

EGLE	Michigan Department of Environment, Great Lakes, and Energy
GEP	good engineering practice
gr/dscf	grains per dry standard cubic foot
HAP	hazardous air pollutant
HCl	hydrochloric acid
HMA	hot mix asphalt
hr/day	hours per day
hr/yr	hours per year
IRSL	Initial Risk Screening Level
ITSL	Initial Threshold Screening Level
km	kilometer(s)
LAER	lowest achievable emission rate
lb	pound(s)
lb/hr	pounds per hour
lb/MMBtu	pounds per million Btus
MACT	Maximum Achievable Control Technology
µg/m ³	micrograms per cubic meter
MDEQ	Michigan Department of Environmental Quality (became EGLE April 22, 2019)
MMBtu/hr	million Btus per hour
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAD83	North American Datum of 1983
NED	National Elevation Dataset
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NSPS	New Source Performance Standards
NSR	New Source Review
O ₃	ozone
PAI	Predicted Ambient Impact
PAC	polynuclear aromatic compounds
Pb	lead
PM	particulate matter
PM _{2.5}	fine particulate matter less than 2.5 microns
PM ₁₀	fine particulate matter less than 10 microns
ppm	parts per million
PSD	prevention of significant deterioration
PTE	potential to emit
PTI	Permit to Install
RAP	recycled asphalt product
RUO	recycled used oil
ROP	Renewable Operating Permit
SCC	Source Classification Code
sf	square foot/feet
SDS	Safety Data Sheet
SER	significant emission rate
SIL	significant impact levels
SO ₂	sulfur dioxide

TAC	toxic air contaminant
T-BACT	Best Available Control Technology for Toxics
tph	tons per hour
tpy	tons per year
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
VOC	volatile organic compound

1.0 Executive Summary

Fishbeck has been retained by Ajax Materials Corporation (Ajax) to submit a request for a PTI for their proposed new HMA process to be located on Energy Drive in Genesee Charter Township, Michigan. This document contains the information required to evaluate the application for the permit, including a description of the plant, equipment, operating schedule, projected emissions characteristics, a BACT Analysis, and an air toxics demonstration.

The Ajax facility will manufacture HMA, primarily for the road construction industry. As part of this project, Ajax is proposing to install a 500 tph counter-flow drum mixer and associated 100,000 cfm baghouse, RAP and aggregate feed bins, six new asphalt cement tanks with a small natural gas heater, and eight 300 ton HMA storage silos.

The proposed project is not subject to PSD review for any criteria pollutants. The following NSPS has been determined to apply to this project: *Subpart I – Standards for Performance of Hot Mix Asphalt Facilities*.

Federal NESHAPs have been evaluated; no NESHAPs apply to this project.

A dispersion modeling analysis is provided for NO_x, SO₂, PM₁₀ and PM_{2.5}. Impacts have been demonstrated to be compliant with applicable NAAQS and PSD increments.

EGLE Rule 225 requires that the predicted maximum ambient impact from the emission of TACs from new and modified sources not exceed health-based screening levels. Compliance with these health-based screening levels have been demonstrated as the PAIs for all TACs are below the applicable air quality screening levels utilizing air dispersion modeling.

2.0 Process Overview

2.1 Process Description

Ajax will manufacture HMA paving materials, primarily for the road construction industry, using a counter-flow drum mixer/dryer process. HMA paving materials are a mixture of aggregates and asphalt cement, which is heated and mixed at metered proportions; RAP is often used to reduce the quantity of virgin aggregates required in the mix. This practice reuses a waste material and reduces the amount of new natural resources needed. As RAP also contains hardened asphalt cement, the quantity of liquid asphalt cement that must be added to the mix is also reduced. The HMA manufacturing process involves combustion of a fuel to dry and heat the aggregates. These actions are carried out in a rotating, direct-fired drum dryer/mixer. Natural gas will be used as the primary fuel at the plant; propane and fuel oils, including RUO, may also be used at the plant.

In a counter-flow drum mixer, the aggregates are moved through a rotating drum in the opposite direction as the fuel combustion products. The drum is inclined with the aggregate feed chute located at the top and the dryer burner located at the bottom. RAP is added at the approximate midpoint of the dryer drum. Asphalt cement is introduced in the lower end of the drum, usually in the last 10 to 12 feet, where rotation of the drum coats the aggregate with the asphalt cement. The asphalt cement mixing zone is located behind the burner flame zone to prevent direct contact with the flame zone.

A discharge chute for the finished product is located at the lower end of the inclined drum. HMA is conveyed to a surge bin and then to the HMA storage silos, where it is loaded into transport trucks. Exhaust gases from the dryer/mixer, including the products of combustion, exit the end of the drum and are controlled by a fabric filter collector.

The plant configuration will include eight HMA silos and a truck load out area with sides that extend toward the ground. Exhaust gases from the load out area will be routed back to the burning zone of the HMA plant or to a standalone collection system for blue smoke control.

A location map is provided as Figure 1 and a proposed site plan is presented as Figure 2.

2.2 Description of Proposed Modification

Ajax is proposing to build a new HMA plant. This plant will include installing a 500 tph counterflow drum, 100,000 cfm baghouse, RAP and feed bins, eight 300-ton HMA silos, six asphalt cement tanks with a small natural gas heater. If RUO is used in the future, an RUO tank will also be installed.

The proposed maximum operating schedule is 24 hours per day, 7 days per week, 52 weeks per year. To limit the plant's potential to emit, Ajax will agree to limit the total annual HMA production to 887,560 tpy of HMA.

3.0 Regulatory Review

3.1 Michigan Air Pollution Control Regulations

3.1.1 Rule 201 – PTI Requirements

Any process or process equipment installed after August 15, 1967, which may emit an air contaminant requires a PTI prior to installation, construction, reconstruction, relocation, alteration, or modification unless specifically exempt. The proposed plant construction will require a PTI.

3.1.2 Rules 224 to 230 – Air Toxics Requirements

Rules 224 to 230, effective November 10, 1998, apply to any proposed, new, or modified process or process equipment for which an application for a PTI is required and which emits a TAC. A TAC is defined in Michigan rules as:

... any air contaminant for which there is no National Ambient Air Quality Standard (NAAQS) and which is or may become harmful to public health or the environment when present in the outdoor atmosphere in sufficient quantities and duration.

A new or modified source of TACs is required to comply both with T-BACT and with health-based screening level requirements.

3.1.2.1 Rule 224 – T-BACT Requirement for New and Modified Sources of Air Toxics

Rule 224 requires that emissions of TACs from a new or modified source not exceed the maximum allowable emission rate that results from the application of the T-BACT.

Rule 224(2) provides exemptions from the T-BACT requirements for:

- Emission unit(s) subject to a standard for HAPs promulgated under 112(d) of the CAA, or for which a control technology determination has been made under Section 112(g) or 112(j). Section 112(d)(6) of the CAA requires the USEPA to review and revise the MACT standards, as necessary, taking into account developments in practices, processes, and control technologies. This exemption applies to both regulated HAPs and other VOCs or PM which are controlled by the same technology. [Rule 224(2)(a)].
- TACs that are carcinogens which have emission rates less than 0.1 lb/hr and an IRSL greater than 0.1 $\mu\text{g}/\text{m}^3$, or TACs that are not carcinogens which have emission rates less than 1.0 lb/hr and ITSLs greater than 200 $\mu\text{g}/\text{m}^3$. [Rule 224(2)(b)].
- Emission units(s) which only emit VOCs or PM that comply with BACT or LAER. [Rule 224(2)(c)].
- Engines, turbines, boilers, and process heaters with heat input capacities up to 100 MMBtu/hr which fire natural gas, diesel, or biodiesel, provided that the effective stack is vertical, unobstructed, and is at least 1.5 times the building height and the building setback is at least 100 feet from the property line. [Rule 224(2)(d)].

A T-BACT analysis is provided in Section 5.0.

3.1.2.2 Rules 225 To 230 – Health-Based Screening Level Requirement for New or Modified Sources of Air Toxics

Rule 225 requires that emissions of TACs not exceed the maximum allowable emission rate that results in a predicted maximum ambient impact above the ITSL, the iRSL, or both.

Rule 227 indicates that compliance with the health-based screening level provisions of Rule 225 can be determined by any of the following:

- Pursuant to Rule 227(1)(a), the emission rate of each TAC is not greater than the rates determined from the algorithms in Table 21 [of Rule 227].
- Pursuant to Rule 227(1)(b), the emission rate of each TAC is not greater than the rate determined from the Ambient Impact Ratio matrix screening methodology in Table 22 [of Rule 227] or determined by any other screening method approved by EGLE.
- The maximum ambient impact of each TAC is less than the applicable screening level determined using the maximum hourly emission rate in accordance with the air quality modeling provisions of Rule 240, 241, or both.

A dispersion modeling analysis for TACs is provided in Section 6.0.

3.1.3 Rule 301 – Standards for Density of Emissions

Rule 301 establishes limitations for the density of particulate emissions. The proposed plant is not expected to have any effect on the ability to comply with the visible emission limitations of Rule 301. Rule 301 limits visible emissions as follows:

- A 6-minute average of 20% opacity, except for one 6-minute average per hour of not more than 27% opacity.
- A limit specified by an applicable federal Standard for the Performance of NSPS. HMA plants are subject to NSPS-Subpart I, which limits opacity to 20%.
- A limit specified as a condition of a PTI or Permit to Operate.

Ajax is confident the new HMA plant will be able to comply with the opacity limitations specified in Rule 301 and NSPS-Subpart I.

3.1.4 Rule 331 – Emission of PM

Rule 331 (Table 31, F) stipulates that asphalt paving plants located outside of Priority I and II areas shall not exceed an emission rate of 0.30 lb of particulate per 1,000 lb of exhaust gas. The proposed HMA plant is subject to the NSPS Subpart I, which limits emissions to 0.04 gr/dscf, which is equivalent to approximately 0.076 lb particulate per 1,000 lb of exhaust gas; therefore, Ajax is confident the drum mixer/dryer will continue to comply with the PM limitations specified in Rule 331.

3.1.5 Rule 702 – VOC BACT

New sources of VOC are subject to Rule 702 which requires an emission limitation based upon the application of BACT. New sources are defined in Rule 701 as:

... any process or process equipment which is either placed into operation on or after July 1, 1979, or for which an application for a Permit to Install, pursuant to the provision of Part 2 of these rules, is made to the department on or after July 1, 1979, or both, except for any process or process equipment which is defined as an existing source pursuant to R336.1601 (Rule 601).

BACT for VOCs is discussed in Section 5.0, BACT Analysis, of this document.

3.1.6 Rule 901 – Nuisance Odors and Dust

Rule 901 prohibits the emissions of air contaminants in quantities that cause either:

- Injurious effects to human health or safety, animal life, plant life of significant economic value, or property.
- Unreasonable interference with the comfortable enjoyment of life and property.

The HMA plant will include eight HMA silos and a truck load enclosure with sides that extend toward ground. Exhaust gases from the load out area will be routed back to the burning zone of the HMA plant or to a standalone collection system.

3.1.7 Part 18 – Prevention of Significant Deterioration

The primary provisions of the PSD Program require that new major stationary sources and major modifications at existing major stationary sources be carefully reviewed prior to onsite construction to ensure compliance with the NAAQS, the applicable PSD Increment provisions, and the requirement to apply BACT on the project's significant emission increases of NSR regulated pollutants. The PSD Program also requires evaluation of potential visibility impacts to federally designated Class I areas, evaluation of air quality impacts as a result of secondary growth associated with the project, and a minimum 30-day public comment process.

The Ajax facility will be located in Genesee County, which is currently in attainment with all NAAQS, which includes: PM₁₀, PM_{2.5}, SO₂, NO₂, CO, O₃, and Pb. Both NO_x and VOCs are regulated for controlling O₃ formation in the ambient air because they both participate in ambient photochemical reactions that result in O₃.

A determination must be made as to whether the PSD Program is applicable to the proposed construction. This determination is based on whether emissions at the stationary source will be greater than 250 tpy for the pollutants in attainment. As demonstrated in this application, the Ajax facility will accept enforceable emission limits and a production limit of 887,560 tpy, which will limit emissions of attainment air pollutants to less than 250 tpy. As a result, the proposed HMA plant is not subject to the PSD Program.

3.1.8 EGLE Dispersion Modeling Guidance

Policy and Procedure AQD 22, *Dispersion Modeling Guidance for Federally Regulated Pollutants*, was issued to address when dispersion modeling is required as part of the PTI Application. The intent of AQD-22 was to ensure that projects do not interfere with the NAAQS or PSD Increment. Pursuant to EGLE guidelines, this determination must be made for both *major source* and *minor source* applications.

The project emissions exceed the SER for SO₂, NO_x, PM_{2.5}, and PM₁₀; therefore, a dispersion modeling analysis for these pollutants is provided in Section 6. Pursuant to Table 2 of AQD-22, an analysis is not required for CO, as project emissions are below 100% of the SER.

3.2 Federal Regulations

3.2.1 40 CFR 60 Subpart I– NSPS

The NSPS require that new emission sources emit less pollutants than existing sources. 40 CFR 60, Subpart I, promulgated July 25, 1977, requires performance standards for HMA. The standards are in effect for equipment constructed, modified, or reconstructed after June 11, 1973. Ajax is subject to an NSPS emission limit for PM of 0.04 gr/dscf of exhaust gas specified in 40 CFR §60.92(a)(1) (the Standard). The NSPS also sets a visible emission limitation, found in 40 CFR §60.92(a)(2), of less than 20% opacity. Compliance testing will be performed following construction and commissioning of the new drum mixer/dryer using the federal reference methods specified in the Standard.

Ajax is confident the plant will comply with the PM and opacity limitations specified in NSPS, Subpart I.

3.2.2 40 CFR 61 and 63 – NESHAPS

Projects of this nature may also be subject to federal requirements for the control of HAP emissions. The first step to determining applicability is to review the pollutant- and source-specific regulations promulgated in 40 CFR §61 and §63; these regulations are collectively known as NESHAPS. The second step for determining applicability is to evaluate whether the modification will be a major source of HAPs and, therefore, subject to the case-by-case MACT requirements pursuant to Section 112(g) of the federal CAA.

NESHAPS apply to both major and area sources of HAPs. A **major source of HAPs** is defined in Section 112 of the CAA, in part as *a stationary source that has a PTE 10 tpy or more of any HAP, or 25 tpy of any combination of HAPs subject to regulation under the CAA*. The design capacity of the drum mixer/dryer, operating 24 hours per day and 365 days per year would result in a total annual production of 4,380,000 tons HMA. Based on this operational capacity, emissions of combined HAPs would be greater than 25 tpy and the facility would meet the definition of a major source of HAPs. However, Ajax will agree to an enforceable operational restriction (annual production limit) to limit the emissions of HAPs to below the major threshold levels.

The facility will be an *area source* of HAP emissions. No area source NESHAP requirements currently apply to this type of source.

3.2.3 40 CFR 70 – Title V

The Ajax HMA plant will not be subject to the Title V (Michigan's ROP) program; issuance of this PTI will not affect the status with respect to Title V.

4.0 Emission Calculations Summary

Emissions were estimated using AP-42, EGLE emission factors, and other standard industry calculations. Tables 1, 2, and 3 summarize the short-term and annual emissions of the HMA plant. The footnotes contained in these tables describe the methods used to calculate emissions.

4.1 PM Emissions

For the counter-flow HMA plant, PM emissions are calculated based on the NSPS emission limit of 0.04 gr/dscf of exhaust gas. This calculation involves the rated capacity of the exhaust fan and the amount of moisture in exhaust gases. HMA plant capacities are rated based on a specific percentage of moisture in the incoming aggregates; the average aggregate moisture content for similar sources is approximately 5%. As the moisture content of the incoming aggregates increases, the capacity of the HMA plant decreases; therefore, PM emissions are calculated based on the plant running at its rated capacity and aggregates' moisture content. The air flow must be converted from actual cubic feet per minute to dry standard cubic feet per minute, using the ideal gas law ($PV = nRT$). See Appendix 1 for the PM calculation methodology.

4.2 SO₂ Emissions

The proposed emission factor, in pounds of SO₂ per ton of HMA produced, is based on RUO sulfur content of 1% and a 43% control for SO₂ from RAP. As the plant will typically run on natural gas, the SO₂ emissions provided in Table 2 are extremely conservative.

4.3 NO_x Emissions

The proposed emission factor, in pounds of NO_x per ton of HMA produced, was based on EGLE Fact Sheet No. 9842 for HMA Plants. The emission factor for SCC 3-05-002-46 (HMA Batch Plants) was used as a conservative approach to calculate the maximum emission rate of NO_x.

4.4 CO Emissions

The proposed emission factor, in pounds of CO per ton of HMA produced, was based on the on EGLE Fact Sheet No. 9842 for HMA Plants, which is the EGLE default CO factor for HMA plants. The emission factor for SCC 3-05-002-10 (Waste Oil Heaters for HMA plants) was used as a conservative approach to calculate the maximum emission rate of CO.

4.5 VOC Emissions

The proposed emission factor, in pounds of VOC per ton of HMA produced, was taken from AP-42, Section 11.1, Table 11.1-8 for a waste oil-fired counter-flow drum mix plant. This emission factor, along with a 100% safety factor, was used to estimate the maximum emission rate of VOC.

4.6 Lead

The proposed emission factor, in pounds of Pb per ton of HMA produced, was based on maximum parts per million allowed in RUO (100 ppm) and 98% control for baghouse. The proposed emission factor was used for the calculation of the maximum emission rate of Pb.

4.7 HAPs and TACs

Emissions of sulfuric acid, nickel, manganese, benzene, formaldehyde, isomers of xylene, toluene, acrolein, and ethylbenzene are based on the current emission limits and the default allowable emission rates from a paper titled *Eliminating the Mandatory Testing Requirement for Toxic Air Contaminants for Hot Mix Asphalt Plants in Michigan* (MDEQ-AQD, June 1, 2012). All other HAP and TAC emissions were estimated using the maximum USEPA Web-fire emission factor for drum mix plants for each fuel used at the plant with a safety factor.

The proposed HCl emission factor, in pounds of HCl per ton of HMA produced, was based on maximum halogen content of RUO (1,000 ppm) and a 61% expected reduction in the HCl emissions based on the nature of an HMA drum mix plant. The proposed emission factor was used for the calculation of the maximum emission rate of HCl. See Appendix 2 for the HCl calculation methodology.

4.8 Miscellaneous Combustion Equipment

The emissions for the small natural gas asphalt cement tank heater are provided in Tables 4 and 5, and were estimated using Web-fire emission factors for SCC 1-02-006-03 (Boiler with a Heat Input Capacity of Less Than 10 MMBtu/hr). In instances where appropriate emission factors do not exist in SCC 1-02-006-03, emission factors for SCC 1-02-006-02 were used (Boiler with a Heat Input Capacity of Greater Than 10 MMBtu/hr).

5.0 BACT Analysis

5.1 Description

Emissions from the HMA dryer/mixer will be controlled by a two-part system designed primarily to control particulate emissions. The exhaust gases from the proposed counter-flow HMA plant will be controlled by a primary collector followed by a fabric filter collector (baghouse) before being exhausted to the atmosphere through a stack. All particulate matter collected by the primary collector and baghouse are returned to the mixing zone of the drum where the asphalt cement is added. This ensures the particulates adhere to the asphalt cement and are not re-entrained in the exhaust gases. The baghouse is currently the most commonly used control device for HMA facilities and is considered to represent T-BACT for new HMA facilities.

Rule 702 requires BACT for VOCs for new and modified sources. There has been significant discussion between the HMA industry and regulators regarding whether newer plant designs, such as counter-flow or dual drum, represent BACT for HMA plants. Data supporting such conclusions is generally subjective rather than objective and quantifiable. VOC emissions from all of the fuels currently used are minimized by using good combustion controls. Good combustion controls will be ensured by regular burner inspections and routine monitoring of CO using a hand-held monitor. Maintaining good combustion control is in Ajax's best interest, as good combustion control is directly related to fuel efficiency and fuel is one of the HMA industry's highest operating costs.

6.0 Air Quality Modeling and Air Toxic Evaluation

As presented in Table 1, the project emissions from the proposed project exceed the SER thresholds for NO_x, SO₂, PM_{2.5}, and PM₁₀ established pursuant to 40 CFR 52.21 and Michigan Rule 1802 (R 336.1802). Therefore, a detailed dispersion modeling analysis for the PSD Increments and compliance with the NAAQS is required as a part of the application. Federal ambient standards have been developed for criteria pollutants consisting of PSD Increments and NAAQS. Compliance with the federal ambient standards for criteria pollutants has been demonstrated through air dispersion modeling as discussed in Section 6.2.

As stated in Rule 225 (R 336.1225), EGLE requires that the ambient impact of the TACs released from a rule subject source be estimated and compared to established air quality standards. An air toxics demonstration is presented in Section 6.3.

Secondary formation analyses for PM_{2.5} and O₃ have not been included as part of the application. Pursuant to current guidance, secondary formation analyses are not required when a project is not subject to PSD regulations.

Model selection and input parameters, used for both criteria pollutant and TAC modeling analyses, are presented in Section 6.1.

6.1 Model Parameters

6.1.1 Model Selection

The model selected for the air dispersion analysis was the AERMOD, Version 19191. Effective December 9, 2005, this model was established as the USEPA-preferred air dispersion model for steady state operations. AERMOD is a modeling system that incorporates air dispersion based on planetary boundary layer turbulence, structure, and scaling concepts, including treatment of both surface and elevated sources and both simple and complex terrain.

BEE line software, which incorporates the USEPA algorithm for the AERMOD program, was used. The software, referred to as BEEST, Version 12.01, was developed by Providence Engineering and Environmental Group, LLC.

6.1.2 GEP Stack Height Analysis

Prior to running the air dispersion model, the potential for building downwash to affect the plume must be evaluated. Building downwash represents the effect that nearby structures have on the air flow near the stack. If the stack is within the area of influence of the building, the swirls and eddies caused by obstruction of the air flow near buildings can affect the plume dispersion.

A GEP analysis was performed using software developed by Providence Engineering and Environmental Group, LLC. The software includes the USEPA BPIP-Prime code for calculating projected building widths. This analysis was run for all buildings depicted in Figure 2. The highest calculated formula GEP stack height of any structure was 97.9 feet (29.84 meters). GEP stack height is the greater of GEP formula stack height or 65 meters (213.3 feet). The structure heights and stack height are listed in Tables 6 and 7, respectively. The stack height is less than the GEP stack height; therefore, direction-specific building effects calculated for each wind direction were entered into the dispersion model as described in the next section.

6.1.3 Model Input Parameters

The direction specific building dimensions calculated during the GEP stack height analysis were entered into the model.

Figure 1 illustrates the site topography. As demonstrated in the figure, the modeling area is relatively flat; however, actual terrain data was used in the model. Figure 2 identifies the stack location.

Land use in the area is predominantly rural; therefore, default rural dispersion coefficients were selected for the model.

The emission source included in this analysis is a point source, with a vertically unobstructed discharge. Model input parameters for this source are provided in Table 7.

6.1.3.1 Receptor Grids

Ajax will prevent access to the property by the general public through a combination of fencing, berms, trees, and shrubs. Therefore, receptors were placed at 25-meter intervals around the inaccessible property line. Dense grids of 25-meter and 50-meter intervals surround the property, and grids of 100 meters, 250 meters, and 500 meters cover the outlying areas to a distance of 10 kilometers. All coordinates are provided in the UTM NAD83 coordinate system.¹

Terrain elevations at receptors were obtained using the BEEST program and USGS NED 1/3 arc-second data. BEEST implements the AERMAP model (Version 18081), which includes processing routines that extract NED data to determine receptor terrain elevations for air quality model input. The NED data used in the modeling had a resolution of 10 meters (1/3 arc-second) and NAD83 datum.

6.1.3.2 Meteorological Data

The meteorological data used in the model was 1-minute data from Bishop International Airport, Flint (FNT) 2019 (Surface Station No. 14826) and White Lake, 2019 (Upper Air Station No. 4830). The meteorological data was provided by EGLE and was processed using the ADJ_U* option in AERMET (Version 18081). All criteria pollutant and TAC modeling was conducted utilizing one year of meteorological data (2019).

6.1.3.3 NO_x Transformation

Tier 1 default modeling was utilized, where 100% of NO_x is conservatively assumed to be NO₂.

6.2 Criteria Pollutant Modeling

A dispersion modeling analysis has been conducted for the criteria pollutants for which emissions are above the SER criteria. As presented in Table 1, these include NO_x, SO₂, PM_{2.5}, and PM₁₀. CO emissions are below 100% of the SER and, pursuant to AQD-22, do not require modeling.

If emissions of the modeled pollutants result in impacts that exceed the SILs, a detailed dispersion modeling impact analysis to demonstrate compliance with the federal PSD Increments and NAAQS is required as a part of the application. If impacts are less than the SILs, no additional modeling is necessary.

Emission rates for the baghouse were conservatively determined for use in the modeling demonstration and are presented in Table 7.

¹ UTM NAD83 Universal Transverse Mercator North American Datum of 1983

6.2.1 Significant Impact Analysis

A significant impact analysis is typically the first step in criteria pollutant modeling. The SIL analysis included impacts from the baghouse.

As presented in Table 8, predicted impacts from the baghouse for NO₂, SO₂, PM_{2.5}, and PM₁₀ were above the applicable SILs, except for annual PM₁₀ impacts. Therefore, additional analyses have been conducted, as discussed in Section 6.2.2.

The USEPA has revoked the previously promulgated SILs for PM_{2.5}. However, USEPA guidance (April 17, 2018)² provides SILs, which the USEPA has documented should be appropriate for all Class II Areas, as well as alternative SILs that can be selected on a case-by-case basis. The SILs recommended in this USEPA guidance have been used in the analysis. Specifically, the following SILs were utilized for the Class II analysis:

- NAAQS SIL
 - 0.2 µg/m³ for Annual PM_{2.5}
 - 1.2 µg/m³ for 24-hr PM_{2.5}
- Increment SIL
 - 0.2 µg/m³ for Annual PM_{2.5}
 - 1.2 µg/m³ for 24-hr PM_{2.5}

6.2.2 NAAQS and Increment Analyses

Because impacts from the proposed project exceed the applicable SILs (except annual PM₁₀), additional analyses have been performed for the pollutants and averaging times as follows:

- 1-hour NO₂ (NAAQS modeling; no Increment established)
- Annual NO₂ (NAAQS and Increment modeling)
- 24-hour and annual PM_{2.5} (NAAQS and Increment modeling)
- 24-hour PM₁₀ (NAAQS and Increment modeling)
- 1-hour SO₂ (NAAQS modeling; no Increment established)
- 3-hour, 24-hour, and Annual SO₂ (NAAQS and Increment modeling)

The first step in the additional analysis is typically to define the significant impact receptors for the project. These are the receptors from the SIL analysis at which the impacts from the project were determined to exceed the SIL. Although there is an SO₂ additional source to consider for NAAQS modeling, the entire SIL grid was used for all Increment and NAAQS modeling for all pollutants to simplify review.

EGLE was contacted to determine which additional sources should be considered in the Increment and NAAQS analyses, as well as appropriate background concentrations to be used in the model. EGLE determined that there was one additional SO₂ source that needed to be included for the analysis. The additional source determination and background data provided by EGLE are presented in Appendix 3.

The model was run for the proposed maximum emission rate for each pollutant from the baghouse; therefore, the model PAI is equal to the actual PAI in µg/m³. The results of the Increment and NAAQS analyses are presented in Tables 9 and 10, respectively. Compliance with Increment and NAAQS are demonstrated. The electronic model input/output files are provided in Appendix 4 (of the original EGLE application only).

² https://www.epa.gov/sites/production/files/2018-04/documents/sils_policy_guidance_document_final_signed_4-17-18.pdf

6.3 Air Toxics Modeling Demonstration

In Rule 225 (R 336.1225) of the Air Pollution Control Commission General Rules, EGLE requires that the ambient impact of the TACs released from a rule-subject source be estimated and compared to established air quality standards. To estimate the ambient air concentrations, each contaminant concentration is calculated at the stack, assuming peak loading conditions. The contaminant loading from the stack is then subjected to air dispersion modeling to simulate the effect of local meteorological conditions. The ambient concentration at hypothetical ground level receptors is then calculated and compared to the air quality screening levels as developed by EGLE.

6.3.1 Model Input Parameters

Model input is addressed in Section 6.1.3.

6.3.2 Results of TAC Modeling Analysis

The input parameter emission rate was 1 lb/hr; therefore, the model output is in units of $\mu\text{g}/\text{m}^3$ per lb/hr. To estimate the actual PAI, the model PAI was multiplied by the maximum emission rate in lb/hr. The unitized model results are included as Table 11. A flash drive containing the electronic model input/output files is provided in Appendix 4 (of the original EGLE version only).

The actual PAI in $\mu\text{g}/\text{m}^3$ is then compared to the screening level. For the polycyclic aromatic hydrocarbons designated by Footnote 5 on the screening level list, the emission rate was multiplied by the relative potency factors as described in an MDEQ memorandum dated February 7, 2017. As indicated in Table 12 the PAIs for all TACs are below the applicable air quality screening levels obtained from the EGLE-AQD *List of Screening Levels*.

7.0 Summary and Conclusion

Ajax manufactures HMA. The proposed plant identified in this permit will be located on Energy Drive, in Genesee Charter Township, Michigan. Ajax is requesting to construct a new HMA plant including the installation of a 500 tph counter-flow drum mixer, a 100,000 cfm rated baghouse, RAP and feed bins, eight storage silos, and six asphalt cement tanks with a small natural gas heater. To support the proposed construction, this application includes an analysis of state and federal air regulatory requirements applicable to the requested installations as well as the demonstration of how the plant will comply with those applicable requirements.

Michigan Rule 702 requires the application of BACT for new sources of VOCs. BACT was demonstrated for the Ajax facility.

Air toxic dispersion modeling estimated the ambient impact of a variety of HAPs and TACs predicted to be emitted from an HMA plant. The calculated maximum concentrations were compared to the ITSLs provided by EGLE-AQD. A comparison indicated that Ajax's proposed HMA plant complies with the current Michigan air toxic regulations.

Table 1 – Project Emission Summary
Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Pollutant	HMA Dryer Emissions (tpy)	AC Tank Heater Emissions (tpy)	Significant Emission Rate	% of SER	Exceeds SER?	PSD Major Source Threshold	Exceeds Major Source Threshold	
CO	89.2	0.7	100	89.9%	No	250	No	
NO _x	53.3	0.9	40	135%	Yes	250	No	
PM	16.2	0.0	25	65%	No	250	No	
PM ₁₀	29.5	0.1	15	197%	Yes	250	No	
PM _{2.5}	29.5	0.1	10	295%	Yes	250	No	
SO ₂	79.0	0.0	40	198%	Yes	250	No	
VOC	28.4	0.0	40	71%	No	250	No	
CO ₂	21,967	1,024.7	See CO ₂ e					
CH ₄	8.0	0.0						
N ₂ O	--	0.0						
CO ₂ e	22,167	1,025.8	75,000	31%	No	NA	NA	
Lead	0.01	0.0	0.6	2%	No	NA	NA	
Fluorides	--	--	3.0	0.0	Yes	NA	NA	
H ₂ S	--	--	10.0	0.0	Yes	NA	NA	
H ₂ SO ₄	1.4	--	7	20%	No	NA	NA	
Highest Single HAP (HCl)	3.3	0.0	NA	NA	NA	NA	No	
Aggregate HAPs*	22.5	0.0	NA	NA	NA	NA	No	

*Will limit single HAPs to 8.9 tpy, and aggregate HAPs to 22.5 tpy.

Table 2 - HMA Counter-flow Drum Dryer NSR Regulated Pollutant Estimated Emissions
 Air Permit to Install
 Ajax Materials, Genesee Twp, Michigan

Maximum Short Term Production	tons HMA/hr	500
Annual Production Limit	tons HMA/yr	887,562
Types of Fuel Permitted	Natural Gas, Propane, Fuel Oil 2-6, RUO	
Density of Fuel Oil (avg)	lb/gal	7.4
Fuel Oil/RUO Sulfur Content	% by weight	1.0

NSR Regulated Pollutant	Emission Factor (see notes)	Notes	Maximum Short Term Emissions (lb/hr)	Annual Emissions (tpy)
CO	0.201 lb/ton HMA	1	100.5	89.2
NO _x	0.12 lb/ton HMA	1	60.0	53.3
PM	0.04 lb/ton HMA	3	18.2	16.2
PM ₁₀	0.07 lb/ton HMA	3	33.2	29.5
PM _{2.5}	0.07 lb/ton HMA	3	33.2	29.5
SO ₂	0.18 lb/ton HMA	2	89.1	79.0
VOC	6.4E-02 lb/ton HMA	4	32.0	28.4
CO ₂	49.5 lb/ton HMA	5	24,750	21,967
CH ₄	1.8E-02 lb/ton HMA	5	9.0	8.0
N ₂ O	-- --	--	--	--
CO ₂ e	49.95 lb/ton HMA	6	24,975	22,167
Lead	3.0E-05 lb/ton HMA	7	0.02	0.01
Fluorides	-- --	--	--	--
H ₂ S	-- --	--	--	--
H ₂ SO ₄	3.2E-03 lb/ton HMA	8	1.6	1.4

¹ Emission factor is from the MDEQ Emission Factor Calculation Fact Sheet for HMA Plants waste oil asphalt heaters (3-05-002-10) for CO;

and batch plant factor (3-05-002-46) for NOX.

² Emission factor is based on RUO sulfur content of 1% and a 43% control for SO₂ from RAP - See SO₂/RAP calculation methodology below

³ PM emissions are based on NSPS emission limit of 0.4 grains/DSCF. See Appendix 2 for particulate emission calculation data. PM₁₀ and

PM_{2.5} emissions are based on PM emissions plus AP-42 condensible emissions, plus H₂SO₄ and HCL emissions, which are assumed to form condensible PM.

⁴ VOC emission factor from AP-42, Section 11.1, Table 11.1-8 for waste oil fired dryer, plus a 100% safety factor.

⁵ Emission factor is from EPA Webfire emission factor for #6 oil-fired counterflow drum mix plant (3-05-002-63); plus a 50% safety factor

⁶ CO₂e emission factor based on global warming potentials for CO₂ (1), CH₄ (25) and N₂O (298) obtained from 40 CFR 98 Subparts A and C,

respectively.

⁷ Lead emission factor is based on maximum ppm allowed in RUO (100 ppm) and 98% control for baghouse, as follows:

7.4 lb/gal * 100 ppm/1e6 X 2 gal oil/ton HMA X (1-.98)

⁸ AQD Default Allowable Emission Rate from June 2012 "Eliminating the Mandatory Testing Requirement for Toxic Air Contaminants for Hot Mix Asphalt Plants in Michigan"

Table 2 - HMA Counter-flow Drum Dryer NSR Regulated Pollutant Estimated Emissions
 Air Permit to Install
 Ajax Materials, Genesee Twp, Michigan

Emission Calculation Methods

PM

See particulate emission calculation methodology. Particulate is assumed to be less than 10 microns in diameter.

SO₂ (RAP)

Design Capacity Emissions (lb/hr) = [Design Material Usage (ton of HMA/hr) x Unit Fuel Consumption (gal/ton) x Fuel Density (lb/gal) x (Sulfur Content (% by Weight)/100) x 64 (lb SO₂/32 (lb S))] x (1 - (43 (% SO₂ control for RAP)/100))

Potential Emissions (lb/hr) = [Permit Limit Material Usage (ton of HMA/hr) x Unit Fuel Consumption (gal/ton) x Fuel Density (lb/gal) x (Sulfur Content (% by Weight)/100) x 64 (lb SO₂/32 (lb S)) / ((1/2000) (lb/ton))] x (1 - (43 (% SO₂ control for RAP)/100))

Expected Emissions (lb/hr) = [Expected Material Usage (ton of HMA/hr) x Unit Fuel Consumption (gal/ton) x Fuel Density (lb/gal) x (Sulfur Content (% by Weight)/100) x 64 (lb SO₂/32 (lb S)) / ((1/2000) (lb/ton))] x (1 - (43 (% SO₂ control for RAP)/100))

NO_x, CO, VOC

Design Capacity Emissions (lb/hr) = Design Material Usage (ton of HMA/hr) x Emission Factor (lb/ton)

Potential Emissions (ton/yr) = Permit Limit Material Usage (ton of HMA/yr) x Emission Factor (lb/ton) x 1/2000 (ton/lb)

Expected Emissions (ton/yr) = Expected Material Usage (ton of HMA/yr) x Emission Factor (lb/ton) x 1/2000 (ton/lb)

CO₂e

CO₂e (lb/hr) = CO₂ (lb/hr) x 1 + CH₄ (lb/hr) x 25 + N₂O (lb/hr) x 298

E_{ST} = Maximum Short Term HMA Production (ton HMA/hr) X EF

E_A = E_F X Annual Production Limit (ton HMA/yr) / 2,000 lb/ton

where:

E_{ST} = Short Term Emissions (lb/hr);

E_A = Annual Emissions (tpy);

EF = emission factor (lb/ton HMA)

Table 3 - HMA Counter-flow Drum Dryer TAC Emissions

Air Permit to Install
 Ajax Materials, Genesee Twp, Michigan

Material Usage	500
tons/hr	
Annual Production Limit	887,562
tons HMA/yr	

Toxic Air Contaminant	CAS No.	Emission Factor (see notes)	Note	Maximum Short Term Emissions (lb/hr)	Annual Emissions (tpy)	HAP?
Octachlorodibenzo-p-dioxins, total	3268-87-9	5.9E-09 lb/ton HMA	3	2.97E-06	2.64E-06	Yes
Hexachlorodibenzo-p-dioxins, total	34465-46-8	1.2E-11 lb/ton HMA	3	5.94E-09	5.27E-09	Yes
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	7.5E-11 lb/ton HMA	3	3.74E-08	3.32E-08	Yes
Octachlorodibenzofurans, total	39001-02-0	1.1E-11 lb/ton HMA	3	5.28E-09	4.69E-09	Yes
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	9.2E-13 lb/ton HMA	3	4.62E-10	4.10E-10	Yes
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	6.8E-13 lb/ton HMA	3	3.41E-10	3.03E-10	Yes
2-Butenal	4170-30-3	1.7E-04 lb/ton HMA	5	8.60E-02	0.08	No
Formaldehyde	50-00-0	1.0E-02 lb/ton HMA	1	5.00E+00	4.44	Yes
Benzo (a) pyrene	50-32-8	2.2E-08 lb/ton HMA	3	1.08E-05	9.57E-06	Yes
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	2.1E-12 lb/ton HMA	3	1.07E-09	9.47E-10	Yes
2-Methyl-2-butene	513-35-9	1.2E-03 lb/ton HMA	5	5.80E-01	0.51	No
2,2,4-Trimethylpentane	540-84-1	8.8E-05 lb/ton HMA	3	4.40E-02	0.04	Yes
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	5.9E-12 lb/ton HMA	3	2.97E-09	2.64E-09	Yes
Benzo (a) anthracene	56-55-3	4.6E-07 lb/ton HMA	3	2.31E-04	2.05E-04	Yes
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	1.8E-12 lb/ton HMA	3	9.24E-10	8.20E-10	Yes
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	9.5E-12 lb/ton HMA	3	4.73E-09	4.20E-09	Yes
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	2.6E-12 lb/ton HMA	3	1.32E-09	1.17E-09	Yes
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	2.9E-12 lb/ton HMA	3	1.43E-09	1.27E-09	Yes
Isovaleraldehyde	590-86-3	6.4E-05 lb/ton HMA	5	3.20E-02	0.03	No
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	3.5E-12 lb/ton HMA	3	1.76E-09	1.56E-09	Yes
Hexanal	66-25-1	2.2E-04 lb/ton HMA	5	1.10E-01	0.10	No
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	2.4E-11 lb/ton HMA	3	1.21E-08	1.07E-08	Yes
Acetone	67-64-1	1.7E-03 lb/ton HMA	5	8.30E-01	0.74	No
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	1.2E-11 lb/ton HMA	3	5.94E-09	5.27E-09	Yes
Benzene	71-43-2	1.0E-03 lb/ton HMA	1	5.00E-01	0.44	Yes
1,1,1-Trichloroethane	71-55-6	1.1E-04 lb/ton HMA	3	5.28E-02	0.05	Yes
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	1.8E-11 lb/ton HMA	3	9.24E-09	8.20E-09	Yes
Manganese	7439-96-5	5.0E-05 lb/ton HMA	1	2.50E-02	0.02	Yes

Table 3 - HMA Counter-flow Drum Dryer TAC Emissions

Air Permit to Install
 Ajax Materials, Genesee Twp, Michigan

Material Usage		tons/hr	500			
Annual Production Limit		tons HMA/yr	887,562			
Toxic Air Contaminant	CAS No.	Emission Factor (see notes)	Note	Maximum Short Term Emissions (lb/hr)	Annual Emissions (tpy)	HAP?
Mercury	7439-97-6	1.0E-06 lb/ton HMA	8	5.20E-04	4.62E-04	Yes
Nickel	7440-02-0	1.0E-04 lb/ton HMA	1	5.00E-02	0.04	Yes
Silver	7440-22-4	1.9E-06 lb/ton HMA	9	9.60E-04	8.52E-04	No
Thallium	7440-28-0	8.8E-06 lb/ton HMA	6	4.40E-03	3.91E-03	No
Antimony	7440-36-0	7.2E-07 lb/ton HMA	8	3.60E-04	3.20E-04	Yes
Arsenic	7440-38-2	3.0E-06 lb/ton HMA	2	1.50E-03	0.00	Yes
Barium	7440-39-3	1.0E-03 lb/ton HMA	6	5.00E-01	0.44	No
Beryllium	7440-41-7	0.0E+00 lb/ton HMA	8	0.00E+00	0.00	Yes
Cadmium	7440-43-9	1.0E-06 lb/ton HMA	2	5.00E-04	0.00	Yes
Chromium	7440-47-3	3.0E-06 lb/ton HMA	2	1.50E-03	0.00	Yes
Cobalt	7440-48-4	6.0E-05 lb/ton HMA	7	3.00E-02	0.03	Yes
Copper	7440-50-8	6.8E-04 lb/ton HMA	6	3.40E-01	0.30	No
Zinc	7440-66-6	7.2E-04 lb/ton HMA	6	3.60E-01	0.32	No
Ethylene	74-85-1	1.4E-02 lb/ton HMA	5	7.00E+00	6.21	No
Acetaldehyde	75-07-0	2.9E-03 lb/ton HMA	3	1.43E+00	1.27	Yes
2-Methyl-1-pentene	763-29-1	8.0E-03 lb/ton HMA	5	4.00E+00	3.55	No
Hydrogen chloride	7647-01-0	7.4E-03 lb/ton HMA	10	3.71E+00	3.29	Yes
Phosphorus (yellow or white)	7723-14-0	4.8E-03 lb/ton HMA	7	2.40E+00	2.13	Yes
Selenium	7782-49-2	9.6E-06 lb/ton HMA	7	4.80E-03	0.00	Yes
Methyl ethyl ketone	78-93-3	4.0E-05 lb/ton HMA	5	2.00E-02	0.02	No
Acenaphthene	83-32-9	3.1E-06 lb/ton HMA	3	1.54E-03	0.00	Yes
Phenanthrene	85-01-8	5.1E-05 lb/ton HMA	3	2.53E-02	0.02	Yes
Fluorene	86-73-7	2.4E-05 lb/ton HMA	3	1.21E-02	0.01	Yes
Naphthalene	91-20-3	1.0E-03 lb/ton HMA	1	5.00E-01	0.44	Yes
2-Methyl Naphthalene	91-57-6	3.7E-04 lb/ton HMA	3	1.87E-01	0.17	Yes
3-Methylpentane	96-14-0	4.2E-04 lb/ton HMA	5	2.09E-01	0.19	No
Heptachlorodibenzofurans, total		8.4E-11 lb/ton HMA	5	4.18E-08	3.71E-08	Yes
Heptachlorodibenzo-p-dioxins, total		1.6E-10 lb/ton HMA	5	7.81E-08	6.93E-08	Yes

Table 3 - HMA Counter-flow Drum Dryer TAC Emissions

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Toxic Air Contaminant	CAS No.	Emission Factor (see notes)	Note	Maximum Short Term Emissions (lb/hr)	Annual Emissions (tpy)	HAP?	Material Usage	
							tons/hr	tons HMA/yr
							500	887,562
Hexachlorodibenzofurans, total		1.8E-11 lb/ton HMA	5	8.91E-09	7.91E-09	Yes		
Pentachlorodibenzofurans, total		1.6E-10 lb/ton HMA	5	8.14E-08	7.22E-08	Yes		
Pentachlorodibenzo-p-dioxins, total		4.8E-11 lb/ton HMA	5	2.42E-08	2.15E-08	Yes		
Polychlorinated dibenzofurans, total		3.3E-10 lb/ton HMA	5	1.65E-07	1.46E-07	Yes		
Polychlorinated benzo-p-dioxins and furans, total		6.6E-09 lb/ton HMA	5	3.30E-06	2.93E-06	Yes		
Polychlorinated benzo-p-dioxins, total		6.2E-09 lb/ton HMA	5	3.08E-06	2.73E-06	Yes		
Tetrachlorodibenzofurans, total		7.3E-11 lb/ton HMA	5	3.63E-08	3.22E-08	Yes		
Tetrachlorodibenzo-p-dioxins, total		2.0E-12 lb/ton HMA	5	1.02E-09	9.08E-10	Yes		

¹ Emission factor is AQD Default Allowable Emission Rate from June 2012 Eliminating the Mandatory Testing Requirement for Toxic Air Contaminants for Hot Mix Asphalt Plants in
² Emission factor is based on maximum ppm allowed in RUO and 98% control for baghouse, as follows: 7.4 lb/gal * 100 ppm/1e6 X 2 gal oil/ton HMA X (1--98). Max ppm allowed for Arsenic is 5 ppm. Max ppm allowed for Cr is 10 ppm. Max ppm allowed for Cd is 2 ppm.
³ Emission factor is based on #6 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-63); plus a Gaseous HAP safety factor of 2.2
⁴ Emission factor is based on #2 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-60); plus a Gaseous HAP safety factor of 2.2
⁵ Emission factor is based on #6 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-63); plus a Gaseous TAC safety factor of 2.0
⁶ Emission factor is based on #2 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-60); plus a Metal TAC safety factor of 4
⁷ Emission factor is based on #2 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-60); plus a Metal HAP safety factor of 4
⁸ Emission factor is based on #6 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-63); plus a Metal HAP safety factor of 4
⁹ Emission factor is based on #6 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-63); plus a Metal TAC safety factor of 4
¹⁰ Hydrochloric Acid pph emissions based on 1000 ppm Halogen RUO. Assumes all Halogens are Cl and are converted to HCl with a 61% capture in process. See emission factor calculations.

Emission Calculation Methods

$E_{ST} = \text{Maximum Short Term HMA Production (ton HMA/hr)} \times EF$

$E_A = E_F \times \text{Annual Production Limit (ton HMA/yr)} / 2,000 \text{ lb/ton}$

where:

$E_{ST} = \text{Short Term Emissions (lb/hr)}$;

$E_A = \text{Annual Emissions (tpy)}$;

$EF = \text{emission factor (lb/ton HMA)}$

Table 4 - Miscellaneous Combustion Equipment - NSR Emissions

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

	MMBtu/hr	AC Tank Heater
Heat Input Capacity	2.0	
Heat Input Capacity	1.96E-03	
Annual Operating Hours	8,760	
Annual Heat Input Limit or Capacity	17,520	
Fuel Heat Value	1,020	

NSR Regulated Pollutant	Emission Factor (See Notes)	Notes	Maximum Short Term Emissions per Unit (lb/hr)	Annual Emissions (tpy)
CO	84 lb/MMCF	1	0.2	0.72
NO _x	100 lb/MMCF	1	0.2	0.86
PM	1.9 lb/MMCF	1	0.0	0.02
PM ₁₀	7.6 lb/MMCF	1	0.0	0.07
PM _{2.5}	7.6 lb/MMCF	1	0.0	0.07
SO ₂	0.6 lb/MMCF	1	0.0	0.01
VOC	5.5 lb/MMCF	1	0.0	0.05
CO ₂	53.1 kg/MMBtu	2	234	1024.72
CH ₄	1.0E-03 kg/MMBtu	2	0.0	0.02
N ₂ O	1.0E-04 kg/MMBtu	2	0.0	0.00
CO _{2e}	53.1 kg/MMBtu	2	234	1025.78
Lead	5.0E-04 lb/MMCF	3	9.80E-07	4.29E-06

¹ Emission factors are from Web-fire for SCC 1-02-006-03 for a Boiler with a heat input capacity of less than 10 MMBtu/hr.

² CO_{2e} global warming potential and emission factors obtained from 40 CFR 98 Subparts A and C, respectively. The global warming potential for CH₄ (25) and N₂O (298) are consistent with the USEPA published changes on November 29, 2013.

³ Emission factors are from Web-fire for SCC 1-02-006-02 for a Boiler with a heat input capacity of greater than 10

Emission Calculation Methods

Using lb/MMCF Emission Factors

$$E_{ST} = C_{MMCF} \times EF_{MMCF}$$

Using kg/MMBtu Emission Factors

$$E_{ST} = C_{HI} \times 2.20462 \text{ lb/kg} \times EF_{kg}$$

$$E_A = E_{ST} \times \text{Annual Operating Hours} / 2,000 \text{ lb/ton}$$

where:

$$E_{ST} = \text{Short Term Emissions (lb/hr)}$$

$$E_A = \text{Annual Maximum Emissions (tpy)}$$

$$C_{MMCF} = \text{Max Fuel Usage (MMCF/hr)}$$

$$EF_{MMCF} = \text{emission factor (lb/MMCF)}$$

$$C_{HI} = \text{Heat Input Capacity (MMBtu/hr)}$$

$$EF_{kg} = \text{emission factor (kg/MMBtu)}$$

Table 5 - Miscellaneous Combustion Equipment - TAC Emissions

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Heat Input Capacity	MMBtu/hr
Heat Input Capacity	MMcf/hr
Annual Operating Hours	hr/yr
Annual Heat Input Limit or Capacity	MMBtu/yr
Fuel Heat Value	MMBtu/MMcf

AC Tank Heater	2.0
	1.96E-03
	8,760
	17,520
	1,020

Toxic Air Contaminant	CAS No.	Emission Factor (See Notes)	Notes	Maximum Short Term Emissions per Unit (lb/hr)	Annual Emissions (tpy)	HAP?
Formaldehyde	50-00-0	7.50E-02 lb/MMCF	1	1.47E-04	6.44E-04	Yes
Benzo (a) pyrene	50-32-8	1.20E-06 lb/MMCF	1	2.35E-09	1.03E-08	Yes
Dibenzo(a,h) anthracene	53-70-3	1.20E-06 lb/MMCF	1	2.35E-09	1.03E-08	Yes
3-Methylcholanthrene	56-49-5	1.80E-06 lb/MMCF	1	3.53E-09	1.55E-08	Yes
Benzo (a) anthracene	56-55-3	1.80E-06 lb/MMCF	1	3.53E-09	1.55E-08	Yes
Dimethylbenz(a)anthracene	57-97-6	1.60E-05 lb/MMCF	1	3.14E-08	1.37E-07	Yes
Benzene	71-43-2	2.10E-03 lb/MMCF	1	4.12E-06	1.80E-05	Yes
Acenaphthene	83-32-9	1.80E-06 lb/MMCF	1	3.53E-09	1.55E-08	Yes
Phenanthrene	85-01-8	1.70E-05 lb/MMCF	1	3.33E-08	1.46E-07	Yes
Fluorene	86-73-7	2.80E-06 lb/MMCF	1	5.49E-09	2.40E-08	Yes
Naphthalene	91-20-3	6.10E-04 lb/MMCF	1	1.20E-06	5.24E-06	Yes
2-Methyl Naphthalene	91-57-6	2.40E-05 lb/MMCF	1	4.71E-08	2.06E-07	Yes
Toluene	108-88-3	3.40E-03 lb/MMCF	1	6.67E-06	2.92E-05	Yes
N-Hexane	110-54-3	1.80E+00 lb/MMCF	1	3.53E-03	1.55E-02	Yes
Anthracene	120-12-7	2.40E-06 lb/MMCF	1	4.71E-09	2.06E-08	Yes
Pyrene	129-00-0	5.00E-06 lb/MMCF	1	9.80E-09	4.29E-08	Yes
Benzo (g,h,i) perylene	191-24-2	1.20E-06 lb/MMCF	1	2.35E-09	1.03E-08	Yes
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06 lb/MMCF	1	3.53E-09	1.55E-08	Yes
Benzo (b) fluoranthene	205-99-2	1.80E-06 lb/MMCF	1	3.53E-09	1.55E-08	Yes
Fluoranthene	206-44-0	3.00E-06 lb/MMCF	1	5.88E-09	2.58E-08	Yes
Benzo (k) fluoranthene	207-08-9	1.80E-06 lb/MMCF	1	3.53E-09	1.55E-08	Yes
Acenaphthylene	208-96-8	1.80E-06 lb/MMCF	1	3.53E-09	1.55E-08	Yes
Chrysene	218-01-9	1.80E-06 lb/MMCF	1	3.53E-09	1.55E-08	Yes
Manganese	7439-96-5	3.80E-04 lb/MMCF	1	7.45E-07	3.26E-06	Yes
Mercury	7439-97-6	2.60E-04 lb/MMCF	1	5.10E-07	2.23E-06	Yes
Molybdenum	7439-98-7	1.10E-03 lb/MMCF	1	2.16E-06	9.45E-06	No
Nickel	7440-02-0	2.10E-03 lb/MMCF	1	4.12E-06	1.80E-05	Yes
Arsenic	7440-38-2	2.00E-04 lb/MMCF	1	3.92E-07	1.72E-06	Yes
Barium	7440-39-3	4.40E-03 lb/MMCF	1	8.63E-06	3.78E-05	No

Table 5 - Miscellaneous Combustion Equipment - TAC Emissions

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Heat Input Capacity	MMBtu/hr	AC Tank Heater
Heat Input Capacity	MMcf/hr	2.0
Annual Operating Hours	hr/yr	1.96E-03
Annual Heat Input Limit or Capacity	MMBtu/yr	8,760
Fuel Heat Value	MMBtu/MMcf	17,520
		1.020

Toxic Air Contaminant	CAS No.	Emission Factor (See Notes)	Notes	Maximum Short Term Emissions per Unit (lb/hr)	Annual Emissions (tpy)	HAP?
Beryllium	7440-41-7	1.20E-05 lb/MMCF	1	2.35E-08	1.03E-07	Yes
Cadmium	7440-43-9	1.10E-03 lb/MMCF	1	2.16E-06	9.45E-06	Yes
Chromium	7440-47-3	1.40E-03 lb/MMCF	1	2.75E-06	1.20E-05	Yes
Cobalt	7440-48-4	8.40E-05 lb/MMCF	1	1.65E-07	7.21E-07	Yes
Copper	7440-50-8	8.50E-04 lb/MMCF	1	1.67E-06	7.30E-06	No
Vanadium	7440-62-2	2.30E-03 lb/MMCF	1	4.51E-06	1.98E-05	No
Zinc	7440-66-6	2.90E-02 lb/MMCF	1	5.69E-05	2.49E-04	No
Ammonia	7664-41-7	3.20E+00 lb/MMCF	1	6.27E-03	2.75E-02	No
Selenium	7782-49-2	2.40E-05 lb/MMCF	1	4.71E-08	2.06E-07	Yes
Dichlorobenzene, mixed isomers	25321-22-6	1.20E-03 lb/MMCF	1	2.35E-05	1.03E-05	No
Aggregate HAPs				3.70E-03	1.62E-02	

¹ Emission factors are from Web-fire for SCC 1-02-006-02 because no TAC factors are available for SCC 1-02-006-03.

Emission Calculation Methods

Using lb/MMCF Emission Factors

$$E_{ST} = C_{MMCF} \times EF_{MMCF}$$

$$E_A = E_{ST} \times \text{Annual Operating Hours} / 2,000 \text{ lb/ton}$$

where:

E_{ST} = Short Term Emissions (lb/hr);

E_A = Annual Maximum Emissions (tpy);

C_{MMCF} = Max Fuel Usage (MMCF/hr); and

EF_{MMCF} = emission factor (lb/MMCF)

Table 6 – Structure Heights

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Structure ID in Model	Height (ft)
CTRL_BLD	24
AC_Tank1	40
AC_Tank2	40
AC_Tank3	40
AC_Tank4	40
AC_Tank5	40
AC_Tank6	40
RJO_Tank	40

Note: This table represents the structures for which the stack is located within the downwash area of the structure ("5L"). Other equipment onsite is elevated and does not obstruct air flow; elevated equipment was not included in the model.

Refer to the model for identification of each structure.

Table 7 – Model Input Parameters
Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Source	Model Name	Discharge Type	NAD 83 UTM Coordinates (m)		Base Elevation (feet)	Stack Height (feet)	Exhaust Temperature (°F)	Exhaust Flow Rate (acfm)	Exit Velocity (fps)	Stack Diameter (inches)	NO _x Emission Rate (lbs/hr)	PM ₁₀ Emission Rate (lbs/hr)	PM _{2.5} Emission Rate (lbs/hr)	SO ₂ Emission Rate (lbs/hr)
			Easting	Northing										
HMA Counterflow Drum Dryer	STACK	DEFAULT	282,851	4,772,991	752.1	80	300	100,000	66.1	68	60.0	33.2	33.2	89.1

NA Not Applicable

Table 8 – SIL Model Results Summary
 Air Permit to Install
 Ajax Materials, Genesee Twp, Michigan

Pollutant	Maximum Predicted Impacts (2019) ($\mu\text{g}/\text{m}^3$)	SIL ($\mu\text{g}/\text{m}^3$)	SIL Averaging Period	Exceeds SIL
NO ₂	42.66	7.5	1-hr	Yes
NO ₂	1.07	1	Annual	Yes
PM ₁₀	7.30	5	24-hr	Yes
PM ₁₀	0.59	1	Annual	No
PM ₂₅	7.30	1.2	24-hr	Yes
PM ₂₅	0.59	0.2	Annual	Yes
SO ₂	84.40	7.8	1-hr	Yes
SO ₂	68.54	25	3-hr	Yes
SO ₂	26.11	5	24-hr	Yes
SO ₂	2.11	1	Annual	Yes

Note: The impact for 1-hour NO₂ represents Tier 1, where 100% of NO_x is conservatively assumed to be NO₂.

Table 9 – Increment Model Results Summary
 Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Pollutant	Maximum Predicted Impacts (2019) ($\mu\text{g}/\text{m}^3$)	Increment ($\mu\text{g}/\text{m}^3$)	Increment Averaging Period	Exceeds Increment
NO ₂	1.07	25	Annual	No
PM ₁₀	7.30	30	24-hr	No
PM ₂₅	7.30	9	24-hr	No
PM ₂₅	0.59	4	Annual	No
SO ₂	68.54	512	3-hr	No
SO ₂	26.11	91	24-hr	No
SO ₂	2.11	20	Annual	No

Note: The impact for 1-hour NO₂ represents Tier 1, where 100% of NO_x is conservatively assumed to be NO₂.

Table 10 – NAAQS Model Results Summary

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Pollutant	Maximum Predicted Impacts (2019) ($\mu\text{g}/\text{m}^3$)	Background Concentration ($\mu\text{g}/\text{m}^3$)	Combined Impact ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)	NAAQS Averaging Period	Exceeds NAAQS
NO ₂	42.66	69.2	111.84	188	1-hr	No
NO ₂	1.07	12.2	13.27	100	Annual	No
PM ₁₀	7.30	35.0	42.30	150	24-hr	No
PM ₂₅	7.30	17.1	24.37	35	24-hr	No
PM ₂₅	0.59	7.1	7.67	12	Annual	No
SO ₂	84.40	10.7	95.14	196	1-hr	No
SO ₂	68.55	10.2	78.76	1300	3-hr	No

Note: The impact for 1-hour NO₂ represents Tier 1, where 100% of NO_x is conservatively assumed to be NO₂.

Table 11 – Unitized Model Results

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Averaging Period	Model PAI ($\mu\text{g}/\text{m}^3$)(lb/hr)
Annual	0.01777
1-HR	0.71101
8-HR	0.46745
24-HR	0.21994

The impacts presented in this table represent the unitized impact from each TAC emission source modeled at 1 lb/hr.

Table 12 - Predicted Ambient Impacts

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Toxic Air Contaminant	CAS No.	Emissions (lb/hr)	Model Results (µg/m³)/(lb/hr)	PAI (µg/m³)	Screening Level (µg/m³)	Averaging Period (µg/m³)	Basis	Percent of Screening Level	Pass/Fail	FootNote
Ethylbenzene	100-41-4	0.50	0.220	1.10E-01	1000	24 hr	ITSL	0.0%	PASS	-
			0.018	8.89E-03	0.4	annual	IRSL	2.2%	PASS	
Benzaldehyde	100-52-7	0.11	0.018	1.95E-03	0.4	annual	IRSL	0.5%	PASS	-
Quinone	106-51-4	0.18	0.467	8.23E-02	4.4	8 hr	ITSL	1.9%	PASS	-
n-Butane	106-97-8	0.67	0.467	3.13E-01	23800	8 hr	ITSL	0.0%	PASS	22
Acrolein	107-02-8	0.50	0.018	8.89E-03	0.16	annual	ITSL	5.6%	PASS	13
			0.711	3.56E-01	5	1 hr	2nd ITSL	7.1%	PASS	
Toluene	108-88-3	3.00	0.220	6.60E-01	5000	24 hr	ITSL	0.0%	PASS	-
N-Pentane	109-66-0	0.21	0.467	9.82E-02	17700	8 hr	ITSL	0.0%	PASS	-
N-Hexane	110-54-3	1.01	0.018	1.80E-02	700	annual	ITSL	0.0%	PASS	-
Valeraldehyde	110-62-3	0.07	0.467	3.13E-02	1760	8 hr	ITSL	0.0%	PASS	-
Anthracene	120-12-7	3.41E-03	0.018	6.06E-05	1000	annual	ITSL	0.0%	PASS	-
Propionaldehyde	123-38-6	0.14	0.018	2.54E-03	8	annual	ITSL	0.0%	PASS	-
Butyraldehyde	123-72-8	0.16	0.018	2.84E-03	7	annual	ITSL	0.0%	PASS	-
Pyrene	129-00-0	3.30E-03	0.018	5.86E-05	100	annual	ITSL	0.0%	PASS	-
Isomers of xylene	1330-20-7	0.50	0.018	8.89E-03	390	annual	ITSL	0.0%	PASS	2
Heptane	142-82-5	9.40	0.467	4.39E+00	3500	8 hr	ITSL	0.1%	PASS	-
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	3.30E-06 6.69E-07	0.018	5.86E-08	0.000002	annual	ITSL	2.9%	PASS	33, D
			0.018	1.19E-08	0.000000023	annual	IRSL	51.7%	PASS	
Chromium (VI)	18540-29-9	1.50E-03	0.018	2.67E-05	0.1	annual	ITSL	0.0%	PASS	-
			0.018	2.67E-05	0.000083	annual	IRSL	32.1%	PASS	
Benzo (g,h,i) perylene	191-24-2	4.40E-05	0.018	7.82E-07	13	annual	ITSL	0.0%	PASS	-
Benzo (e) pyrene	192-97-2	1.21E-04	0.220	2.66E-05	0.002	24 hr	ITSL	1.3%		A
Perylene	198-55-0	9.68E-06	0.018	1.72E-07	13	annual	ITSL	0.0%	PASS	B
Fluoranthene	206-44-0	6.71E-04	0.018	1.19E-05	140	annual	ITSL	0.0%	PASS	-
Acenaphthylene	208-96-8	0.02	0.018	4.30E-04	35	annual	ITSL	0.0%	PASS	-
2-Butenal	4170-30-3	0.09	0.711	6.11E-02	9	1 hr	ITSL	0.7%	PASS	-
Formaldehyde	50-00-0	5.00 1.02	0.220	1.10E+00	30	24 hr	ITSL	3.7%	PASS	E
			0.018	1.82E-02	0.08	annual	IRSL	22.7%	PASS	
Benzo (a) pyrene	50-32-8	1.08E-05	0.220	2.37E-06	0.002	24 hr	ITSL	0.1%	PASS	5
			0.018	1.92E-07	0.001	annual	IRSL	0.0%	PASS	
2-Methyl-2-butene	513-35-9	0.58	0.018	1.03E-02	106	annual	ITSL	0.0%	PASS	-
2,2,4-Trimethylpentane	540-84-1	0.04	0.467	2.06E-02	3500	8 hr	ITSL	0.0%	PASS	1
Isovaleraldehyde	590-86-3	0.03	0.018	5.69E-04	800	annual	ITSL	0.0%	PASS	-
Hexanal	66-25-1	0.11	0.018	1.95E-03	2	annual	ITSL	0.1%	PASS	-
Acetone	67-64-1	0.83	0.467	3.88E-01	5900	8 hr	ITSL	0.0%	PASS	-
Benzene	71-43-2	0.50	0.018	8.89E-03	30	annual	ITSL	0.0%	PASS	-
			0.220	1.10E-01	30	24 hr	2nd ITSL	0.4%	PASS	
			0.018	8.89E-03	0.1	annual	IRSL	8.9%	PASS	
1,1,1-Trichloroethane	71-55-6	0.05	0.220	1.16E-02	6000	24 hr	ITSL	0.0%	PASS	-
Manganese	7439-96-5	0.03	0.018	4.44E-04	0.3	annual	ITSL	0.1%	PASS	29
Mercury	7439-97-6	5.20E-04	0.018	9.24E-06	0.3	annual	ITSL	0.0%	PASS	7
			0.220	1.14E-04	1	24 hr	2nd ITSL	0.0%	PASS	

Table 12 - Predicted Ambient Impacts
 Air Permit to Install
 Ajax Materials, Genesee Twp, Michigan

Toxic Air Contaminant	CAS No.	Emissions (lb/hr)	Model Results (µg/m³)/(lb/hr)	PAI (µg/m³)	Screening Level (µg/m³)	Averaging Period (µg/m³)	Basis	Percent of Screening Level	Pass/Fail	FootNote
Nickel	7440-02-0	0.05	0.018	8.89E-04	0.006	annual	IRSL	14.8%	PASS	-
Silver	7440-22-4	9.60E-04	0.467	4.49E-04	0.1	8 hr	ITSL	0.4%	PASS	-
Thallium	7440-28-0	4.40E-03	0.018	7.82E-05	0.1	annual	ITSL	0.1%	PASS	-
			0.467	2.06E-03	0.2	8 hr	2nd ITSL	1.0%	PASS	
Antimony	7440-36-0	3.60E-04	0.018	6.40E-06	0.2	annual	ITSL	0.0%	PASS	-
Arsenic	7440-38-2	1.50E-03	0.018	2.67E-05	0.0002	annual	IRSL	13.3%	PASS	-
Barium	7440-39-3	0.50	0.467	2.34E-01	5	8 hr	ITSL	4.7%	PASS	35
Beryllium	7440-41-7	-	0.220	0.00E+00	0.02	24 hr	ITSL	0.0%	PASS	-
			0.018	0.00E+00	0.0004	annual	IRSL	0.0%	PASS	
Cadmium	7440-43-9	5.00E-04	0.018	8.89E-06	0.0006	annual	IRSL	1.5%	PASS	-
Chromium	7440-47-3	1.50E-03	0.018	2.67E-05	0.5	annual	ITSL	0.0%	PASS	-
Cobalt	7440-48-4	0.03 6.08E-03	0.467	1.40E-02	0.2	8 hr	ITSL	7.0%	PASS	42
			0.018	1.08E-04	0.00013	annual	IRSL	83.1%	PASS	
Copper	7440-50-8	0.34	0.467	1.59E-01	2	8 hr	ITSL	7.9%	PASS	-
Zinc	7440-66-6	0.36	0.467	1.68E-01	20	8 hr	ITSL	0.8%	PASS	C
Ethylene	74-85-1	7.00	0.018	1.24E-01	6240	annual	ITSL	0.0%	PASS	-
Acetaldehyde	75-07-0	1.43	0.018	2.54E-02	9	annual	ITSL	0.3%	PASS	-
			0.018	2.54E-02	0.5	annual	IRSL	5.1%	PASS	
Hydrogen chloride	7647-01-0	3.71	0.018	6.59E-02	20	annual	ITSL	0.3%	PASS	13
			0.711	2.64E+00	2100	1 hr	2nd ITSL	0.1%	PASS	
Phosphorus (yellow or white)	7723-14-0	2.40	0.220	5.28E-01	20	24 hr	ITSL	2.6%	PASS	32
Selenium	7782-49-2	4.80E-03	0.467	2.24E-03	2	8 hr	ITSL	0.1%	PASS	34
Methyl ethyl ketone	78-93-3	0.02	0.220	4.40E-03	5000	24 hr	ITSL	0.0%	PASS	-
Acenaphthene	83-32-9	1.54E-03	0.018	2.74E-05	210	annual	ITSL	0.0%	PASS	-
Phenanthrene	85-01-8	0.03	0.018	4.50E-04	0.1	annual	ITSL	0.4%	PASS	-
Fluorene	86-73-7	0.01	0.018	2.15E-04	140	annual	ITSL	0.0%	PASS	-
Naphthalene	91-20-3	0.50	0.018	8.89E-03	3	annual	ITSL	0.3%	PASS	-
			0.467	2.34E-01	520	8 hr	2nd ITSL	0.0%	PASS	
			0.018	8.89E-03	0.08	annual	IRSL	11.1%	PASS	
2-Methyl Naphthalene	91-57-6	0.19	0.018	3.32E-03	10	annual	ITSL	0.0%	PASS	-
3-Methylpentane	96-14-0	0.21	0.467	9.77E-02	3500	8 hr	ITSL	0.0%	PASS	-
H2SO4	7664-93-9	1.60	0.018	2.84E-02	1	annual	ITSL	2.8%	PASS	9,13
			0.711	1.14E+00	120	1 hr	2nd ITSL	0.9%	PASS	

Table 12 - Predicted Ambient Impacts

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Toxic Air Contaminant	CAS No.	Emissions (lb/hr)	Model Results (µg/m ³)/(lb/hr)	PAI (µg/m ³)	Screening Level (µg/m ³)	Averaging Period (µg/m ³)	Basis	Percent of Screening Level	Pass/Fail	FootNote	
Polynuclear Aromatic Compounds with a Footnote of 5											PEF
benzo(a)pyrene	50-32-8	1.08E-05	0.22	2.37E-06	0.002	24 hr	ITSL	0.1%	PASS	5	1
dibenz(a,h)anthracene	53-70-3	-								5	1.1
3-methylcholanthrene	56-49-5	-								5	5.7
benz(a)anthracene	56-55-3	2.31E-04								5	0.1
7,12-dimethylbenz(a)anthracene	57-97-6	-								5	65
dibenzo(a,i)pyrene	189-55-9	-								5	10
dibenzo(a,h)pyrene	189-64-0	-								5	10
dibenzo(a,l)pyrene	191-30-0	-								5	10
dibenzo(a,e)pyrene	192-65-4	-								5	1
Indeno(1,2,3-cd)pyrene	193-39-5	7.70E-06								5	0.1
benzo(j)fluoranthene	205-82-3	-								5	0.1
Benzo(b)fluoranthene	205-99-2	1.10E-04								5	0.1
Benzo(k)fluoranthene	207-08-9	4.51E-05								5	0.1
chrysene	218-01-9	1.98E-04								5	0.01
5-methylchrysene	3697-24-3	-								5	1
PAH TOTAL	50-32-8	0.00	0.22	1.15E-05	0.002	24 hr	ITSL	0.6%	PASS	5	
			0.02	9.27E-07	0.001	annual	IRSL	0.1%	PASS		

A-compared to SL for Benzo(a)pyrene, which is conservative as Benzo(e)pyrene is not carcinogenic

B-compared to SL for benzo(g,h,i)perylene

C-compared to SL for zinc oxide

D-sum of all dioxins and furans, including totals, which is conservative. Used annual average emission rate for annual SL.

E-Used annual average emission rate for annual SL.

EGLE Referenced Footnotes

- The combined ambient impact of all petroleum hydrocarbon materials with Note #1 cannot exceed the ITSL of 3500 µg/m³ (8-hour average). If a chemical with this footnote has an ITSL other than 3,500 µg/m³, the ambient impact for that chemical also cannot exceed the chemical specific ITSL.
- The combined ambient impact of all forms of xylene with Note #2 cannot exceed the initial threshold screening level (ITSL) of 390 µg/m³ (annual average).
- The polycyclic aromatic hydrocarbons (PAHs) with this footnote are carcinogenic and have potency equivalency factors (PEFs) that quantitate their potency relative to that of benzo(a)pyrene (CAS# 50-32-8). Air emission mixtures of carcinogenic PAHs, including asphalt fumes, should be evaluated additively using these PEFs and the benzo(a)pyrene IRSL and SRSL. The ITSL for benzo(a)pyrene applies only to benzo(a)pyrene and none of the other PAHs.
- Besides the assessment of mercury ambient air impacts in comparison to the ITSLs, larger individual sources of mercury emissions undergoing permit review (e.g., greater than 5 to 10 lbs/yr) may be evaluated on a case-by-case basis
- This chemical has two ITSLs with different averaging times. Ambient air impacts cannot exceed either ITSL. Both ITSLs also apply for determinations of permit to install exemptions under R 336.1290 (Rule 290).
- The combined ambient impact of butane (CAS# 106-97-8) and isobutane (CAS# 75-28-5) should be evaluated together so that the combined impact does not exceed a hazard index value of one.
- The ITSL for manganese is 0.3 µg/m³ with an annual averaging time. This ITSL is most appropriately applied to PM10-Mn or PM2.5-Mn data rather than TSP-Mn data. This ITSL applies to "manganese and manganese compounds," therefore emissions of multiple forms of manganese must be accounted for additively to ensure that the combined ambient air impact does not exceed the manganese ITSL. This ITSL applies to ambient air impacts of the manganese atom, therefore the emissions and modeled impacts of various manganese compounds may be molecular weight-adjusted to the equivalent emission rate and ambient air impact of the manganese alone. Please note that potassium permanganate (CAS# 7722-64-7) also has a short-term ITSL = 0.6 µg/m³ (8 hour averaging time).
- The Chemical Abstract Service number (CAS#) has been changed to 12185-10-3. Since the original number 7723-14-0, is still used by many organizations, it is listed as the primary CAS#.
- With regards to the health-based screening levels for tetrachlorodibenzo(p)dioxin (CAS# 1746-01-6), Rule 336.1225(6)(a) states that all polychlorinated dibenzodioxins and dibenzofurans shall be considered as one toxic air contaminant, expressed as an equivalent concentration of 2,3,7,8-tetrachlorodibenzo(p)dioxin based on the relative potency of the isomers emitted from the emission unit or units. The current toxic equivalency factors (TEFs) for use are those recommended by the World Health Organization (WHO, 2005), as provided in: Van den Berg, M. et al., 2006. The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds. Toxicological Sciences 93(2): 223-241.
- The combined ambient impact of all selenium and inorganic selenium compounds with the CAS# 7446-08-4, 7446-34-6, 7488-56-4, 7783-00-8, 10102-18-8, and 13410-01-0 cannot exceed 2 µg/m³ (8-hour averaging time).
- The combined ambient impact of all barium and soluble barium compounds with the CAS# 543-80-6, 1304-28-5, 10022-31-8, 10361-37-2, 10553-31-8, 13477-00-4, 13718-50-8, 17194-00-2, and 21109-95-5 cannot exceed 5 µg/m³ (8-hour averaging time).

Appendix 1

Appendix 1 - Particulate Emissions

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Plant Capacity Rating	=	500	TPH	
Amount of Aggregate	=	473	TPH	
Amount of Asphalt Cement	=	27	TPH	Average AC Content 5.35%
Yearly Production Limitation	=	887,562	TPY	
Density of Oil	=	7.40	Lbs/gal	
Oil Fuel Use	=	2.5	Gals/ton HMA Produced (#2 rounded up)	
Specific Volume of H ₂ O	=	26.799	ft ³ /lb @ 212 °F	
Moisture Content	=	5.00	%	Manufacturer's maximum moisture content
Baghouse Temperature	=	300	°F	
Baghouse Fan Rating	=	100,000	ACFM	
NSPS PM Limit	=	0.04	Grain/DSCF	
Specific Volume of H ₂ O	=	[(Specific Volume of H ₂ O) x (Baghouse Temperature + 460)]/(212 + 460)		
	=	[26.80	x (300 + 460)]/(212 + 460)	
	=	30.31	ft ³ /lb @ 249 °F	
Amount of H ₂ O in Exhaust Gas	=	(Moisture Content/100) x (Amount of Aggregate - TPH) x (2000 Lbs/Ton)		
	=	(5.00 /100) x (473 TPH) x (2000 lbs/ton)		
	=	47,300	PPH	
	=	788.33	Lbs./Min.	
Total Volume of H ₂ O in Exhaust Gases	=	(Amount of Aggregate) x (Specific Volume of H ₂ O)		
	=	(788.33 lbs/min) x (30.31 ft ³ /lb)		
	=	23,893	ft ³ /min	
Exhaust Gas Flow Rate (ACFM -dry)	=	(Fan Rating) - (Volume of H ₂ O)		
	=	(100,000 ACFM) - (23,893 ACFM)		
	=	76,107	ACFM	
Exhaust Gas Flow Rate (DSCFM)	=	[(Exhaust Gas Flow Rate ACFM dry) x (70 °F + 460)]/(300 °F + 460)		
	=	[76,107 ACFM x (70 °F + 460)]/(300 °F + 460)		
	=	53,075	DSCFM	
Allowed Hourly Particulate Emissions	=	(NSPS PM Limit) x (Exhaust Gas Flow Rate DSCFM) x (1 lb/7000 grains) x (60 mins/hr)		
	=	(0.04 grain/DSCFM) x (53,075 DSCFM) x (1 lb/7,000 grains) x (60 mins/hr)		
	=	18.20	Lbs/Hr	
		*Emission factor for H ₂ SO ₄ is based on prior permitting modeling results		
Particulate Emission Factor (Lbs/Ton HMA)	=	$\frac{\text{Allowed Hourly Particulate Emissions}}{\text{Plant Capacity Rating}}$		
	=	$\frac{18.20 \text{ Lbs/Hr}}{500 \text{ Tons HMA/Hr}}$		
	=	0.04	Lbs/Ton HMA	
Requested Allowed Annual Particulate Emissions	=	Particulate Emission Factor (Lbs/Ton HMA) x Yearly Production Limitation		
	=	0.036 Lbs/Ton HMA x 887,562 Tons HMA/Yr		
	=	32,302	Lbs/Yr	
	=	16.2	Tons/Yr	

Appendix 2

Appendix 2 - Hydrogen Chloride Emissions
 Air Permit to Install
 Ajax Materials, Genesee Twp, Michigan

Rated Dryer Capacity	=	500	TPH
Yearly Production Limitation	=	887,562	TPY
Density of Oil	=	7.40	Lbs/gal
Maximum Halogen Content	=	1.00E-03	Lb/lb
Annual Average Halogen Content	=	1.00E-03	Lb/lb
Oil Fuel Use	=	2.5	Gals/ton HMA Produced (#2 rounded up)
Maximum Potential Oil Usage	=	1,250	Gal/hr
Molecular Weight of Chlorine	=	35.45	Moles
Molecular Weight of Hydrogen	=	1.01	Moles

Hydrogen Chloride Emission Calculations

$$\begin{aligned}
 \text{Total Chlorine Emissions} &= \text{Oil Usage (Gal/hr)} \times \text{Density of Oil (Lb/gal)} \times \text{Halogen Content (lb/lb)} \\
 &= 1,250 \text{ gal/hr} \times 7.4 \text{ lb/gal} \times 0.0010 \text{ lb halogen/lb oil} \\
 &= 9.25 \text{ lb/hr (based on 4000 ppm oil)} \\
 &= 1,250 \text{ gal/hr} \times 7.4 \text{ lb/gal} \times 0.00100 \text{ lb halogen/lb oil} \\
 &= 9.25 \text{ lb/hr (based on 3450 ppm oil)}
 \end{aligned}$$

$$\begin{aligned}
 \text{HCl Emission Factor} &= \frac{(\text{Molecular Weight of Chlorine} + \text{Molecular Weight of Hydrogen})}{\text{Molecular Weight of Chlorine}} \\
 &= \frac{(35.5 + 1.01)}{35.5} \\
 &= 1.03 \text{ lb HCl/lb Cl}
 \end{aligned}$$

$$\begin{aligned}
 \text{Maximum Potential HCl Emissions} &= \text{Total Chlorine Emissions (lbs/hr)} \times \text{HCl Emission Factor} \\
 &= 9.25 \text{ lbs Cl/hr} \times 1.03 \text{ lb HCl/lb Cl} \\
 &= 9.51 \text{ lbs/hr (based on 1000 ppm oil)}
 \end{aligned}$$

$$\begin{aligned}
 \text{HCl Emission Factor} &= \frac{\text{Maximum Potential HCl Emissions (lbs/hr)}}{\text{Rated Dryer Capacity (tons/hr)}} \\
 &= \frac{9.51 \text{ lbs/hr}}{500 \text{ tons HMA/hr}} \\
 &= 0.0190 \text{ lb HCl/ton HMA Produced (based on 1000 ppm oil)}
 \end{aligned}$$

Expected reduction in the theoretical HCl emission rate of 61%.

$$\begin{aligned}
 \text{Expected HCl Emission Factor} &= \text{HCl Emission Factor} \times (1 - \text{stack test reduction}) \\
 &= 0.019 \times (1 - 0.61) \\
 &= 0.0074 \text{ lb HCl/ton HMA Produced (based on 1000 ppm oil)}
 \end{aligned}$$

Appendix 3

Appendix 3 – EGLE Additional Source and Background Concentration Data
 Air Permit to Install
 Ajax Materials, Genesee Twp, Michigan

Year	NO2 Lansing	
	1-hr 98th pctl	Annual Avg
2017	36.4	6.5
2018	29.9	6.5
2019	44.1	6.4
	36.8	6.5
	ppb	ppb

PM-10 Grand Rapids	
24-hr Max	Annual Avg
34.0	7.10
31.0	7.33
104.0	6.81
	7.1
	ug/m3

PM-2.5 Flint	
24-hr 98th pctl	Annual Avg
16.8	7.10
16.9	7.33
17.5	6.81
	7.1
	ug/m3

Year	SO2 Grand Rapids			
	1-hr 99th pctl	3-hr Max	24-hr Max	Annual Avg
2017	4.0	3.0	1.5	0.38
2018	4.4	3.9	1.1	0.12
2019	3.9	3.1	0.9	0.39
	4.1	3.9	1.5	0.39
	ppb	ppb	ppb	ppb

NAAQS MODELING BACKGROUND SUMMARY

NO2	
69.2	12.2
ug/m3	ug/m3

PM-10	
35.0	7.1
ug/m3	ug/m3
(3-yr 4th High)	

PM-2.5	
17.1	7.1
ug/m3	ug/m3

SO2			
10.7	10.2	3.9	1.0
ug/m3	ug/m3	ug/m3	ug/m3

Appendix 4

Appendix 4 is provided on the enclosed flash drive in the *original* EGLE copy only.

Kelly VanMarter

From: Laura Murphy-Rizk <lauramurphy-rizk@outlook.com>
Sent: Thursday, December 2, 2021 10:29 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Cc: diabrizk@outlook.com
Subject: Vote No: Rezoning for Capital Asphalt

Good morning:

My name is Laura Murphy-Rizk, and I live at 426 Natanna DR. I urgently request that you vote NO on Monday, December for the request to rezone. As a Genoa Township resident, I do not support allowing Capital Asphalt to open a plant. The impact to home values, health, environment, and safety would be greatly impacted by this rezoning.

Sincerely,
Laura Murphy-Rizk

Laura Murphy-Rizk, PHR
Phone – 269.303.3925
Email – lauramurphy-rizk@outlook.com
[Click Here to View my LinkedIn Profile](#)

Bill, do not to approve the rezoning from IND to a PID overlay district!

Anna Nummy <anna.nummy@gmail.com>

Mon 11/29/2021 10:00 AM

To: Bill Rogers <Bill@genoa.org>;

Dear Genoa Township board member,

I recently became aware that the Township Planning Commission had an approval recommendation for the rezoning of an area on the north side of I-96 about 1 mile west of Latson to allow the build of an asphalt plant. I'm writing to you today to tell you to reject this rezoning. **As a township resident located within 10 miles of this proposed plant, my health, and the health of my family including 3 young children, would be directly affected by pollution from this plant.**

Sources of emissions from Asphalt Plants are neither regulated nor monitored, and they can release more than 300 tons of toxic air emissions annually. Shockingly, pollutants that are released from a facility are estimated by computers and mathematical formulas rather than by actual stack testing. These flawed tests underestimate health risks.

Did you know that according to the National Institute for Occupational Safety and Health, asphalt fumes are considered occupational carcinogens? Here are some facts for you to consider:

- The federal Environmental Protection Agency (EPA) states that Asphalt Fumes are known toxins.
- Even if an asphalt plant meets all air pollution standards, people living nearby are still exposed to cancer-causing substances that can cause long-term damage (DHHS).
- Stagnant air and local weather patterns often increase the level of exposure to local communities (downwind, low-lying and lake areas are most greatly affected).

Here's a list of just seven deadly emissions that come from asphalt plants:

- Hydrogen sulfide (H₂S)
- Benzene (C₆H₆)
- Chromium (Cr) (VI)
- Formaldehyde (CH₂O)
- Polycyclic Aromatic Hydrocarbons (PAHS)
- Cadmium (Cd)
- Arsenic (As) -inorganic

Of just these seven, and there are hundreds of others, one is considered a toxin, three are cancer causing, and three are considered *both* toxins and cancer causing.

Both spills and atmospheric deposition are causes of pollution. While safety measures can be put in place to minimize spills, they can still happen. More importantly, *there are no safety measures that can be put in place to completely control atmospheric deposition. This guarantees toxic cancer-causing pollution that myself and my children will be breathing.* While it's not my main concern, a plant like this would also negatively affect property values, no one wants to live near toxic waste.

Once again, I am writing to instruct you not to approve the rezoning from Industrial District (IND) to a Planned Industrial Development (PID) overlay district. Do not allow a known health hazard in our community.

Sincerely,
Anna Nummy

From: [Bill Rogers](#)
To: [Amy Ruthig](#)
Subject: Fw: asphalt plant concerns
Date: Monday, November 29, 2021 2:56:09 PM
Attachments: [asphalt.pdf.pdf](#)
[asphalt PP.pptx](#)

From: John Palmer <johnpalmer1955@yahoo.com>
Sent: Tuesday, November 23, 2021 7:37 AM
To: Bill Rogers
Subject: asphalt plant concerns

Bill, I was made aware the format of the attachment I sent to you may not be compatible to open.

I have attached the same document in different formats so that if you had this problem you will be able to access it.

thanks again

john palmer

Did You Know?

Did You Know?

Capital Asphalt wants to build an asphalt plant in your backyard



Did You Know?

That adding an asphalt plant to this location increases traffic in the area to as many as 75 of these...



per
DAY!

Did You Know?

What comes out of an Asphalt Plant?

Sources of emissions from Asphalt Plants are neither regulated nor monitored, and depending on the size of the asphalt operation, can release **300+ tons** of toxic air emissions annually.

Flawed Tests Underestimate Health Risks - pollutants that are released from a facility are estimated by computers and mathematical formulas rather than by actual stack testing

Did You Know?

- According to the National Institute for Occupational Safety and Health: *asphalt fumes are considered occupational carcinogens*
- The federal Environmental Protection Agency (EPA) states that, *Asphalt Fumes are Known Toxins*
- Even if an asphalt plant meets all air pollution standards, *people living nearby are still exposed to cancer-causing substances that can cause long-term damage* (DHHS)
- Stagnant air and local weather patterns often increase the level of exposure to local communities (downwind, low-lying and lake areas are most greatly affected)

Did You Know?

About the 7 Deadly Fugitive
Emissions that come from
Asphalt Plants

Hydrogen sulfide (H₂S)

- Hydrogen sulfide (after leaving the smokestack) remains in the air for about 18 hrs.
- Exposures to hydrogen sulfide may result in:
 - respiratory distress
 - pulmonary edema
 - nervous system depression
 - cardiovascular effects
 - tissue hypoxia
 - neurobehavioral effects (headaches, lack of coordination, confusion, depression, tension, trouble concentrating)



Benzene (C₆H₆)

- Benzene enters the body through the lungs, gastrointestinal tract, and through the skin
- Benzene is a known carcinogen or cancer-causing agent
- Brief exposure (5-10 minutes) to high levels of benzene in air can result in death
- Benzene exposure can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness
- Benzene can pass from the mother's blood to a developing fetus
- Studies with pregnant animals show that breathing benzene has harmful effects on the developing fetus



Chromium (Cr) (VI)

- Chromium is a known carcinogen
- Breathing chromium(VI) can cause irritation such as runny nose, nosebleeds, and ulcers and holes in the nasal septum
- Ingesting large amounts of chromium(VI) can cause stomach upsets and ulcers, convulsions, kidney and liver damage, and even death
- Skin contact with chromium(VI) compounds can cause skin ulcers
- Some people are extremely sensitive to chromium(VI) and suffer severe anaphylactic (allergic) reactions



Formaldehyde (CH₂O)

- Formaldehyde is a human carcinogen or cancer-causing agent
- Formaldehyde is an eye, skin, and respiratory tract irritant
- Inhalation of vapors can produce narrowing of the bronchi and accumulation of fluid in the lungs
- Children are more susceptible than adults to the respiratory effects of formaldehyde
- Even low concentrations of formaldehyde can produce nose and throat irritation, chest pain, shortness of breath, and wheezing
- Higher exposures can cause inflammation and accumulation of fluid in the lungs (chemical pneumonia)



Polycyclic Aromatic Hydrocarbons (PAHS)

- PAHs are expected to cause cancer
- PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer) or had them applied to their skin (skin cancer)
- PAHs are found in air attached to dust particles, and can enter water through *fallout of fugitive emissions or accidental discharges* from industrial plants where they can move through soil to contaminate groundwater (wells)



Cadmium (Cd)

- Breathing air with high levels of cadmium can severely damage the lungs and may cause death
- Breathing air with lower levels of cadmium over long periods of time (for years) results in kidney disease, lung damage and fragile bones
- Studies show that rats that breathed in cadmium developed lung cancer, liver damage and changes in the immune system
- Female rats and mice that breathed high levels of cadmium had fewer litters, babies with more birth defects than usual, reduced fetal body weight and babies born with behavioral problems and learning disabilities



Arsenic (As) -inorganic

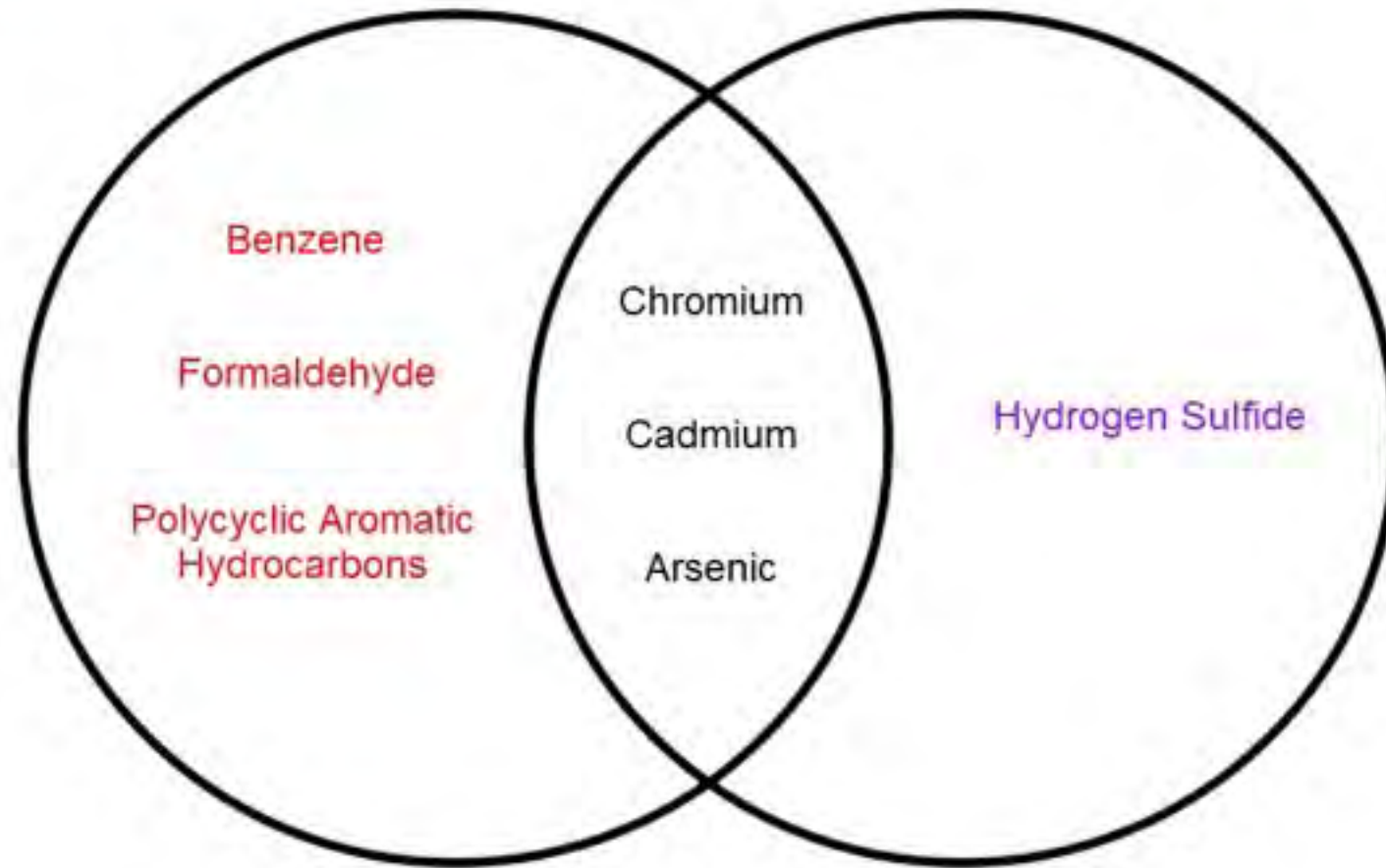
- Breathing high levels of inorganic arsenic will result in a sore throat, irritated lungs and the potential to develop lung cancer
- People who live near sites emitting inorganic arsenic have an increased risk of lung cancer
- Children may be more susceptible to health effects from inorganic arsenic than adults
- There is evidence that long-term exposure to inorganic arsenic in children may result in lower IQ scores



Cancer-causing Agent

BOTH

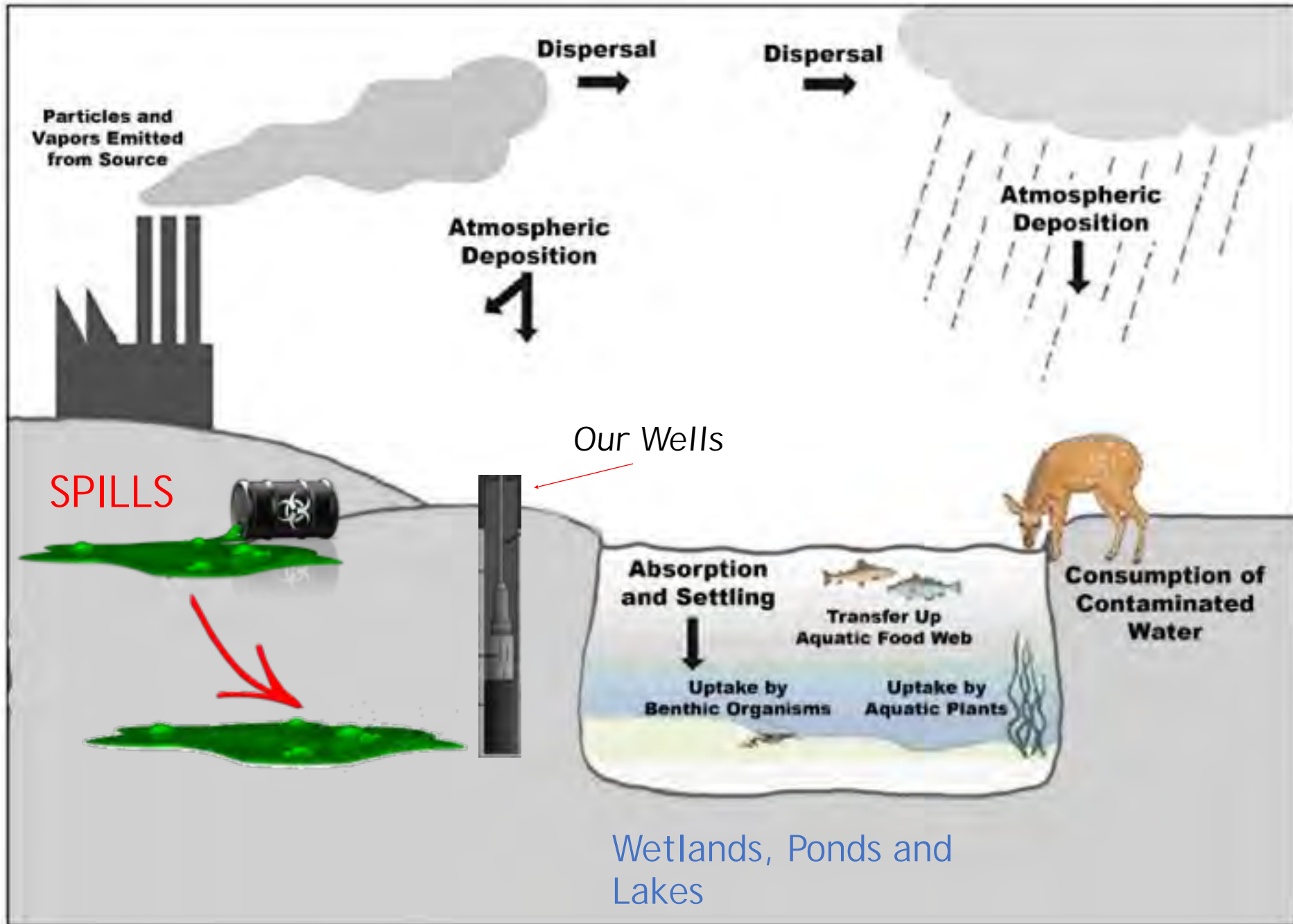
Toxin



Did You Know?

The (2) Ways These
Contaminants Get Into Our
Environment?

SPIILLS and ATMOSPHERIC DEPOSITION



*ALL toxicological information has been
extracted from:*

[Agency for Toxic Substances and Disease Registry](#)

Final Thought:

A property value study documented losses of up to 56% because of the presence of a nearby asphalt plant

-study performed by [BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE](#)

From: [Erin Stirling](#)
To: [Mike Archinal](#); [Kelly VanMarter](#); [Amy Ruthig](#); [Kathleen Murphy](#)
Subject: PLEASE DO NOT APPROVE THE ASPHALT PLANT
Date: Wednesday, December 1, 2021 2:40:05 PM

Hello,

My family and I are residents of Howell (Marion Township) and we live off of Peavy Rd. My husband is a Howell native, he has lived here his entire life. We have many relatives nearby as well. I am writing this email to ask you to **PLEASE vote AGAINST** the addition of this dangerous and harmful plant. This facility was rejected by other townships, why are we considering it here? We have a 9 month old daughter and we plan to have more children. There are many children that live in our neighborhood and surrounding neighborhoods that don't deserve the toxicity that this plant will cause. How could we possibly be okay with adding this facility that has the potential to cause cancer and contaminate our water and air? It is proven that an asphalt plant such as this one has this potential. **Ultimately, it will lead to a decrease in our home values and decrease the tax base for our city.** From every standpoint, it is not a good idea. **I am asking you to please vote no and keep our community safe.** Keep it a safe place for our children. We already have so many other issues and life obstacles to face living through this pandemic, please, please do us some good here.

Thank you,
Erin McDonald

From: [Bill Rogers](#)
To: [Amy Ruthig](#)
Subject: Fw: Proposed Asphalt Plant - Taylor
Date: Monday, November 29, 2021 2:56:56 PM

From: Douglas Taylor <taysag3@sbcglobal.net>
Sent: Monday, November 29, 2021 12:30 PM
To: Mike Archinal
Cc: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Terry Croft; Diana Lowe; Jim Mortensen
Subject: Proposed Asphalt Plant - Taylor

Mr. Archinal:

I write as a concerned area resident. Odors from asphalt plants do not confine themselves to Township borders. And odors are always a by-product of asphalt production. Depending on wind direction/speed these odors can extend for miles, encompassing residential and business districts far beyond the plant's immediate environment. The Township may enjoy the revenue of a new business, but this could be, in this asphalt manufacturing business, at the expense of [quality of life](#) and property values of, and fresh air in, its and adjoining established residential and business communities.

That a business's proposal advanced in zoning reviews does not make it "right" for the community. And here I mean. not only the Genoa Township community, but also the whole geographic area around and up and down-wind of this proposed site. It is reported that two other Townships (Tyrone and Hamburg) have rejected this proposed asphalt plant locating within their jurisdiction. Genoa isn't, then, even a first or second choice ... just a softer touch target?

The welcome of potentially 30 new jobs for this plant (many likely not to be filled by Genoa residents) should not be the determinant for approval. Nor does the simple availability of a site for such a plant (without an immediate alternative use) suggest approval should be given. The offsetting negatives for all of us in the immediate and adjoining vicinity would be significant.

Genoa Township is not a poor entity struggling for added revenue from any source. I hope that the Genoa Township Board will vote for the community and not just for a business wanting entry – a business that can be injurious for all.

Douglas Taylor
Brighton Township

P.S. The October 12 minutes re this issue said that the asphalt company (Net Least Associates South ?) would address any odor problem should it occur (a “remedy could be put in place”); but the minutes did not mention what the company’s “how” would be; nor did it mention what timing of a fix would be put in place when needed or any further detail – “trust me” is not a business/municipality option these days. And if such an option exists, why would it not have been included in the original plan by the asphalt company (its strategy to go “least expensively” if possible) or be demanded by the Planning Board or any subsequent Township review/approval group before such approval to proceed would be given? Seems like an error or omission by the Planning Board.

From: Adam VanTassell
Sent: Wednesday, December 1, 2021 9:04 AM
To: Mike Archinal <Mike@genoa.org>
Subject: FW: Asphalt Plant

From: jim barton <jcrango@hotmail.com>
Sent: Tuesday, November 30, 2021 4:49 PM
To: info <info@genoa.org>
Subject: Asphalt Plant

To Genoa Twp Officials,

Please don't allow the proposed asphalt plant. The smell in asphalt is benzine. Benzin causes cancer. It caused my Lukemia.

James Barton
800 Pathway
Howell MI 48843
248-922-4942

Genoa Township Board,

As a physician and voting property owner in Genoa Township, I am shocked that this Board would even consider permitting an asphalt plant to be built in Genoa Township. Asphalt plants contaminate our air, lakes, groundwater, and even our bodies, with over 300 known toxic chemicals. These chemicals include arsenic, benzene, cadmium, and formaldehyde, to name a few. The EPA states "asphalt fumes are a known toxin". According to the National Institute for Occupational Safety and Health, "asphalt fumes are considered an occupational carcinogen".

A study of property values documented losses of up to 56%, because of the presence of a nearby asphalt plant, according to the Blue Ridge Environmental Defense League. A decrease in property values would not only affect Genoa's bottom line, but the investment of many of Genoa Township's taxpayers.

Many of us moved here to enjoy the fresh air, beautiful lakes, and green spaces. Please do not contribute to the devastation of our beautiful township and the health of its citizens, lakes, woods, and wildlife,, by allowing an asphalt plant to be built in Genoa township.

Regards,
Dr. Donnie Beasley Bettles
3430 Pineridge Ln
Brighton, MI 48116

From: [Mike Archinal](#)
To: ht1956@aol.com
Cc: [Jim Mortensen](#); [tcroft](#); [JeanLedford](#); [Diana Lowe](#); [Bill Rogers](#); [Robin Hunt](#); [Polly](#); [Kelly VanMarter](#)
Subject: FW: I live 1/4 mile West of Victory Road
Date: Thursday, December 2, 2021 12:03:50 PM

Ms. Book,

Thank you for your comments regarding the proposed Capital Asphalt project. I have forwarded your email to the Township Board of Trustees.

Best regards,

Michael Archinal, AICP
Township Manager
Genoa Charter Township
2911 Dorr Road
Brighton MI, 48116
mike@genoa.org

From: beth book <ht1956@aol.com>
Sent: Wednesday, December 1, 2021 6:33 PM
To: Mike Archinal <Mike@genoa.org>
Subject: I live 1/4 mile West of Victory Road

Mr. Archinal,

I would like to thank you ahead of time for reading this very important report below;

In a North Carolina study by the Blue Ridge Environmental Defense League (BREDL), **45% of residents!!** living within a half mile of a new asphalt plant **reported a deterioration of their health, which began after the plant opened!!**

Reported losses of up to 56% on property values!

I ask you to consider the above and vote **NO on the proposed asphalt company.**

I live in the Lakeshore Apartments located a 1/4 mile west of Victory Drive. (I will have to move if my health will be compromised.)

Thank you, Beth Book
616-481-1467

Sent from my iPhone

Please VOTE NO on proposed asphalt plant

Claudia Capos <capocomm@sbcglobal.net>

Wed 12/1/2021 11:09 AM

To: Mike Archinal <Mike@genoa.org>;

Cc: Polly <pskolarus@genoa.org>; Robin Hunt <Robin@genoa.org>; Jean Ledford <Jean@genoa.org>; Terry Croft <Terry@genoa.org>;
Diana Lowe <diana@genoa.org>; Jim Mortensen <Jim@genoa.org>; Bill Rogers <Bill@genoa.org>;

Dear Mr. Archinal and board members,

I am writing to you as a long-time Livingston County resident and school supporter to express my concern about the possible deleterious health impacts on area schoolchildren, teachers and staff if a proposed asphalt plant is allowed to be constructed on the outskirts of Howell.

The toxic pollution and possible water contamination from such a plant would be a blight on the Howell-Brighton residential community and pose a danger to all residents, including the most vulnerable -- our children and the elderly. The site's proximity to Walmart, Cleary University, shopping centers, restaurants, and new housing developments would be detrimental to local businesses and an important educational institution.

The dust and fumes could travel for miles in every direction once they became airborne. Residents' lives, health, and property values would be hard-hit by the pollution. Two other townships (Hamburg and Tyrone) have already rejected this proposed plant in their jurisdiction.

I urge you to VOTE NO on the proposal for this asphalt plant and to keep our community safe and livable.

Thank you.

Sincerely,

Claudia Capos

Request

Shannon Douglas <shandouglas19@gmail.com>

Tue 11/30/2021 9:45 AM

To Bill Rogers <Bill@genoa.org>; Polly <pskolarus@genoa.org>; Robin Hunt <Robin@genoa.org>; Jean Ledford <Jean@genoa.org>; Jim Mortensen <Jim@genoa.org>; Terry Croft <Terry@genoa.org>; Diana Lowe <diana@genoa.org>;

Good morning Genoa Township leaders,

I was unable to attend the board meeting yesterday to voice my concern and strong opposition to the proposal of an asphalt plant being placed in our community. In allowing this to be approved it will negatively impact our air quality and inevitably our health. Please make the right decision for ourselves and our children and deny this request.

Sincerely
Shannon Douglas
Concerned Genoa Township resident

Request to introduce proposed rezoning ordinance number Z-21-02 and to set the meeting date for the purpose of considering the proposed ordinance for adoption before the Township Board on Monday, December 6th, 2021. The properties proposed for rezoning are located on the east side of Victory Drive, north and south of Toddiem Drive involving parcels 4711-08-100-009 and 4711-05-303-015. The request is petitioned by Net Lease Associates to be rezoned from Industrial (IND) to Planned Industrial Development (PID).

Sent from my iPhone

Kelly VanMarter

From: Paula Gomez <paula.k.gomez@outlook.com>
Sent: Thursday, December 2, 2021 11:52 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: NO to the Asphalt plant

As a concerned Genoa township resident, I am writing to voice my concern over the proposal for the Asphalt plant to be built near my home.

I cannot attend the 12/6 meeting but please take this into consideration.

Thanks
Paula Gomez
1094 Chemung Drive, Howell.

From: [Mike Archinal](#)
To: rgriewsk@comcast.net
Cc: [Jim Mortensen](#); [JeanLedford](#); [tcroft](#); [Diana Lowe](#); [Bill Rogers](#); [Robin Hunt](#); [Polly](#); [Kelly VanMarter](#)
Subject: FW: Asphalt Factory is a NO NO NO.
Date: Thursday, December 2, 2021 12:01:59 PM

Mr. Griewski,

Thank you for your comments regarding the proposed Capital Asphalt project. I have forwarded your email to the Township Board of Trustees.

Best regards,

Michael Archinal, AICP
Township Manager
Genoa Charter Township
2911 Dorr Road
Brighton MI, 48116
mike@genoa.org

From: Rgriewsk <rgriewsk@comcast.net>
Sent: Thursday, December 2, 2021 8:23 AM
To: Mike Archinal <Mike@genoa.org>
Cc: Richard Griewski <rgriewsk@comcast.net>; Claudia Capos <capocomm@sbcglobal.net>; Douglas Taylor <taysag3@sbcglobal.net>
Subject: Asphalt Factory is a NO NO NO.

Why Do we have to go through this! NO is a no brainer! Asphalt in town?!

The smell and the cost of short and term damage to Grand River avenue from the heavy trucks is enough about NO.

Down river Detroit can be our learning example.

I can already hear the trains and smell enough from Howell light industry cross Thompson lake. This will trash properly values.

Please find alternative site!

Thanks

Please don't approve the TOXIC asphalt plant!!!

Barbara Hierholzer <barbiehier@yahoo.com>

Tue 11/30/2021 9:50 AM

To Bill Rogers <Bill@genoa.org>; Polly <pskolarus@genoa.org>; Robin Hunt <Robin@genoa.org>; Jean Ledford <Jean@genoa.org>; Jim Mortensen <Jim@genoa.org>; Terry Croft <Terry@genoa.org>; Diana Lowe <diana@genoa.org>;

Dear Board members,

Please, do not allow the township (and surrounding areas!) to be ruined and poisoned by approving the proposal from Capital Asphalt!

I can not imagine or believe that this would even be under serious consideration by any of the township board. It is absolutely ridiculous! WHO would want this type of smelly, loud and toxic industrial plant right in people's back yards, right next to Cleary University, businesses and restaurants? The TOXIC fumes coming from such a plant would be enough to drive away residents (if they could even sell their homes) and would discourage businesses and customers from shopping in the area. How would any of you like to have something like this in your backyard?

THINK about this, ACT on behalf of the RESIDENTS whom you represent and DENY this company from building in this location. This type of company should not be located near homes! Absolutely ridiculous that this has even made it this far in the planning process.

Do not allow the township to become a toxic dump. Your community deserves better!

Barbara Hierholzer
Howell resident

Opposition to proposed asphalt plant

keith_kramer@aol.com

Tue 11/30/2021 1:47 PM

To: Bill Rogers <Bill@genoa.org>;

I would like to register my opposition to the proposed asphalt plant and expect you as a representative to vote no on this plant.

Keith Kramer
4039 Aster Blvd
Howell, MI 48843
517-540-6092

From: [Mike Archinal](#)
To: [Jim Mortensen](#); [tcroft](#); [JeanLedford](#); [Diana Lowe](#); [Bill Rogers](#); [Robin Hunt](#); [Polly](#); [Kelly VanMarter](#)
Subject: FW: Capital Asphalt rezoning
Date: Thursday, December 2, 2021 11:53:50 AM

With attachment.

From: Adam VanTassell
Sent: Thursday, December 2, 2021 10:52 AM
To: Mike Archinal <Mike@genoa.org>
Subject: FW: Capital Asphalt rezoning

From: Mike Kupfer <mike.kupfer@gmail.com>
Sent: Thursday, December 2, 2021 10:41 AM
To: info <info@genoa.org>
Subject: Capital Asphalt rezoning

Please find attached a sunset photo of my peice of paradise in Genoa township. This is lake Chemung located about a half a mile from the Genoa Township municipal center and less than two miles east of the proposed site for Capital Asphalt . We love living in Genoa Township with its open fresh air and beautiful sunsets ,we often walk our dog in the Genoa Park next your offices. I am asking that you do not change any zoning ordinances allowing this company to build a factory in our area we do not want to live with the pollution and oder this facility would bring.

I have discovered Capital Asphalt has had several violations with the EPA in the past and do not care about our clean air and natural resources. Please do not rezone for this company.

Thank you

Mike Kupfer



Re: December 6th Meeting_Capital Gas

Bruce Macey <bgmii@yahoo.com>

Tue 11/30/2021 9:56 AM

To: Dawn <dcondon@comcast.net>;

Cc: Bill Rogers <Bill@genoa.org>; Polly <pskolarus@genoa.org>; Robin Hunt <Robin@genoa.org>; Jean Ledford <Jean@genoa.org>; Jim Mortensen <Jim@genoa.org>; Terry Croft <Terry@genoa.org>; Diana Lowe <diana@genoa.org>; Kelly VanMarter <Kelly@genoa.org>;

Nicely written Dawn, thank you.

Sent from my iPad

On Nov 30, 2021, at 8:58 AM, Dawn <dcondon@comcast.net> wrote:

Good morning,

I am president of our HOA Board for Rolling Ridge I, a resident as well as owning another home (both residences within 1.5-2 miles of this proposed location.) I as well as some of our residents will be in attendance for the December 6th meeting, however wanted to have this research report recorded. I do understand we are further along in the process than Tyrone was at the completion of their report but the documentation and effects remain the same. As it was completed less than a year ago, within our county and Capital Gas was also the proposed site occupier, the research and information were completed by environmental consultants in the asphalt industry, toxicologists and engineers.

Livingston County already has several asphalt plants operating at less than 50% capacity. The demand does not warrant another location within the county, especially our township. If you have passed by their location in Lansing in warm months, you are very aware of the odors emitted. The difference between Lansing and our location is that it is in an industrial area near an auto plant. This asphalt plant can decrease our home values, create toxic fumes as well as increase the traffic in an area already that already has several accidents.

Unfortunately, during the planning meeting, my kids contracted Covid and I could not attend, I obviously deeply regret this after seeing it was approved. I am concerned that this was approved without extreme research into the effects of running such a plant. Hopefully after reading the attached report, you will understand negative effects allowing Capital to move into our township. While I understand the existing business technically isn't any better for our community, they are not emitting toxic fumes endangering our residents/families.

Thank you for taking the time to read my correspondence as well as the research report.

Regards,

Dawn Condon

3466 Snowden Lane

Howell, MI 48843

<04-15-21_Proposed_Rezoning_and_Construction_of_a_Hot-Mix_Asphalt+Plant_An_Overview_of+Relevant_Risks_v1.0.pdf>

Asphalt plant

Joyce Matevia <jmatevia@hotmail.com>

Tue 11/30/2021 11:23 PM

To: Bill Rogers <Bill@genoa.org>;

Hi Bill, this is from Jerry and Joyce Matevia, think you might know us 😊 Just wanted to add our plea to so many others to not allow this asphalt plant into Genoa. Living on Lake Chemung and seeing the changes that have happened even since we had our house built in 2000, we cannot afford to have something so capable of adding even more pollution to the area. You and your family have always taken care to work with the land and not be intrusive on the land. We are in Florida and will not be able to attend the Board Meeting to discuss this matter. Please forward this email as our protest to allowing the asphalt plant to whoever should receive it.

Thank you.

Sent from Mail for Windows

To Board 12/6/0

Polly

From: Rob McColl <rob.mccoll.1964@gmail.com>
Sent: Wednesday, November 24, 2021 11:29 AM
To: Polly
Subject: Victory Lane proposed Asphalt Plant vote in December 6th meeting

Hi Polly,

I became aware of this request and topic for the next board meeting. Is this really the case? My subdivision does not support this and wondered if we could send an email to you in request to deny of this proposed zone change.

Regards,

rob

Sent from [Mail](#) for Windows

Proposed Asphalt Plant

COLLEEN QUINN <cquinn4042@comcast.net>

Mon 11/29/2021 8:17 PM

To: Bill Rogers <Bill@genoa.org>; Polly <pskolarus@genoa.org>; Robin Hunt <Robin@genoa.org>; Jean Ledford <Jean@genoa.org>; Jim Mortensen <Jim@genoa.org>; Terry Croft <Terry@genoa.org>; Diana Lowe <diana@genoa.org>;

We just became aware that the Genoa Township Planning Commission has approved and recommended the rezoning of an area on the north side of I-96 about 1 mile west of Latson to allow the build of an asphalt plant. **This will have an adverse effect on the health of residents and the environment within at least 10 miles.**

We are totally against this project and are shocked that you would entertain such a proposition. Our health is at stake. Tim has severe COPD so your project would directly impact his health. How would he be able to enjoy sitting on the patio when he would be subjecting himself to toxins? This project would also negatively impact house values. A property value study documented losses of up to 56% because of the presence of a nearby asphalt plant. Why would you turn our beautiful community into basically a junkyard full of toxins?

Tyrone Township and Hamburg have reportedly already rejected the rezoning proposed for this development in their jurisdiction due to the harm the asphalt plant would bring. They made the wise decision. There are Industrial zoning projects that would not be toxic to residents.

Below is information to support a **NO Vote** on this project:

According to the National Institute for Occupational Safety and Health: asphalt fumes are considered occupational carcinogens

- The federal Environmental Protection Agency (EPA) states that, Asphalt Fumes are Known Toxins
- Even if an asphalt plant meets all air pollution standards, people living nearby are still exposed to cancer-causing substances that can cause long-term damage (DHHS)
- Stagnant air and local weather patterns often increase the level of exposure to local communities (downwind, low-lying and lake areas are most greatly affected)

Did You Know What comes out of an Asphalt Plant?

Sources of emissions from Asphalt Plants are neither regulated nor monitored, and depending on the size of the asphalt operation, can release 300+ tons of toxic air emissions annually.

Flawed Tests Underestimate Health Risks - pollutants that are released from a facility are estimated by computers and mathematical formulas rather than by actual stack testing

Did You Know About the 7 Deadly Fugitive Emissions that come from Asphalt Plants?

Hydrogen sulfide (H₂S)

- Hydrogen sulfide (after leaving the smokestack) remains in the air for about 18

hrs.

- Exposures to hydrogen sulfide may result in:
 - respiratory distress
 - pulmonary edema
 - nervous system depression
 - cardiovascular effects
 - tissue hypoxia
 - neurobehavioral effects (headaches, lack of coordination, confusion, depression, tension, trouble concentrating)

Benzene (C₆H₆)

- Benzene enters the body through the lungs, gastrointestinal tract, and through the skin
- Benzene is a known carcinogen or cancer-causing agent
- Brief exposure (5-10 minutes) to high levels of benzene in air can result in death
- Benzene exposure can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness
- Benzene can pass from the mother's blood to a developing fetus
- Studies with pregnant animals show that breathing benzene has harmful effects on the developing fetus

Formaldehyde (CH₂O)

- Formaldehyde is a human carcinogen or cancer-causing agent
- Formaldehyde is an eye, skin, and respiratory tract irritant
- Inhalation of vapors can produce narrowing of the bronchi and accumulation of fluid in the lungs
- Children are more susceptible than adults to the respiratory effects of formaldehyde
- Even low concentrations of formaldehyde can produce nose and throat irritation, chest pain, shortness of breath, and wheezing
- Higher exposures can cause inflammation and accumulation of fluid in the lungs (chemical pneumonia)

Chromium (Cr) (VI)

- Chromium is a known carcinogen
- Breathing chromium(VI) can cause irritation such as runny nose, nosebleeds, and ulcers and holes in the nasal septum
- Ingesting large amounts of chromium(VI) can cause stomach upsets and ulcers, convulsions, kidney and liver damage, and even death
- Skin contact with chromium(VI) compounds can cause skin ulcers
- Some people are extremely sensitive to chromium(VI) and suffer severe anaphylactic (allergic) reactions

Polycyclic Aromatic Hydrocarbons (PAHS)

- PAHs are expected to cause cancer
- PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer) or had them applied to their skin (skin cancer)
- PAHs are found in air attached to dust particles, and can enter water through fallout of fugitive emissions or accidental discharges from industrial plants where they can move through soil to contaminate groundwater (wells)

Cadmium (Cd)

- Breathing air with high levels of cadmium can severely damage the lungs and may cause death
- Breathing air with lower levels of cadmium over long periods of time (for years) results in kidney disease, lung damage and fragile bones
- Studies show that rats that breathed in cadmium developed lung cancer, liver damage and changes in the immune system
- Female rats and mice that breathed high levels of cadmium had fewer litters, babies with more birth defects than usual, reduced fetal body weight and babies born with behavioral problems and learning disabilities

Arsenic (As) -inorganic

- Breathing high levels of inorganic arsenic will result in a sore throat, irritated lungs and the potential to develop lung cancer
- People who live near sites emitting inorganic arsenic have an increased risk of lung cancer
- Children may be more susceptible to health effects from inorganic arsenic than adults
- There is evidence that long-term exposure to inorganic arsenic in children may result in lower IQ scores

**Did you know the (2) ways these Contaminants get into our environment?
SPILLS and ATMOSPHERIC DEPOSITION**

ALL toxicological information has been extracted from: Agency for Toxic Substances and Disease Registry

We hope you review all of this information and seriously consider our request to vote down this project. It saddens us to think that something serene and beautiful like the Padre Pio Chapel and Garden was voted down but a toxic industrial project could be in our backyards.

Please vote NO on this!

Sincerely,

Tim and Colleen Quinn
4042 Brookstone Ct.
Howell, MI 48843 Genoa Township

From: [Mike Archinal](#)
To: robred99@aol.com
Cc: [Jim Mortensen](#); [tcroft](#); [JeanLedford](#); [Diana Lowe](#); [Bill Rogers](#); [Robin Hunt](#); [Polly](#); [Kelly VanMarter](#)
Subject: FW: Against - proposed Asphalt plant requiring rezoning in Genoa Township
Date: Thursday, December 2, 2021 11:56:24 AM

Robin,

Thank you for your comments regarding the proposed Capital Asphalt project. I have forwarded your email to the Township Board of Trustees.

Best regards,

Michael Archinal, AICP
Township Manager
Genoa Charter Township
2911 Dorr Road
Brighton MI, 48116
mike@genoa.org

From: Adam VanTassell
Sent: Thursday, December 2, 2021 10:29 AM
To: Mike Archinal <Mike@genoa.org>
Subject: FW: Against - proposed Asphalt plant requiring rezoning in Genoa Township

From: Robin Redwine-Fischer <robred99@aol.com>
Sent: Thursday, December 2, 2021 10:14 AM
To: info <info@genoa.org>
Subject: Against - proposed Asphalt plant requiring rezoning in Genoa Township

Dear Board,

Please do not approve the request for the Asphalt company to build and operate in Genoa Township. This asphalt company will not add value to a community such as ours.

There are numerous of other already approved heavy industrial locations already available for operations such as this. The area does not have the zoning required and was set up as is for a reason.

This has been proposed in two other areas that are similar, smaller communities and those boards stood for the residents and it did not pass for multiple reasons. It is

concerning the company stated they will only meet minimum state requirements and depend on government monitoring. Has Genoa established local additional requirements to what the state requires to protect the local citizens and their health?

Please protect the citizens, schools and residential communities in and around Genoa Township.

Ultimately the members we elected to the Genoa Offices are accountable to and responsible for the safety and well being of current citizens, businesses, homes and schools of this community that are already here.

Thank you. We are depending on the people we voted for to protect the current community from those who have no other interest beyond finding a place to do business that is potentially harmful. Again, not zoned for such and should not be entertained to protect integrity of this overall community as a valued and high desirable Town and Country type setting.

Regards,
Robin and Patrick Fischer
5766 Long Pointe Drive
Howell MI 48843
810-623-2899

asphalt plant Genoa Township

Louise Simon <lts_1@yahoo.com>

Tue 11/30/2021 3:52 PM

To: Bill Rogers <Bill@genoa.org>; Polly <pskolarus@genoa.org>; Robin Hunt <Robin@genoa.org>; Jean Ledford <Jean@genoa.org>; Jim Mortensen <Jim@genoa.org>; Terry Croft <Terry@genoa.org>; Diana Lowe <diana@genoa.org>;

Dear Genoa Township board member,

I recently became aware that the Township Planning Commission had an approval recommendation for the rezoning of an area on the north side of I-96 about 1 mile west of Latson to allow the construction of an asphalt plant. I'm writing to you today to tell you to reject this rezoning. While I live outside of the 10 mile area near said site, my daughter, her husband and three grandsons all live only a few miles from the proposed site. This is a highly residential area which would expose many families with children to toxic fumes from such a plant. I am a Ph.D. with a degree in Immunology and have first-hand experience with components of asphalt and diesel emissions as a Postdoctoral Graduate working in Carcinogenesis and Toxicology at Michigan State University. Specifically, I did research on mutagenic (chemicals which cause changes in chromosome/gene composition and expression) and carcinogenic components found in asphalt and diesel emissions and their effects on human cells grown *in vitro* and on the Immune System in animal models. Components of asphalt are both mutagenic/carcinogenic and toxic to the immune system and human nerve cells, especially in children.

Sources of emissions from Asphalt Plants are neither regulated nor monitored, and they can release more than 300 tons of toxic air emissions annually. Shockingly, pollutants that are released from a facility are estimated by computers and mathematical formulas rather than by actual stack testing. These flawed tests underestimate health risks.

According to the National Institute for Occupational Safety and Health, **asphalt fumes are considered occupational carcinogens**. Here are some facts to consider:

- The federal Environmental Protection Agency (EPA) states that Asphalt Fumes are **known toxins**.
- Even if an asphalt plant meets all air pollution standards, people living nearby are still exposed to cancer-causing substances that can cause long-term damage (DHHS).
- Stagnant air and local weather patterns often increase the level of exposure to local communities (downwind, low-lying and lake areas are most greatly affected).

While there are many more components in asphalt, these seven deadly emissions from asphalt plants are especially toxic and/or carcinogenic:

- Hydrogen sulfide (H₂S) **extremely flammable and highly toxic**
- Benzene (C₆H₆) **Long-term exposure to high levels of benzene in the air can cause leukemia, cancer of the blood.**
- Chromium (Cr) (VI) inhaled, it **is a human carcinogen, resulting in an increased risk of lung cancer.**
- Formaldehyde (CH₂O) can **cause human cancer after prolonged exposure**
- Polycyclic Aromatic Hydrocarbons (PAHS) **is a toxin and carcinogen**
- Cadmium (Cd) **is a toxin and carcinogen**
- Arsenic (As) -inorganic **is a toxin and carcinogen**

Of just these seven (and there are hundreds of others) one is considered a toxin, three are cancer causing, and three are considered *both* toxins and cancer causing.

Both spills and atmospheric deposition are causes of pollution. While safety measures can be put in place to minimize spills, they can still happen. More importantly, *there are no safety measures that can be put in place to completely control atmospheric deposition. This guarantees toxic cancer-causing pollution* **those living nearby including my daughter and her family**. A plant like this would also negatively affect property values, since if residents nearby wished to sell, no one wants to live near toxic waste.

In conclusion, a highly residential area is the **WRONG PLACE** to build this asphalt plant. I am writing to instruct you not to approve the rezoning from Industrial District (IND) to a Planned Industrial Development (PID) overlay district. Do not allow a known health hazard in this community.

Sincerely,

Louise Simon Ph.D.

Asphalt Plant

Madelyn Thomas <netowlady@gmail.com>

Mon 11/29/2021 4:26 PM

To: Bill Rogers <Bill@genoa.org>; Polly <pskolarus@genoa.org>; Robin Hunt <Robin@genoa.org>; Jean Ledford <Jean@genoa.org>; Jim Mortensen <Jim@genoa.org>; Terry Croft <Terry@genoa.org>; Diana Lowe <diana@genoa.org>;

Good Afternoon,

Please vote against plans and rezoning to allow the construction of an asphalt plant in Genoa Township. I understand Hamburg and Tyrone Townships have rejected this idea for obvious reasons.

EPA studies show that these plants give off toxic fumes and gases that harm our health and environment. Regulation is by computer model only and not real actual measurements.

Please consider the safety of all residents in the area.

Thank you for your attention to this matter.

Madelyn Thomas
Brighton, MI

Kelly VanMarter

From: Al Bee <aia7908@yahoo.com>
Sent: Thursday, December 2, 2021 7:09 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant

Dear Trustees,

I am writing because I can't attend the meeting in person about the potential approval of the asphalt plant. As a tax paying member of Genoa Township I would like to object to the asphalt plant. There are too many health risk involved in exposure to volatile organic compounds (VOCs), the particles of dangerous substances, emitted into the air after certain chemical reactions. They vaporize at room temperature, so they stay airborne indefinitely. Asphalt plants emit significant amounts of these gases, and living next to such plants can be hazardous to people's health. Overexposure to VOC emissions can lead to the following:

- Headache or loss of concentration
- Nausea
- Nose, throat, and eyes irritation
- Damage to the kidneys, liver, and lungs
- Dizziness and fatigue
- Cancer

VOC can travel in the air and potential cause these issue to local residents as well as children who attend school in the vicinity.

Another reason I object is the increase in large truck traffic. It will cause damage to our roads and create more traffic in our already congested township.

Please take into consideration my objection, as well as many other members of Genoa Township, in the decision making process. Please keep traffic down and the area free of VOCs so us and our children can have a safe healthy place to live.

Thank you for reading this letter.

Have a good day,
Alaina Bennett

United States
Environmental Protection
Agency

Office Of Air Quality
Planning And Standards
Research Triangle Park, NC 27711

EPA-454/R-00-019
December 2000

Air



HOT MIX ASPHALT PLANTS

EMISSION ASSESSMENT REPORT



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HOT MIX ASPHALT PLANTS
EMISSION ASSESSMENT REPORT

This document was prepared by:

Emissions Monitoring and Analysis Division
Office of Air Quality Planning and Standards
United States Environmental Protection Agency
Research Triangle Park, NC

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U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

December 2000

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DISCLAIMER

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PREFACE

This report was produced by the Source Measurement Technology Group of EPA's Emissions Measurement Center located in Research Triangle Park, NC. It is one of a series of twelve reports prepared to document an EPA program to characterize emissions to the air from hot mix asphalt plants. These twelve reports and their associated EPA document numbers and publication dates are:

Document Title	EPA Document Number	Publication Date
Hot Mix Asphalt Plants Emission Assessment Report	EPA 454/R-00-019	December 2000
Hot Mix Asphalt Plants Kiln Dryer Stack Instrumental Methods Testing Asphalt Plant A, Cary, North Carolina	EPA 454/R-00-020	April 2000
Hot Mix Asphalt Plants Kiln Dryer Stack Manual Methods Testing Asphalt Plant A, Cary, North Carolina Volume 1 of 2	EPA 454/R-00-021a	April 2000
Volume 2 of 2	EPA 454/R-00-021b	April 2000
Hot Mix Asphalt Plants Kiln Dryer Stack Instrumental Methods Testing Asphalt Plant B, Clayton, North Carolina	EPA 454/R-00-022	April 2000
Hot Mix Asphalt Plants Kiln Dryer Stack Manual Methods Testing Asphalt Plant B, Clayton, North Carolina Volume 1 of 2	EPA 454/R-00-023a	April 2000
Volume 2 of 2	EPA 454/R-00-023b	April 2000
Hot Mix Asphalt Plants Truck Loading and Silo Filling Instrumental Methods Testing Asphalt Plant C, Los Angeles, California	EPA 454/R-00-024	May 2000
Hot Mix Asphalt Plants Truck Loading and Silo Filling Manual Methods Testing Asphalt Plant C, Los Angeles, California Volume 1 of 8	EPA 454/R-00-025a	May 2000
Volume 2 of 8	EPA 454/R-00-025b	May 2000
Volume 3 of 8	EPA 454/R-00-025c	May 2000
Volume 4 of 8	EPA 454/R-00-025d	May 2000
Volume 5 of 8	EPA 454/R-00-025e	May 2000
Volume 6 of 8	EPA 454/R-00-025f	May 2000
Volume 7 of 8	EPA 454/R-00-025g	May 2000
Volume 8 of 8	EPA 454/R-00-025h	May 2000
Hot Mix Asphalt Plants Technical Systems Audit of Testing at Asphalt Plant C Asphalt Plant C, Los Angeles, California	EPA 454/R-00-026	May 2000

Document Title	EPA Document Number	Publication Date
Hot Mix Asphalt Plants Truck Loading Instrumental Methods Testing Asphalt Plant D, Barre, Massachusetts	EPA 454/R-00-027	May 2000
Hot Mix Asphalt Plants Truck Loading Manual Methods Testing Asphalt Plant D, Barre, Massachusetts	EPA 454/R-00-028	May 2000
Hot Mix Asphalt Plants Response to Comments on Testing Program for Asphalt Plants C and D	EPA 454/R-00-029	May 2000
Hot Mix Asphalt Plants Stakeholders Opinions Report	EPA 454/R-00-030	

These documents, including this Emissions Assessment Report document, are available for downloading, on CD-ROM and in paper.

Downloads can be made from:

<http://www.epa.gov/ttn/emc/asphalt.html>

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Research Triangle Park, NC 27711

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LIST OF ACRONYMS

ASTM	American Society of Testing and Materials
Btu	British thermal unit
CH ₄	methane
CO	carbon monoxide (as measured by EPA Method 10)
CO ₂	carbon dioxide (as measured by EPA Method 3)
EPA	Environmental Protection Agency
HAP	hazardous air pollutant (listed in or pursuant to section 112(b) of the 1990 Clean Air Act Amendments)
HMA	hot mix asphalt
NO _x	nitrogen oxides (as measured by EPA Method 7)
PAH	polycyclic aromatic hydrocarbon (a class of HAPs)
PM	particulate matter (as measured by EPA Methods 5 or 17)
PM-10	particulate matter less than 10 microns in diameter
PM-2.5	particulate matter less than 2.5 microns in diameter
RAP	reclaimed asphalt pavement
RTFOT	rolling thin film oven test (ASTM Method D2872-88)
SCC	source classification code
SO ₂	sulfur dioxide (as measured by EPA Methods 6 or 8)
SO _x	sulfur oxides
TOC	total organic compounds (as measured by EPA Method 25A)
VOC	volatile organic compound (refer to 40 CFR 51.100); VOC is TOC plus formaldehyde, less methane, ethane, acetone, and other chemicals listed as negligibly photochemically reactive.

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1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

This report presents an assessment of emissions from hot mix asphalt (HMA) manufacturing facilities. Included in the report is a description of the manufacturing process and the emissions associated with HMA production; the procedures for developing emission factors and emission inventories for the HMA industry; and estimated annual emissions for typical HMA facilities.

1.2 OVERVIEW OF HMA INDUSTRY

Hot mix asphalt is used primarily as paving material and consists of a mixture of aggregate and liquid asphalt cement, which are heated and mixed in measured quantities. Hot mix asphalt facilities can be broadly classified as either drum mix plants or batch mix plants, according to the process by which the raw materials are mixed. In a batch mix plant, the aggregate is dried first, then transferred to a mixer where it is mixed with the liquid asphalt. In a drum mix plant, a rotary dryer serves to dry the aggregate and mix it with the liquid asphalt cement. After mixing, the HMA generally is transferred to a storage bin or silo, where it is stored temporarily. From the silo, the HMA is emptied into haul trucks, which transport the material to the job site. Figure 1 presents a diagram of a typical batch mix HMA plant; a typical drum mix HMA plant is depicted in Figure 2.

In 1996, approximately 500 million tons of HMA were produced at the 3,600 (estimated) active asphalt plants in the United States. Of these 3,600 plants, approximately 2,300 are batch plants, and 1,300 are drum mix plants. The total 1996 HMA production from batch and drum mix plants is estimated at about 240 million tons and 260 million tons, respectively. Based on these figures, an average batch mix plant produces approximately 100,000 tons of HMA annually, and an average drum mix plant produces about 200,000 tons of HMA per year. Natural gas fuel is used to produce 70 to 90 percent of the HMA. The remainder of the HMA is produced using oil, propane, waste oil, or other fuels.

The primary emission sources associated with HMA production are the dryers, hot bins, and mixers, which emit particulate matter (PM) and a variety of gaseous pollutants. Other emission sources found at HMA plants include storage silos, which temporarily hold the HMA; truck load-out operations, in which the HMA is loaded into trucks for hauling to the job site; liquid asphalt storage tanks; hot oil heaters, which are used to heat the asphalt storage tanks; and yard emissions, which consist of fugitive emissions from the HMA in truck beds. Emissions also result from vehicular traffic on paved and unpaved roads, aggregate storage and handling operations, and vehicle exhaust.

The PM emissions associated with HMA production include the criteria pollutants PM-10 (PM less than 10 micrometers in aerodynamic diameter) and PM-2.5, hazardous air pollutant (HAP) metals, and HAP organic compounds. The gaseous emissions associated with HMA production include the criteria pollutants sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC), as well as volatile HAP organic compounds.

1.3 DEVELOPMENT AND USE OF EMISSION FACTORS FOR HMA FACILITIES

An emission factor relates the quantity (weight) of pollutants emitted to a unit of activity of the source. Emission factors for the HMA industry are generally determined in units of pounds of pollutant emitted per ton of HMA produced. These emission factors typically are used to estimate area-wide

emissions for a large number of facilities and emissions for specific facilities where source-specific emissions data are not available or where source testing is cost prohibitive.

To develop emission factors for the HMA industry, data from more than 390 emission test reports and other documents on the industry were compiled and reviewed. Through a careful screening process, the documents that were determined to be unusable for emission factor development were excluded from further evaluation. The remaining reports were compiled by plant type, emission source, pollutant, and emission control. For each emission test, emission factors were calculated by dividing the measured emission rates by the HMA production rate measured at the time of the emission test. These emission factors were then grouped by source, pollutant, and control device, and an average emission factor was calculated for each group.

Emission factors can be used to estimate emissions from one or more HMA facilities by multiplying the emission factor by the HMA production rate. For example, the emission factor for CO emissions from a natural gas-fired drum mix dryer is 0.13 pounds per ton (lb/ton). If the dryer produces 200,000 tons per year (ton/yr), the estimated CO emissions during that period would be: $200,000 \text{ ton/yr} \times 0.13 \text{ lb/ton} = 26,000 \text{ lb/yr}$ or 13 tons/yr.

1.4 ESTIMATED ANNUAL EMISSIONS FROM TYPICAL HMA FACILITIES

Annual emissions for a facility can be estimated by summing up the emissions from each emission source over the course of a year. Annual emissions for a specific source can be estimated by multiplying the annual throughput or production rate for that source by its corresponding emission factors. For an HMA facility, annual emissions can be estimated by multiplying the annual HMA production rate by the emission factors for each type of source at the facility. Table 1 summarizes annual emissions for a typical HMA batch mix plant, and Table 2 summarizes annual emissions for a typical drum mix HMA plant. The estimates presented in these tables account for all of the identified emission sources at each type of facility. For both batch mix plants (Table 1) and drum mix plants (Table 2), the estimate includes emissions from the dryer/mixer, load-out operations, asphalt storage, yard (fugitive emissions from loaded trucks), diesel exhaust, paved and unpaved road dust, and aggregate processing (screening, conveyor transfer, and reclaimed asphalt pavement [RAP] crushing). Additionally, for the drum mix plant (Table 2), the estimate includes emissions from silo filling operations. Estimates are presented for criteria pollutants (pollutants for which national ambient air quality standards have been developed) and hazardous air pollutants (HAPs, as defined in section 112(b) of the 1990 Clean Air Act Amendments). Criteria pollutants include PM-10, VOC, CO, SO₂, and NO_x. Emissions for three classes of HAPs are presented in Tables 1 and 2: polycyclic aromatic hydrocarbons (PAHs), volatile organic HAPs, and metal HAPs. The emissions were estimated using the emission factors developed for the HMA industry and the following assumptions:

- Dryers are fueled with natural gas or No. 2 fuel oil (estimates are presented for both types). It is estimated that between 70 and 90 percent of HMA plants use natural gas, although some HMA plants use fuel oil as an alternative to natural gas.
- Dryer emissions are controlled with fabric filters.
- PM emissions from load-out and silo filling are entirely PM-10.
- Annual HMA production rate for a typical batch mix plant is 100,000 ton/yr.
- Annual HMA production rate for a typical drum mix plant is 200,000 ton/yr.
- The typical HMA plant has two 18,000-gallon asphalt storage tanks.

As indicated in Table 1, a typical batch mix plant using a No. 2 fuel oil-fired dryer emits over 74,000 lb/yr of criteria pollutants, and a typical batch mix plant using a natural gas-fired dryer emits over

56,000 lb/yr of criteria pollutants, of which approximately 41,000 lb/yr are CO and approximately 10,700 lb/yr are PM-10; emissions of other criteria pollutants range from about 500 to about 12,000 lb/yr. The same plant would emit about 770 lb/yr of HAPs. A typical drum mix plant using a No. 2 fuel oil-fired dryer emits about 83,000 lb/yr of criteria pollutants, and a typical drum mix plant using a natural gas-fired dryer emits around 75,000 lb/yr of criteria pollutants, of which approximately 28,000 lb/yr are CO, about 10,000 lb/yr are VOC, and around 31,000 lb/yr are PM-10. A typical drum mix plant emits from 1,300 to 2,000 lb/yr of HAPs, depending on the fuel used in the dryer.

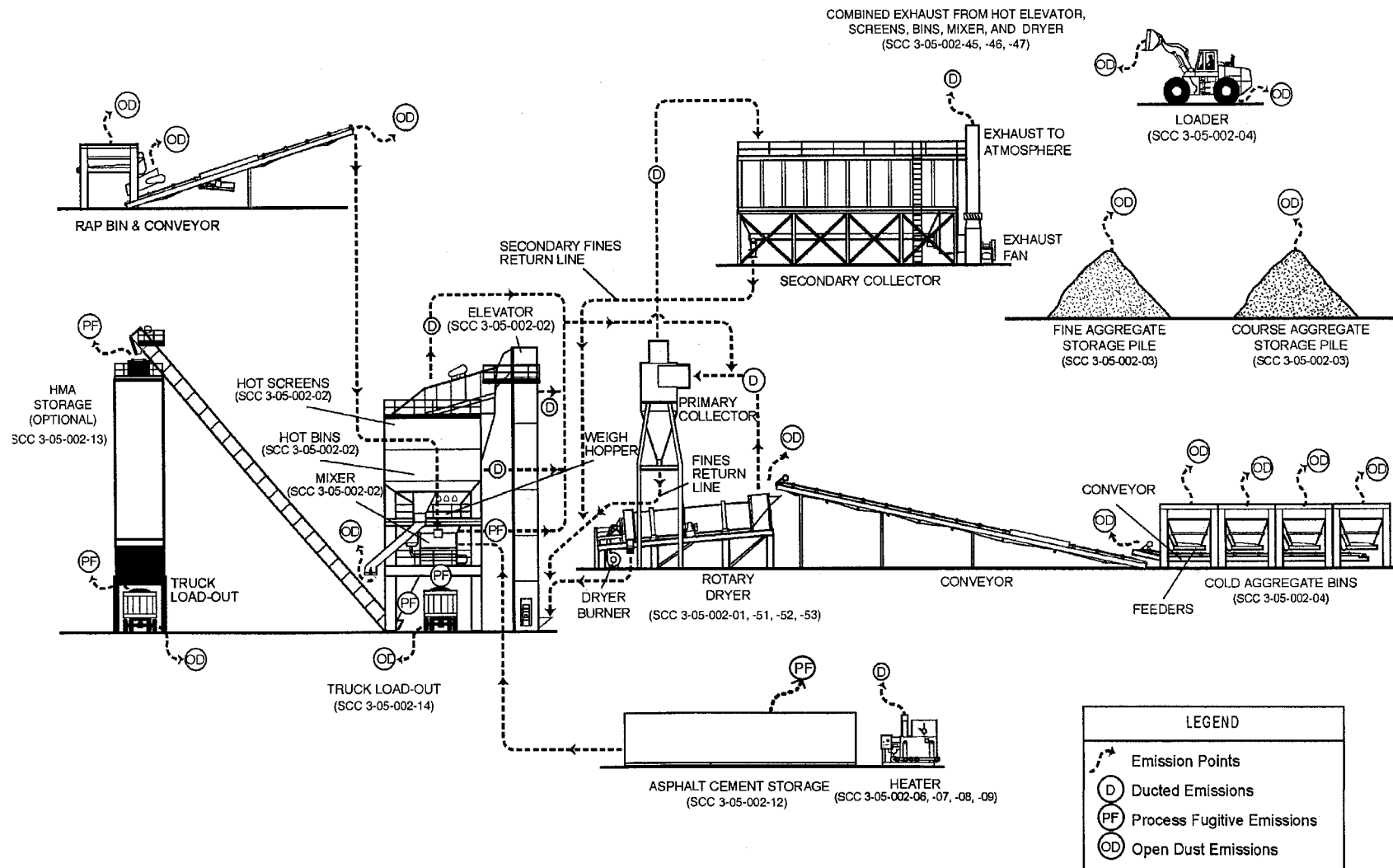


Figure 1. General process flow diagram for batch mix asphalt plants (source classification codes in parentheses).

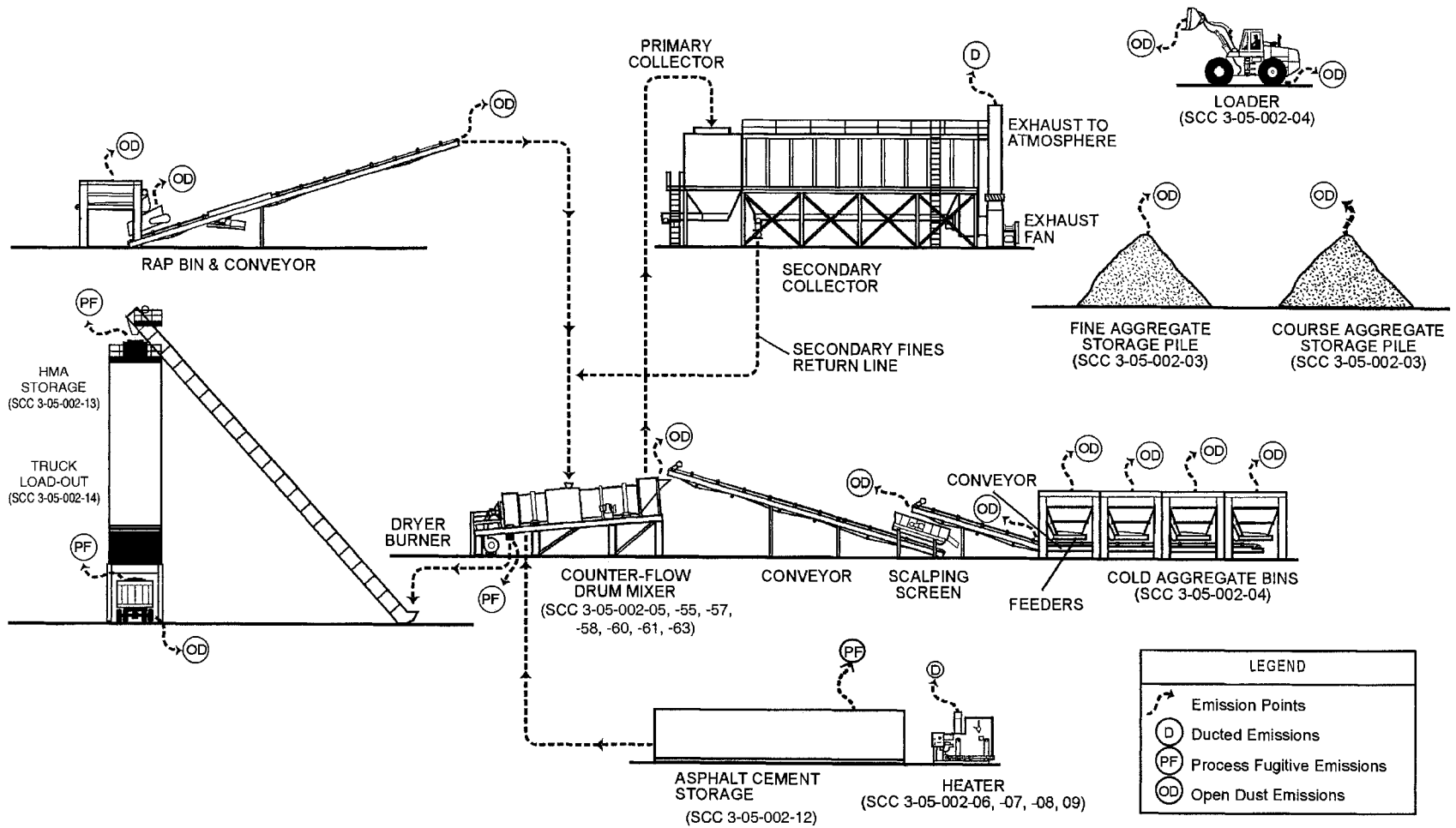


Figure 2. General process flow diagram for counter-flow drum mix asphalt plants (source classification codes in parentheses).

TABLE 1. ESTIMATED ANNUAL EMISSIONS FOR A TYPICAL BATCH MIX HMA FACILITY^a

Pollutant	Annual emissions by source, pounds per year								
	Mobile sources (diesel exhaust)	Material handling and road dust	No. 2 fuel oil-fired dryer, hot screens, and mixer ^b	Natural gas-fired dryer, hot screens, and mixer ^c	Load-out ^d	Asphalt Storage ^e	Yard ^f	Total ^g (oil-fired)	Total ^g (gas-fired)
Criteria air pollutants									
Particulate matter less than 10 micrometers (PM-10)	46	7,900	2,700	2,700	52			10,700	10,700
Volatile organic compounds (VOC)	100		820	820	391	32	110	1,500	1,500
Carbon monoxide (CO)	700		40,000	40,000	135	3	35	41,000	41,000
Sulfur dioxide (SO ₂)	22		8,800	460				8,800	480
Nitrogen oxides (NO _x)	380		12,000	2,500				12,400	2,900
Hazardous air pollutants (HAPs)									
Polycyclic aromatic hydrocarbons (PAHs)	0.035		11	11	2.0	0.12		13	13
Phenol					0.40			0.40	0.40
Volatile HAPs	1.9		751	751	6.2	140	1.6	760	760
Metal HAPs			1.4	1.4				1.4	1.4
Total HAPs ^g	1.9		760	760	8.6	140	1.6	770	770

^a Based on an annual HMA production rate of 100,000 tons per year.

^b Between 10 and 30 percent of the HMA is produced using fuel oil.

^c Between 70 and 90 percent of the HMA is produced using natural gas.

^d Loading of HMA into haul trucks.

^e Includes emissions from oil-fired hot oil heaters.

^f Fugitive emissions from loaded trucks prior to departure to the job site.

^g Total expressed using two significant figures.

TABLE 2. ESTIMATED ANNUAL EMISSIONS FOR A TYPICAL DRUM MIX HMA FACILITY^a

Pollutant	Annual emissions by source, pounds per year									
	Mobile sources (diesel exhaust)	Material handling and road dust	No. 2 fuel oil-fired dryer ^b	Natural gas-fired dryer ^c	Load-out ^d	Silo filling ^e	Asphalt storage ^f	Yard ^g	Total ^h (oil-fired)	Total ^h (gas-fired)
Criteria air pollutants										
Particulate matter less than 10 micrometers (PM-10)	220	26,000	4,600	4,600	104	117			31,000	31,000
Volatile organic compounds (VOC)	190		6,400	6,400	782	2,440	64	220	10,000	10,000
Carbon monoxide (CO)	1,200		26,000	26,000	270	236	6	72	28,000	28,000
Sulfur dioxide (SO ₂)	26		2,200	680					2,200	710
Nitrogen oxides (NO _x)	560		11,000	5,200					12,000	5,800
Hazardous air pollutants (HAPs)										
Polycyclic aromatic hydrocarbons (PAHs)	0.13		176	37	4.0	5.8	0.12		190	50
Phenol					0.80				0.80	0.80
Volatile HAPs	6.6		1,560	1,020	12.4	31	140	3.3	1,800	1,200
Metal HAPs			19	16					19	16
Total HAPs ^h	6.7		1,800	1,100	17	37	140	3.3	2,000	1,300

^a Based on an annual HMA production rate of 200,000 tons per year.

^b Between 10 and 30 percent of the HMA is produced using fuel oil.

^c Between 70 and 90 percent of the HMA is produced using natural gas.

^d Loading of HMA into haul trucks

^e Filling of temporary storage silo prior to load-out.

^f Includes emissions from oil-fired hot oil heaters.

^g Fugitive emissions from loaded trucks prior to departure to the job site.

^h Total expressed using two significant figures.

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2. ASSESSMENT OF HOT MIX ASPHALT EMISSIONS

This section presents the results of an assessment of emissions from HMA manufacturing. An overview of the HMA industry and process operations is provided first (Section 2.1). Section 2.2 summarizes the methodology used to develop emission factors for the HMA industry. Section 2.3 identifies other sections of AP-42 that apply to HMA plants. An overview of the process for conducting an emission inventory is presented in Section 2.4, and Section 2.5 presents estimates of annual emissions from typical HMA facilities.

2.1 INDUSTRY OVERVIEW AND PROCESS DESCRIPTION¹

Hot mix asphalt paving materials are a mixture of well-graded, high-quality aggregate and liquid asphalt cement, which is heated and mixed in measured quantities. The aggregate often includes RAP. Aggregate and RAP (if used) constitute over 92 percent by weight of the total mixture. Aside from the amount and grade of asphalt cement used, mix characteristics are determined by the relative amounts and types of aggregate and RAP used. A certain percentage of fine aggregate (less than 74 micrometers [μm] in physical diameter) is required for the production of good quality HMA.

Hot mix asphalt plants can be classified by their mixing operation as one of the following: (1) batch mix plants, (2) continuous mix (mix outside dryer drum) plants, (3) parallel flow drum mix plants, and (4) counterflow drum mix plants. An HMA plant can be constructed as a permanent plant, a skid-mounted (easily relocated) plant, or a portable plant. All plants can have RAP processing capabilities.

In 1996, approximately 500 million tons of HMA were produced at the 3,600 (estimated) active asphalt plants in the United States. Of these 3,600 plants, approximately 2,300 are batch plants, 1,000 are parallel flow drum mix plants, and 300 are counterflow drum mix plants. The total 1996 HMA production from batch and drum mix plants is estimated at about 250 million tons and 260 million tons, respectively. About 85 percent of new plants being constructed today are of the counterflow drum mix design, while batch plants and parallel flow drum mix plants account for 10 percent and 5 percent respectively. Continuous mix plants represent a very small fraction of the plants in use (≤ 0.5 percent) and, therefore, are not discussed further. While most HMA plants have the capability to use both fuel oil and natural gas, it is estimated that between 70 and 90 percent of the HMA in the U. S. is produced using natural gas. The process operations at typical batch mix and drum mix plants are described in the following paragraphs.

2.1.1 Batch Mix Plants²

Processing begins as the aggregate is hauled from onsite storage piles and is placed in the appropriate hoppers of the cold feed unit. The material is metered from the hoppers onto a conveyer belt and is transported into a rotary dryer (typically gas- or oil-fired). As the hot aggregate leaves the dryer, it drops into a bucket elevator, is transferred to a set of vibrating screens, then separated into as many as four different grades (sizes), and dropped into “hot” bins according to size. At newer facilities, RAP may be transferred to a separate heated storage bin. At the same time, liquid asphalt cement is pumped from a heated storage tank to an asphalt bucket, where it is weighed to achieve the desired aggregate-to-asphalt cement ratio in the final mix. To control the aggregate size distribution in the final batch mix, the operator transfers material from various hot bins (and RAP bins, if used) to a weigh hopper until the desired mix

¹ See Appendix A, Section 11.1.1, and Appendix B, Section 2.1, for more detailed information.

² See Appendix A, Section 11.1.1.1, and Appendix B, Section 2.2.1, for more detailed information.

and weight are obtained. The aggregate from the weigh hopper is dropped into the mixer (pug mill) and dry-mixed for 6 to 10 seconds. The liquid asphalt is then dropped into the pug mill where it is mixed for an additional period of time. At older plants, RAP typically is conveyed directly to the pug mill from a storage hopper and combined with the hot aggregate. Total mixing time usually is less than 60 seconds. Then, the hot mix is conveyed to a hot storage silo or is dropped directly into a truck and hauled to the job site. Figure 1 depicts a typical batch mix plant.

2.1.2 Drum Mix Plants³

This process is a continuous mixing type process. The major difference between this process and the batch process is that the dryer is used not only to dry the material but also to mix the heated and dried aggregates with the liquid asphalt cement. In a parallel flow drum mixer, the aggregate is introduced to the drum at the burner end. As the drum rotates, the aggregate, as well as the combustion products from the burner, move toward the other end of the drum in parallel. Liquid asphalt cement is introduced in the mixing zone midway down the drum in a lower temperature zone, along with any RAP and PM from collectors. In a counterflow drum mixer, the material flow in the drum is opposite or counterflow to the direction of exhaust gases. In addition, the liquid asphalt cement mixing zone is located behind the burner flame zone so as to remove the materials from direct contact with hot exhaust gases. After mixing, the mixture is discharged at the end of the drum and is conveyed to either a surge bin or HMA storage silos. Figure 2 illustrates a counterflow drum mix plant.

In a parallel flow mixer, the exhaust gases also exit the end of the drum and pass on to the collection system. Parallel flow drum mixers have an advantage, in that mixing in the discharge end of the drum captures a substantial portion of the aggregate dust, therefore lowering the load on the downstream PM collection equipment. For this reason, most parallel flow drum mixers are followed only by primary collection equipment (usually a baghouse or venturi scrubber). However, because the mixing of aggregate and liquid asphalt cement occurs in the hot combustion product flow, organic emissions (gaseous and liquid aerosol) may be greater than in other processes.

Counterflow drum mix plants likely will have organic stack emissions (gaseous and liquid aerosol) that are lower than parallel flow drum mix plants because the liquid asphalt cement, virgin aggregate, and RAP are mixed in a zone removed from the exhaust gas stream. A counterflow drum mix plant normally can process RAP at ratios up to 50 percent with little or no observed effect upon emissions.

2.1.3 Recycle Processes⁴

Reclaimed asphalt pavement significantly reduces the amount of new aggregate and asphalt cement needed to produce HMA. In the reclamation process, old asphalt pavement is removed from the road base. This material is then transported to the plant, and is crushed and screened to the appropriate size for further processing. The paving material then is heated and mixed with new aggregate (if applicable), and the proper amount of new asphalt cement is added to produce HMA that meets the quality requirements of the customer.

³ See Appendix A, Sections 11.1.1.2 and 11.1.1.3, and Appendix B, Sections 2.2.2 and 2.2.3, for more detailed information.

⁴ See Appendix A, Section 11.1.1.4, and Appendix B, Section 2.2.4, for more detailed information.

2.1.4 Emissions and Controls⁵

Hot mix asphalt plants have two major categories of emissions: ducted sources (those vented to the atmosphere through some type of stack, vent, or pipe), and fugitive sources (those not confined to ducts and vents but emitted directly from the source to the ambient air). Dryers are the most significant ducted sources of emissions from both batch mix and drum mix HMA plants. Emissions from these sources consist of water (as steam evaporated from the aggregate); PM; products of combustion (carbon dioxide [CO₂], NO_x, and sulfur oxides [SO_x]); CO; and small amounts of organic compounds of various species (including VOC, methane [CH₄], and HAPs). The CO and organic compound emissions result from incomplete combustion of the fuel and also are released from the heated asphalt.

At batch mix plants, other potential process sources include the hot-side conveying, classifying, and mixing equipment, which are vented to either the primary dust collector (along with the dryer gas) or to a separate dust collection system. These emissions are mostly aggregate dust, but they also may contain gaseous organic compounds, CO, and a fine aerosol of condensed organic particles. This organic aerosol is created by the condensation of gas into particles during cooling of organic vapors volatilized from the asphalt cement in the mixer. The amount of organic aerosol produced depends to a large extent on the temperature of the asphalt cement and aggregate entering the mixer. Organic vapor and its associated aerosol also are emitted directly to the atmosphere as process fugitives during truck load-out, from the bed of the truck itself during transport to the job site, and from the asphalt storage tank. Both the low molecular weight organic compounds and the higher weight organic aerosol may contain small amounts of HAP. The ducted emissions from the heated asphalt storage tanks may include gaseous and aerosol organic compounds and combustion products from the tank heater.

At most HMA facilities, fabric filters are used to control emissions from dryers. Other controls used include mechanical collectors and scrubbers. Emissions from aggregate handling and transfer typically are controlled with fabric filters or scrubbers. Large diameter cyclones and settling chambers also are used as product recovery devices. The material collected in those devices is recycled back into the process.

There also are a number of fugitive dust sources associated with batch mix HMA plants, including vehicular traffic generating fugitive dust on paved and unpaved roads, aggregate material handling, and other aggregate processing operations.

2.2 EMISSION FACTOR DEVELOPMENT FOR AP-42 SECTION 11.1, HOT MIX ASPHALT PLANTS

A detailed description of how the emission factors were developed for the HMA industry is provided in Section 4 of Appendix B. The following paragraphs summarize the methodology used.

To develop emission factors for the HMA industry, data from about 390 emission test reports and other documents on the industry were compiled and reviewed (a complete list of these references is provided following Section 4 of Appendix B). The majority of these reports documented measurements of emissions from batch plant dryer/mixers and drum plant dryers. Through a careful screening process, 35 of the reports were determined to be unusable for emission factor development and were excluded from further evaluation. About 350 reports remained and were compiled by plant type, emission source, pollutant, and emission control. These emission factors were then grouped by source, pollutant, and

⁵ See Appendix A, Section 11.1.2, and Appendix B, Section 2.3, for more detailed information.

control device, and an average emission factor was calculated for each group. Table 3 presents a matrix of all of the sources and pollutants for which emission factors are presented in AP-42 (Appendix A).

While the particulate, CO₂, CO, and TOC emission factors are based on over 100 tests, most of the remaining criteria pollutant emission factors are based on between 5 and 10 tests. A few HAP emission factors are based on more than 5 tests, although the majority are based on between 2 and 5 tests. Information on the supporting data for specific emission factors and the quality rating assigned to the emission factor is included in the section or table in Appendices A and B as indicated in Table 4. Column four of Table 4 references the tables in Appendix A that present the emission factors and quality ratings. Column five of Table 4 references the paragraphs in Appendix B that discuss the basis for the emission factors developed for all of the sources and pollutants. Column six of Table 4 references the tables in Appendix B that present the emission factors and the individual data used to develop the emission factors. Generally, the amount of supporting data is typical of many AP-42 sections. However, the amount of data supporting the particulate, CO₂, CO, and TOC emission factors is greater than most AP-42 sections. The following paragraphs summarize the procedures followed to develop the emission factors for HMA facilities.

2.2.1 Batch Mix and Drum Mix Dryers

The usable data on batch mix and drum mix plant dryer emissions were compiled according to source type, emission control, and pollutant. Data on fuel types, the percentage of RAP used in the mix, and the process operating rate (e.g., dryer production rate) also were recorded. The quality of the emission data was evaluated with respect to the level of documentation in the report, the test methods used, the number of test runs, and any reported problems with the sampling procedures or the operation of the source during the test period. On the basis of this evaluation, data ratings of A, B, C, or D were assigned to each data set. Specific procedures used to evaluate the data are specified in *Procedures for Preparing Emission Factor Documents* (EPA-454/R-95-015).

For each emission test, an emission factor also was calculated for each pollutant sampled. These test-specific emission factors then were grouped according to source type, emission control device, pollutant, and, in the case of combustion sources, fuel type. At this stage in the process, D-rated data sets were discarded, provided there were higher quality data available for that particular group (i.e., that specific combination of source, control, fuel, and pollutant). In addition, where there were data from multiple tests on the same specific emission source, the test-specific emission factors were averaged to yield a source-specific emission factor. In subsequent calculations, this source-specific emission factor was used.

A statistical analysis of the data for batch and drum mix dryers was performed to determine the effects of RAP content, fuel type, production rate on emissions of several pollutants. The analysis showed no strong correlation between these parameters and emission factors. Details on the statistical analysis can be found in Section 4.3 of Appendix B.

To develop emission factors, the mean of the test-specific emission factors was calculated for each of the emission factor groups discussed above. In some cases, the data for two or more groups were combined and an overall mean emission factor was calculated. For example, if the data indicated that fuel type had no apparent effect on emissions of a specific pollutant, fuel type was ignored and all of the data for that source type and pollutant were combined. The final step in developing emission factors is to assign a quality rating of A, B, C, D, or E. Quality ratings are a function primarily of the number of data points

from which a specific emission factor is calculated. Additional information on the rating system used is discussed in Section 3 of Appendix B.

2.2.2 Hot Oil Heaters

For hot oil heaters, only a single test report for an oil-fired hot oil heater was available. The report was reviewed and the emission factors compiled using the procedures described previously. Appendix B, Section 4.2.4.2, provides a detailed description of how these emission factors were developed. It should be noted that most hot oil heaters are gas-fired, and the emission factors developed from the available data would not necessarily be representative of gas-fired heaters.

2.2.3 Truck Load-Out

Truck load-out emissions were developed from two emission tests sponsored by the U. S. Environmental Protection Agency (EPA) (Appendix B References 355 and 356). In designing, performing and evaluating these two tests, EPA was involved with a number of groups. The groups included citizens, State and local health agencies, State and local air pollution control agencies, and industry associations. These different groups provided input on the selection of facilities for emissions testing, the design of the test program, reviewed the individual site-specific test plans, observed emissions testing, commented on the draft test reports and provided suggestions for analysis of the data to develop emission factors. The procedures used to develop emission factors generally were the same as those described above. However, additional steps were taken to ensure the quality and consistency of the data and the representativeness and universality of the emission factors developed from the data. For example, two quality assurance scientists from Research Triangle Institute were employed to independently audit the test. These additional steps are summarized below. Detailed explanations of the methodology used are provided in Section 4.4 of Appendix B.

At one of the facilities the sampling area was enclosed but did not meet EPA requirements for a total enclosure. Consequently, the capture efficiency was quantitatively estimated and the data were corrected for capture efficiency.

At one facility, emissions due to diesel truck operation could not be segregated from emissions due to truck load-out. Therefore, background concentrations also were sampled. To account for background levels of various pollutants emitted from truck operation, the as-measured background concentrations were subtracted from the capture efficiency corrected load-out emission concentrations. For the most part, values were treated as zero if the background concentration exceeded the capture-efficiency-adjusted run concentration.

Because the asphalt types and temperatures for the two facilities differed, adjustments also were made to normalize the emission data. To account for differences in the volatility of the liquid asphalts used, samples of asphalt were collected during the emission tests and analyzed by ASTM Method D 2872-88, *Effects of Heat and Air on a Moving Film of Asphalt (Rolling Thin Film Oven Test - RTFOT)* to determine the “loss-on-heating” values for the asphalts. Additional loss-on-heating data also were obtained from several State departments of transportation laboratories in order to determine a common RTFOT value to use as a default in those situations where no historical information is available. Based upon the RTFOT data collected and the desire to select a default which encourages the use of site-specific data, a default of -0.5 percent was selected as a default value for use in the predictive emission factor equations developed from the data.

To account for differences in the load-out temperatures of the two facilities the data were adjusted using the Clausius-Clapeyron equation, which relates vapor pressure and temperature of a substance. This equation and the asphalt laboratory data provide a mechanism to normalize the emissions to a temperature of 325°F, which is the maximum midpoint load-out temperature recommended by the Asphalt Pavement Environmental Council's Best Practices Guide dated March 2000.

Using the adjusted data and the temperature and volatility relationship described above, separate predictive emission factor equations were developed for emissions of total PM, organic PM, total organic compounds (TOC), and CO from drum mix and batch mix load-out operations. Additionally, adjusted data for a variety of HAP's were used to develop ratios of the HAP pollutant to either organic PM or TOC (speciation profiles). These speciation profiles are applicable to load-out emissions and yard emissions.

2.2.4 Silo Filling

Silo filling emission factors were developed from one of the emission tests described in the previous paragraphs for load-out emissions (Appendix B Reference 355). These data also were collected and evaluated with stakeholder involvement. Additionally, the same basic methodology described in the previous paragraphs for load-out emissions was used to adjust the data on emissions from silo filling operations. Predictive emission factor equations also were developed for total PM, organic PM, TOC, and CO. A detailed explanation of the methodology used to develop these equations is provided in Section 4.4.4 of Appendix B. Speciation profiles for silo filling emissions were also developed using the methodology described for load-out emissions. The speciation profiles from silo filling are applicable to asphalt storage tank emissions.

2.2.5 Asphalt Storage Tanks

To estimate emissions from heated organic liquid storage tanks, the methodologies described in Chapter 7 of AP-42 and the TANKS software are generally used. The emissions from these types of tanks depend on the contents of the tank, the volume of gas vented, and the operating temperature range of the liquid in the tank. Emissions during the filling of these tanks (working loss) are governed by the saturation concentration of the liquid stored in the tank and the volume of gas displaced by the addition of liquid to the tank. Emissions during other periods (breathing losses) are governed by the saturation concentration of the liquid stored in the tank and the changes in the volume of the gas caused by temperature variations. Although vapor pressure information on paving asphalt is not available to allow the use of the TANKS program without additional information, information was available from the silo filling test report to infer emissions during the filling of the asphalt storage tank and, by extension, the vapor pressure characteristics of paving asphalt at the typical operating temperatures. Using these data, input values for Antoine's equation and liquid and vapor molecular weight were developed for use with the TANKS program to calculate working and breathing losses for asphalt storage tanks. A detailed explanation of the methodology used to develop these values is presented in Section 4.4.5 of Appendix B.

2.2.6 Yard Emissions

At one of the EPA-sponsored emission tests described in the previous paragraphs for load-out emissions (Appendix B Reference 355), data also were collected on fugitive emissions from loaded trucks as they sat in the yard prior to departure for the job site. As with the other data from this reference, these data were evaluated with stakeholder involvement. The data obtained were fitted to a power function in order to develop an equation for these yard emissions as a function of time. A specific emission factor for cumulative emissions over an 8-minute period (which represents the maximum time represented by the

data) was calculated using the power function equation developed from the emission data. A detailed explanation of the methodology used to develop the equations and the emission factor is provided in Section 4.4.6 of Appendix B.

2.3 OTHER APPLICABLE AP-42 SECTIONS

Emission factors for other generic sources associated with HMA facilities can be found in other sections of AP-42 (<http://www.epa.gov/ttn/chief/ap42/index.html>). As discussed above, methodologies for estimating emissions from asphalt storage tanks can be found in Chapter 7 of AP-42. Methods for estimating fugitive dust emissions from vehicular traffic are presented in AP-42 Chapter 13 (Sections 13.2.1 and 13.2.2). Material handling emissions and storage pile emissions are addressed in AP-42 Chapter 11 (Section 11.19.2) and Chapter 13 (Section 13.2.4). Emission factors for truck exhaust are provided in AP-42 Volume II: Mobile Sources (<http://www.epa.gov/oms/ap42.htm>).

To calculate the material handling and mobile source emission estimates presented in Tables 1 and 2 of this report, suitable emission factors for these material handling and mobile sources were determined. The following paragraphs describe the basis for the emission factors that were used:

- Receipt of new aggregate – Used equation from AP-42 Section 13.2.4, assuming an average moisture content of 1.5 percent and an average wind speed of 10 miles per hour (mph). The resulting PM-10 emission factor is 0.0041 lb/ton of new aggregate. The resulting PM-2.5 emission factor is 0.0013 lb/ton of new aggregate.
- Transfer of aggregate from storage to conveyor belt or between conveyor belts – Used controlled emission factor from AP-42 Section 11.19.2. The PM-10 emission factor is 0.000048 lb/ton of new aggregate.
- Screening of aggregate – Used controlled emission factor from AP-42 Section 11.19.2. PM-10 emission factor is 0.00084 lb/ton of new aggregate.
- RAP crushing – Used controlled tertiary crushing emission factor from AP-42 Section 11.19.2. PM-10 emission factor is 0.00059 lb/ton of new aggregate.
- Paved road dust emissions – Used paved roads equation from AP-42 Section 13.2.1, assuming an average vehicle weight of 22 tons and a road silt content of 3 grams per square meter. The resulting PM-10 emission factor is 0.016 lb per vehicle mile traveled. The resulting PM-2.5 emission factor is 0.0040 lb per vehicle mile traveled.
- Unpaved road dust emissions – Used unpaved roads equation from AP-42 Section 13.2.2, assuming an average vehicle weight of 6 tons, a road silt percentage of 10 percent, a surface moisture content of 0.7 percent. The resulting PM-10 emission factor is 2.04 lb per vehicle mile traveled. The resulting PM-2.5 emission factor is 0.29 lb per vehicle mile traveled.
- Diesel exhaust emissions – Used heavy duty diesel truck emission factors for idling and for an average speed of 10 mph with a 250 brake horsepower engine. The diesel engines get 10 miles per gallon at 10 mph and burn 1 gallon per hour (gal/hr) of fuel at idle. The sulfur content of diesel fuel is 0.05 percent. At idle, the emissions factors for diesel engines are: VOC - 0.208 grams per minute (g/min) (0.00046 pound per minute [lb/min]), CO - 1.57 g/min (0.0035 lb/min), NO_x - 0.917 g/min (0.0020 lb/min), SO₂ - 0.157s pounds per gallon of fuel (lb/gal) (where s is fuel sulfur content) and PM - 0.043 g/min (0.000095 lb/min). When traveling at an average speed of 10 mph, the emission factors for diesel engines are: VOC - 3.18 grams per mile (g/mile) (0.0070 pounds per mile [lb/mile]), CO - 18.82 g/mile (0.041 lb/mile), NO_x - 8.50 g/mile (0.019 lb/mile), SO₂ - 0.157s lb/gal fuel (where s is fuel sulfur content), and PM - 0.1011 grams per brake horsepower hour (0.00022 pounds per horsepower hour). For organic HAP emissions - Used medium duty diesel truck emission

factors from article by Schauer, et. al., in Environmental Science & Technology of May 15, 1999. The volatile HAP emission factors presented were 0.084 grams per kilometer (g/km) (0.00030 lb/mile) and 0.0016 g/km (0.0000057 lb/mile) for PAHs.

The ducted and process fugitive emissions estimates presented in Tables 1, 2, 7, and 11 are based on the following additional assumptions:

- 84,800 ton/yr of new aggregate for batch mix plant.
- 10,000 ton/yr of recycled pavement for batch plant.
- 1.25 million gallons (5,200 tons) of asphalt for batch plant.
- 150,900 ton/yr of new aggregate for drum mix plant.
- 40,000 ton/yr of recycled pavement for drum mix plant.
- 2.5 million gallons (10,400 tons) of asphalt for drum mix plant.
- Two 18,000-gallon asphalt storage tanks.
- Five open conveyor transfer points for new aggregate.
- Front end loader travel over unpaved roads of 0.25 mile per ton of RAP used.
- Vehicle travel over paved roads of 1.5 miles per 25 tons of HMA produced.
- Vehicle idling time of 128,000 min (an average of 4 trucks in line during the average 8-minute load-out time) for batch plant.
- Vehicle idling time of 72,000 min (an average of 6 trucks in line during the average 1.5-minute load-out time) for drum mix plant.

2.4 EMISSION INVENTORY FOR TYPICAL HOT MIX ASPHALT PLANTS

To perform an emission inventory for a typical HMA plant, the first step is to identify the types of emission sources and to count the total number of each type of source. The next step is to identify the best emission estimation tools, which include: (1) facility-specific emissions test data; (2) source-specific emission factors; (3) other types of source-specific data, such as mass balance data; (4) emission factors for similar sources; (5) emission factors for sources that are believed to be somewhat similar to the source being considered; and (6) engineering estimates. After selecting appropriate emission estimation tools, activity factors, such as production rates, should be determined for each source so that emissions can be estimated for a specified period of time. The emissions over the specified period of time for each source and pollutant then are summed to complete the emission inventory. Appendix C provides more detailed information on procedures for performing an emission inventory at an HMA plant.

2.5 EMISSION ESTIMATES FOR TYPICAL HOT MIX ASPHALT PLANTS

Tables 1 and 2 present annual estimates of emissions of criteria pollutants and HAPs for typical batch mix and drum mix HMA plants, respectively. The estimates presented in these tables account for the most significant emission sources at each type of facility. Tables 5 through 12 present more detailed annual emission estimates for typical batch and drum mix HMA plants. Table 5 summarizes the estimated emissions from a typical batch mix plant dryer, hot screens, and mixer. Included in the table are estimates for criteria pollutants as well as specific PAHs, volatile HAPs, and metal HAPs for which emission factors were developed. Estimated annual criteria pollutant, PAH and volatile HAP emissions from typical batch mix plant load-out operations and asphalt storage tank are summarized in Tables 6 and 7. Tables 8, 9, 10, and 11 summarize the estimated annual emissions from a typical drum mix plant dryer, load-out operations, silo filling operations, and asphalt storage tank respectively. These tables includes estimates for criteria pollutants, PAHs, volatile HAPs, and metal HAPs for which emission factors were developed. Finally, Table 12 presents estimates of fugitive emissions from loaded trucks (yard emissions) for a typical

batch mix and drum mix plant. The emissions estimates presented in Tables 5 through 12 are based on the emission factors developed for the HMA industry and the following assumptions:

- Batch mix plant and drum mix plant dryers are fueled with either natural gas or fuel oil. It is estimated that between 70 and 90 percent of HMA plants use natural gas, although some HMA plants use fuel oil as an alternative to natural gas. As shown in Tables 5 and 8, fuel oil-fired mixers and dryers have higher emissions of SO₂, NO_x, and some HAPs.
- Batch mix plant dryer, hot screens, and mixer and drum mix plant dryer emissions are controlled with fabric filters.
- PM emissions from load-out and silo filling are entirely PM-10. (However, the organic portion of these emissions also can be assumed to be PM-2.5. Information is available in AP-42 Appendix B.1, Particle Size Distribution Data and Sized Emission Factors for Selected Sources, for categorizing the inorganic or filterable PM into PM-10 and PM-2.5 fractions.)
- Average asphalt loss on heating is -0.5 percent (asphalt volatility).
- Average HMA load-out temperature is 325°F.
- The typical HMA plant has two asphalt storage tanks that are 50 feet long and 8 feet in diameter. It is estimated that these storage tanks require a total heating capacity of about 200,000 Btu/hr, based on a heat loss of 60 Btu/ft² of tank surface area. The asphalt storage tanks are kept at 325°F continuously for the five months the HMA plant operates. As a result, 720 million Btu are used to maintain the temperature of the asphalt in the storage tank. For a gas-fired hot oil heater, 720,000 ft³ of gas is combusted. For an oil-fired hot oil heater, 5,100 gallons of fuel oil are combusted. It should be noted that this fuel usage is about 3 percent of the fuel used in a typical batch mix plant and 1.6 percent of the fuel used in a typical drum mix plant.

TABLE 3. MATRIX OF EMISSION FACTORS DEVELOPED FOR HMA SOURCES

Plant type	Source	Criteria pollutants	HAPs	Other pollutants
Batch mix	Dryer, hot screens, and mixer	PM-10, NO _x , CO, SO ₂ , VOC	24 organic HAPs 9 metal HAPs	CO ₂ 4 other organics 3 other metals
	Hot oil heaters		22 organic HAPs	
	Load-out	PM, CO, VOC,	41 organic HAPs	3 other organics
	Yard emissions	VOC	19 organic HAPs	
Drum mix	Dryer	PM-10, NO _x , CO, SO ₂ , VOC	58 organic HAPs 11 metal HAPs	CO ₂ 15 other organics, 6 other metals
	Hot oil heaters		22 organic HAPs	
	Load-out	PM, CO, VOC	41 organic HAPs	3 other organics
	Silo filling	PM, CO, VOC	28 organic HAPs	3 other organics
	Yard emissions	VOC	19 organic HAPs	

TABLE 4. LOCATIONS OF SUPPORTING DATA FOR EMISSION FACTORS

Plant Type	Source	Pollutant	Appendix A Table	Appendix B Section	Appendix B Table
Batch Mix	Dryer, hot screens, mixer	PM-10	11.1-1, 11.1-2	4.2.4.3.1-4.2.4.3.6	4-19
		CO	11.1-5	4.2.4.3.7	4-20
		CO ₂	11.1-5	4.2.4.3.8	4-20
		NO _x	11.1-5	4.2.4.3.9	4-20
		SO ₂	11.1-5	4.2.4.3.10	4-20
		TOC/VOC/methane	11.1-6	4.2.4.3.11, 4.2.4.3.12	4-20
		Speciated organics	11.1-9	4.2.4.3.12-4.2.4.3.15	4-22
		Trace metals	11.1-11	4.2.4.3.16	4-21
Drum Mix	Dryer/mixer	PM-10	11.1-3, 11.1-4	4.2.4.1.1-4.2.4.1.6	4-14
		CO	11.1-7	4.2.4.1.7	4-15
		CO ₂	11.1-7	4.2.4.1.8	4-15
		NO _x	11.1-7	4.2.4.1.9	4-15
		SO ₂	11.1-7	4.2.4.1.10	4-15
		TOC/VOC/methane	11.1-8	4.2.4.1.11	4-15
		HCl	11.1-8	4.2.4.1.18	4-17
		Speciated organics	11.1-10	4.2.4.1.12-4.2.4.1.15, 4.2.4.1.19	4-17
		Dioxin/furans	11.1-10	4.2.4.1.17	4-17
		Trace metals	11.1-12	4.2.4.1.16	4-16
Batch or Drum Mix	Hot oil heater	Organic pollutants	11.1-13	4.2.4.2	4-18
	Load-out	PM, organic PM, TOC, CO, speciated organics	11.1-14 11.1-15 11.1-16	4.4.4	4-27 to 4-37, 4-43, 4-44
	Silo filling	PM, organic PM, TOC, CO, speciated organics	11.1-14 11.1-15 11.1-16	4.4.4	4-38 to 4-44
	Asphalt storage	Speciated organics	11.1-15 11.1-16	4.4.5	4-43, 4-44
	Yard emissions	Speciated organics	11.1-15 11.1-16	4.4.6	4-45, 4-46

TABLE 5. ESTIMATED ANNUAL EMISSIONS FOR A TYPICAL BATCH MIX PLANT DRYER, HOT SCREENS, AND MIXER^a

Pollutant	Oil-fired dryer	Natural gas-fired dryer
	Emissions, lb/yr	
Criteria Pollutants		
PM-10	2,700	2,700
VOC	820	820
CO	40,000	40,000
SO ₂	8,800	460
NO _x	12,000	2,500
PAHs (semi-volatile HAPs)		
Naphthalene	3.6	3.6
2-Methylnaphthalene	7.1	7.1
Acenaphthene	0.090	0.090
Acenaphthylene	0.058	0.058
Anthracene	0.021	0.021
Benzo(a)anthracene	0.00046	0.00046
Benzo(a)pyrene	0.000031	0.000031
Benzo(b)fluoranthene	0.00094	0.00094
Benzo(g,h,i)perylene	0.00005	0.00005
Benzo(k)fluoranthene	0.0013	0.0013
Chrysene	0.00038	0.00038
Dibenz(a,h)anthracene	0.0000095	0.0000095
Fluoranthene	0.016	0.016
Fluorene	0.16	0.16
Indeno(1,2,3-cd)pyrene	0.00003	0.00003
Phenanthrene	0.26	0.26
Pyrene	0.0062	0.0062
Total PAHs	11	11
Volatile HAPs		
Acetaldehyde	32	32
Benzene	28	28
Ethylbenzene	220	220
Formaldehyde	74	74
Quinone	27	27
Toluene	100	100
Xylene	270	270
Total Volatile HAPs	751	751
Metal HAPs		
Arsenic	0.046	0.046
Beryllium	0.015	0.015
Cadmium	0.061	0.061
Chromium	0.057	0.057
Lead	0.089	0.089
Manganese	0.69	0.69
Mercury	0.041	0.041
Nickel	0.3	0.3
Selenium	0.049	0.049
Total metal HAPs	1.35	1.35

^a Dryer, hot screens, and mixer controlled by fabric filter producing 100,000 tons of hot mix asphalt per year. Between 70 and 90 percent of HMA is produced using natural gas; most of the remaining HMA is produced using fuel oil.

TABLE 6. ESTIMATED ANNUAL EMISSIONS FOR TYPICAL BATCH MIX PLANT LOAD-OUT OPERATIONS^a

Pollutant	Emissions, lb/yr
Criteria Pollutants	
PM-10	52
VOC	391
CO	135
PAHs (semi-volatile HAPs)	
Acenaphthene	0.089
Acenaphthylene	0.0095
Anthracene	0.0239
Benzo(a)anthracene	0.0065
Benzo(b)fluoranthene	0.0026
Benzo(k)fluoranthene	0.00075
Benzo(g,h,i)perylene	0.00065
Benzo(a)pyrene	0.00078
Benzo(e)pyrene	0.0027
Chrysene	0.035
Dibenz(a,h)anthracene	0.00013
Fluoranthene	0.017
Fluorene	0.26
Indeno(1,2,3-cd)pyrene	0.00016
2-Methylnaphthalene	0.81
Naphthalene	0.43
Perylene	0.0075
Phenanthrene	0.28
Pyrene	0.051
Total PAHs	2.02
Other semi-volatile HAPs	
Phenol	0.40
Volatile HAPs	
Benzene	0.22
Bromomethane	0.040
2-Butanone	0.20
Carbon disulfide	0.054
Chloroethane	0.00087
Chloromethane	0.062
Cumene	0.46
Ethylbenzene	1.16
Formaldehyde	0.37
n-Hexane	0.62
Isooctane	0.0075
Methylene chloride	0.00
Methyl tert-butyl ether	0.00
Styrene	0.030
Tetrachloroethene	0.032
Toluene	0.87
1,1,1-Trichloroethane	0.00
Trichloroethene	0.00
Trichlorofluoromethane	0.0054
m-/p-Xylene	1.70
o-Xylene	0.33
Total volatile HAPs	6.18

^a Uncontrolled emissions from 100,000 tons of hot mix asphalt per year.

TABLE 7. ESTIMATED ANNUAL EMISSIONS FOR TYPICAL BATCH MIX PLANT ASPHALT STORAGE TANK^a

Pollutant	Emissions, lb/yr
Criteria Pollutants	
PM-10	ND
VOC	32
CO	3
PAHs (semi-volatile HAPs)	
Acenaphthene	0.0027
Acenaphthylene	0.0010
Anthracene	0.00092
Benzo(b)fluoranthene	0.00051
Fluoranthene	0.00022
Fluorene	0.00016
Naphthalene	0.087
Phenanthrene	0.025
Pyrene	0.00016
Total PAHs	0.12
Volatile HAPs	
Benzene	0.010
Bromomethane	0.0016
2-Butanone	0.012
Carbon disulfide	0.0051
Chloroethane	0.0012
Chloromethane	0.0074
Ethylbenzene	0.012
Formaldehyde	140
n-Hexane	0.032
Isooctane	0.000099
Methylene chloride	0.000086
Phenol	0.00
Styrene	0.0017
Toluene	0.020
m-/p-Xylene	0.061
o-Xylene	0.018
Total volatile HAPs	140

^a Uncontrolled emissions from plant producing 100,000 tons of hot mix asphalt per year. Includes emissions from oil-fired hot oil heaters. All calculated PAH emissions and almost all of the formaldehyde emissions are from the oil-fired hot oil heater.

TABLE 8. ESTIMATED ANNUAL EMISSIONS FOR
A TYPICAL DRUM MIX DRYER^a

Pollutant	No. 2 fuel oil-fired dryer	Natural gas-fired dryer
	Emissions, lb/yr	
Criteria Pollutants		
PM-10	4,600	4,600
VOC	6,400	6,400
CO	26,000	26,000
SO ₂	2,200	680
NO _x	11,000	5,200
PAHs (semi-volatile HAPs)		
2-Methylnaphthalene	34	15
Acenaphthene	0.28	0.28
Acenaphthylene	4.4	1.7
Anthracene	0.62	0.044
Benzo(a)anthracene	0.042	0.042
Benzo(a)pyrene	0.0020	0.0020
Benzo(b)fluoranthene	0.020	0.020
Benzo(e)pyrene	0.022	0.022
Benzo(g,h,i)perylene	0.0080	0.0080
Benzo(k)fluoranthene	0.0082	0.0082
Chrysene	0.036	0.036
Fluoranthene	0.12	0.12
Fluorene	2.2	0.76
Indeno(1,2,3-cd)pyrene	0.0014	0.0014
Naphthalene	130	18
Perylene	0.0018	0.0018
Phenanthrene	4.6	1.5
Pyrene	0.60	0.11
Total PAHs	180	37
Volatile HAPs		
Isooctane	8.0	8.0
Hexane	184	180
Benzene	78	78
Ethylbenzene	48	48
Formaldehyde	620	620
Methyl chloroform	9.6	9.6
Toluene	580	30
Xylene	40	40
Total volatile HAPs	1,568	1,020
Metal HAPs		
Lead	3	0.12
Mercury	0.52	0.048
Antimony	0.036	0.036
Arsenic	0.11	0.11
Beryllium	0.000	0.000
Cadmium	0.082	0.082
Chromium	1.1	1.1
Manganese	1.5	1.5
Nickel	12.6	12.6
Selenium	0.070	0.070
Total metal HAPs	19	16

^a Dryer controlled by fabric filter producing 200,000 tons of hot mix asphalt per year. Between 70 and 90 percent of HMA is produced using natural gas; most of the remaining HMA is produced using fuel oil.

TABLE 9. ESTIMATED ANNUAL EMISSIONS FOR TYPICAL
DRUM MIX PLANT LOAD-OUT OPERATIONS^a

Pollutant	Emissions, lb/yr
Criteria Pollutants	
PM-10	104
VOC	780
CO	270
PAHs (semi-volatile HAPs)	
Acenaphthene	0.177
Acenaphthylene	0.0191
Anthracene	0.0477
Benzo(a)anthracene	0.013
Benzo(b)fluoranthene	0.0052
Benzo(k)fluoranthene	0.0015
Benzo(g,h,i)perylene	0.0013
Benzo(a)pyrene	0.00157
Benzo(e)pyrene	0.0053
Chrysene	0.070
Dibenz(a,h)anthracene	0.00025
Fluoranthene	0.034
Fluorene	0.53
Indeno(1,2,3-cd)pyrene	0.00032
2-Methylnaphthalene	1.62
Naphthalene	0.85
Perylene	0.015
Phenanthrene	0.55
Pyrene	0.10
Total PAHs	4.05
Other semi-volatile HAPs	
Phenol	0.80
Volatile HAPs	
Benzene	0.43
Bromomethane	0.080
2-Butanone	0.41
Carbon disulfide	0.11
Chloroethane	0.0017
Chloromethane	0.12
Cumene	0.91
Ethylbenzene	2.3
Formaldehyde	0.73
n-Hexane	1.25
Isooctane	0.015
Methylene chloride	0.00
Methyl tert-butyl ether	0.00
Styrene	0.06
Tetrachloroethene	0.064
Toluene	1.74
1,1,1-Trichloroethane	0.00
Trichloroethene	0.00
Trichlorofluoromethane	0.011
m-/p-Xylene	3.40
o-Xylene	0.66
Total volatile HAPs	12.35

^a Uncontrolled emissions from 200,000 tons of hot mix asphalt per year.

TABLE 10. ESTIMATED ANNUAL EMISSIONS FOR TYPICAL
DRUM MIX PLANT SILO FILLING OPERATIONS^a

Pollutant	Emissions, lb/yr
Criteria Pollutants	
PM-10	120
VOC	2,400
CO	240
PAHs (semi-volatile HAPs)	
Acenaphthene	0.24
Acenaphthylene	0.0071
Anthracene	0.066
Benzo(a)anthracene	0.028
Benzo(e)pyrene	0.0048
Chrysene	0.11
Fluoranthene	0.076
Fluorene	0.51
2-Methylnaphthalene	2.7
Naphthalene	0.92
Perylene	0.015
Phenanthrene	0.91
Pyrene	0.22
Total PAHs	5.8
Other semi-volatile HAPs	
Phenol	0.00
Volatile HAPs	
Benzene	0.78
Bromomethane	0.12
2-Butanone	0.95
Carbon disulfide	0.39
Chloroethane	0.095
Chloromethane	0.56
Ethylbenzene	0.93
Formaldehyde	17
n-Hexane	2.4
Isooctane	0.0076
Methylene chloride	0.0066
Styrene	0.13
Toluene	1.5
m-/p-Xylene	4.6
o-Xylene	1.4
Total volatile HAPs	31

^a Uncontrolled emissions from 200,000 tons of hot mix asphalt per year.

TABLE 11. ESTIMATED ANNUAL EMISSIONS FOR TYPICAL DRUM MIX PLANT ASPHALT STORAGE TANK^a

Pollutant	Emissions, lb/yr
Criteria Pollutants	
PM-10	ND
VOC	64
CO	6
PAHs (semi-volatile HAPs)	
Acenaphthene	0.0027
Acenaphthylene	0.0010
Anthracene	0.00092
Benzo(b)fluoranthene	0.00051
Fluoranthene	0.00022
Fluorene	0.00016
Naphthalene	0.087
Phenanthrene	0.025
Pyrene	0.00016
Total PAHs	0.12
Volatile HAPs	
Benzene	0.020
Bromomethane	0.0031
2-Butanone	0.025
Carbon disulfide	0.010
Chloroethane	0.0025
Chloromethane	0.015
Ethylbenzene	0.024
Formaldehyde	140
n-Hexane	0.064
Isooctane	0.00020
Methylene chloride	0.00017
Phenol	0.00
Styrene	0.0035
Toluene	0.040
m-/p-Xylene	0.12
o-Xylene	0.036
Total volatile HAPs	140

^a Uncontrolled emissions from plant producing 200,000 tons of hot mix asphalt per year. Includes emissions from an oil-fired hot oil heater. All of the calculated PAH emissions and almost all of the formaldehyde emissions are from the oil-fired hot oil heater.

TABLE 12. ESTIMATED ANNUAL YARD VOC EMISSIONS FOR TYPICAL BATCH MIX AND DRUM MIX HMA PLANTS^a

	Batch mix ^b	Drum mix ^c
Pollutant	Emissions, lb/yr	
Criteria Pollutants		
PM-10	ND	ND
VOC	110	220
CO	36	72
PAHs (semi-volatile HAPs)	ND	ND
Other semi-volatile HAPs		
Phenol	0.00	0.00
Volatile HAPs		
Benzene	0.057	0.11
Bromomethane	0.011	0.021
2-Butanone	0.054	0.11
Carbon disulfide	0.014	0.029
Chloroethane	0.00023	0.0046
Chloromethane	0.017	0.033
Cumene	0.12	0.24
Ethylbenzene	0.31	0.62
Formaldehyde	0.10	0.19
n-Hexane	0.17	0.33
Isooctane	0.0020	0.0040
Methylene chloride	0.00	0.00
Styrene	0.0080	0.016
Tetrachloroethene	0.0085	0.017
Toluene	0.23	0.46
Trichlorofluoromethane	0.0014	0.0029
m-/p-Xylene	0.45	0.90
o-Xylene	0.088	0.18
Total volatile HAPs	1.6	3.3

^a Fugitive VOC emissions from loaded haul truck for eight minutes after completion of load-out.

^b Uncontrolled emissions from plant producing 100,000 tons of hot mix asphalt per year.

^c Uncontrolled emissions from plant producing 200,000 tons of hot mix asphalt per year.

APPENDIX A

AP-42 Section 11.1
Hot Mix Asphalt Plants

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APPENDIX B

Emission Factor Documentation for AP-42 Section 11.1
Hot Mix Asphalt Production

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APPENDIX C

Chapter 3:
Preferred and Alternative Methods for Estimating
Air Emissions from Hot Mix Asphalt Plants
Emission Inventory Improvement Program (EIIP)
July 1996

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TECHNICAL REPORT DATA

(Please read Instructions on reverse before completing)

1. REPORT NO. EPA-454/R-00-019		2.	3. RECIPIENT'S ACCESSION NO.	
4. TITLE AND SUBTITLE Hot Mix Asphalt Plants Emission Assessment Report			5. REPORT DATE December 2000	
			6. PERFORMING ORGANIZATION CODE	
7. AUTHOR(S) Ron Myers (EPA) Brian Shrager (MRI) Gary Brooks (ERG)			8. PERFORMING ORGANIZATION REPORT NO.	
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Environmental Protection Agency Office of Air Quality Planning and Standards Research Triangle Park, NC 27711			10. PROGRAM ELEMENT NO.	
			11. CONTRACT/GRANT NO. 68D-98-027 (MRI) 68-D7-0068 (ERG)	
12. SPONSORING AGENCY NAME AND ADDRESS Office of Air Quality Planning and Standards Office of Air and Radiation U.S. Environmental Protection Agency Research Triangle Park, NC 27711			13. TYPE OF REPORT AND PERIOD COVERED	
			14. SPONSORING AGENCY CODE EPA/200/04	
15. SUPPLEMENTARY NOTES				
16. ABSTRACT The United States Environmental Protection Agency (EPA) Emission Factors and Inventory Group (EFIG) is investigating the Hot Mix Asphalt industry to identify and quantify criteria and hazardous air pollutants (HAP's) emitted from kiln stacks, transport truck loading and silo filling. EFIG obtained over 300 emission tests from kiln stacks that characterize emissions of criteria pollutants and hazardous air pollutants' emissions. EFIG requested that EPA's Emission Measurement Center (EMC) conduct the required testing of the transport truck and silo filling operations. Under separate EPA contracts, Midwest Research Institute (MRI) and Pacific Environmental Services (PES) performed two emissions tests. The primary objective of the testing program was to characterize uncontrolled emissions of the criteria pollutants particulate matter (PM) and total hydrocarbons (THC) and emissions of volatile and semi-volatile organic HAP's including polycyclic organic matter, phenol, benzene, toluene, xylene, ethyl benzene, 2-butanone, cumene, formaldehyde, hexane, isooctane and others. The results of the two test reports and responses to comments on these test reports are covered in separate EPA reports (EPA 454/R-00-024, EPA 454/R-00-025 (a through h), EPA 454/R-00-026, EPA 454/R-00-027, EPA 454/R-00-028 and EPA 454/R-00-029). This document characterizes hot mix asphalt plant operations, summarizes emissions from the typical batch mix and drum mix plants, presents emission factors specifically developed for hot mix asphalt plants and presents analyses used to develop the emission factors developed and presents information needed to inventory the emissions at hot mix asphalt plants.				
17. KEY WORDS AND DOCUMENT ANALYSIS				
a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS		c. COSATI Field/Group
		Air Pollution control		
18. DISTRIBUTION STATEMENT Release Unlimited		19. SECURITY CLASS (Report) Unclassified		21. NO. OF PAGES 592
		20. SECURITY CLASS (Page) Unclassified		22. PRICE

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Kelly VanMarter

From: Claudia Capos <capocomm@sbcglobal.net>
Sent: Thursday, December 2, 2021 2:57 PM
To: Mike Archinal
Cc: Jim Mortensen; tcroft; JeanLedford; Diana Lowe; Bill Rogers; Robin Hunt; Polly; Kelly VanMarter
Subject: Re: FW: Please VOTE NO on proposed asphalt plant

Mr. Archinal,

Thank you for forwarding my comments to the board trustees. I would like to draw your attention to an EPA report detailing the estimated amount of annual emissions from asphalt facilities. These emissions include many hazardous air pollutants and criteria air pollutants. The EPA recommends NOT locating such facilities anywhere near populated areas. Here is the link to the report:

<https://www3.epa.gov/ttnchie1/ap42/ch11/related/ea-report.pdf>

Thank you.

Claudia Capos

On 12/2/2021 12:22 PM, Mike Archinal wrote:

> Ms. Capos,

>

> Thank you for your comments regarding the proposed Capital Asphalt project. I have forwarded your email to the Township Board of Trustees.

>

> Best regards,

>

>

> Michael Archinal, AICP

> Township Manager

> Genoa Charter Township

> 2911 Dorr Road

> Brighton MI, 48116

> mike@genoa.org

>

>

>

> -----Original Message-----

> From: Claudia Capos <capocomm@sbcglobal.net>

> Sent: Wednesday, December 1, 2021 10:59 AM

> To: Mike Archinal <Mike@genoa.org>

> Cc: Polly <pskolarus@genoa.org>; Robin Hunt <Robin@genoa.org>; Jean

> Ledford <Jean@genoa.org>; Terry Croft <Terry@genoa.org>; Diana Lowe

> <diana@genoa.org>; Jim Mortensen <Jim@genoa.org>; Bill Rogers

> <Bill@genoa.org>

> Subject: Please VOTE NO on proposed asphalt plant

>

> Dear Mr. Archinal and board members,

>

> I am writing to you as a long-time Livingston County resident and school supporter to express my concern about the possible deleterious health impacts on area schoolchildren, teachers and staff if a proposed asphalt plant is allowed to be constructed on the outskirts of Howell.

>

> The toxic pollution and possible water contamination from such a plant would be a blight on the Howell-Brighton residential community and pose a danger to all residents, including the most vulnerable -- our children and the elderly. The site's proximity to Walmart, Cleary University, shopping centers, restaurants, and new housing developments would be detrimental to local businesses and an important educational institution.

>

> The dust and fumes could travel for miles in every direction once they became airborne. Residents' lives, health, and property values would be hard-hit by the pollution. Two other townships (Hamburg and Tyrone) have already rejected this proposed plant in their jurisdiction.

>

> I urge you to VOTE NO on the proposal for this asphalt plant and to keep our community safe and livable.

>

> Thank you.

>

> Sincerely,

>

> Claudia Capos

>

>

>

Kelly VanMarter

From: Tracy Poremba <tap1231@gmail.com>
Sent: Thursday, December 2, 2021 6:32 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Toxic Asphalt

To whom it may concern...

I am unable to attend the meeting but I AM COMPLETELY AGAINST the approval of this factory/dumping ground!

Sincerely
Tracy Tomasso
Livingston County Resident since 2008

Sent from my iPhone

Kelly VanMarter

From: Stephanie Raupp <steph.raupp@gmail.com>
Sent: Thursday, December 2, 2021 2:35 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Opposed to re-zoning and asphalt plant

Hello all,

Due to other commitments, I don't think I will be able to attend the meeting on Monday 12/6.

My husband and I are very much against the re-zoning and approval for the Asphalt Plant in Genoa Township. Which of your goals and objectives does this hit?? It seems in opposition to ALL of your long-term goals for the township. This area is far too populated as well as being directly upwind from Lake Chemung as well as several other wetlands and small freshwater lakes. Lake Chemung is a critical migratory bird lake and an asphalt plant like this would disrupt and pollute the entire area. This sort of plant should be in a more rural environment, away from major freshwater and certainly away from neighborhoods and schools.

On a personal note, we have sunk our financial assets into a home on Lake Chemung and we love the wildlife and watersports. Lake Chemung is one of the crown jewels of this county and certainly of Genoa Township. Can you imagine floating on your pontoon in the lake with Asphalt fumes in the air??!!? This plant will drive away businesses, and residents, hurting the environment as well as home-owners. Please do NOT re-zone and do NOT approve of this plant.

Thank you,
-Stephanie Raupp
610 Black Oaks Trail

Kelly VanMarter

From: Kimberly Schroeder <kmsrn12@hotmail.com>
Sent: Thursday, December 2, 2021 2:36 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Re-zoning for Asphalt Facility

Good Afternoon,

I am writing to express my emphatic opposition to the preposed re-zoning to build the asphalt facility.

The industrial emissions of harmful carcinogenic toxins that will be released as a result, will compromise the integrity of the quality of the air that we will be breathing and will have severe environmental consequences and be hazardous and detrimental to public health and safety.

Furthermore, a study performed by Blue Ridge Environmental Defense league was brought to my attention. This study shows that having an asphalt plant nearby negatively affects property values by as much as 56%. As property owner, plummeting values would not only be a financial hardship to myself and others to endure, but would be a burden to live near.

There are numerous people in my neighborhood alone that share my concerns and opposition and have even expressed their plans to move out of the area if this plant is indeed built. I sincerely hope you take this under consideration.

Sincerely,
Kimberly Schroeder
4976 Oak Bluff Drive
Howell, Mi 48843
734-589-3329

Sent from my iPhone

Kelly VanMarter

From: Ronnie Harrow <ronniemharrow@gmail.com>
Sent: Friday, December 3, 2021 12:29 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Proposed Asphalt Plant in Howell

I am writing this email to let you know of my opposition to the proposed asphalt plant. I am afraid that having this plant in our community could pose significant health risks to residents. As a homeowner in Genoa Township, I also believe that the construction of this plant will have a negative impact on home values. For these reasons, I strongly encourage you to vote NO to the construction of a plant by Capital Asphalt in our area.

Thank you for your consideration.

Ronnie M. Harrow
1908 Genoa Circle
Howell, Michigan 48843

Kelly VanMarter

From: Kyle Hierholzer <kylehierholzer@icloud.com>
Sent: Friday, December 3, 2021 5:50 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant

Genoa Township Planning Commission,

Please do not allow Capital Asphalt permission to build a toxic asphalt plant in Genoa Township!

As you all know, this type of plant emits toxic fume plumes that travel for miles and will negatively impact the health of Genoa Township residents, employees who work in the area, customers who shop in the area, students in nearby schools (Three Fires and Cleary University), hospitals, restaurants and even people driving through our community, as well as wildlife and recreation facilities. Who would want to visit or shop in Genoa Township, if there are toxic fumes being spewed from huge smokestacks? Residential home values will also plummet. Who would want to buy a home within this toxic bubble?

There are several personal and professional ties to the current owner of the property and those on the planning commission which it at the very least a conflict of interest. This is very troubling on many levels. Approving this plan would not be beneficial to the residents of Genoa Township, except for those who are selling the property. Stop playing favorites and stop the back room deals.

This type of plant does not belong in Genoa Township.

Kelly VanMarter

From: Morgan Parkinson <morganrparkinson@gmail.com>
Sent: Friday, December 3, 2021 3:25 PM
To: Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Kelly VanMarter; Diana Lowe; Bill Rogers; Polly
Subject: Genoa Township Board of Trustees Regarding Capital Asphalt Building here

Hello,

I am a resident of Genoa Township at 2471 Wellington Drive and am unable to make it to the meeting to vote on the building of Capital Asphalt building in our township. I wanted to make it known that I OPPOSE the plant being built.

Thank you,

A concerned citizen,

Morgan Parkinson

From: [Nichol Stanley](#)
To: [Amy Ruthig](#)
Subject: Asphalt company
Date: Friday, December 3, 2021 1:41:17 PM

The poisonous gasses that these companies release into the air we breathe. Think about all of the people that live in this area. Would you like one of your loved ones living within a mile of this??!? I think not!

Please don't allow this to happen!

Nichol

Kelly VanMarter

From: jasonhassell@sbcglobal.net <natalie_hassell2000@yahoo.com>
Sent: Saturday, December 4, 2021 1:57 PM
To: Kelly VanMarter
Subject: NO!! ASPHALT PLANT

Hi Kelly,

We are unable to join you at your board meeting on Monday 12/06/21, but we are writing to plead with you all to stop this asphalt plant from being built in our backyard.

We are surrounded by pristine lakes and streams with gorgeous rolling forestry living among our countless animal friends and we cannot and will not have it ruined by a company raping our land for a buck.

Please let me know if additional information is required to help ensure our collective, unified voices are heard.

Thank you,

Jason, Natalie & Kennedy Hassell

[Sent from Yahoo Mail on Android](#)

From: [Michael Perrin](#)
To: [Mike Archinal](#); [Kelly VanMarter](#); [Amy Ruthig](#); [Kathleen Murphy](#)
Subject: Vote "No" on Asphalt Plant
Date: Saturday, December 4, 2021 10:28:40 PM

Genoa Township Board of Trustees,

I am writing to you today to implore you not to permit the proposed Asphalt Plant on the North Side of I-96. There are many reasons for you to not let this proposal pass, including the unregulated toxicity, potential health issues, and the lack of jobs it will actually create.

According to the U.S. Environmental Protection Agency (EPA), Asphalt plants produce particulate matter (PM) and various gaseous toxins. These toxins include, but are not limited to, sulfur dioxide, nitrogen oxides, carbon monoxide, and volatile organic compounds (VOC)¹. These are all extreme pollutants that are not regulated, and you should not allow our community to be harmed by them. They harm the environment by entering water sources, which then contaminates lakes and crops.

These toxins also harm health. They enter our systems and cause cancer, respiratory distress, gastrointestinal illnesses, increased suicide rates, and even death². To me, this does not seem like a good trade off. If you, for even a second, value profit over your constituents lives, then you do not deserve to serve in your position.

The draw of jobs is not as strong as you might think, either. The plant will likely only create 3-5 jobs, and some of those will be seasonal, due to the plant shutting down in the colder months.

I thank you for your understanding, and I know you will make the right choice.

Sincerely,

Michael Perrin

Source One: <https://www3.epa.gov/ttnchie1/ap42/ch11/related/ea-report.pdf>

Source Two:

<https://www.atsdr.cdc.gov/HAC/pha/APACCarolinaIncandAssociatedAsphaltInc/APAC%20Carolina%20Inc.&%20Associated%20Asphalt%20Inc.%20HC%202-14-07.pdf>

From: [Michael Perrin](#)
To: [Kathleen Murphy](#); [Amy Ruthig](#); [Kelly VanMarter](#); [Mike Archinal](#)
Subject: NO to Asphalt Plant
Date: Saturday, December 4, 2021 10:25:49 PM

Genoa Township Board of Trustees,

I am writing to you today to implore you not to permit the proposed Asphalt Plant on the North Side of I-96. There are many reasons for you to not let this proposal pass, including the unregulated toxicity, potential health issues, and the lack of jobs it will actually create.

According to the U.S. Environmental Protection Agency (EPA), Asphalt plants produce particulate matter (PM) and various gaseous toxins. These toxins include, but are not limited to, sulfur dioxide, nitrogen oxides, carbon monoxide, and volatile organic compounds (VOC)¹. These are all extreme pollutants that are not regulated, and you should not allow our community to be harmed by them. They harm the environment by entering water sources, which then contaminates lakes and crops.

These toxins also harm health. They enter our systems and cause cancer, respiratory distress, gastrointestinal illnesses, increased suicide rates, and even death². To me, this does not seem like a good trade off. If you, for even a second, value profit over your constituents lives, then you do not deserve to serve in your position.

The draw of jobs is not as strong as you might think, either. The plant will likely only create 3-5 jobs, and some of those will be seasonal, due to the plant shutting down in the colder months.

I thank you for your understanding, and I know you will make the right choice.

Sincerely,

Lissa Perrin

Source One: <https://www3.epa.gov/ttnchie1/ap42/ch11/related/ea-report.pdf>

Source Two:

<https://www.atsdr.cdc.gov/HAC/pha/APACCarolinaIncandAssociatedAsphaltInc/APAC%20Carolina%20Inc.&%20Associated%20Asphalt%20Inc.%20HC%202-14-07.pdf>

From: [Dana Sleder](#)
To: [Kathleen Murphy](#); [Mike Archinal](#); [Kelly VanMarter](#); [Amy Ruthig](#)
Subject: Asphalt Plant Proposed for Genoa Township
Date: Saturday, December 4, 2021 11:37:56 PM

Genoa Township Board of Trustees,

I am writing to you today to implore you not to permit the proposed Asphalt Plant on the North Side of I-96. There are many reasons for you to not let this proposal pass, including the unregulated toxicity, potential health issues, and the lack of jobs it will actually create.

According to the U.S. Environmental Protection Agency (EPA), Asphalt plants produce particulate matter (PM) and various gaseous toxins. These toxins include, but are not limited to, sulfur dioxide, nitrogen oxides, carbon monoxide, and volatile organic compounds (VOC)¹. These are all extreme pollutants that are not regulated, and you should not allow our community to be harmed by them. They harm the environment by entering water sources, which then contaminates lakes and crops.

These toxins also harm health. They enter our systems and cause cancer, respiratory distress, gastrointestinal illnesses, increased suicide rates, and even death². To me, this does not seem like a good trade off. If you, for even a second, value profit over your constituents lives, then you do not deserve to serve in your position.

The draw of jobs is not as strong as you might think, either. The plant will likely only create 3-5 jobs, and some of those will be seasonal, due to the plant shutting down in the colder months.

I thank you for your understanding, and I know you will make the right choice.

Sincerely,
Dana Sleder

Source One: <https://www3.epa.gov/ttnchie1/ap42/ch11/related/ea-report.pdf>

Source Two:

<https://www.atsdr.cdc.gov/HAC/pha/APACarolinaIncandAssociatedAsphaltInc/APAC%20Carolina%20Inc.&%20Associated%20Asphalt%20Inc.%20HC%202-14-07.pdf>

From: Leah Sleder
To: Amy Ruthig; Kathleen Murphy; Kelly VanMarter; Mike Archinal
Cc: Crystal Carder; MOLLY PERRIN
Subject: Asphalt Plant Proposed for Genoa Township
Date: Saturday, December 4, 2021 11:07:59 PM

Genoa Township Board of Trustees,

I am writing to you today to implore you not to permit the proposed Asphalt Plant on the North Side of I-96. There are many reasons for you to not let this proposal pass, including the unregulated toxicity, potential health issues, and the lack of jobs it will actually create.

According to the U.S. Environmental Protection Agency (EPA), Asphalt plants produce particulate matter (PM) and various gaseous toxins. These toxins include, but are not limited to, sulfur dioxide, nitrogen oxides, carbon monoxide, and volatile organic compounds (VOC)¹. These are all extreme pollutants that are not regulated, and you should not allow our community to be harmed by them. They harm the environment by entering water sources, which then contaminates lakes and crops.

These toxins also harm health. They enter our systems and cause cancer, respiratory distress, gastrointestinal illnesses, increased suicide rates, and even death². To me, this does not seem like a good trade off. If you, for even a second, value profit over your constituents lives, then you do not deserve to serve in your position.

The draw of jobs is not as strong as you might think, either. The plant will likely only create 3-5 jobs, and some of those will be seasonal, due to the plant shutting down in the colder months.

I thank you for your understanding, and I know you will make the right choice.

Sincerely,
Leah Sleder

Source One: <https://www3.epa.gov/ttnchie1/ap42/ch11/related/ea-report.pdf>

Source Two:

<https://www.atsdr.cdc.gov/HAC/pha/APACCarolinaIncandAssociatedAsphaltInc/APAC%20Carolina%20Inc.&%20Associated%20Asphalt%20Inc.%20HC%202-14-07.pdf>

From: [Tom Sleder](#)
To: [Kathleen Murphy](#); [Mike Archinal](#); [Kelly VanMarter](#); [Amy Ruthig](#)
Subject: Asphalt Plant Proposed for Genoa Township
Date: Saturday, December 4, 2021 11:31:49 PM

Genoa Township Board of Trustees,

I am writing to you today to implore you not to permit the proposed Asphalt Plant on the North Side of I-96. There are many reasons for you to not let this proposal pass, including the unregulated toxicity, potential health issues, and the lack of jobs it will actually create.

According to the U.S. Environmental Protection Agency (EPA), Asphalt plants produce particulate matter (PM) and various gaseous toxins. These toxins include, but are not limited to, sulfur dioxide, nitrogen oxides, carbon monoxide, and volatile organic compounds (VOC)¹. These are all extreme pollutants that are not regulated, and you should not allow our community to be harmed by them. They harm the environment by entering water sources, which then contaminates lakes and crops.

These toxins also harm health. They enter our systems and cause cancer, respiratory distress, gastrointestinal illnesses, increased suicide rates, and even death². To me, this does not seem like a good trade off.

The draw of jobs is not as strong as you might think, either. The plant will likely only create 3-5 jobs, and some of those will be seasonal, due to the plant shutting down in the colder months.

I thank you for your understanding, and I know you will make the right choice.

Sincerely,
Tom Sleder

Source One: <https://www3.epa.gov/ttnchie1/ap42/ch11/related/ea-report.pdf>

Source Two:

<https://www.atsdr.cdc.gov/HAC/pha/APACCarolinaIncandAssociatedAsphaltInc/APAC%20Carolina%20Inc.&%20Associated%20Asphalt%20Inc.%20HC%20-14-07.pdf>

Polly

From: Todd Smith <tsmith@laurexrealestate.com>
Sent: Saturday, December 4, 2021 8:15 PM
To: Robin Hunt; JeanLedford; Jim Mortensen; Diana Lowe; Terry Croft; Polly; Joe Seward
Subject: Last email I promise!

I don't envy any of the board on this upcoming Mondays meeting for the Asphalt Plant. I appreciate your patience with my emails. I wanted to point out a few items ahead of the meeting so everyone can have an idea on what is going to be put out there during the public hearing. As you can imagine the board may have to schedule the hearing at a facility that will be able to handle the amount of crowds for the public input. Internally, it is a fair question to raise on how this was advanced to the Board without following the due process as required.

I have been made aware that the township planning commission made recommendation only as to the zoning overlay. In talking with a few of the planning members they did not realize that someone at township was going to try to ram thru the PUD/PID agreement and impact assessment without their input. Most of them were under the impression that a denial or use restrictions could be placed n the development reducing the 86' silo, the above ground tanks, require them to address odors in the impact statement etc

Therefore, I don't even believe that the Township Board can hear or take public comment of the remaining items prior to planning commission's recommendation!

I think the easiest way to even start the meeting would be to deny or table the public hearing as the applicant has not finished with the required reviews of the township boards. Specifically, Kelly points out in section C of her review to the board the following.

" C. Process

The review and approval process is outlined below. The applicant is at Step 1 in the process.

1. The Township Planning Commission makes a recommendation to the Township Board on the rezoning (PID overlay), conceptual PUD plan, draft PUD Agreement and Environmental Impact Assessment following a public hearing.
2. The County Planning Commission reviews the rezoning and provides comments for consideration by the Township Board.
3. The Township Board acts on the rezoning, conceptual PUD plan, PUD Agreement and Impact Assessment."

As correctly spelled out, the townships Planning commission must review and make a recommendation to the board not just for the zoning request, but also the pud plan, the actual pud agreement and the impact statement. This has not been done! Again I will publicly ask who has decided to put this in front of the board despite the ordinance review requirements.

I have pointed out in my other emails that the remaining items of review would not meet with township standards or desires.

It is my hope that all of you would again agree that this is not anyway a good vision or development for the township and would ask prior to opening of the public hearing that a motion is made to not hear the application and refer it back to the planning commission as required. Your residents will applaud your action to stop this project with the appearance of special interests at play.

Thank you and I again I know how much of a difficult position everyone is facing.

Todd Smith

December 2, 2021

Dear Honorable Board Members
Genoa Charter Township
Livingston County, Michigan

Dear Members:

I am writing you in regards to an item that is on your agenda for December 6th, specifically the Rezoning and PUD/PID agreement for a proposed Asphalt Plant.

I was very surprised to learn that this use and item has gotten this far in the approval process. While I have been removed from local politics in the Township over the past few years, over 20 years that I had served the township would have never contemplated such a use with such drastic variances from its vision and values.

Before I address specifics, I would like to point out that the Planning commission recommended the rezoning to you without the knowledge that you would be approving a PUD agreement which allows for 86' high Silo and variances to buffer zones and additional above ground storage. This Language was negotiated after their meeting and they had no input into this. For that matter who did have input into the language and under whose direction? Therefore, their recommendation should only be considered as to the desire to have a zoning overlay that can be site planned and negotiated to the Townships benefit. In speaking to many of the members they were under the impression that they could later **not approve** the added height and other items so they solely looked at a zoning overlay.

To begin with the items that are of Concern:

1. The qualification for a PUD/PID to apply is that it is 20 acres in size However, The township **MAY** consider 15 acres if it is serviced with Sanitary Sewer and Water. The ordinance states the Township **MAY**, not must, shall or be required to grant. Therefore on the face of the application for rezoning, it is within the Townships Board purview to **Deny** this request.

Understanding that the PUD/PID Overlay provides the Township Boards with much flexibility, I can understand the desire to use the overlay provisions to ultimately benefit the Township, its Local Businesses and most importantly its Residents. I would ask that you consider if this proposed use in any way shape or form benefits any of the Residents, our Businesses, Our Image or the Township as a whole.

I would say that this meets neither the needs nor goals as long laid out for the township and are reflective of the residents who are proud to call Genoa Township their Home. Unless of course you

think an 86' tall Silo as our main view from the Freeway furthers our community and to run the risk of offensive Odors at your doorstep each day when you get home.

Therefore, I do not want to go into much more drastic details and littered throughout the application and the review by the Township of the many errors. I am sure each of you will catch many of their inaccuracies or vague responses/ information. I would suggest the following resolutions as a result of the Meeting on Monday December 6, 2021

Moved by _____, Supported by _____ to Deny and Not adopt Ordinance No. Z-21- 02.

This denial is made because the proposed amendment to the Zoning Map and reclassification as a Planned Industrial District (PID)

1. The application does not meet with the existing zoning and use standards in the area
2. The related development agreement is deficient as to environment concerns including odors.
3. The development agreement does not provide for necessary assurances to the Township that a development shall meet any and all existing building and use restrictions including setbacks, height requirements and to promote the health safety of the residents of Genoa Charter Township that exist on the date of this request

Moved by _____ Supported by: _____ to Deny the Impact Statement

1. The Impact statement is **FALSE** as it states in section E
"The proposed use depicted on the development plan is consistent with existing development in the area and is consistent with the long-term planning within the township"

This proposed use is **NOT** consistent with existing development anywhere in this area or this county for that matter

The Impact agreement addresses sound and lighting but does not address Odors which has historically been the largest complaint of residents across the nation near Asphalt Plants. Further the Impact Statement provides that applicant will only ADDRESS Odors AFTER they become a problem.

2. Failure to provide a Traffic Study of over 750 Asphalt Trucks and their interaction with existing traffic patterns in or around Genoa Townships premier Retail locations.

Moved by _____, Supported by _____ to Deny Conceptual PUD Plan

1. The proposed site plan shows buildings and Silos that do not conform to any existing zoning ordinance provision in both Height and Setback
2. Additional Above Grade Storage tanks in excess of what are permitted
3. Site plan does not meet buffer requirements as provided within Genoa Townships ordinances.

Finally The interpretation of Sections 10.07.01 and 22.04 is incorrect and does not meet with the long standing planning goals of Genoa Charter Township. stating that all development shall with the related development agreement, impact assessment and conceptual plan has been found to comply with the qualifying conditions and the criteria stated in Sections 10.07.01 and 22.04 of the Township Zoning Ordinance

I appreciate the Township Board has many difficult and in some cases contentious decisions to make in regards to this application. It is my hope that just because the existing use on the site which is an eyesore and the owner is unwilling to repair, clean or to generally take care of his property, the township approves a use that will have long term detrimental impacts to the Entire Township and its residents.

Sincerely

A handwritten signature in black ink, appearing to read 'Todd Smith', written over a horizontal line.

Todd Smith
1132 Chemung
Howell, MI 48843

248-207-8042

Kelly VanMarter

From: Jamie Zachar <deibel1012@gmail.com>
Sent: Saturday, December 4, 2021 2:17 PM
To: Bill Rogers; Polly; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter; Robin Hunt
Subject: Proposed Asphalt Plant

Hello,

My wife and 2 kids live in Howell in a neighborhood off of Latson Rd near Grand River. We are concerned about the Proposed Asphalt Plant it be built nearby. We believe that it would be bad for our community in that location. The smell would also be a concern and can cause health concerns for people with asthma. Also it can reduce home values in all surrounding areas. Please keep this in mind while making your decision.

Thanks,

Michael Deibel

Kelly VanMarter

From: Dana Balogh <dana.balogh@live.com>
Sent: Sunday, December 5, 2021 9:37 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Keep the Asphalt Plant out of Genoa Twp!

Good evening,

Your mailboxes are flooded, residents are outraged, and this entire plan reeks long before a single furnace vents this pollution into our community.

I'll keep this short and simple, my family moved to Genoa because of what this township is all about: "a charter township located in the heart of Livingston County, Michigan. Lakes and wetlands, rolling hills and meadows, state parks and wildlife all abound in this beautiful community of country living." (<https://www.genoa.org/>)

If we are truly the HEART of Livingston County, do not allow this corporation to deteriorate what makes this township beautiful. This proposal provides no value to the people of this township and we are asking that you protect us and the health of our children for years to come.

Thank you for your support,
Tim and Dana Balogh, residents of Genoa Twp & parents of two
(248)701-7526

Kelly VanMarter

From: Laura Bickel <laurabickel365@gmail.com>
Sent: Sunday, December 5, 2021 10:59 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Capital Asphalt plant

Hey Folks,

As a new member of this community, I want to share the same sentiment I had when my previous property was threatened by the proposal of the Capital Asphalt plant.

As a home owner and tax payer in Genoa Township, this plant will have measurable affect on our health and property values. Asphalt plants are allowed to emit tons of hazardous air pollutants every year which include; Carbon monoxide, lead, particulates, sulfur dioxide, nitrogen oxide, benzene, toluene, ethylbenzene, and Xylene to name a few.

The increase of air quality issues from emissions, noise, dust, truck traffic and asphalt odors do not need to be taking place near farms and residential areas. Please do not approve this plan for such a dirty industry in these areas. This is not an industry which will have positive impact for either Genoa Township or the surrounding communities.

Respectfully,
Laura Bickel
7714 Gunnison Court
Brighton, MI 48114

Kelly VanMarter

From: Eda Biegas <ebiegas@hotmail.com>
Sent: Sunday, December 5, 2021 4:30 PM
To: Bill Rogers; poly@genoa.org; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Say no to the Asphalt plant!

This is wrong for our community on so many levels. Allowing this to go forward would be a great betrayal to the voters who elected you.

The health and wellbeing of Genoa Township residents should be the number one obligation of our elected officials. Do right by the residents of Genoa Township and vote no on rezoning keeping the asphalt plant and all it's toxins and smells away from Genoa Township.

Eda Biegas

1950 Genoa Circle Howell 48843

[Outlook for Android](#)

Kelly VanMarter

From: C Lo <chrispy1332@gmail.com>
Sent: Sunday, December 5, 2021 7:52 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Please do not approve the Asphalt Plant

Dear Genoa Township Board Members,

My wife and I are moving into the township. We chose Genoa to build our final retirement home. I agree that there is a need for Asphalt for roads and its uses. The issue is contamination in a populated area.

Plants such as these should be constructed in settings away from populated areas for obvious reasons.

Please work toward a responsible solution. Have your community in mind....

Thank you

Kelly VanMarter

From: Dawn <dcondon@comcast.net>
Sent: Sunday, December 5, 2021 9:06 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Re: December 6th Meeting_Capital Gas
Attachments: 04-15-21_Proposed_Rezoning_and_Construction_of_a_Hot-Mix_Asphalt+Plant_An_Overview_of+Relevant_Risks_v1.0.pdf

Good evening,

As a follow up before the meeting, below is a link of residents still fighting after 4 years of an asphalt plant being allowed near a residential area. If you do a search, there's several articles pertaining to this issue. Is this really something you want to do to the residents you represent?

There are several of us that will be requesting a motion to deny. It's extremely clear when reaching out to a member of the planning commission a comment was made to reach out to x for more information. I personally feel if you are voting in favor, then you should be able to answer a basic question. If the eyesore of the existing property hasn't been addressed, then how in good faith can anyone imply they'd address further issues down the line with the Asphalt plant. I honestly believe the proper research, thorough investigation into the ramifications was not completed. This situation shouldn't be at your doorstep to deal with as all the necessary information for the vote wasn't present by Capital Asphalt to begin with.

Thank you again for your time, looking forward to seeing you all tomorrow evening.

<https://www.chicagotribune.com/news/environment/ct-environmental-justice-mckinley-park-asphalt-plant-20210528-bc352axgnzbqtlxf4yw6tj64nu-story.html>

Dawn

On Nov 30, 2021, at 8:59 AM, Dawn <dcondon@comcast.net> wrote:

Good morning,

I am president of our HOA Board for Rolling Ridge I, a resident as well as owning another home (both residences within 1.5-2 miles of this proposed location.) I as well as some of our residents will be in attendance for the December 6th meeting, however wanted to have this research report recorded. I do understand we are further along in the process than Tyrone was at the completion of their report but the documentation and effects remain the same. As it was completed less than a year ago, within our county and Capital Gas was also the proposed site occupier, the research and information were completed by environmental consultants in the asphalt industry, toxicologists and engineers.

Livingston County already has several asphalt plants operating at less than 50% capacity. The demand does not warrant another location within the county, especially our township. If you have passed by their location in Lansing in warm months, you are

very aware of the odors emitted. The difference between Lansing and our location is that it is in an industrial area near an auto plant. This asphalt plant can decrease our home values, create toxic fumes as well as increase the traffic in an area already that already has several accidents.

Unfortunately, during the planning meeting, my kids contracted Covid and I could not attend, I obviously deeply regret this after seeing it was approved. I am concerned that this was approved without extreme research into the effects of running such a plant. Hopefully after reading the attached report, you will understand negative effects allowing Capital to move into our township. While I understand the existing business technically isn't any better for our community, they are not emitting toxic fumes endangering our residents/families.

Thank you for taking the time to read my correspondence as well as the research report.

Regards,

Dawn Condon

3466 Snowden Lane

Howell, MI 48843

Kelly VanMarter

From: Kelly Dailey <kellycdailey@yahoo.com>
Sent: Sunday, December 5, 2021 6:38 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: 6 December Meeting

Good Evening,

Unfortunately, I will not be able to attend the meeting on 6 December.

As a resident of Genoa Township, I am writing this in regard to the Capital Asphalt plant. **I do not support this proposal.** There are many toxic chemicals used at these plants which will have a negative impact on our environment here in Howell. Everyone that is in Howell will be affected not just us here in Genoa Township. Health issues and property values are also a major concern for me. Destroying our farm and wetlands for an asphalt plant is the opposite of what we should be doing. We need to look at our future and preserve what we already have.

Thanks for listening to what I have to say.

Have a great day,

Kelly Dailey
399 Natanna Dr
Howell, MI 48843

Kelly VanMarter

From: Joel Duchesne <joelduchesne1@gmail.com>
Sent: Sunday, December 5, 2021 7:26 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant rezoning

Ladies and gentlemen:

Please do not approve rezoning of the area west of Latson and north of I-96 to allow for an asphalt processing plant. I live less than 5 miles from the proposed site and have 3 children ages 5, 3, and 1 that attend daycare / preschool at a facility less than 1 mile from the proposed site. This facility would be detrimental to the health of the people of this community. Please, do not approve the rezoning that would allow this to happen. Because of my small children and the fact that my wife is a nurse at U of M, I will not be able to attend this meeting in person, but I am hoping that this email will serve as a way to express my thoughts. I hope that you will take into consideration the severe negative impact that this proposal could have on our community.

Sincerely,

Joel Duchesne

From: [Claire F](#)
To: [Mike Archinal](#); [Kelly VanMarter](#); [Amy Ruthig](#); [Kathleen Murphy](#)
Subject: Asphalt Plant
Date: Sunday, December 5, 2021 9:35:02 PM

Genoa Township Zoning Department,

Formaldehyde, hexane, phenol, polycyclic organic matter, and toluene are among the toxins released into the air by asphalt plants. These are not only harmful to the human body but also to the earth we inhabit. Asphalt plants also decrease property value. The presence of a plant nearby can decrease the values by as much as 56%.

The fumes listed above are known pollutants that do serious damage. Cancer, central nervous system problems, liver damage, respiratory problems and skin irritation are among the potential medical complications caused by asphalt plants. In one report, citizens reported their quality of life decreasing, the most common issue being higher blood pressure.

Not only that, but toxic emissions are not regulated. Most asphalt plants are not even tested for toxic emissions. Forty percent of the toxins from asphalt plants do not meet air quality standards. For the remaining 60% of these emissions, the state lacks sufficient data to determine safe levels. This makes it unsafe to have an asphalt plant near you.

Asphalt plants decrease property values. The presence of a plant nearby can decrease the value by as much as 56%. The toxic air emissions affect air quality within 1 mile of the plant; this can lead to a loss of up to \$4.25 million for the households within this area.

Asphalt plants are damaging to the community and should not be allowed in Genoa township. This will affect all the people living in this area and contribute to air pollution.

Thank you for your consideration

Sincerely Claire Flory

“Asphalt Plants - Chej.org.” *Children's Health* , <http://www.chej.org/wp-content/uploads/Asphalt-Plants-PUB-131.pdf>.

Currie, Janet, et al. “Environmental Health Risks and Housing Values: Evidence from 1,600 Toxic Plant Openings and Closings.” *The American Economic Review*, U.S. National Library of Medicine, Feb. 2015, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4847734/>.

From: [FLORY, DREW](#)
To: [Mike Archinal](#); [Kelly VanMarter](#); [Amy Ruthig](#); [Kathleen Murphy](#); [Crystal Carder](#)
Subject: Asphalt Plant
Date: Sunday, December 5, 2021 9:32:49 PM

Genoa Township Zoning Department,

Formaldehyde, hexane, phenol, polycyclic organic matter, and toluene are among the toxins released into the air by asphalt plants. These are not only harmful to the human body but also to the earth we inhabit. Asphalt plants also decrease property value. The presence of a plant nearby can decrease the values by as much as 56%.

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Asphalt plants decrease property values. The presence of a plant nearby can decrease the value by as much as 56%. The toxic air emissions affect air quality within 1 mile of the plant; this can lead to a loss of up to \$4.25 million for the households within this area.

Asphalt plants are damaging to the community and should not be allowed in Genoa township. This will affect all the people living in this area and contribute to air pollution.

Thank you for your consideration,

Sincerely,
Drew Flory

“Asphalt Plants - Chej.org.” *Children's Health* , <http://www.chej.org/wp-content/uploads/Asphalt-Plants-PUB-131.pdf>.

Currie, Janet, et al. “Environmental Health Risks and Housing Values: Evidence from 1,600 Toxic Plant Openings and Closings.” *The American Economic Review*, U.S. National Library of Medicine, Feb. 2015, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4847734/>.

From: [Kristen Flory](#)
To: [Mike Archinal](#); [Kelly VanMarter](#); [Amy Ruthig](#); [Kathleen Murphy](#)
Subject: Asphalt Plant
Date: Sunday, December 5, 2021 9:36:12 PM

Genoa Township Zoning Department,

Formaldehyde, hexane, phenol, polycyclic organic matter, and toluene are among the toxins released into the air by asphalt plants. These are not only harmful to the human body but also to the earth we inhabit. Asphalt plants also decrease property value. The presence of a plant nearby can decrease the values by as much as 56%.

The fumes listed above are known pollutants that do serious damage. Cancer, central nervous system problems, liver damage, respiratory problems and skin irritation are among the potential medical complications caused by asphalt plants. In one report, citizens reported their quality of life decreasing, the most common issue being higher blood pressure.

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Asphalt plants decrease property values. The presence of a plant nearby can decrease the value by as much as 56%. The toxic air emissions affect air quality within 1 mile of the plant; this can lead to a loss of up to \$4.25 million for the households within this area.

Asphalt plants are damaging to the community and should not be allowed in Genoa township. This will affect all the people living in this area and contribute to air pollution.

Thank you for your consideration

Sincerely Kristen Flory

“Asphalt Plants - Chej.org.” *Children's Health* , <http://www.chej.org/wp-content/uploads/Asphalt-Plants-PUB-131.pdf>.

Currie, Janet, et al. “Environmental Health Risks and Housing Values: Evidence from 1,600 Toxic Plant Openings and Closings.” *The American Economic Review*, U.S. National Library of Medicine, Feb. 2015, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4847734/>.

Kelly VanMarter

From: Denice Gillette <deni421@att.net>
Sent: Sunday, December 5, 2021 11:11 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt

Genoa Cit Council, I am writing to tell you I oppose this business being a part of my township and the city of Howell. I'm from the City 15 miles outside DETROIT AND ANY GIVEN DAY depending on the wind the smells and industrial dust became a terrible issue. We moved here to enjoy the small town feel and the community. Free from noise and traffic ect. I live on Chemung lake and the peace and quiet and nature are amazing. We do not need or want that disrupted by the foul smell from an asphalt plant. The impact is horrendous. Thankyou concerned citizen Denice C Gillette

Sent from my iPhone

Kelly VanMarter

From: Katie Greer <katie.s.greer@gmail.com>
Sent: Sunday, December 5, 2021 8:41 PM
To: Bill Rogers; diana@genoa.irg; Jean Ledford; Jim Mortensen; Kelly VanMarter; Polly; Robin Hunt; Terry Croft
Subject: No to asphalt plant, please!

Greetings,

I write as a resident of nearly twenty years close to the proposed asphalt plant location. I am incredibly dismayed that this is even a possibility—this area is highly residential, full of families, and we do not want this toxic plant anywhere near us. It will affect our home blue, our health, and the beautiful area we call home.

I urge you, please, to reject this proposal.

Katie Greer
1365 Callaway Ct

From: [John and Cheryl Judd](#)
To: [Bill Rogers](#); [Mike Archinal](#); [Kelly VanMarter](#); [Polly](#); [Mary Krencicki](#); [Sharon Stone-Francis](#); [Amy Ruthig](#)
Subject: Please VOTE NO on asphalt plant!!!
Date: Sunday, December 5, 2021 11:36:55 AM

We ask that you kindly forward this email to anyone we may have missed on this email, that has a vote in this matter.

We were very concerned to learn that Genoa Township is considering letting a toxic asphalt plant come to our neighborhoods. To say this is a huge health concern for our community is an understatement. This is not what we thought Genoa Township stands for.

We are perplexed as to why Genoa Township would consider this idea, after two other nearby townships defeated allowing this plant come to their neighborhoods.

We urge you to place a NO VOTE on the asphalt plant decision. Not only will property values plummet, more importantly, the health of our entire community is at stake. How many giant asphalt trucks per day would be traveling our roads?

We have read that sources of emissions from asphalt plants are neither regulated nor monitored, and depending on the size of the operation can release 300+ TONS of toxic air emissions annually. And even if it were regulated/monitored, more times than not these tests are flawed and grossly underestimate the public health risk to obtain their desired outcome.

We have a school where children are outside playing. The school athletics fields are used by thousands of children each year between football, baseball, soccer, track and cross country. To subject children to the toxins in the air emitted by this plant would be criminal.

We are assuming that at least some of you, if not all of you also live in Genoa Township and we are wondering why you would even consider having this in our township.

We implore you to please, please, please VOTE NO on the asphalt plant for Genoa Township.

Thank you, and again, please forward this email to all people at Genoa Township who have a vote on this subject. We are unable to be present at the meeting on Monday evening and submit this email as our opinion on the matter.

Sincerely,
Cheryl & John Judd
4686 Crooked Lake Road
Howell, MI 48843
810-599-0186

Kelly VanMarter

From: Kamil Suzie Kowalski <0622kowalski@gmail.com>
Sent: Sunday, December 5, 2021 5:53 PM
To: info; Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Board of trustees meeting 12/6/2021

Good evening,

My name is Suzanne Kowalski and I am a homeowner and resident of Genoa township. Since I will be out of state and unable to attend the meeting tomorrow on December 6th, I am emailing to voice not only my concerns but my opposition in the proposed re-zoning in efforts to build the asphalt facility. To keep this to the point my concerns are as follows;

The industrial emissions of harmful carcinogenic toxins that will be released as a result if rezoning is approved, will compromise the integrity of the quality of the air that we will be breathing for not only human beings but all the residents of the surrounding areas. In turn, effecting all creatures and the delicate ecosystems of the many near by lakes. This will have severe environmental consequences and be hazardous and detrimental to public health and safety.

I feel allocation of this new zoning can and will hinder beneficial future growth. The re-zoning of this plot of land that's proposed to be used in this intended manner, surely does not promote the highest and best use for the land that is on the doorstep of the immediate residential area. It is my understanding that the purpose of zoning is to segregate land uses that might be incompatible. In this specific location if re-zoning is granted and this intended plant is built it would in deed be incompatible. Erecting factories next to a residential community will have its many consequences and a negative impact on the quality of living in the area.

Furthermore, a study performed by Blue Ridge Environmental Defense league was brought to my attention. This study shows that having an asphalt plant nearby negatively affects property values by as much as 56%. As a property owner, plummeting values would not only be a financial hardship to myself and others to endure, but would be a burden to live near.

In addition to these concerns, I would like to know answers to the following questions;

With the increase of traffic and the many large trucks that will be frequently transporting materials to and from this facility combined with increased commuting traffic, How will the influx and flow of traffic will be resolved and mitigated as a result if this re-zoning is approved?

Aside from fires and the many more pollutants being released as a result of fires, what are all the other possible foreseeable risks and dangers that the stored onsite hazardous materials will have to the general public?

Supervisor Bill Rogers says the asphalt plant will approve the appearance of the proposed location. But I strongly feel that many large details were over looked. quality of life depends on this matter let alone the appearance -- especially when it comes to air quality. "Genoa Township is the charter township located in the heart of Livingston County, Michigan. Lakes and wetlands, rolling hills and meadows, state parks and wildlife all abound in this beautiful community of country living." This is what it states on the Genoa web site and what our township truly depicts as well as the image our community has always strived for. What part of an asphalt plant fits that description and depiction?

In regards to Mr. Rogers and his position, is it considered a conflict of interest since he has a close personal relationship with Bruce & Betsy Huntley and is advocating and indicated his support for Mr. Huntley, whom is the seller of the land and in turn has a special interest in seeing this asphalt plant continue ahead so his friend and supporter may get a payday for selling his land. As a citizen, registered voter and tax payer of this Township are we able to ask Mr. Rogers to excuse himself from this matter if it is a conflict of interest?

My final thoughts and question is directed towards our elected zoning board commission officials. Are you yourself okay with going into work everyday and being endlessly exposed to the mass discharge of extremely toxic contaminants and harmful gases that have been recognized by OSHA as cancer causing agents. Putting any financial gains as a priority, while sacrificing quality of life and health of yourself and others that have put their good faith in your hands, turning a blind eye to the outweighing and disastrous negative affects this approval would have?

If the factory is built it can certainly have some advantage. This can potentially Increase the economic growth and bring more job opportunity to local peoples. However, I believe it will do more harm than good especially in the proposed area.

Location is key and simply put, is not the location for this facility! This is something that needs to be in a remote area much further from residing families, largely populated regions, and bodies of water with thriving ecosystems. The awful effects that the factory would cause in it's proposed location is a matter we simply can not ignore.

Thank you for taking the time to read my concerns. I am looking forward to your response addressing my concerns and my questions.

Sincerely,
Suzanne Kowalski

Sent from my iPhone

Kelly VanMarter

From: Kayla Lerma <kaylamarielerma@gmail.com>
Sent: Sunday, December 5, 2021 3:00 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: rezoning for the asphalt plant

Hello,

My name is Kayla and I live in genoa township. I am a wife and mom of 3 little kids and when i heard that there could be the chance to have an asphalt plant in my literal backyard, I freaked out. Just so you know I am totally opposed to the idea here in genoa township as it is a very residential area full of families and businesses. I am afraid of what it would do to the housing market, the environment and health and well being of the people who already reside here. My kids just woke up from a nap so I can't write as long of an email stating why I am against this but I am. I wish they would look for a place where they wouldn't be affecting as many humans with their toxins - no matter how "careful" they are - most people put profit over the environment unfortunately. I don't like the traffic it would bring nor do I think it would benefit this township. It will be a detriment to all involved. PLEASE DO NOT allow the change in zoning for them.

Sincerely,
Kayla Lerma

From: [Gloria Moore](#)
To: [Mike Archinal](#); [Kelly VanMarter](#); [Amy Ruthig](#); [Kathleen Murphy](#)
Subject: asphalt plant
Date: Sunday, December 5, 2021 10:02:18 PM

It has come to my attention that you are voting Monday night on whether to allow an asphalt to be built approximately 1 mile west of Latson Road. I am a resident in a rural area not too far West of Latson Road in Howell. We absolutely do not want an asphalt plant in the area polluting our well water and our air. We don't want the increased traffic from asphalt trucks either. I implore you to vote no on permitting the plant to be built. Put people ahead of business profits.

Thank You,

Gloria Moore

Kelly VanMarter

From: Kaitlin Nye <nyekaitl@gmail.com>
Sent: Sunday, December 5, 2021 12:40 PM
Subject: Asphalt Plant

To Whom It May Concern,

My husband and I moved to Genoa Township 3 years ago and have loved being in the area ever since. We are expecting a child and looked forward to raising him in our home. However, upon learning of the townships plan to allow an asphalt plant into our community we will be forced to leave our home and the township as clearly our health and well being is not a priority.

Please reconsider this decision.

Thank you,

Kaitlin Nye

From: [PUPA, ISABELLA](#)
To: [Amy Ruthig](#); [Kathleen Murphy](#); [Kelly VanMarter](#); mike@geona.org
Subject: Genoa Township zoning department
Date: Sunday, December 5, 2021 7:34:45 PM

Dear Genoa Township board of trustees,
I am writing you this email to express my utmost concerns with putting in an asphalt plant in Genoa Township. Asphalt plants produce several toxic air pollutants including, cadmium, benzene, hexane, arsenic, and more which negatively affect the environment and the people who live around them. The toxic pollutants that asphalt plants produce are known to cause cancer, liver damage, skin irritation, respiratory issues, and nervous system issues in humans. Asphalt ,aka bitumen, is a major source of air pollution. Traditional asphalt absorbs up to 90% of the suns radiation and contributes to warming up the surrounding air not only during the day time hours but also during the night time as well. All the information I have given you in this email are the most important reasons as to why you should reconsider putting in an asphalt plant in Genoa Township. Thank you for your time and for considering the information I have provided.

On the behalf of the environment,
Bella Pupa

Sources:

<https://www.newscientist.com/article/2253470-asphalt-on-roads-may-soon-be-greater-source-of-air-pollution-than-cars/>

<https://bigthink.com/technology-innovation/la-is-painting-its-streets-white-to-cool-down-the-city/>

<https://sites.google.com/site/kundaparkneighbours/web-sites-against-asphalt-plants>

Kelly VanMarter

From: Diab Rizk <diabrizk@outlook.com>
Sent: Saturday, December 4, 2021 3:12 PM
To: Laura Murphy-Rizk; Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Re: Vote No: Rezoning for Capital Asphalt

Good afternoon,

I echo my wife's comments. We chose Genoa township because of its combination of aesthetics which include small town feel, cleanliness, and convenience. When I pass by the recycling junkyard for lack of a better term, I am happy that the eye sore is hidden from view absent a trip down I96. This rezoning will end that and add an environmental hazard that has the potential to exceed that of ChemTrend. Home values, aesthetics, and good people are the cornerstones of Genoa Township and Livingston County. You are getting ready to put a lethal injection into what makes this county home to so many voters and taxpayers.

What's more, if what I have read and seen is true, the level of conflict of interest in this vote is shameful and plagued with a lack of integrity. If you want to approve any rezoning for Capital Asphalt, ask yourself if you'd like it in your backyard. If the answer to that is yes, then you should not be allowed to represent the interests of Genoa Township.

Respectfully myself, neighbors and community ask you to deny the rezoning request.

Thank you,
Diab Rizk, J.D
426 Natanna Dr.

From: Laura Murphy-Rizk <lauramurphy-rizk@outlook.com>
Sent: Thursday, December 2, 2021, 10:28 AM
To: bill@genoa.org; polly@genoa.org; robin@genoa.org; jean@genoa.org; jim@genoa.org; terry@genoa.org; diana@genoa.org; kelly@genoa.org
Cc: diabrizk@outlook.com
Subject: Vote No: Rezoning for Capital Asphalt

Good morning:

My name is Laura Murphy-Rizk, and I live at 426 Natanna DR. I urgently request that you vote NO on Monday, December for the request to rezone. As a Genoa Township resident, I do not support allowing Capital Asphalt to open a plant. The impact to home values, health, environment, and safety would be greatly impacted by this rezoning.

Sincerely,
Laura Murphy-Rizk

Laura Murphy-Rizk, PHR
Phone – 269.303.3925
Email – lauramurphy-rizk@outlook.com
[Click Here to View my LinkedIn Profile](#)

Kelly VanMarter

From: Jamie <mcvicke4@att.net>
Sent: Sunday, December 5, 2021 4:02 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Reject the asphalt proposal!

Hello,

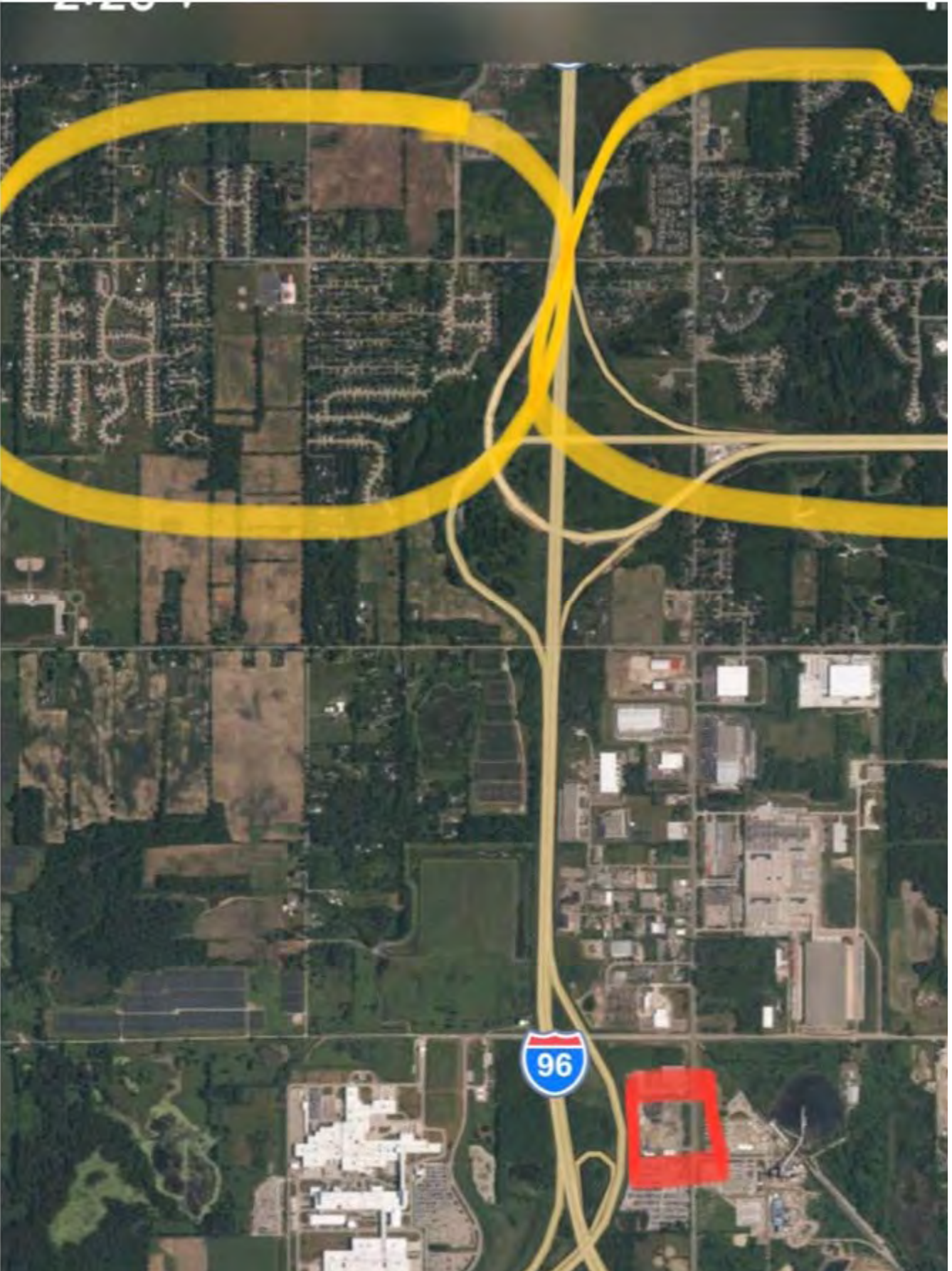
As a resident of the area for the last 13years, and having been born and raised in Lansing, I cannot support the proposal to allow Capital Asphalt to build a plant in our backyard!

I am shocked and disheartened to learn that this is even being considered for this area by the township board members. Not only would it be detrimental to the health of many community members in neighboring residential areas, but the local wildlife and nearby lakes. The charm that has kept me living in Genoa township would be obliterated.

One key consideration I hope you take a deeper look at is the satellite images of the existing Lansing location compared to the proposal site in Howell. The Lansing location is a true industrial park, where most neighboring residential subdivisions are north a minimum of 4.5miles away, and to the south are homes at least 2.5miles away or more. The surrounding area to the Howell location has residential apartments (and Cleary University dorm) less than 2miles away, residential home and condo subdivisions ~2.5miles away.

The population of residents near this proposal is far higher in volume than the existing plant. Also, consider the areas of wildlife with the surrounding lake communities...is there research data from Lake Delta near the Lansing plant? Do we know the toxicity of the water or population of fish and birds? This plant is an airborne pollutant hazard!

I hope you realize the negative effects approving this rezoning and opening up the path to allow Capital asphalt to build in this area and OPPOSE this plan! The cons are dangerous and far outweigh any potential positive points in the plan.



~Jamie Schingeck
Hampton Ridge

~Jamie Schingeck
Sent from my iPhone

From: [SERUGA, ANNIKA](#)
To: [Mike Archinal](#); [Kelly VanMarter](#); [Amy Ruthig](#); [Kathleen Murphy](#); [Bill Rogers](#); [Polly](#); [Robin Hunt](#); [Jean Ledford](#); [Jim Mortensen](#); [Terry Croft](#); [Diana Lowe](#)
Subject: Asphalt Plant
Date: Sunday, December 5, 2021 8:59:48 PM

Dear Genoa Township Board of Trustees,

I am a senior at Howell High School. At school I partake in an AP Environmental Science course. In recent news I have discovered with the help of my environmental science teacher that you are meeting to discuss the zoning of an asphalt plant in Genoa township. And to also discuss the public's stances on this topic.

I for one am a part of the public. And would like to share my stance with you. I for one am horrified about the idea of putting a plant there. For one think about all of the damage that will be done to the environment and the health problems of the residents that would live near that plant. Not only will this plant increase the traffic around the area increasingly high but all of that air pollution from the plant and the cars will produce more greenhouse gases. Destroying our earth's atmosphere. (1) Did you know that asphalt plants are known to produce many toxic air pollutants, including arsenic, benzene, formaldehyde, and cadmium, that may cause cancer, central nervous system problems, liver damage, respiratory problems and skin irritation. Also this plant will release silica dust into the air on a regular basis. (2) Would you want to put the lives of your people in danger, by releasing these deadly chemicals into the air and polluting our bodies and the earth we live on?

I know that one reason to put this plant is to create more jobs. But why would we need any more jobs when covid has spiked many job opportunities for the public. Most of these jobs are nowhere near deadly and polluted like this plant would be. You would be putting the lives of the workers at risk as well as the community.

Please consider all of the damage this plant would cause. All of this damage can be avoided if you just reject this proposal. Think about the lives that this plant would put in danger and how destructive it would be for the environment.

-- Thank you for your time,

Annika Seruga

(1) <https://www.asphaltpavement.org/uploads/documents/SR206-EnviromentalImpact-web.pdf>

(2) <http://chej.org/wp-content/uploads/Asphalt-Plants-PUB-131.pdf>

Kelly VanMarter

From: Morgan Bailey <morgbailey83@me.com>
Sent: Monday, December 6, 2021 1:35 PM
To: "To:bill"@genoa.org; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Please protect us

Good evening,

Your mailboxes are flooded, residents are outraged, and this entire plan reeks long before a single furnace vents this pollution into our community.

I'll keep this short and simple, my family moved to Genoa because of what this township is all about: "a charter township located in the heart of Livingston County, Michigan. Lakes and wetlands, rolling hills and meadows, state parks and wildlife all abound in this beautiful community of country living."

[\(https://www.genoa.org/\)](https://www.genoa.org/)

If we are truly the HEART of Livingston County, do not allow this corporation to deteriorate what makes this township beautiful. This proposal provides no value to the people of this township and we are asking that you protect us and the health of our children for years to come.

Thank you for your support,
Patrick and Morgan Drummond, caregivers to seniors and parents to two small children.

734-239-5569

Sent from my iPhone

Kelly VanMarter

From: George Currier <gcur0523@gmail.com>
Sent: Monday, December 6, 2021 10:42 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Re proposed Asphalt plant

Dear Board Members,

We live in Genoa township and STRONGLY oppose the building of an asphalt plant in our community. We don't want the toxins, traffic, and risk associated with this plant! The damage to our community is immeasurable!

Thank you,

George Currier

3027 E Telluride, Brighton, MI 48114

Kelly VanMarter

From: Kathy Currier <hammacurrier@gmail.com>
Sent: Monday, December 6, 2021 10:39 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Proposed Capital Asphalt building

Dear Board Members

We live in Genoa township and strongly oppose the building of an asphalt plant in our community. We don't want the toxins, traffic, and risk associated with this plant! The damage to our community is immeasurable!

Thank you,

Kathryn Currier

3027 E Telluride, Brighton, MI 48114

Kelly VanMarter

From: SHERI Dunatchik <sdunatchik@comcast.net>
Sent: Monday, December 6, 2021 1:52 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Urgent - Asphalt Fumes are considered Occupational Carcinogens

Hello,

I am a resident of Genoa Township and strongly oppose the proposed building of a asphalt plant by Capital Asphalt in Genoa Township or anywhere at all in close proximity.

Please record my opposition for the following reasons:

- 1) Asphalt fumes are considered an occupational carcinogen (that is enough right there to end the debate as to whether this is a safe decision for the residents and especially the elderly and children)
- 2) According to the EPA, asphalt fumes are known toxins, causing a variety of health problems to the community residents.
- 3) Sources of emissions from asphalt plants are neither regulated nor monitored depending on the size of the operation. With the labor shortage, this is certainly to be an issue.
- 4) The rise in truck traffic would increase dramatically and could pose harm to residents and those commuting through
- 5) Property values would significantly decrease.

Due to health, safety, and economic concerns, the risks would significantly outweigh any benefits that would possibly be realized in the local community impacted by the presence of the asphalt plant. Please record my opposition to Capital Asphalt or any other hazardous industry building a plant in this community.

If you do plan to vote yes and allow them to build, can you please advise on why you would think it beneficial to risk human health and life, safety, and economic downturn to the community you represent?

Thank you for your time.

Sheri Dunatchik

From: [Bill Rogers](#)
To: [Amy Ruthig](#)
Subject: Fw: Re-zoning to allow Capital Asphalt Project
Date: Monday, December 6, 2021 1:41:25 PM

Place in file

From: Nick Haller <halle1jn@gmail.com>
Sent: Monday, December 6, 2021 1:18 PM
To: Bill Rogers; Diana Lowe; Jean Ledford; Jim Mortensen; Kelly VanMarter; Polly; Robin Hunt; Terry Croft
Subject: Re: Re-zoning to allow Capital Asphalt Project

Also, one last thing. It is not a secret that Bill has had several contributions made to his campaign by Mr. and Mrs. Dave Hundley. Bill, you may kindly remove yourself from any voting matters or we will tie this up in litigation until you're blue in the face and I'll happily include Dave and Elizabeth on the defendant list, whom ironically is the Liv Co Clerk.... We're not stupid. We know a snake when we see one...this one is just really obvious. WDIV, 7 Action News, and Fox have all been notified of Bill's continued relationship with the land sellers here. Genoa township is not big politics, so please Bill, stop trying to pad your pockets with lobbyists or ship out to Washington where you apparently belong. In fact, part of me hopes this gets passed because I would LOVE to get this in front of a jury. Remember, you approve this, it's your ticket out of office without a doubt and then likely years of conflict of interest lawsuits, environmental lawsuits, I mean the list goes on. If I were your campaign manager, I'd tell you to step away and get as far away from this vote as you can moving forward because what I've shared with you is only the tip of the iceberg of what we are starting to uncover.

Good luck!!

On Mon, Dec 6, 2021 at 11:17 AM Nick Haller <halle1jn@gmail.com> wrote:

Good morning!

As I am just receiving news that this meeting looks like it will be post-poned, I wanted to make sure to reach out to advise on my opposition.

After spending several years on Judges' campaign staffs, countless hours earning my Masters in Public Administration and the amount of time spent in county government alongside my fellow commissioners.....I am sure this will not pass as that would essentially be your own decisions to remove yourselves from the next election ticket. Right? I mean, I don't know of anyone who is supporting this other than Capital Asphalt and (my understanding) one of you whom happens to have different motivations with this company.

That being said, I am not going to throw a ton of research at you all to explain why this isn't a good idea. I think you all clearly know how toxic this plant will be just 3600 feet away from where my family resides. I think you all are well aware that the EPA recommends these plants being built several miles from any mass communities (ie. subdivision) and I think you all can agree that you likely would oppose this considering the risks it would pose to your children. What I will say is that if this passes, my family will have no choice but to move from this township. I came here because it's quiet. I came here because I knew I was leaving a former town that decided that building on every property was necessary development.... No. Nothing is necessary. So we moved out here to have that same hometown feel I used to have when I grew up. However, now instead of building another office building, we are pondering the rezoning (zoned that way originally for a REASON) a site to allow a factory be built that has extensive research regarding its toxic levels it omits in the air and the ground. You could approve 10 office buildings there and we wouldn't mind...

Housing values? I can't say that they will go down but I can say that I will have a really hard time selling if you put this plant up. I live next to a park...certainly a family will buy my home in the hopes to enjoy the outdoors as much as I have. Ask the kids in Lansing where the current capital asphalt plant is built if they enjoy playing outside? Ask them if the toxic fumes don't get in the way of their breathing when trying to shoot hoops. AND THEY ARE 4.5 miles away!! We are 3600 feet!! No parent should ever purchase my home for their family that close to an asphalt plant.

And finally, didn't you all become council members because you loved our community? Wasn't the sole purpose of your representation to make sure that you embody the views and opinions of your fellow neighbors? I think that myself as well as the 8 of you would agree that Genoa Township is not and was not intended to be a destination for industrial development. This is where we zone our land to build community centers, parks, and places where we can share in the beauty of our town. The industries that have made their home here already have respected our community and have not polluted our lives. DO NOT allow this company to build in our township.

Make your vote count or I will see to it that we make our votes count next time either one of you hopes to fill that seat. This is an all or nothing approach for us. We do not care if you voted No if it still passes. If this rezoning is passed, we will see to it that this will be the last term for each one of you, including the city manager. This isn't fun and games, this is real life, this is health. Ask Rick Snyder how putting money and business before known health concerns played out for him...If my kid endures ANYTHING from this, the paper trail leads right back to you 8, so don't get caught up in politics. Think about whether or not you want your child to have cancer. Really simple. If you do not, then you have your answer to this rezoning.

Respectfully,

Nick Haller, JD, MPA
Father - Husband

Kelly VanMarter

From: Nick Haller <halle1jn@gmail.com>
Sent: Monday, December 6, 2021 11:18 AM
To: Bill Rogers; Diana Lowe; Jean Ledford; Jim Mortensen; Kelly VanMarter; Polly; Robin Hunt; Terry Croft
Subject: Re-zoning to allow Capital Asphalt Project

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Nick Haller, JD, MPA
Father - Husband

Kelly VanMarter

From: Nick Haller <halle1jn@gmail.com>
Sent: Monday, December 6, 2021 1:18 PM
To: Bill Rogers; Diana Lowe; Jean Ledford; Jim Mortensen; Kelly VanMarter; Polly; Robin Hunt; Terry Croft
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Housing values? I can't say that they will go down but I can say that I will have a really hard time selling if you put this plant up. I live next to a park...certainly a family will buy my home in the hopes to enjoy the outdoors as much as I have. Ask the kids in Lansing where the current capital asphalt plant is built if they enjoy playing outside? Ask them if the toxic fumes don't get in the way of their breathing when trying to shoot hoops. AND THEY ARE 4.5 miles away!! We are 3600 feet!! No parent should ever purchase my home for their family that close to an asphalt plant.

And finally, didn't you all become council members because you loved our community? Wasn't the sole purpose of your representation to make sure that you embody the views and opinions of your fellow neighbors? I think that myself as well as the 8 of you would agree that Genoa Township is not and was not intended to be a destination for industrial development. This is where we zone our land to build community centers, parks, and places where we can share in the beauty of our town. The industries that have made their home here already have respected our community and have not polluted our lives. DO NOT allow this company to build in our township.

Make your vote count or I will see to it that we make our votes count next time either one of you hopes to fill that seat. This is an all or nothing approach for us. We do not care if you voted No if it still passes. If this rezoning is passed, we will see to it that this will be the last term for each one of you, including the city manager. This isn't fun and games, this is real life, this is health. Ask Rick Snyder how putting money and business before known health concerns played out for him...If my kid endures ANYTHING from this, the paper trail leads right back to you 8, so don't get caught up in politics. Think about whether or not you want your child to have cancer. Really simple. If you do not, then you have your answer to this rezoning.

Respectfully,

Nick Haller, JD, MPA
Father - Husband

Kelly VanMarter

From: Ralph Hatt <airhatt@gmail.com>
Sent: Monday, December 6, 2021 6:31 PM
To: Kelly VanMarter
Subject: No Asphalt plant

Follow Up Flag: Follow up
Flag Status: Flagged

Sent from my iPhone

Kelly VanMarter

From: Brittney Kirby <brittney.g.kirby@gmail.com>
Sent: Monday, December 6, 2021 11:20 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: No to the Asphalt Plant

To Our Genoa Board,

Please understand that myself and our Genoa community are vehemently against re-zoning to allow for an asphalt plant. The current zoning does not allow for it and it's for good reason. There are several important concerns that cannot be ignored. We moved to this community for the country community/lake living, the smell coming from this plant would ruin our quality of life and the reason we moved here. Second, there are known carcinogens that are emitted from these plants. One study found 50% of residents within one square mile had negative health effects. Do not endanger our community. This will be detrimental to our residents as well as those that come to Genoa for shopping /to work. Third, the property values will drop dramatically. Our community is growing please do not kill it now. Lastly, it is my understanding that two of the board members seek to benefit from the sale of the property that would be used to build this plant. This is an abhorrent abuse of power and the definition of conflict of interest. These individuals should not be able to vote on this matter and/or should not be allowed to be in office and attempt to facilitate this deal. I am extremely disappointed that we find our community in this situation and hope that the board will do the right thing and vote NO.

Not for Genoa.

Brittney Kirby

Sent from my iPhone

From: [Bill Rogers](#)
To: [Amy Ruthig](#)
Subject: Fw: Capital Asphalt
Date: Monday, December 6, 2021 1:53:32 PM

From: Kate Lawrence <katelawrence2001@yahoo.com>
Sent: Monday, December 6, 2021 1:41 PM
To: Bill Rogers
Subject: Capital Asphalt

Supervisor Rogers,

As a lifelong resident of Livingston County, I'm writing you in regards to the agenda item on your December 6, 2021 meeting .

If the Board of Trustees are inclined to support this PID Rezoning and Conceptual PUD, then the proposed property is the right location for this type of business.

I ask that you forward a copy of this email to the board.

Thank you,

Kate Lawrence
Brighton, Mi 48116

Kelly VanMarter

From: j2make@aol.com
Sent: Monday, December 6, 2021 10:54 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Proposed Capital Asphalt Plant

Dear Genoa Township Board of Trustees,

I have just become aware of the location for the proposed Capital Asphalt plant. I strongly object to this proposed location because of the toxic, carcinogenic pollution it will produce. This is too close to businesses and residential properties. It will result in decrease in property values and personal medical problems which may lead to loss of life, as well. Please consider their new location to be in a huge, vacant land area away from developments.

Thank you for expressing my strong opposition at your board meeting on Dec 6th. Jean Makela

Kelly VanMarter

From: BOB MUSCH <rlmusch@comcast.net>
Sent: Monday, December 6, 2021 3:22 PM
To: Polly; Bill Rogers; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter; info
Subject: Fwd: Genoa Twp board meeting, Asphalt plant

Name

Robert Musch
3500 Pineridge Lane
Brighton Mi 48116

Regarding the Asphalt plant

Brief background, I was born and raised in Genoa township and have lived here on and off almost 70 years. Prior to retirement, I worked for Dow Chemical in Midland Mi (Dow) for 30+ years.

I like most here are concerned that you would even consider an asphalt plant for this area. Originally, I thought the Latson road quaradior was being planned as a research campus. Now I see less that a mile away, you are considering a operation that has know carcinergins coming from it stack(s) that could pour over the district. Also not far away is Three Fires elementary school, where our kids are playing and youth football teams are practicing/playing their games. It's know that some of these toxins will stay airborne for more than 18 hours no matter if we have a north,east, south or westly wind will track right straight across schools, shopping centers, homes and lakes in the vicinity.

I am sure the Petitioner will tell you they are regulated and have all the necessary equipment (ie scrubbers) to burn off the chemicals, but the real question should be, what type or guarantees can they give that their equipment will be fully operational 100% of the time. We aren't just talking 1-2 years we are talking 5, 10 and 20 years. Are there other assurances as well. Do they have on board environmental epidemiologist, or personnel that will monitor the air levels or provide an early warning system if there are any releases? Do they have financial resources (millions of dollars) to clean up the environment if they have a spill or release.

Basically, the question is what level of risk is the board willing to take, as the townships representative, to allow such an operation that could impact the community so drastically. Yes, I am sure they have a preventive maintenance program and are monitored by the EPA or OSHA but how often are their audits. Yearly, at best. So they are audited today and the equipment breaks tomorrow and who will know? And now you have up to 7 carcinogenic chemicals airborne.

I know having worked for Dow that even with their billions of dollars and multiple resources there are no guarantees. That is why they are spending millions of dollars

hiring full time environmental epidemiologies, air quality experts and spending unknown sums on preventative maintenance programs. Despite that, I have personally experienced situations where they have had chemical releases like MECL. Any release is a big deal, but when MECL reaches the atmosphere and combines with moisture it forms HCL or acid rain. I have had to have my car repainted and seen the community on lock down, having folks stay inside or risk being burned due to the acid. Most any release of that nature can be harmful if not deadly. What happens to the solids when they settle to the ground is also concerning. That is where our lakes and rivers and even our land is impacted. In Midland they have the Titabawasee river flowing through it. It is known and documented that there are dioxins in the water. When there is high spring water or heavy rains causing flooding, like we have experienced this past summer, all the land downstream becomes contaminated as well. If that happened here you would see lakes like East and West Crooked which flow into Chilson and eventually the Huron River. Or Woodland which flows into the Mill Pond and downstream to Ore Lake and all points in-between contaminating wildlife and vegetation on top of impacting the quality of our lakes.

You might be saying this isn't Midland and it would never happen here. So let's look at some of our corporate citizens closer to home. I recall a few like GM's Milford's Proving Grounds and the contamination from their fuel tanks and salt piles. All the folks in the area were/are still drinking bottled water. Another, would be the contamination of Fonda lake when the MDOT didn't have sheds covering their salt supply. When it rained the run off went into the neighboring lakes. Possibly the most impactful for Genoa township is the underground plume of carcinogenic chemicals from the Refrigeration Research area moving across the area towards Pine Creek. We know it is being monitored all around the Brighton high school and that they even put in city water just in case/when the well water would be contaminated. When it will reach the lakes and sub is anyone's guess. Finally, just this past August we had 1200 gallons or so of Diesel fuel that spilled at the Corrigan facility. These incidents all pale in comparison to the Asphalt plant and what it could do to the community.

What I am saying is, the **risk** of approving such a business outweighs the benefit. If/when there are incidents, we may not know the **impact** for years but the decision you are making today will **impact** the lives of many of yours and my children or grandchildren for years to come. My daughter was diagnosed with cancer when she was only 9 months old and I'll tell you I wouldn't wish that on anyone. If I was on the board, I wouldn't want my **legacy** to be that I voted for a plant that left our community with the highest level of cancer in the county or an environment that is worst off than it is today.

Please review the Power Point you were provided and strongly consider the consequences. I'll bet if you have/had a loved one with cancer you wouldn't even be considering this.

Roads can use asphalt coming from other plants over in Whitmore lake for Green Oak along with concrete provided by the numerous cement plants in the vicinity.

Regards
Bob Musch

Kelly VanMarter

From: Beth <bethodea17@gmail.com>
Sent: Monday, December 6, 2021 7:15 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: No Asphalt Plant

Dear members of the board,

I am writing you as a concerned parent and citizen. I am imploring you to please not allow this asphalt plant into our area. We moved to the area approximately 10 years ago from the suburbs of Detroit to get away from these types of businesses. I believe the location of the proposed plant will cause many issues for the residents of the area. Of course first and foremost is the pollution and odor that are imminent. Where is the waste from this plant going? Into the land or the water in the area? There are many living close to the proposed site as well as schools. This is not the type of pollutants we need around our children. The large amount of traffic that will be brought to the area from large trucks down our main roads is surely to cause road damage as well as more pollution and of course frustrations to those of us who have to travel the same daily.

What concerns me most is several other locations have turned this company away. Why is Genoa even entertaining it? What does the township stand to gain from this coming to the area? Let's keep our small town, non-industrial feeling are just that. A place people want to move to escape the sights and sound of the city and keep these types or companies out of our town.

Thank you in advance for doing what is right for our area and not allowing the asphalt company to build.

Sincerely,
A concerned citizen

Elizabeth O'Dea
Howell, MI

Kelly VanMarter

From: Rebecca Pawlik <rebecca.pawlik@gmail.com>
Sent: Monday, December 6, 2021 8:06 AM
To: Kelly VanMarter
Subject: say NO to the asphalt plant

Hi Kelly,

I am a very concerned Genoa Township resident asking you to turn down any further development of the asphalt plant proposed for our community. Unfortunately due to my work schedule I am unable to make it to the meeting tonight, but wanted to share my opinion.

From the Genoa Township website: "GENOA TOWNSHIP is a charter township located in the heart of Livingston County, Michigan. Lakes and wetlands, rolling hills and meadows, state parks and wildlife all abound in this beautiful community of country living."

It doesn't seem to me that a toxin-emitting asphalt plant fits well into that description. I have great concerns for the pollution to our air and water systems - both drinking and recreational - if this were to proceed. How can those of us that reside down-wind of this place rest easy knowing that the emissions are blowing out into this direction as we cruise around Lake Chemung?

In medicine we make decisions on risks vs benefits, and the benefits of our treatment plans should outweigh the risks. While I'm sure there may be some benefit to putting the plant here (hopefully more than just to the pocketbooks of some of those on the board), I can't imagine that those benefits can be greater than the visual and environmental impact this plant would have on our community.

Please reject this plan.

Thank you for your consideration,
Rebecca A. Pawlik, MD

Kelly VanMarter

From: Debbie Soper <d-soper@sbcglobal.net>
Sent: Monday, December 6, 2021 2:15 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Capital Asphalt

Hello -

My neighbor brought this issue to the attention of my neighborhood. My husband and I moved from Livonia to Howell seven years ago. We love it here so much we are now in our second home in those 7 years. Finally building our forever (retirement) home. We love it here, love the small town feel, the activities, the concerts outside, the Christmas parade of lights...all of it.

I would really hate it if the air quality becomes compromised, the traffic of large trucks increases which inevitably ruin the road we have. Howell and Livingston county have great roads compared to Livonia. Please be considerate of the people who live here, the families who are raising their families here. I am a cancer survivor. I would hate to be exposed to any harmful carcinogens. What will this do to the wildlife and marine life in the surrounding areas.

Please, please take all of this into consideration when making your decisions and turn this Asphalt plant down.

Debbie Soper
3280 Waverly Woods Lane
Oceola Twp.

Kelly VanMarter

From: Mark Surel <mark@newvintageusa.com>
Sent: Monday, December 6, 2021 2:31 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Need more information on the asphalt plant

Good day.

I am trying my best to keep an open mind on this subject. I realize that things change and something that seems bad may be good long term.

I am, however finding it difficult to find any positives on the proposed asphalt plant in our beautiful township other than aesthetics.

I have also been requesting that the township openly and actively acknowledge this proposal via Facebook to which I have not had a response. Information on the subject has been hard to come by which looks very suspicious in the eyes of the citizens. I am not saying that there is something not up to snuff with this subject, but the optics are not good. In addition the news articles I am finding do not have the township officials in a good light on this subject.

Transparency and some sort of pros/cons information could be made available to the public so we can make an informed decision. That is the only way to convince residents that this is a good idea.

Our family moved to the Brighton Area in 2013 and absolutely love it. As an East Crooked Lake resident, we are worried about damage to the lakes. Unfortunately we can only find negative information about asphalt plants and their result on the environment and property values in the area.

For now, until I have some data from Genoa Township that shows the plant is a benefit, my opinion is to **not** move forward with the project.

Mark Surel
3333 Pineridge
Brighton, MI 48116

Mark Surel
President
NVU Inc.
www.newvintageusa.com
ph. 248.850.5482
fox. 248.565.8291

Kelly VanMarter

From: Jennifer Surel <jennifer@newvintageusa.com>
Sent: Monday, December 6, 2021 2:44 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Highly concerned about Asphalt plant proposed site in Genoa Twp

Good day.

I am trying my best to keep an open mind on this subject. I realize that things change and something that seems bad may be good long term.

I am, however finding it difficult to find any positives on the proposed asphalt plant in our beautiful township other than aesthetics.

I have also been requesting that the township openly and actively acknowledge this proposal via Facebook to which I have not had a response. Information on the subject has been hard to come by which looks very suspicious in the eyes of the citizens. I am not saying that there is something not up to snuff with this subject, but the optics are not good. In addition the news articles I am finding do not have the township officials in a good light on this subject.

Transparency and some sort of pros/cons information could be made available to the public so we can make an informed decision. That is the only way to convince residents that this is a good idea.

Our family moved to the Brighton Area in 2013 and absolutely love it. As an East Crooked Lake resident, we are worried about damage to the lakes. Unfortunately we can only find negative information about asphalt plants and their result on the environment and property values in the area.

For now, until I have some data from Genoa Township that shows the plant is a benefit, my opinion is to **not** move forward with the project.

Mark Surel
3333 Pineridge
Brighton, MI 48116

Jennifer Surel
Vice President
New Vintage USA INC
248-850-5482

Kelly VanMarter

From: Emily Tanner <emilytanner918@gmail.com>
Sent: Monday, December 6, 2021 12:47 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: No to Asphalt Plant!!

Dear Board Members,

I implore you to vote no to the proposed building of a Capital Asphalt plant in Genoa Township. The proposed location is in very close proximity (approximately a mile!) to Gilden Woods Early Care and Preschool, located at 3811 Grand Oaks Drive in Howell. My 18 month old son attends this center daily and I shudder at the thought of him breathing in toxic, cancer-causing chemicals and fumes as he plays each day. If the past two years of living in a pandemic has taught us anything, it's that we need to come together as a community to protect our most vulnerable!

My son already has breathing issues every time he catches a simple cold which has resulted in two different ER visits so far and now requires the use of two different inhalers with each infection. Although he is too young to be properly diagnosed with asthma, he has been diagnosed with reactive airway disease. We have been told that he could develop asthma as he gets older. I can't imagine the deterioration to his general health and worsening of his breathing if he were to be exposed to these fumes daily, not mention the effects on his health in the long term. As a parent, it is my job to protect my son with everything in me. If any of you are parents, I ask, would you want a plant that releases these toxins next to door to your child's daycare or school?

Furthermore, as residents of Oceola Township, we live about 2.5 miles north of this proposed site. I think of my home as my refuge and my place of safety to return to each day. I can't imagine having it spoiled by the smell of asphalt. No more family events, backyard BBQs, enjoying nice weather on our patio, or watching my son run through the yard. Who can enjoy a home that is plagued by noxious odors?

Please do the right thing for our community and our children that live and play here. Vote No!

Emily Tanner

Kelly VanMarter

From: Kathryn Tuck <kathrynatuck@gmail.com>
Sent: Monday, December 6, 2021 8:40 AM
To: Diana Lowe; Kelly VanMarter; Jim Mortensen; Terry Croft; Robin Hunt; Jean Ledford; Bill Rogers; Polly
Subject: Capital Asphalt LLC proposed site - 12/6/2021 meeting

Greetings:

I'm writing on behalf of my elderly parents, who reside in The Landings, and also for my children, who attend school within the proposed impacted zone.

Before you vote at the meeting tonight, I want to share with you the story of residents in two different communities who fought multi-year battles against asphalt plants permitted near residential areas. If you search, you'll find several articles pertaining to this issue.

<https://www.crainsdetroit.com/manufacturing/detroit-turns-down-asphalt-plant-proposal>

<https://www.whmi.com/news/article/applicant-withdrawns-tyrone-township-asphalt-plan>

Several of the residents will request a motion to deny, and I wholeheartedly support them. It's extremely clear the planning commission and even members of your own board are too deeply connected to the people who will profit financially from this decision, but not deeply enough connected to its impact and detriment to the community. If you already plan to vote in favor, then you should be able to resolve the following long-standing problem: If the eyesore of the existing property hasn't been addressed by its current owners, then how, in good faith will Capital Asphalt, LLC or the township promise to address further issues down the line? Additionally, I would ask if this is really something you want to do to the residents you represent? Do you really want the tallest structure in your township to be an asphalt plant silo?

At best, this issue needs more time. Time that would allow for you to conduct your own research of asphalt plant operations; its side effects on our most vulnerable - particularly the elderly, unborn, and pregnant women; and, a full review of the community impact study with the public and merchants located within a five mile radius.

Thank you for your time and attention to this matter. I hope when you vote tonight, you will consider all of those not able to be present in-person at the meeting. They elected you to represent them, their interests, and the township's future. I find it hard to believe that Genoa Township's best future will be paved by the inclusion of a dangerous, unsightly asphalt plant.

With regards,
Kathryn Tuck
Howell resident

Kelly VanMarter

From: Deanna Wennberg <wennbergsn@hotmail.com>
Sent: Monday, December 6, 2021 2:53 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; terry@genoa; Diana Lowe; Kelly VanMarter
Subject: asphalt company

Good Afternoon,

I am writing to share my concerns about the asphalt company that would like to develop a plant in Genoa township. While this is not my township, as a neighboring township citizen, I have deep concerns about the impact on our community and town. The off gassing substances are proven to contribute to cancer. As a community citizen and health care provider, I cannot support this development. Please, vote no to this development.

Sincerely,
Deanna Wennberg, FNP- c
3288 Waverly woods lane
Howell, Mi 48843
Sent from [Mail](#) for Windows

Kelly VanMarter

From: Laura Wildman <sunbum97@yahoo.com>
Sent: Monday, December 6, 2021 7:59 PM
To: info; Bill Rogers; Jean Ledford; Jim Mortensen; Robin Hunt; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Proposed Asphalt plant is not a good fit.

Since we did NOT have the opportunity to state our concerns at the meeting tonight, I ask that my prepared comments are made public record.

At the risk of appearing disrespectful by wearing a hat to such an important public meeting, I want to point out this is a GUARD HAT.

Genoa. United. Against. Reckless. Development, which was a group formed in 2004 to alert citizens Genoa Township of potential issues.

The term “reckless development’ tonight is an understatement. If you use any search engine on the planet (I have used Google), type in “emissions from asphalt plant” and you will have pages of results (these here are the LINKS to various articles).

An asphalt plant in the proposed location is a reckless and dangerous proposition. It doesn’t work. It poses significant environmental concerns to every single person and creature in this township and in this county.

After stating the obvious that the current location doesn’t make sense, I would like to follow up with two thoughts and/or questions.

Who has the expertise to navigate the intensely precise and difficult decisions needed to oversee a plant of this magnitude? Even the most basic questions have not been addressed upfront! – what type of fuel will be utilized to create the asphalt? Who monitors, or God forbid, FIXES issues after the fact? I don’t feel we have the expertise to manage and monitor something so intricate or dangerous! If we do, who is the point person for this?

Lastly, and I ask this respectfully

Mr. Rogers, please recuse yourself from further discussions, actions, votes related to the proposed Asphalt plant. It is documented that you have a relationship with some of the beneficiaries of this transaction. Once recused, I would ask that the remaining decision makers on both the Board of Trustees and on the Planning Board to look deep within their hearts and understand that their decisions on this matter will have impact for the rest of their lives, our lives, our families’ lives and all WILDLIFE!

Please vote no to amend the current zoning of Industrial “IND” to Planned Industrial or “PID”. Let the land use remain as is (rather than opening the door to a project not one of us can assure will be successful or safe).

I want to add that this is a highly charged and emotional topic and the constituents are not going to go away. Promise!

Sincerely,
Laura Wildman
658 Pathway Drive
810 333 2591

Sent from [Mail](#) for Windows

Kelly VanMarter

From: Ashley Yount <ashjay108@gmail.com>
Sent: Monday, December 6, 2021 10:57 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Capital Asphalt plant and zoning proposal

Hello,

My wife and I are not in favor of the request by Capital Asphalt to rezone and urge you to vote NO on that very request. As Genoa Township residents, part of why we moved to this area was to live in an area that was clean and safe.

We do not support allowing Capital Asphalt to open an asphalt plant in the area where we live, work, and shop. Nor do we support the attempt to rezone, which will pollute not just our air, but potentially our water and will contribute increased sound pollution, increased traffic and wear-and-tear to our roads because of large industrial trucks, and will negatively affect our skyline because of the large industrial tanks that go along with Asphalt plants lording over other buildings in the area.

The impact on our health, our environment, and our safety would be greatly and negatively affected by this rezoning, so please vote AGAINST it!

Thank you,

Jason & Ashley Miller

Kelly VanMarter

From: Nick Haller <halle1jn@gmail.com>
Sent: Tuesday, December 7, 2021 10:45 AM
To: Bill Rogers; Diana Lowe; Jean Ledford; Jim Mortensen; Kelly VanMarter; Polly; Robin Hunt; Terry Croft
Subject: Recusal of Bill Rodgers and FOIA Request

Well. I had a good laugh this morning. Reading Bills interview in WHMIs article. I would just like to address this, because you made yourself seem very clearly inadequate to hold public office. Here's why:

You said that you would not recuse yourself because you 'know someone'. I was not aware that someone even needed to inform you of this but you don't just know them. THEY ARE CAMPAIGN CONTRIBUTORS MAKING IT A CLEAR-CUT CONFLICT IF INTEREST!!!! Seriously, Bill? You call yourself a public official and the most common form of conflict of interest you chalk up as 'simply knowing someone'? Your comment about having known people for 60 years and if that's the issue you shouldn't be in public office at all....we all kind of agree. Regardless, you'll certainly never be re-elected here again so I still don't know what you're thinking other than a huuuggeee payout from your buddy apparently.

FOIA: we are requesting the appropriate documentation needed to file a FOIA request. We are looking to file a formal request for public records indicating all campaign contributions to Mr. Rodgers since he has been a part of the Genoa township board. Further, we would request additional documents dating back to his involvement in the county commissioners office. The records will be accepted via email, paper, or compact disk/flash drive. If this request shall incur any fees, please provide an itemized breakdown of those fees PRIOR to competing this action as we must provide this information to our community. We are not opposed to paying for this, but need to know how much it will cost before we move forward with our request.

If the township does not respond via email within 5 days, all fees incurred will be the responsibility of the township AND the FOIA request will remain active until formerly responded to as outlined in Michigans Township FOIA request guidelines. My understanding is that each office has a FOIA coordinator and will be in contact with me based on this email request. He/she is required to provide the proper documentation to make the formal request we seek.

It's all coming out Bill! Might want to revise your stance on whether or not you will recuse yourself. Black and white conflict of interest. The texts and emails we plan to uncover will also be pretty black and white. I've seen this story play out many times in my political career and it has NEVER ended in the politicians favor. Good luck

Regards,

Concerned constituents

Kelly VanMarter

From: Sara Underwood <slunderwood21@gmail.com>
Sent: Tuesday, December 7, 2021 11:24 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Opposition to asphalt plant

Good afternoon,

I chose Genoa township because of its combination of aesthetics which include small town feel, cleanliness, and convenience. When I pass by the recycling junkyard for lack of a better term, I am happy that the eye sore is hidden from view absent a trip down I96. This rezoning will end that and add an environmental hazard that has the potential to exceed that of ChemTrend. Home values, aesthetics, and good people are the cornerstones of Genoa Township and Livingston County. You are getting ready to put a lethal injection into what makes this county home to so many voters and taxpayers.

Additionally, I myself have already had cancer before the age of 30, at 35 years of age I am 5 year cancer survivor with 2 young children and I go to the healthcare system at Latson road for my yearly screenings and I live off Latson. I do not want to further expose myself or my children to carcinogens while I'm at my home and even more so while I'm literally getting a CT-scan to ensure my cancer has not returned. This decision to place an asphalt plant so close to my home and my medical center will greatly impact my decision to move out of our lovely community.

What's more, if what I have read and seen is true, the level of conflict of interest in this vote is shameful and plagued with a lack of integrity. If you want to approve any rezoning for Capital Asphalt, ask yourself if you'd like it in your backyard. If the answer to that is yes, then you should not be allowed to represent the interests of Genoa Township.

Respectfully myself, neighbors and community ask you to deny the rezoning request.

Thank you,
Sara Underwood-Stankevich
4221 Sonata Dr.

Sent from my iPhone

Kelly VanMarter

From: Deb Beattie <onewithcats@yahoo.com>
Sent: Wednesday, December 8, 2021 9:40 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt plant

Hello,

I am writing to voice my concerns about the possibility of an asphalt plant that is being considered in Genoa Twp.

I am very opposed to the site in question. The property is surrounded by many businesses, some homes and many homes just a mile or so away from the site.

This site is in the middle of an area where many residents work, live and shop.

This is absolutely NOT the right location for an asphalt plant.

Sincerely,

Deborah Beattie & family

3109 Pineview tr

Howell, mi

810-923-1980

Kelly VanMarter

From: Dawn <dcondon@comcast.net>
Sent: Wednesday, December 8, 2021 10:29 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: January 3rd Meeting_Capital Gas

Good evening,

I am writing on behalf of myself and the attendees of the December 6th meeting.

It's been passed around that the new venue for the meeting 1/3/22 will only be accommodating 200 attendees. We have also been made aware that Community Bible Church is willing to host the meeting and can accommodate more attendees.

We are respectfully requesting the larger venue willing to host is selected for this meeting. We had roughly 200 in attendance on the 6th, by booking a smaller venue you are only ensuring another adjournment.

Zoom should ONLY be an option to attend and not the main source of attendance. The Zoom only option was only authorized for Covid mandated shutdown and restrictions. Zoom should be made available for those unable to leave their homes for medical issues/quarantine due to positive Covid status.

There's many eyes on this meeting and the outcome. I have every confidence you'll make the right decision as it's public knowledge the church has offered their location.

Respectfully submitted,

Dawn

Kelly VanMarter

From: Tracy Eckel <tracy.eckel@gmail.com>
Sent: Wednesday, December 8, 2021 7:40 PM
To: Bill Rogers; Polly; Jean Ledford; Robin Hunt; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Township Meeting on January 3, 2022

Hello,

The construction of the asphalt plant in Genoa Township is a significant change to our community. Due to the strong public interest, as displayed by the overwhelming response to the December 6th meeting, I respectfully request that you to move forward with an in-person meeting on January 3rd. The board stated that they would try to find a location that would accommodate a larger group. The Community Bible Church will allow the meeting to take place in their building which can hold up to 550 people.

Since an appropriate location has been identified and there are not currently COVID protocols prohibiting indoor gatherings, conducting the meeting via Zoom is not appropriate. It alienates residents that are not computer savvy and places barriers to participation for those that do not have a stable internet access.

Respectfully,

Tracy Eckel
5982 Oak Bend Ct
Howell, Mi 48843

Kelly VanMarter

From: Mike Kupfer <mike.kupfer@gmail.com>
Sent: Wednesday, December 8, 2021 9:14 PM
To: Mike Archinal
Cc: Jim Mortensen; tcroft; JeanLedford; Diana Lowe; Bill Rogers; Robin Hunt; Polly; Kelly VanMarter
Subject: Re: Capital Asphalt rezoning

Please do the right thing and invite the public to attend the rescheduled meeting in person . A facility has been secured and Genoa township residence deserve leaders that have nothing to hide and govern with total transparency. We look forward to hearing from you with details for the meeting and look forward to seeing you there

Best regards
Mike Kupfer

On Thu, Dec 2, 2021, 11:53 AM Mike Archinal <Mike@genoa.org> wrote:

Mr. Kupfer,

Thank you for your comments regarding the proposed Capital Asphalt project. I will forward your email to the Township Board of Trustees.

Best regards,

Michael Archinal, AICP

Township Manager

Genoa Charter Township

2911 Dorr Road

Brighton MI, 48116

mike@genoa.org

From: Adam VanTassell
Sent: Thursday, December 2, 2021 10:52 AM
To: Mike Archinal <Mike@genoa.org>
Subject: FW: Capital Asphalt rezoning

From: Mike Kupfer <mike.kupfer@gmail.com>
Sent: Thursday, December 2, 2021 10:41 AM
To: info <info@genoa.org>
Subject: Capital Asphalt rezoning

Please find attached a sunset photo of my peice of paradise in Genoa township. This is lake Chemung located about a half a mile from the Genoa Township municipal center and less than two miles east of the proposed site for Capital Asphalt . We love living in Genoa Township with its open fresh air and beautiful sunsets ,we often walk our dog in the Genoa Park next your offices. I am asking that you do not change any zoning ordinances allowing this company to build a factory in our area we do not want to live with the pollution and oder this facility would bring.

I have discovered Capital Asphalt has had several violations with the EPA in the past and do not care about our clean air and natural resources. Please do not rezone for this company.

Thank you
Mike Kupfer

Kelly VanMarter

From: John Palmer <johnpalmer1955@yahoo.com>
Sent: Wednesday, December 8, 2021 12:22 PM
To: info; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; diann@genoa.org; Kelly VanMarter
Subject: reject asphalt plant in our township

Follow Up Flag: Follow up
Flag Status: Flagged

I was there Monday night, it is clear your base does NOT want or need any part of an asphalt plant in the area. We certainly don't need the tax revenue, especially considering the de-valuation of property and lower taxes we will get going forward. And we don't need the asphalt as so many of those plants are nowhere near capacity.

Zoom is a terrible idea. Even for those computer savvy this didn't work well during the pandemic and for many of the residents you represent this is not even an option.

Face to face is best and you owe it to us to see us and let us represent our opinions personally.

Is it true the next meeting is January 3, 2022?

And is it true you are looking for a site to hold 200? That is not big enough. If you limit to 200 some will be shut out or you will postpone again.

I know for a fact we could use Community Bible Church on Grand River and can fit 550 people.

Thank you for doing the right thing and stand up to your leadership that wants this plant for whatever reason... but it surely is not to better our community.

Sincerely,

John Palmer
734-620-4866

Kelly VanMarter

From: Ryan Zucal <ryanzucal@gmail.com>
Sent: Wednesday, December 8, 2021 9:31 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant

I recently moved to this area close to Lake Chemung. I have a wife and 2 young kids. As a constituent, I ask you do everything in your power to stop the authorization of the proposed asphalt plant. We move to this area from the east side of the state to get away from pollution and congestion. Genoa township has unique culture between Brighton and Howell and approving the plant will devalue our precious community by adding an eye sore to the skyline, dangerous pollutants to the air and a stigma that will last forever.

Kelly VanMarter

From: Ronda Brockman <rondabrockman@gmail.com>
Sent: Thursday, December 9, 2021 10:21 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt plant

Hello,

We live at 342 Natanna in Ravines of Rolling Ridge. This proposed location is very near our home. We strongly object to this and hope that this proposal is denied.

Thank you.

Ronda Anderson
734-658-5138

Kelly VanMarter

From: Matthew Bruce <matthewbruce99@yahoo.com>
Sent: Thursday, December 9, 2021 9:11 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Proposed Asphalt Plant

Good Morning Board,

My name is Matt Bruce - my family and I live at 3076 Stillriver Dr. in the Ravines of Rolling Ridge subdivision - Genoa Twp.

If you're not familiar with my address, it is **LESS THAN 3,200 FEET** from the proposed asphalt plant location (less than $\frac{3}{4}$ of a mile across Grand River, to the north/northeast of Victory Dr.) - along with hundreds of other homes in surrounding neighborhoods. This major health hazard that does not belong anywhere near our community.

I am also emailing you today to make sure that the Board is searching for a venue that will seat more than 500 people. We want this to be an IN-PERSON meeting that allows all of you to see and hear every one of the people that you represent. I am suggesting the Brighton Area for Performing Arts (or similar capacity venue) - that houses nearly 500-900 people.

Thank you,

Matt Bruce
Genoa Twp. Resident

Kelly VanMarter

From: Mark Lazar <mark.lazar@gmail.com>
Sent: Thursday, December 9, 2021 11:30 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant Proposal

Members of the Genoa Township Board of Trustees,

I hope this email finds you well.

I am reaching out to express my extreme objection to the proposal to re-zone and authorize an Asphalt Plant within our township.

I am sure (or rather I hope) you have heard from countless other residents about the health risks and the negative impact this will have on home values (and thus tax income for the township).

With two small children (6 and 2), the thought of living near an Asphalt plant is an unacceptable option. I equate this to living under high voltage power lines or a toxic waste treatment plant. We have seen countless examples in the news of these highly toxic industrial companies having environmental "spills" which impact air and ground water quality.

Any increase in tax revenue from allowing this, seems like it would be negated from residents moving. Which would likely mean that other local businesses would also relocate.

Please. Please do not allow this to happen.

Thank you for your time,
Walter Mark Lazar II
444 Natanna Dr
Howell, Mi 48843

Kelly VanMarter

From: Robin Redwine-Fischer <robred99@aol.com>
Sent: Friday, December 10, 2021 7:34 PM
To: Bill Rogers
Cc: Polly; Robin Hunt; jean@genoa.com; jim@genoa.com; terry@genoa.com; diana@genoa.com; Kelly VanMarter
Subject: Live Meeting Requested for the adjourned Asphalt Zoning Meeting and points to consider

Good Afternoon Bill and the Genoa Township Board,

Below is an excerpt of a letter recently sent to you regarding the adjournment of a 12-6-21 meeting and rescheduling to a later date regarding zoning on a property on to allow building an asphalt plant off Latson Road and Grand River, north of I96.

We are AGAINST using Zoom in place of a face to face with citizens. Many citizens are not familiar with the Zoom App and it does not always work. I believe the citizens want their voices heard, as this could very much, negatively impact their homes as well as the entire community.

Since a local church is willing to allow the community to use their facility, we are asking the you and the Township to please commit to using the church and make sure the date, time and location are provided to citizens well ahead of time.

Here are some additional points to consider with this issue or any where there is potential for environmental damage due to pollution. If Mich has to shut down pipelines for potential environmental impacts, elected leaders are pushing wind power and solar for cleaner power sources, concerns with green house gases and air pollution and climate. Should we be allowing operations like this to perpetuate or expand to new areas. Why not continue in existing approved heavy industrial locations? When you start investigating Asphalt Plants - dozens web sites pop up from across the country with Class-Action Lawsuits filed by local citizen groups filed against local governments and asphalt companies for damages. In looking through some, it is dad and I realize that this could be use in years to come **There is the saying; "it is easier to ask forgiveness, than permission"**. We all know how sales people promise the world and then deliver something less.

The Zoning was established to protect and direct and organize our community. Please honor the Zoning Laws that are in place. We are in the middle of the Chain of Lakes area of Michigan and water shed. We should be very careful to protect the people who live here and our environmental assets.

Last year the Genoa web page noted that we should be more proactive to protect the pollinators in the area, especially since there is a large agricultural aspect to the community. I would believe that the toxins know to be used and expelled are not good for us nor the pollinators.

If this were rezoned, what are the Township plans to deal with this a operation such as asphalt? I understand there is existing polluted ground. What are the current owners responsibilities to clean up?

What are the costs to citizens that we ultimately pay through taxes to DEQ for monitoring. What do we get as citizens? Is there any consideration how violations would be handled? Who? How many violations are allowed and to what extent is harm allowable on a citizen or environment before action

is taken. Would the local Township lose control of our community to the state level agencies such as DEQ?

Please think about this. In a case such as this where there appears to be a conflict of interest, where it is not just any citizen, or friend, but this is a financial relationship with someone who publicly acknowledge a financial contribution to you. The appearance of that political financial relationship, whether fair or not, it makes people question the defensive response on the recusal question. Maybe you don't see it that way, but it is a topic of conversation. I hope the this adds to the questions that we need answers to and where the Township needs to do some additional homework.

Subject: asphalt township meeting

Bill, I understand you make the decision to do a zoom meeting or an in person meeting. I was at the meeting on Monday and I believe we need to do an in person meeting. The residents asked for it and there is no good reason not to support your constituents.

Community Bible Church can accommodate 550 people and will allow us to use their facility.

Zoom didn't work well for computer savvy people during the pandemic and it will certainly not work well with the age group I saw at the Monday meeting.

The board stated we would try to find a location that we could use and we have found one. Failure to have an in person meeting would create a good amount of suspicion around this agenda item.

I look forward to a transparent meeting regarding the asphalt plant decision.

We appreciate what the Board does on daily basis to protect the community and realize this is something that you have no choice but to present at owners request.

Regards,
Robin and Patrick Fisher
5766 Long Pointe Dr
Howell, MI 48843

Kelly VanMarter

From: David N <dkdorf@gmail.com>
Sent: Saturday, December 11, 2021 11:14 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant

Dear Board Members,

Please vote NO on an Asphalt Plant in Genoa Township!!

Sincerely,
David & Kay Niendorf

Kelly VanMarter

From: Home Email <biltz5@comcast.net>
Sent: Monday, December 13, 2021 11:14 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: NO ASPHALT PLANT

Follow Up Flag: Follow up
Flag Status: Flagged

We moved to Genoa township over 30 years ago for the quality of life it could provide. All of nature has been our yard here with hiking, fishing, canoeing, biking and hunting. Our three children were raised here and we have enjoyed our time immensely.

Allowing a polluting asphalt plant to set up and operate within our boundaries completely negates what I've stated above. Property values will decrease, health of many would suffer. Lakes and streams, along with forest areas, could become polluted removing wildlife from the area. Our beautiful outdoor adventures will no longer be enjoyable due to smells, chemicals, and runoff.

Currently, Genoa township is benefiting from increased home values, construction of new subdivisions, and young families moving into the area. All of these are a boon to our current account economy. If this polluting plant is allowed to enter our area, all of these things could cease, and quickly.

My family and I do not support the asphalt plant being granted permission to construct and operate within Genoa township, or in Livingston county. Please do not allow this to occur.

Respectfully,

Michelle Biltz

Sent from my iPad

Kelly VanMarter

From: Taylor Lloyd <taylloyd06@yahoo.com>
Sent: Monday, December 13, 2021 6:34 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt plant

My family and I will not be able to attend the meeting in January due to work. We live in Genoa Township, and are very concerned about the possibility of an asphalt plant being built in our neighborhood. We have a 4 month old infant, for whom we do everything we can to limit the exposure of chemicals and toxins that she is exposed to, every single day. If this passes, that is not something we can protect her from. There are many young children living in our sub division and they are all at risk. We all deserve to breath clean air, an asphalt plant is going to take that right. Nobody should have to live in close contact to the plant, the amount of pollution and toxins released from this is going to be a health hazard to the surrounding residents. Please consider the families, infants, toddlers, young children, adults, elderly people, and pets in the area. We all deserve clean/safe air in the city that we live in. We are voting against the asphalt plant in our city, in our neighborhood, in our backyard.

-The Lloyd and Moore family.

Kelly VanMarter

From: Nancy Smith <smithnjb@att.net>
Sent: Tuesday, December 14, 2021 10:31 AM
To: Kelly VanMarter
Subject: Capital Asphalt Plant

My husband and I are both seniors, 73 years old. We moved to Howell (Genoa Township) to live a healthier lifestyle during retirement. We are extremely opposed to having an asphalt plant so near our home. This should be allowed out in the country, away from residential areas. Please do not vote to change zoning which would allow this plant to be built in Genoa Township.

Thank you,
Nancy Smith

Kelly VanMarter

From: Melissa Nantais <melissanantais@me.com>
Sent: Tuesday, December 14, 2021 8:15 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant

Greetings,

My name is Melissa Nantais and I am a resident of Genoa Township. I moved here in May to be closer to my family and because of the beauty of the area. I grew up visiting my grandparents in Marion Township near the Howell Nature Center. I have always enjoyed this area of the state and am proud to call it home. So, you can understand why it is alarming to me that our township is considering allowing an asphalt plant in our community.

Allowing an asphalt plant in our community will be a detriment to the community as asphalt plants are unregulated and produce carcinogenic agents (cancer causing agents) into the environment that will adversely effect or impact humans and the environment, including the air, water and wildlife. As a resident of Genoa Township, I am concerned about my health and the health of my neighbors. I am also concerned about the environment and the negative impact the asphalt plant will have on the water, air, and wildlife. One of the many joys of living in this area is the abundance of beautiful outdoor space and wildlife. How can it be in our communities best interest to risk all of this for the asphalt plant?

Did you know that there are 7 deadly fugitive emissions that come from Asphalt Plants. According to the National Institute for Occupational Safety and Health, asphalt fumes are considered occupational carcinogens. The Federal Environmental Protection Agency (EPA) states the asphalt fumes are know toxins. Even if an asphalt plant meets all air pollution standards, people living nearby are still exposed to cancer causing substances that can cause long term damage. How can we as a community, you as our township board even entertain the idea of the asphalt plant given the known and unknown risks? It makes it easy for one to question the integrity of the decision making process.

Studies have also shown that these types of plants near residential areas can negatively impact property values up to 56%. As someone who just invested in a new condo in the area, I am concerned about the property values and the impact of asphalt plant. In your own Planning Commission meeting minutes from 10/12/21, concerns were raised about the potential impact on air quality and odor

or dust and it was noted that if these become an issue, a remedy would be put in place. We know these are issues and still you consider moving forward. Why?

I strongly encourage you to do the right thing and do not move forward with approval for the asphalt plant.

Thank you for your time and attention to this matter,

Melissa Nantais, Ph.D.
1938 Genoa Circle
Howell, MI 48843

Kelly VanMarter

From: Mary Jo Lorr <mjlorr@att.net>
Sent: Saturday, December 18, 2021 12:15 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Capital Asphalt Plant

Trustees;

No rezoning. No asphalt plant. No to additional air pollution, toxins, carcinogens, etc. It's detrimental to our people, our lakes, our economy, our property values as well as the air we breathe.
Please shut these proposals down without delay.

Mary Jo Lorr
5064 Northfield Dr.
North Shore Subdivision
Genoa Township
517-540-1110

Kelly VanMarter

From: Pat Anderson <peanderson1512@gmail.com>
Sent: Monday, December 20, 2021 2:13 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Stop asphalt plant

Dear township trustees,

Please note our opposition to the proposed asphalt plant in the township. We reside in the Hampton Ridge condo complex, very close to the site. The area of Latson Rd and Grand River is already congested with noise, traffic, and pollution. I can't imagine living with any fumes or odors.

We are unable to attend the February meeting but please note our correspondence and opposition.

Thank you,
Patricia Anderson & David Grob
4280 Hampton Ridge Blvd
Howell

peanderson1512@gmail.com
734-255-7855

Kelly VanMarter

From: Kristen Teets <kteets2@gmail.com>
Sent: Monday, December 20, 2021 4:49 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Proposed plant

I strongly object to this plant going in our area. This is right by our home and we do not want this anywhere near where we live. Health impacts are my number one concern.

Please say NO to this proposed asphalt plant.

Kristen Teets

Sent from my iPhone

Kelly VanMarter

From: Nancy Wrosch <nwrosch@umich.edu>
Sent: Monday, December 20, 2021 4:00 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Genoa Township Proposed Asphalt Plant Location

As a Genoa Township resident, I strongly oppose the rezoning change sought to accommodate a proposed asphalt plant locating in our Township. It would be detrimental to the health and wellbeing of the residents, not to mention our property values would suffer as well because of the foul smell.

I am asking that the Board of Trustees vote no on this proposal for the sake of the community. Thank you.

Nancy Wrosch
1943 Genoa Circle
Howell, MI 48843

From: [Tracy Eckel](#)
To: [Bill Rogers](#); [Polly](#); [Robin Hunt](#); [Jean Ledford](#); [Jim Mortensen](#); [Terry Croft](#); [Diana Lowe](#); [Kelly VanMarter](#)
Subject: Opposed to Capital Asphalt Plant
Date: Wednesday, December 22, 2021 5:32:04 PM
Attachments: [image.png](#)
[Health Effects Notebook for Hazardous Air Pollutants.pdf](#)
[Letter to City of Howell.pdf](#)
[Analysis of Asphalt Plant Pollution Impacts on Public Health and Agriculture.pdf](#)

Dear Trustees,

Thank you for taking the time to read my email regarding the proposed asphalt plant in Genoa Township. I know that you have received many similar letters from residents in the area, but I still felt it was important to participate in the discussion.

I respectfully request the Zoning Board and the Trustees to not approve the zoning requests and special land use permits for the Capital Asphalt Plant. Outlined below are a few items to consider when making your decision.

All asphalt plants, even those that are functioning perfectly and in compliance with state regulations, result in air pollution and negative health effects.

Outlined below is a summary of the air pollution caused by Capital Asphalt in Lansing, Michigan based off their own reporting. The EPA provides health effect information at <https://www.epa.gov/haps/health-effects-notebook-hazardous-air-pollutants>. For your convenience, I attached PDF copies of many of the chemicals listed on this report as well as separate study titled "An Analysis of Asphalt Plant Pollution Impacts on Public Health and Agriculture in Umatilla County, Oregon".

CAP - stands for Criteria Air Pollutants
 HAP - stands for Hazardous Air Pollutants
 VOC - stands for Volatile Organic Carbon

Program	Pollutant	Units	Trend	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
NEI	Total CAPs	Pounds					27,316.37			46,808.65			
NEI	Total HAPs	Pounds					307.35			403.86			
NEI	Total VOCs	Pounds					2,276.30			3,055.05			

Emissions Data

Program	Pollutant Type	Pollutant	Units	Trend	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
NEI	HAP	1,1,1-Trichloroethane	Pounds					2.61			3.51			
NEI	HAP/VOC	2,2,4-Trimethylpentane	Pounds					2.17			2.92			
NEI	HAP/VOC	2-Methylnaphthalene	Pounds					4.72			6.35			
NEI	HAP/VOC	Acenaphthene	Pounds					.14			.19			
NEI	HAP/VOC	Acenaphthylene	Pounds					.47			.63			
NEI	HAP/VOC	Anthracene	Pounds					.03			.04			
NEI	HAP	Antimony	Pounds					.03			.01			
NEI	HAP	Arsenic	Pounds					.09			.04			
NEI	HAP/VOC	Benz[a]anthracene	Pounds					.02			.03			
NEI	HAP/VOC	Benzene	Pounds					21.38			28.76			
NEI	HAP/VOC	Benzo[a]pyrene	Pounds					.00			.00			
NEI	HAP/VOC	Benzo(b)fluoranthene	Pounds					.01			.01			
NEI	HAP/VOC	Benzo[e]pyrene	Pounds					.01			.01			
NEI	HAP/VOC	Benzo[ghi]perylene	Pounds					.01			.00			
NEI	HAP/VOC	Benzo[k]fluoranthene	Pounds					.00			.00			
NEI	HAP	Cadmium	Pounds					.01			.03			

NEI	HAP/VOC	Carbon disulfide	Pounds					.11			.15				
NEI	CAP	Carbon monoxide	Pounds					5,874.10			15,697.00				
NEI	HAP/VOC	Chloroethane	Pounds					.03			.04				
NEI	HAP/VOC	Chloromethane	Pounds					.14			.19				
NEI	HAP	Chromium(VI)	Pounds					.01			.03				
NEI	HAP/VOC	Chrysene	Pounds					.04			.05				
NEI	HAP	Cobalt	Pounds					.00			.00				
NEI	HAP/VOC	Ethylbenzene	Pounds					13.28			17.87				
NEI	HAP/VOC	Fluoranthene	Pounds					.05			.07				
NEI	HAP/VOC	Fluorene	Pounds					.35			.47				
NEI	HAP/VOC	Formaldehyde	Pounds					172.86			232.53				
NEI	HAP/VOC	Hexane	Pounds					50.60			68.07				
NEI	HAP/VOC	Indeno[1,2,3-cd]pyrene	Pounds					.00			.00				
NEI	CAP	Lead	Pounds					.40			1.10				
NEI	HAP	Manganese	Pounds					1.18			.56				
NEI	HAP	Mercury	Pounds					.01			.02				
NEI	HAP/VOC	Methyl bromide	Pounds					.03			.04				
NEI	HAP	Methylene chloride	Pounds					.00			.00				
NEI	HAP/VOC	Naphthalene	Pounds					5.14			6.91				
NEI	HAP	Nickel	Pounds					9.66			4.55				
NEI	CAP	Nitrogen oxides	Pounds					3,194.00			3,601.00				
NEI	HAP/VOC	o-Xylene	Pounds					.38			.51				
NEI	HAP/VOC	Perylene	Pounds					.00			.01				
NEI	HAP/VOC	Phenanthrene	Pounds					.66			.89				
NEI	HAP	Phosphorus	Pounds					1.52			2.04				
NEI	CAP	Primary PM10, filterable portion only	Pounds					1,934.59			6,121.72				
NEI	CAP	Primary PM10 (filterables and condensibles)	Pounds					5,423.97			7,274.02				
NEI	CAP	Primary PM2.5, filterable portion only	Pounds					542.32			4,249.28				
NEI	CAP	Primary PM2.5 (filterables and condensibles)	Pounds					4,031.70			5,401.58				
NEI	CAP	Primary PM condensible portion, less than 1 micron	Pounds					3,489.38			1,152.30				
NEI	HAP/VOC	Pyrene	Pounds					.09			.12				
NEI	HAP	Selenium	Pounds					.05			.03				
NEI	HAP/VOC	Styrene	Pounds					.04			.05				
NEI	CAP	Sulfur dioxide	Pounds					549.61			255.60				
NEI	HAP/VOC	Toluene	Pounds					8.56			11.52				
NEI	CAP/VOC	Volatile organic compounds	Pounds					2,276.30			3,055.05				
NEI	HAP/VOC	Xylene	Pounds					10.86			14.61				

Genoa Township has historically prioritized the public health, safety and welfare of its Residents.

Please take a moment to re-read the attached letter from Genoa Township to City of Howell Board of Zoning Appeals.

While I understand there are difference between the two projects, Genoa Township clearly stood up for protecting the Resident's best interest, as outlined in this excerpt:

There is certainly no basis to conclude that the variances would do substantial justice to surrounding property owners. In fact, just the opposite would occur. Rather than enclose the operation and pave the required parts of the site, adjacent property owners would now be exposed to more noise, odor, vibration, dust and environmental hazards and other impacts than they would have if the ordinance requirements were satisfied, let alone the negative impact such an improperly exposed use and operation could have on the value, marketability and future uses of their properties. Such operations are known to experience significant fire and environmental hazards which are described more fully in the appeal of the special land use filed by Livingston County Catholic Charities with this Board and the materials supporting that appeal, all of which are incorporated herein by reference.

I imaging that Genoa Township is receiving letter from its Residents referencing the EXACT SAME concerns that our Township expressed to Howell.

Genoa Residents do not support this project.

Between the emails that you have received and the public comments at the various Township meetings, I'm confident that you are getting the message that this is not supported by our Residents. Once piece of information that you may not have heard is in regards to our paper petition. I have been meeting with people face to face to discuss the project. 84.7% of residents sign immediately, 8.5% of residents ask for more information to review, and 6.8% prefer not to sign.

Your hands are not tied.

While I understand that the Township has a set of regulations and processes that are in place to make Zoning Board decisions, it is my understanding that Capital Asphalt will be asking for variances. Does Genoa Township want this to be the highest structure in the entire Township or even County? Is this how we want to welcome our visitors coming off I-96? Are we comfortable with the additional hazardous material storage on-site with all of the lakes, ponds and wetlands in our area? Are we prepared to handle an emergency at this location that stores and processes so much hazardous material? After looking at the report of where asphalt plants have been constructed, we are comfortable that this will not harm property values? Are you ready to answer those residents that have health issues due to the carcinogens and dust? I understand that may of these question will come up over the course of the approval process. Please continue to ask yourselves, is the risk worth the reward and who is really winning if this plant is constructed?

Thank you again for your consideration. I look forward to seeing you and all of my fellow Genoa residents on February 7th at Community Bible Church.

Sincerely,

Tracy Eckel
5982 Oak Bend Ct
Howell, MI 48843

Technical Report No. 13-346

AN ANALYSIS OF ASPHALT PLANT POLLUTION IMPACTS
ON PUBLIC HEALTH AND AGRICULTURE
IN UMATILLA COUNTY, OREGON

December 12, 2013

Louis A. Zeller

Blue Ridge Environmental Defense League

www.BREDL.org PO Box 88 Glendale Springs, North Carolina 28629 BREDL@skybest.com (336) 982-2691

**AN ANALYSIS OF ASPHALT PLANT POLLUTION IMPACTS
ON PUBLIC HEALTH AND AGRICULTURE IN UMATILLA COUNTY, OREGON**
December 12, 2013

RE: General Air Contaminant Discharge Permit AQGP-007
Issued in Accordance with OAR 340-216-0060
Application No. 27430, Approved 08/16/2013
Issued to Humbert Asphalt, Inc.
SIC Code is 2951/NAICS Code 324121

Background Information

The Oregon Department of Environmental Quality (ODEQ) has issued to Humbert Asphalt, Inc. a general air permit to build and operate an asphaltic concrete paving plant in Umatilla County.

The proposed plant is a counter-flow drum mix type, manufactured by Gencor in 1998. The plant design capacity is 150 tons per hour. The owner-operator's projected operating time is 10 hours per day, five days per week and forty weeks per year for a total of 2000 hours per year. See Form AQGP-107 Plant Information 2.j, 2.k, 2.l and 2.m. Also according to the permit application, projected annual asphalt production is 40,000 tons per year. *Ibid.* 2.g. The company states that it will use recycled asphalt paving, or RAP, up to a limit of 20% of product. See Plant Information 2.o, 2.n and Permit Condition 2.7. To support the drum mix operation at the site and included in the air permit are two electric power generators rated at 650 KWH and 100 KWH, each powered primarily by diesel fuel and operating for 10 hours per day, 5 days per week and 40 weeks per year. See AQGP-107, 3-Power Generator Information. Projected electric generator fuel use is given at 200 gallons per hour and 50,000 gallons per year. *Ibid.*, 4-Generator Fuel Usage Information. According to Permit Conditions 7.4 and 5.1.b.i, the plant is not new and there have been no compliance source tests performed within the last five years.¹

The Humbert Asphalt ODEQ Air Contaminant Discharge Permit Application Forms² (Application) list the company address as 84899 Hwy. 11 Milton-Freewater, OR 97862, but the site address line in the application is blank. See Form AQGP-100, page 1. The plant is designated "portable" but information provided by local residents indicates that the proposed plant location is 57445657491 Birch Creek Road, Milton-Freewater, Oregon. The area is zoned for farm use and is primarily planted in dry land type crops wheat, peas and pasture.

Analysis

In addition to state law, asphalt plants are subject to the federal Clean Air Act. Large plants that have the potential to emit (PTE) 250 tons per year or more are required to limit emissions for the prevention of significant deterioration, or PSD. PTE is based on an air pollution emitted by a

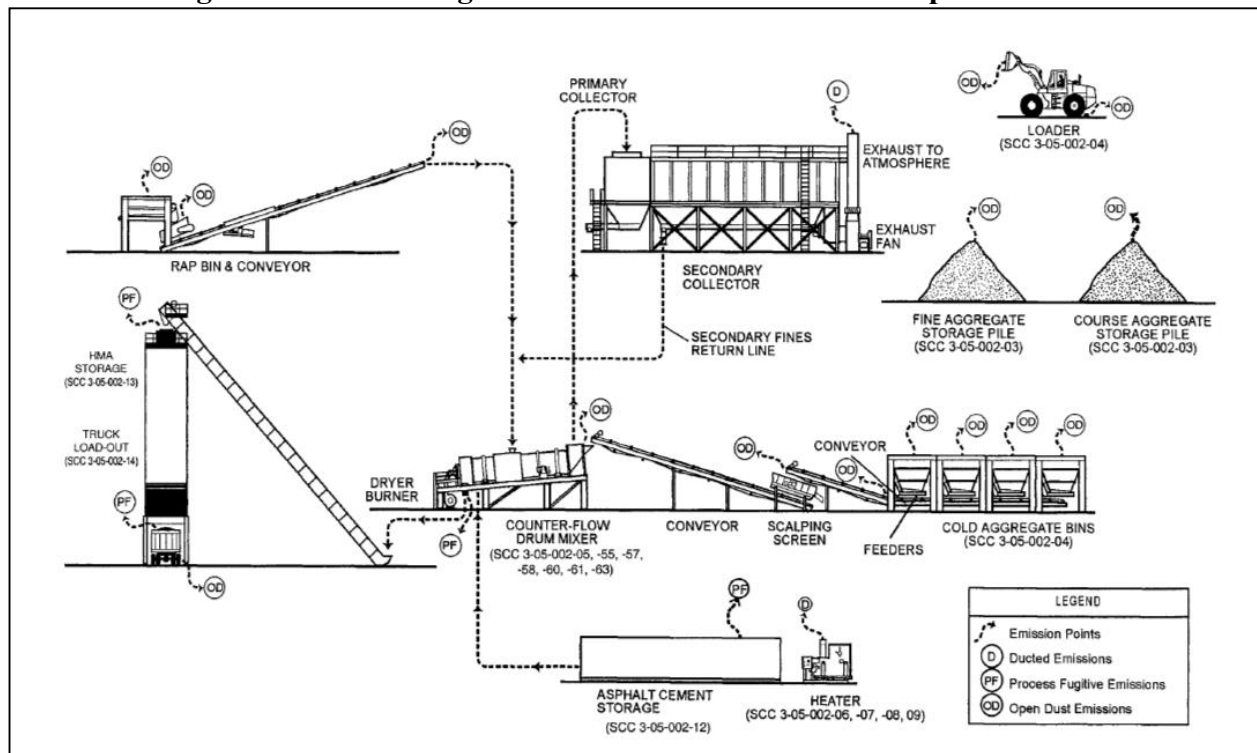
¹ Technical specifications in this paragraph are those provided by the company in their Oregon Department of Environmental Quality Form AQGP-100, Application for General Air Contaminant Discharge Permit submitted August 8, 2013, Application No. 27430.

² ODEQ Forms AQGP-100, AQGP-107, AQ202, AQ304 and AQ402

plant operating for 8760 hours per year. Also, New Source Performance Standard (NSPS) require that fugitive emissions be counted when determining major source status for hot-mix asphalt plants. Further, plants that have the potential to emit 10 tons per year or more of a hazardous air pollutant (HAP) or 25 tons per year of all HAPs combined, including fugitive emissions, are also subject to the Act's maximum achievable control technology program.

A major source of the pollution from the counter-flow drum-mix plant proposed by Humbert Asphalt is the rotary drum dryer. Emissions from the drum consist of steam evaporated from the aggregate, particulate matter (PM), products of combustion, products of incomplete combustion, and toxic compounds of various types including volatile organic compounds (VOC), methane (CH₄), hazardous air pollutants (HAP) and polycyclic aromatic hydrocarbons (PAH). The carbon monoxide and organic compounds are also released by the heated asphalt fumes, the telltale blue smoke observed at many asphalt plant sites. Figure 1 illustrates the many sources of air pollution.

Figure 1. Process Diagram: Counter-flow Drum Mix Asphalt Plant³



The above process diagram breaks the emissions into three types: 1) ducted emissions which exit the plant through the stack via a pollution control device such as a fireproof fabric filter, 2) process fugitive emissions which are hot gases emitted from various points without passing through any filters and 3) open dust emissions from the many piles, bins and conveyors of aggregate rock and sand.

³ US EPA AP-42 Emission Factors, Figure 11.1-3

Omissions and Errors in the Permit

The company omits certain projected pollution emissions for the asphalt plant. Projected emissions of eight air contaminants are listed for natural gas operation of the plant, but oil-fired emissions are listed as 0.0.⁴ However, elsewhere in the Application the company states that the primary fuel will be Diesel. Natural gas (propane) is only listed as a back-up fuel.⁵

Although the ODEQ permit application projects a maximum annual production of 40,000 tons of asphalt, the plant capacity and operating schedule of 2000 hours per year indicate maximum asphalt production of 300,000 tons per year, or 7 ½ times more than projected by the Application. The permit as issued does not limit annual production. There is no enforcement, no penalties and no fines to be levied by ODEQ for exceeding the 40,000 ton level or even the 300,000 ton level of projected annual asphalt production.

Further, although the Application states proposed asphalt plant hours of operation at 10 hours per day, testimony offered at public hearing indicated that during project production the operating hours are typically 6 AM to 6 PM.⁶ Therefore, plant operations of 12 hours per day, 5 days per week and 40 weeks per year would result in annual totals of 2,400 hours of operation and 360,000 tons of asphalt. This would be a more logical basis for ODEQ to calculate maximum air contaminant impacts than the 40,000 tons of asphalt per year projected by the company.

The Application underestimates power generator fuel use.⁷ If the electric generators use 200 gallons of fuel per hour, annual fuel usage would be 400,000 gallons per year, not 50,000 gallons per year as listed in the Application (200 gallons/hour × 2000 hours/year = 400,000 gallons/year).

The Application's Power Generator Information lists the primary fuel as Diesel with propane as back-up fuel (AQGP-107 Section 3, page 2). However, elsewhere in the Application the asphalt plant information lists primary fuel as liquid propane with Diesel as back-up fuel (ODEQ Asphalt Plant Information Answer Sheet, Form AQ202, page 2).

Pollution Impacts

Asphalt plants are largely regulated as point sources of air pollution from the main smoke stack which carries emissions from the aggregate dryer through the bag-house filter. Based on information provided by the permit applicant to ODEQ and US EPA emission factors, the annual air pollution emissions from the main stack are listed in Table A.

⁴ ODEQ Form AQGP-107 page 4, Section 4.b. Maximum Projected Pollution Emissions, Drum Plants

⁵ ODEQ Form AQGP-107 page 2, Section 3. Power Generator Information

⁶ Testimony of Troy Humbert, Final Findings and Conclusions, Umatilla County Planning Commission, Humbert Asphalt, Conditional Use Request Asphalt Plant #C-1226-13, October 24, 2013, page 6.

⁷ ODEQ Form AQGP-107 page 2, Section 4. Fuel Information

Table A. Yearly Asphalt Plant Pollution–Main Stack

Pollutant	Annual Emissions (pounds)	
	Natural Gas (propane)	Fuel Oil #2
CO	39000	39000
NO _x	7800	16500
PM	9900	9900
PM-10	6900	6900
SO ₂	1020	3300
HAP	1590	2610
Formaldehyde	930	930
PAH	57	264
Naphthalene	27	195
Benzene	117	117

The ODEQ permit allows Humbert Asphalt to burn either natural gas or diesel fuel to operate the plant. Natural gas and diesel fuel have different pollution impacts, with fuel oil in some cases many times dirtier. Relative emissions of polynuclear aromatic hydrocarbons (PAH) and hazardous air pollutants (HAP) using natural gas and fuel oil are compared in Table B.

Table B. Air Pollution from Fuel Oil versus Natural Gas⁸

	Natural gas	Fuel oil	Difference: Fuel Oil emissions are
Total non-PAH HAP	0.0051	0.0078	53% higher
Total PAH HAP	0.00019	0.00088	4.6 times higher

The dual fuel permit means that it is up to the operator to decide which fuel to use; the availability and the cost of fuel are the determining factors: either fuel may be used on any given day of operation.

In addition to the main stack, asphalt plants have many sources of emissions including the asphalt cement heater and storage tank, fuel tanks, conveyor belts, hoppers and other equipment close to ground level. Because these emissions occur close to ground level and are not ejected upwards through the main stack, wind velocity is reduced and air pollution is not subject to the dispersion which occurs at higher levels. Stagnant air conditions and inversions increase the level of exposure to the local community.

Fugitive emissions from asphalt are greatly underestimated. Asphalt cement typically comprises 5% of hot mix asphalt. Fugitive air emissions equal 1.07% of the consumed asphalt cement. Two thousand hours of operation at 150 tons per hour (which the ODEQ permit posits) would yield the production of 300,000 tons of hot mix asphalt per year. If we factor these percentages with the proposed plant output, we find the following:

$$300,000 \text{ tons asphalt} \times 0.05 = 15,000 \text{ tons per year of asphalt cement}$$

$$15,000 \times 0.0107 = 160 \text{ tons per year of asphalt vapor fugitive emissions}$$

⁸ US Environmental Protection Agency, Air Pollution Emission Factors, AP-42, Chapter 11.1 Hot Mix Asphalt Plants, Table 11.1-10

The bulk of the fugitive emissions are condensed particulates. Volatile organic compounds (VOCs) comprise about 29% of the total.⁹ Therefore, in addition to the emissions from the drum-mix heater vented through the bag house filter, about 114 tons of particulates and 46 tons of VOC may be emitted by the Humbert Asphalt plant as fugitive emissions unfiltered and uncontrolled. There are almost 2000 dangerous chemicals in asphalt fume, and the decision to build an asphalt plant must include fugitive emissions as well as smokestack emissions.

Drum mix asphalt plants also release fugitive emissions of particulate matter and volatile organic compounds from transport and handling of the asphalt from the drum mixer to the storage silos and from the load-out operations to the delivery trucks (illustrated in Figure 1).

In addition to plant process emissions and fugitive emissions, the Humbert Application states that the plant will utilize onsite electric generators to provide motive power. Two generators would use internal combustion engines, emitting a variety of air pollutants similar to those of the main stack but which are uncontrolled by fabric filtering devices. The Humbert Application projects annual fuel usage of 50,000 gallons for these power generators. These pollutant totals are compiled in column two of Table C.¹⁰ However, the stated 200 gallon per hour rate running for the full 2000 operating hours per year would result in 400,000 gallons of fuel use annually. Therefore, column three includes pollution totals which would be emitted at the higher level of operation projected by the company's Application.

Table C. Electric Power Generator Emissions

Pollutant	Annual Emissions At 50,000 gallons/year	Annual Emissions At 400,000 gallons per year
CO	6500	52000
NO _x	30200	241600
PM/PM-10	2125	17000
SO ₂	1985	15880
VOC	2495	19720

The air pollution impact of this asphalt plant operation is complicated by the combination of the drum-mix operation, fugitive emissions and electric generator emissions.

Ambient Pollution Estimates

This report uses an EPA spreadsheet based on the SCREEN3 air dispersion model which calculates all emission modeling modes: area source and volume source as well as point source. Pollution calculations were done for asphalt production levels of 300,000 tons per year. The higher number is the more realistic estimate of maximum projected annual production based on the applicant's projected work schedule.

Appendix B outlines the air pollution model used in this report. The maps in Appendix C and the data readouts in Appendix D indicate the extent of modeled air pollution impacts above

⁹ Data on fugitive emissions from the work of Dr. R.M. Nadkarni

¹⁰ The values in Table B's Column two are identical to those listed in the Application Form AQGP-107, Section c, page 5, but are rendered in pounds instead of tons.

minimal response levels, or MRLs, set by the Agency for Toxic Substances and Disease Registry. According to information on MRLs published by the National Center for Biotechnology Information:

Minimal risk levels (MRLs) are health-based guidance values derived for individual substances by conducting a thorough review of the literature, identifying appropriate target organs of response, and identifying a dose level where a no adverse effect or the lowest adverse effect level is seen. This level is then evaluated for uncertainty in the data base and for other extenuating factors and subsequently adjusted with uncertainty or modifying factors. The resulting calculation yields the MRL that is defined as an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse noncancer health effects over a specified duration of exposure.

Naphthalene, benzene, formaldehyde, mercury and cadmium are hazardous air pollutants emitted by all asphalt plants. These toxic substances are not reduced by bag-house filter pollution controls because they are much too small for capture by such devices.

Benzene is a known carcinogen or cancer-causing agent. Formaldehyde is a probable human carcinogen and an eye, skin, and respiratory tract irritant. Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are created during the incomplete burning of fossil fuel and other organic substances. The Department of Health and Human Services has determined that some PAHs may reasonably be expected to cause cancer. Breathing air with low levels of cadmium over long periods of time may result kidney disease, lung damage and fragile bones. Animal studies show that inhalation of cadmium promotes lung cancer, liver damage and changes in the immune system. Exposure to naphthalene by inhalation and ingestion is associated with hemolytic anemia, damage to the liver, and neurological damage. Mercury and most of its compounds are extremely toxic, causing tremors, impaired cognitive skills, and sleep disturbance with chronic exposure even at low concentrations.

The highest risk levels as determined by the modeling show mercury exceeding acceptable levels 300 meters from the asphalt plant (about a football field), benzene and cadmium exceeding acceptable levels 600 meters from the plant (over one-third of a mile), naphthalene exceeding acceptable levels 1,800 meters from the plant (over one mile), and formaldehyde exceeding acceptable levels 2,600 meters from the plant (over a mile and a half).

Agricultural Impacts

The Umatilla County area proposed for the asphalt plant is primarily agricultural. A recent study indicates that edible wheat would serve as a portal for human exposure to polycyclic aromatic hydrocarbons (PAH).¹¹ Appendix A includes the full abstract of this analysis. As outlined in the study, the risk to humans is significant. A number of PAHs are mutagenic or carcinogenic, and PAH may be absorbed into the blood through inhalation, ingestion, and dermal contact, causing systemic toxic effects.

¹¹ "Polycyclic aromatic hydrocarbons in edible grain: A pilot study of agricultural crops as a human exposure pathway for environmental contaminants using wheat as a model crop," Kobayashi R et al, Environmental Research 107 (2008) 1456151

According to ATSDR, naphthalene has been found in milk from dairy cows and eggs from laying hens exposed to the pollutant. Also, naphthalene and methylnaphthalenes have been found in fish and shellfish in polluted bodies of water.

Conclusion

The Oregon Department of Environmental Quality has issued a defective permit filled with internal contradictions and errors of fact. Toxic air pollution levels indicated in this report based on the permit present an unacceptable level of risk to the residents living near the plant site. The permit should provide no confidence to county officials that public health and agricultural livelihood would be protected.

A handwritten signature in black ink that reads "Louis A. Zeller". The signature is written in a cursive style and is positioned above a horizontal line.

Louis A. Zeller, Science Director
December 12, 2013

Appendices

Appendix A

Polycyclic aromatic hydrocarbons in edible grain: A pilot study of agricultural crops as a human exposure pathway for environmental contaminants using wheat as a model crop

Kobayashi R et al, Environmental Research 107 (2008) 1456151

Abstract

The concentrations of polycyclic aromatic hydrocarbons (PAHs) were investigated in a pilot study of field wheat grain as a model indicator for environmental contamination. The edible grain would serve as a portal for human exposure. Wheat grain was initially studied since it is one of the major food crops consumed internationally by many including infants and children. Wheat grain samples from five different geographical growing locations in California that span approximately 450km were collected during the same growing season. The same variety of grain was harvested and analyzed for PAHs that ranged from 2- to 6-rings. PAHs were detected in all grain samples and were mainly 2- to 4-ring PAHs with naphthalene the most abundant among them. There were geographical differences in the levels of PAHs in the grain. The sources of the PAHs were not known in this pilot study, but the principal component analysis indicates that the major source is similar in all locations except for naphthalene. Grain naphthalene concentrations may reflect local naphthalene emissions. Diesel-fueled harvesting operations did not appear to contribute to the observed PAH concentrations in the grain. An estimate of naphthalene intake from eating grain compared to inhalation intake demonstrated the potential importance of field contamination of grain as a possible portal of human exposure. The relationship between PAH concentrations in grain and air should be quantitatively investigated to better quantitate exposure and to identify effective measures to lower the risk from PAH exposure through eating grain.

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Appendix B

Screen modeling tool to calculate worst case calculations

Air pollutant emission sources are commonly characterized as point, area or volume sources:

- Point source: A single, identifiable source of air pollutant emissions; for example, a combustion boiler flue gas stack. A point source has no geometric dimensions.
- Area source: A two-dimensional source of diffuse air pollutant emissions; for example, a landfill or vapors from a large spill of volatile liquid.
- Volume source: A three-dimensional source of diffuse air pollutant emissions. Essentially, it is an area source with height; for example, the fugitive gaseous emissions from piping flanges, valves and other equipment at various heights within industrial facilities such as petrochemical plants.

To calculate worst case calculations from point, area or volume source with spreadsheet:

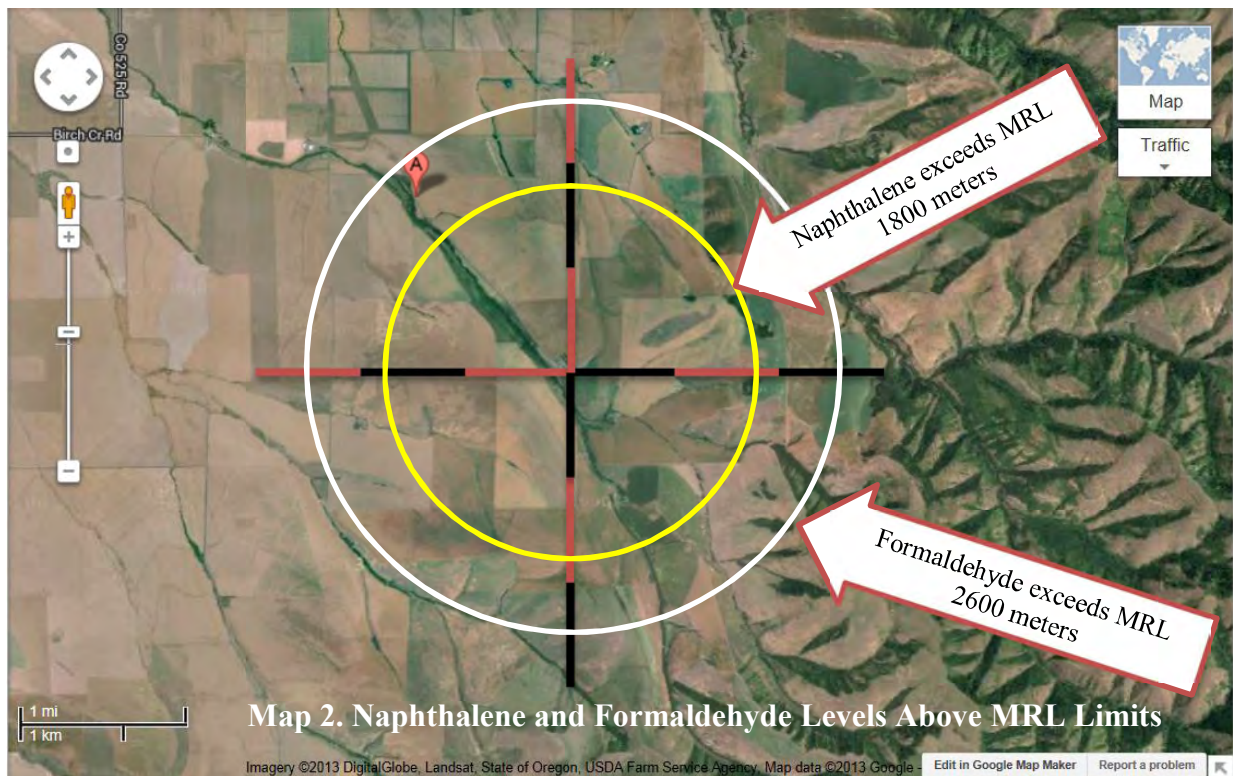
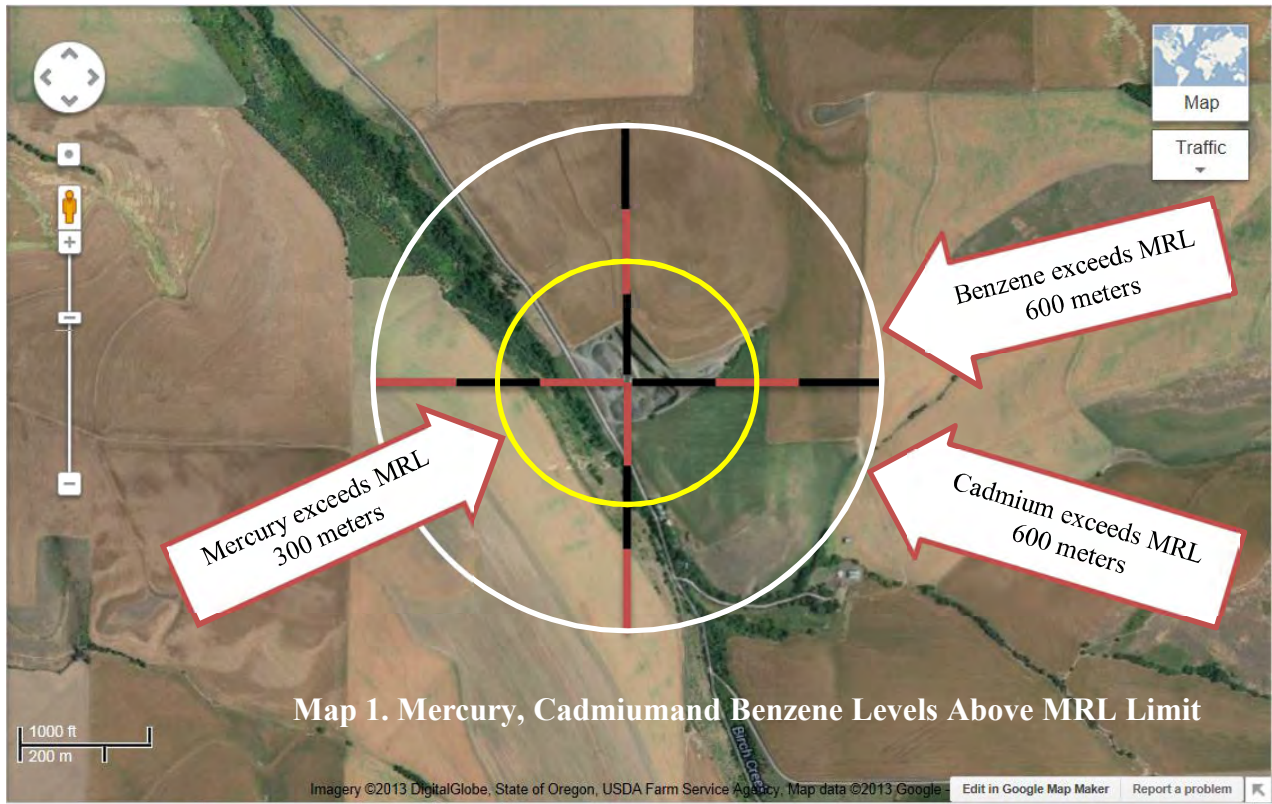
If the emission rate is entered (where the big red value is) the spreadsheet will make the downwind calculations for each of the source types.

If the concern level is entered (at the smaller red value) the spreadsheet will make a comparison of the values.

In the calculations below, the emission rate is from US Environmental Protection Agency AP-42 Emission Factors, Chapter 11, Mineral products Industry for hot-mix asphalt, Available at <http://www.epa.gov/ttnchie1/ap42/ch11/final/c11s01.pdf>

The concern level is set at the Minimal Risk Levels (MRLs) for hazardous substances established by the Agency for Toxic Substances and Disease Registry, updated July 2013. Available at <http://www.atsdr.cdc.gov/mrls/mrllist.asp>

Appendix C



Appendix D

This section contains pollution impact calculations from a 150 ton per hour asphalt plant burning No. 2 fuel oil and/or natural gas (propane). US EPA Emission Factors are used to determine Peak (30 minute) Emission Rates. Concern Levels are from the Agency for Toxic Substances and Disease Registry (ATSDR) minimal risk levels (MRLs), updated July 2013. The pollution level and radius of impact for each substance is an instantaneous result; i.e., the impacts calculated under point, area, volume and worst would occur anytime the plant operates at full capacity. The right-most column recommends emission reductions at all distances from the plant for which ambient air pollution would exceed the corresponding level of concern.

EMISSIONS CALCULATIONS—ONLY FUEL OIL

Naphthalene: C₁₀H₈ CAS No. 91-20-3

Peak (30 min) Emission Rate =			0.012	g/s	0.4272	tons/yr	
MW=			128.17				
Concern level			0.0007	ppm	3.6695	ug/m3	
Fuel: FO							
Distance (M)	Point	Area	Volume	Worst	Recommendation		
10	1.58E+02	2.11E+03	2.10E+02	2.11E+03	reduce emissions		
100	9.07E+00	2.90E+02	9.47E+01	2.90E+02	reduce emissions		
200	4.95E+00	1.15E+02	5.25E+01	1.15E+02	reduce emissions		
300	3.40E+00	6.24E+01	3.38E+01	6.24E+01	reduce emissions		
400	2.61E+00	3.95E+01	2.38E+01	3.95E+01	reduce emissions		
500	2.13E+00	2.75E+01	1.78E+01	2.75E+01	reduce emissions		
600	1.80E+00	2.04E+01	1.43E+01	2.04E+01	reduce emissions		
700	1.52E+00	1.58E+01	1.16E+01	1.58E+01	reduce emissions		
800	1.33E+00	1.28E+01	9.64E+00	1.28E+01	reduce emissions		
900	1.33E+00	1.07E+01	8.26E+00	1.07E+01	reduce emissions		
1000	1.33E+00	9.03E+00	7.13E+00	9.03E+00	reduce emissions		
1100	1.31E+00	7.81E+00	6.24E+00	7.81E+00	reduce emissions		
1200	1.32E+00	6.84E+00	5.52E+00	6.84E+00	reduce emissions		
1300	1.31E+00	6.05E+00	4.92E+00	6.05E+00	reduce emissions		
1400	1.30E+00	5.40E+00	4.43E+00	5.40E+00	reduce emissions		
1500	1.29E+00	4.86E+00	4.01E+00	4.86E+00	reduce emissions		
1600	1.26E+00	4.40E+00	3.65E+00	4.40E+00	reduce emissions		
1700	1.24E+00	4.01E+00	3.35E+00	4.01E+00	reduce emissions		
1800	1.21E+00	3.68E+00	3.08E+00	3.68E+00	reduce emissions		
1900	1.18E+00	3.39E+00	2.84E+00	3.39E+00	its OK		
2000	1.15E+00	3.13E+00	2.67E+00	3.13E+00	its OK		
2100	1.12E+00	2.92E+00	2.50E+00	2.92E+00	its OK		
2200	1.08E+00	2.73E+00	2.34E+00	2.73E+00	its OK		
2300	1.05E+00	2.56E+00	2.20E+00	2.56E+00	its OK		
2400	1.02E+00	2.41E+00	2.07E+00	2.41E+00	its OK		

2500	9.93E-01	2.27E+00	1.96E+00	2.27E+00		its OK	
2600	9.64E-01	2.14E+00	1.85E+00	2.14E+00		its OK	
2700	9.37E-01	2.03E+00	1.76E+00	2.03E+00		its OK	
2800	9.10E-01	1.92E+00	1.67E+00	1.92E+00		its OK	
2900	8.84E-01	1.83E+00	1.59E+00	1.83E+00		its OK	
3000	8.60E-01	1.74E+00	1.52E+00	1.74E+00		its OK	
3500	7.51E-01	1.41E+00	1.24E+00	1.41E+00		its OK	
4000	6.63E-01	1.18E+00	1.04E+00	1.18E+00		its OK	
4500	5.92E-01	1.00E+00	8.86E-01	1.00E+00		its OK	
5000	5.32E-01	8.69E-01	7.69E-01	8.69E-01		its OK	
5500	4.82E-01	7.63E-01	6.77E-01	7.63E-01		its OK	
6000	4.40E-01	6.78E-01	6.02E-01	6.78E-01		its OK	
6500	4.04E-01	6.08E-01	5.41E-01	6.08E-01		its OK	
7000	3.72E-01	5.50E-01	4.90E-01	5.50E-01		its OK	
7500	3.45E-01	5.02E-01	4.48E-01	5.02E-01		its OK	
8000	3.22E-01	4.62E-01	4.12E-01	4.62E-01		its OK	
8500	3.01E-01	4.27E-01	3.81E-01	4.27E-01		its OK	
9000	2.82E-01	3.96E-01	3.54E-01	3.96E-01		its OK	
9500	2.66E-01	3.69E-01	3.30E-01	3.69E-01		its OK	
10000	2.51E-01	3.45E-01	3.08E-01	3.45E-01		its OK	

Mercury: Hg CAS No. 7439-97-6

Peak (30 min) Emission Rate =			0.000049	g/s	0.0017	tons/yr
MW=			200.59			
Concern level			0.000024	ppm	0.1969	ug/m3
Fuel: FO						
Distance (M)	Point	Area	Volume	Worst		Recommendation
10	6.29E-01	8.42E+00	8.38E-01	8.42E+00		reduce emissions
100	3.61E-02	1.16E+00	3.77E-01	1.16E+00		reduce emissions
200	1.97E-02	4.58E-01	2.09E-01	4.58E-01		reduce emissions
300	1.36E-02	2.48E-01	1.35E-01	2.48E-01		reduce emissions
400	1.04E-02	1.57E-01	9.50E-02	1.57E-01		its OK
500	8.47E-03	1.10E-01	7.09E-02	1.10E-01		its OK
600	7.16E-03	8.13E-02	5.69E-02	8.13E-02		its OK
700	6.06E-03	6.30E-02	4.62E-02	6.30E-02		its OK
800	5.28E-03	5.11E-02	3.84E-02	5.11E-02		its OK
900	5.30E-03	4.25E-02	3.29E-02	4.25E-02		its OK
1000	5.32E-03	3.60E-02	2.84E-02	3.60E-02		its OK
1100	5.24E-03	3.11E-02	2.49E-02	3.11E-02		its OK
1200	5.24E-03	2.72E-02	2.20E-02	2.72E-02		its OK
1300	5.23E-03	2.41E-02	1.96E-02	2.41E-02		its OK
1400	5.19E-03	2.15E-02	1.76E-02	2.15E-02		its OK
1500	5.12E-03	1.94E-02	1.60E-02	1.94E-02		its OK

1600	5.03E-03	1.75E-02	1.46E-02	1.75E-02		its OK
1700	4.93E-03	1.60E-02	1.33E-02	1.60E-02		its OK
1800	4.82E-03	1.47E-02	1.23E-02	1.47E-02		its OK
1900	4.70E-03	1.35E-02	1.13E-02	1.35E-02		its OK
2000	4.58E-03	1.25E-02	1.06E-02	1.25E-02		its OK
2100	4.45E-03	1.16E-02	9.95E-03	1.16E-02		its OK
2200	4.32E-03	1.09E-02	9.32E-03	1.09E-02		its OK
2300	4.19E-03	1.02E-02	8.77E-03	1.02E-02		its OK
2400	4.07E-03	9.58E-03	8.26E-03	9.58E-03		its OK
2500	3.95E-03	9.04E-03	7.80E-03	9.04E-03		its OK
2600	3.84E-03	8.54E-03	7.38E-03	8.54E-03		its OK
2700	3.73E-03	8.09E-03	7.00E-03	8.09E-03		its OK
2800	3.63E-03	7.67E-03	6.65E-03	7.67E-03		its OK
2900	3.52E-03	7.29E-03	6.33E-03	7.29E-03		its OK
3000	3.43E-03	6.94E-03	6.07E-03	6.94E-03		its OK
3500	2.99E-03	5.63E-03	4.94E-03	5.63E-03		its OK
4000	2.64E-03	4.69E-03	4.13E-03	4.69E-03		its OK
4500	2.36E-03	3.99E-03	3.53E-03	3.99E-03		its OK
5000	2.12E-03	3.46E-03	3.06E-03	3.46E-03		its OK
5500	1.92E-03	3.04E-03	2.70E-03	3.04E-03		its OK
6000	1.75E-03	2.70E-03	2.40E-03	2.70E-03		its OK
6500	1.61E-03	2.42E-03	2.15E-03	2.42E-03		its OK
7000	1.48E-03	2.19E-03	1.95E-03	2.19E-03		its OK
7500	1.38E-03	2.00E-03	1.78E-03	2.00E-03		its OK
8000	1.28E-03	1.84E-03	1.64E-03	1.84E-03		its OK
8500	1.20E-03	1.70E-03	1.52E-03	1.70E-03		its OK
9000	1.13E-03	1.58E-03	1.41E-03	1.58E-03		its OK
9500	1.06E-03	1.47E-03	1.31E-03	1.47E-03		its OK
10000	1.00E-03	1.37E-03	1.23E-03	1.37E-03		its OK

EMISSIONS CALCULATIONS—EITHER FUEL OIL OR NATURAL GAS

Benzene: C₆H₆ CAS No. 71-43-2

Peak (30 min) Emission Rate =			0.007	g/s	0.256	tons/yr	
MW=			78.11				
Concern level			0.003	ppm	9.584	ug/m3	
Fuel: FO/NG							
Distance (M)	Point	Area	Volume	Worst		Recommendation	
10	9.46E+01	1.27E+03	1.26E+02	1.27E+03		reduce emissions	
100	5.43E+00	1.74E+02	5.67E+01	1.74E+02		reduce emissions	

200	2.96E+00	6.89E+01	3.15E+01	6.89E+01		reduce emissions
300	2.04E+00	3.74E+01	2.03E+01	3.74E+01		reduce emissions
400	1.57E+00	2.37E+01	1.43E+01	2.37E+01		reduce emissions
500	1.27E+00	1.65E+01	1.07E+01	1.65E+01		reduce emissions
600	1.08E+00	1.22E+01	8.56E+00	1.22E+01		reduce emissions
700	9.12E-01	9.48E+00	6.95E+00	9.48E+00		its OK
800	7.94E-01	7.69E+00	5.77E+00	7.69E+00		its OK
900	7.97E-01	6.39E+00	4.95E+00	6.39E+00		its OK
1000	8.00E-01	5.41E+00	4.27E+00	5.41E+00		its OK
1100	7.88E-01	4.68E+00	3.74E+00	4.68E+00		its OK
1200	7.89E-01	4.10E+00	3.31E+00	4.10E+00		its OK
1300	7.87E-01	3.63E+00	2.95E+00	3.63E+00		its OK
1400	7.80E-01	3.24E+00	2.65E+00	3.24E+00		its OK
1500	7.70E-01	2.91E+00	2.40E+00	2.91E+00		its OK
1600	7.57E-01	2.64E+00	2.19E+00	2.64E+00		its OK
1700	7.41E-01	2.41E+00	2.00E+00	2.41E+00		its OK
1800	7.25E-01	2.20E+00	1.84E+00	2.20E+00		its OK
1900	7.07E-01	2.03E+00	1.70E+00	2.03E+00		its OK
2000	6.89E-01	1.88E+00	1.60E+00	1.88E+00		its OK
2100	6.69E-01	1.75E+00	1.50E+00	1.75E+00		its OK
2200	6.50E-01	1.63E+00	1.40E+00	1.63E+00		its OK
2300	6.31E-01	1.53E+00	1.32E+00	1.53E+00		its OK
2400	6.12E-01	1.44E+00	1.24E+00	1.44E+00		its OK
2500	5.95E-01	1.36E+00	1.17E+00	1.36E+00		its OK
2600	5.78E-01	1.28E+00	1.11E+00	1.28E+00		its OK
2700	5.61E-01	1.22E+00	1.05E+00	1.22E+00		its OK
2800	5.45E-01	1.15E+00	1.00E+00	1.15E+00		its OK
2900	5.30E-01	1.10E+00	9.52E-01	1.10E+00		its OK
3000	5.15E-01	1.04E+00	9.13E-01	1.04E+00		its OK
3500	4.50E-01	8.46E-01	7.43E-01	8.46E-01		its OK
4000	3.98E-01	7.05E-01	6.22E-01	7.05E-01		its OK
4500	3.55E-01	6.01E-01	5.31E-01	6.01E-01		its OK
5000	3.19E-01	5.20E-01	4.61E-01	5.20E-01		its OK
5500	2.89E-01	4.57E-01	4.05E-01	4.57E-01		its OK
6000	2.64E-01	4.06E-01	3.61E-01	4.06E-01		its OK
6500	2.42E-01	3.64E-01	3.24E-01	3.64E-01		its OK
7000	2.23E-01	3.29E-01	2.93E-01	3.29E-01		its OK
7500	2.07E-01	3.01E-01	2.68E-01	3.01E-01		its OK
8000	1.93E-01	2.77E-01	2.47E-01	2.77E-01		its OK
8500	1.80E-01	2.56E-01	2.28E-01	2.56E-01		its OK
9000	1.69E-01	2.37E-01	2.12E-01	2.37E-01		its OK
9500	1.59E-01	2.21E-01	1.98E-01	2.21E-01		its OK
10000	1.50E-01	2.07E-01	1.85E-01	2.07E-01		its OK

Cadmium: Cd CAS No. 7440-43-9

Peak (30 min) Emission Rate =			0.000007749	g/s	0.0003	tons/yr	
MW=			112.4				
Concern level			0.00000218	ppm	0.01	ug/m3	
Fuel: FO/NG							
Distance (M)	Point	Area	Volume	Worst		Recommendation	
10	9.94E-02	1.33E+00	1.33E-01	1.33E+00		reduce emissions	
100	5.71E-03	1.83E-01	5.97E-02	1.83E-01		reduce emissions	
200	3.12E-03	7.24E-02	3.31E-02	7.24E-02		reduce emissions	
300	2.14E-03	3.93E-02	2.13E-02	3.93E-02		reduce emissions	
400	1.65E-03	2.49E-02	1.50E-02	2.49E-02		reduce emissions	
500	1.34E-03	1.74E-02	1.12E-02	1.74E-02		reduce emissions	
600	1.13E-03	1.29E-02	9.00E-03	1.29E-02		reduce emissions	
700	9.59E-04	9.97E-03	7.30E-03	9.97E-03		its OK	
800	8.35E-04	8.08E-03	6.07E-03	8.08E-03		its OK	
900	8.38E-04	6.72E-03	5.20E-03	6.72E-03		its OK	
1000	8.41E-04	5.69E-03	4.49E-03	5.69E-03		its OK	
1100	8.28E-04	4.92E-03	3.93E-03	4.92E-03		its OK	
1200	8.29E-04	4.31E-03	3.48E-03	4.31E-03		its OK	
1300	8.28E-04	3.81E-03	3.10E-03	3.81E-03		its OK	
1400	8.21E-04	3.40E-03	2.79E-03	3.40E-03		its OK	
1500	8.10E-04	3.06E-03	2.53E-03	3.06E-03		its OK	
1600	7.96E-04	2.77E-03	2.30E-03	2.77E-03		its OK	
1700	7.80E-04	2.53E-03	2.11E-03	2.53E-03		its OK	
1800	7.62E-04	2.32E-03	1.94E-03	2.32E-03		its OK	
1900	7.43E-04	2.13E-03	1.79E-03	2.13E-03		its OK	
2000	7.24E-04	1.97E-03	1.68E-03	1.97E-03		its OK	
2100	7.03E-04	1.84E-03	1.57E-03	1.84E-03		its OK	
2200	6.83E-04	1.72E-03	1.47E-03	1.72E-03		its OK	
2300	6.63E-04	1.61E-03	1.39E-03	1.61E-03		its OK	
2400	6.44E-04	1.52E-03	1.31E-03	1.52E-03		its OK	
2500	6.25E-04	1.43E-03	1.23E-03	1.43E-03		its OK	
2600	6.07E-04	1.35E-03	1.17E-03	1.35E-03		its OK	
2700	5.90E-04	1.28E-03	1.11E-03	1.28E-03		its OK	
2800	5.73E-04	1.21E-03	1.05E-03	1.21E-03		its OK	
2900	5.57E-04	1.15E-03	1.00E-03	1.15E-03		its OK	
3000	5.42E-04	1.10E-03	9.60E-04	1.10E-03		its OK	
3500	4.73E-04	8.90E-04	7.81E-04	8.90E-04		its OK	
4000	4.18E-04	7.42E-04	6.53E-04	7.42E-04		its OK	
4500	3.73E-04	6.32E-04	5.58E-04	6.32E-04		its OK	
5000	3.35E-04	5.47E-04	4.84E-04	5.47E-04		its OK	
5500	3.04E-04	4.81E-04	4.26E-04	4.81E-04		its OK	
6000	2.77E-04	4.27E-04	3.79E-04	4.27E-04		its OK	
6500	2.54E-04	3.83E-04	3.41E-04	3.83E-04		its OK	

7000	2.35E-04	3.46E-04	3.08E-04	3.46E-04		its OK	
7500	2.18E-04	3.16E-04	2.82E-04	3.16E-04		its OK	
8000	2.03E-04	2.91E-04	2.59E-04	2.91E-04		its OK	
8500	1.90E-04	2.69E-04	2.40E-04	2.69E-04		its OK	
9000	1.78E-04	2.49E-04	2.23E-04	2.49E-04		its OK	
9500	1.67E-04	2.32E-04	2.08E-04	2.32E-04		its OK	
10000	1.58E-04	2.17E-04	1.94E-04	2.17E-04		its OK	

Formaldehyde: CH₂O CAS No. 50-00-0

Peak (30 min) Emission Rate =			0.059	g/s	2.0349	tons/yr	
MW=			30.03				
Concern level			0.008	ppm	9.8258	ug/m3	
Fuel: FO/NG							
Distance (M)	Point	Area	Volume	Worst		Recommendation	
10	7.52E+02	1.01E+04	1.00E+03	1.01E+04		reduce emissions	
100	4.32E+01	1.38E+03	4.51E+02	1.38E+03		reduce emissions	
200	2.36E+01	5.48E+02	2.50E+02	5.48E+02		reduce emissions	
300	1.62E+01	2.97E+02	1.61E+02	2.97E+02		reduce emissions	
400	1.25E+01	1.88E+02	1.14E+02	1.88E+02		reduce emissions	
500	1.01E+01	1.31E+02	8.48E+01	1.31E+02		reduce emissions	
600	8.57E+00	9.73E+01	6.80E+01	9.73E+01		reduce emissions	
700	7.25E+00	7.53E+01	5.52E+01	7.53E+01		reduce emissions	
800	6.32E+00	6.11E+01	4.59E+01	6.11E+01		reduce emissions	
900	6.34E+00	5.08E+01	3.93E+01	5.08E+01		reduce emissions	
1000	6.36E+00	4.30E+01	3.40E+01	4.30E+01		reduce emissions	
1100	6.26E+00	3.72E+01	2.97E+01	3.72E+01		reduce emissions	
1200	6.27E+00	3.26E+01	2.63E+01	3.26E+01		reduce emissions	
1300	6.26E+00	2.88E+01	2.35E+01	2.88E+01		reduce emissions	
1400	6.20E+00	2.57E+01	2.11E+01	2.57E+01		reduce emissions	
1500	6.12E+00	2.32E+01	1.91E+01	2.32E+01		reduce emissions	
1600	6.02E+00	2.10E+01	1.74E+01	2.10E+01		reduce emissions	
1700	5.89E+00	1.91E+01	1.59E+01	1.91E+01		reduce emissions	
1800	5.76E+00	1.75E+01	1.47E+01	1.75E+01		reduce emissions	
1900	5.62E+00	1.61E+01	1.36E+01	1.61E+01		reduce emissions	
2000	5.48E+00	1.49E+01	1.27E+01	1.49E+01		reduce emissions	
2100	5.32E+00	1.39E+01	1.19E+01	1.39E+01		reduce emissions	
2200	5.16E+00	1.30E+01	1.11E+01	1.30E+01		reduce emissions	
2300	5.01E+00	1.22E+01	1.05E+01	1.22E+01		reduce emissions	
2400	4.87E+00	1.15E+01	9.87E+00	1.15E+01		reduce emissions	
2500	4.73E+00	1.08E+01	9.33E+00	1.08E+01		reduce emissions	
2600	4.59E+00	1.02E+01	8.82E+00	1.02E+01		reduce emissions	
2700	4.46E+00	9.67E+00	8.37E+00	9.67E+00		its OK	
2800	4.33E+00	9.17E+00	7.96E+00	9.17E+00		its OK	

2900	4.21E+00	8.72E+00	7.57E+00	8.72E+00		its OK	
3000	4.10E+00	8.30E+00	7.26E+00	8.30E+00		its OK	
3500	3.58E+00	6.73E+00	5.91E+00	6.73E+00		its OK	
4000	3.16E+00	5.61E+00	4.94E+00	5.61E+00		its OK	
4500	2.82E+00	4.78E+00	4.22E+00	4.78E+00		its OK	
5000	2.54E+00	4.14E+00	3.66E+00	4.14E+00		its OK	
5500	2.30E+00	3.63E+00	3.22E+00	3.63E+00		its OK	
6000	2.10E+00	3.23E+00	2.87E+00	3.23E+00		its OK	
6500	1.92E+00	2.90E+00	2.58E+00	2.90E+00		its OK	
7000	1.77E+00	2.62E+00	2.33E+00	2.62E+00		its OK	
7500	1.65E+00	2.39E+00	2.13E+00	2.39E+00		its OK	
8000	1.53E+00	2.20E+00	1.96E+00	2.20E+00		its OK	
8500	1.43E+00	2.03E+00	1.81E+00	2.03E+00		its OK	
9000	1.35E+00	1.89E+00	1.68E+00	1.89E+00		its OK	
9500	1.27E+00	1.76E+00	1.57E+00	1.76E+00		its OK	
10000	1.20E+00	1.64E+00	1.47E+00	1.64E+00		its OK	

EMISSIONS CALCULATIONS—ONLY NATURAL GAS

Naphthalene: C₁₀H₈ CAS No. 91-20-3

Peak (30 min) Emission Rate =			0.002	g/s	0.059	tons/yr	
MW=			128.17				
Concern level			0.0007	ppm	3.6695	ug/m3	
Fuel: NG							
Distance (M)	Point	Area	Volume	Worst		Recommendation	
10	2.18E+01	2.92E+02	2.91E+01	2.92E+02		reduce emissions	
100	1.25E+00	4.01E+01	1.31E+01	4.01E+01		reduce emissions	
200	6.84E-01	1.59E+01	7.26E+00	1.59E+01		reduce emissions	
300	4.71E-01	8.62E+00	4.68E+00	8.62E+00		reduce emissions	
400	3.61E-01	5.46E+00	3.29E+00	5.46E+00		reduce emissions	
500	2.94E-01	3.81E+00	2.46E+00	3.81E+00		reduce emissions	
600	2.49E-01	2.82E+00	1.97E+00	2.82E+00		its OK	
700	2.10E-01	2.19E+00	1.60E+00	2.19E+00		its OK	
800	1.83E-01	1.77E+00	1.33E+00	1.77E+00		its OK	
900	1.84E-01	1.47E+00	1.14E+00	1.47E+00		its OK	
1000	1.84E-01	1.25E+00	9.86E-01	1.25E+00		its OK	
1100	1.82E-01	1.08E+00	8.62E-01	1.08E+00		its OK	
1200	1.82E-01	9.45E-01	7.63E-01	9.45E-01		its OK	
1300	1.82E-01	8.36E-01	6.81E-01	8.36E-01		its OK	
1400	1.80E-01	7.47E-01	6.12E-01	7.47E-01		its OK	
1500	1.78E-01	6.72E-01	5.54E-01	6.72E-01		its OK	

1600	1.75E-01	6.09E-01	5.05E-01	6.09E-01		its OK	
1700	1.71E-01	5.55E-01	4.62E-01	5.55E-01		its OK	
1800	1.67E-01	5.08E-01	4.26E-01	5.08E-01		its OK	
1900	1.63E-01	4.68E-01	3.93E-01	4.68E-01		its OK	
2000	1.59E-01	4.33E-01	3.69E-01	4.33E-01		its OK	
2100	1.54E-01	4.03E-01	3.45E-01	4.03E-01		its OK	
2200	1.50E-01	3.77E-01	3.24E-01	3.77E-01		its OK	
2300	1.46E-01	3.54E-01	3.04E-01	3.54E-01		its OK	
2400	1.41E-01	3.33E-01	2.86E-01	3.33E-01		its OK	
2500	1.37E-01	3.13E-01	2.71E-01	3.13E-01		its OK	
2600	1.33E-01	2.96E-01	2.56E-01	2.96E-01		its OK	
2700	1.29E-01	2.81E-01	2.43E-01	2.81E-01		its OK	
2800	1.26E-01	2.66E-01	2.31E-01	2.66E-01		its OK	
2900	1.22E-01	2.53E-01	2.20E-01	2.53E-01		its OK	
3000	1.19E-01	2.41E-01	2.11E-01	2.41E-01		its OK	
3500	1.04E-01	1.95E-01	1.71E-01	1.95E-01		its OK	
4000	9.17E-02	1.63E-01	1.43E-01	1.63E-01		its OK	
4500	8.18E-02	1.39E-01	1.22E-01	1.39E-01		its OK	
5000	7.36E-02	1.20E-01	1.06E-01	1.20E-01		its OK	
5500	6.67E-02	1.05E-01	9.35E-02	1.05E-01		its OK	
6000	6.08E-02	9.37E-02	8.32E-02	9.37E-02		its OK	
6500	5.58E-02	8.40E-02	7.47E-02	8.40E-02		its OK	
7000	5.15E-02	7.60E-02	6.77E-02	7.60E-02		its OK	
7500	4.77E-02	6.94E-02	6.19E-02	6.94E-02		its OK	
8000	4.45E-02	6.38E-02	5.69E-02	6.38E-02		its OK	
8500	4.16E-02	5.90E-02	5.26E-02	5.90E-02		its OK	
9000	3.90E-02	5.47E-02	4.89E-02	5.47E-02		its OK	
9500	3.67E-02	5.10E-02	4.56E-02	5.10E-02		its OK	
10000	3.47E-02	4.77E-02	4.26E-02	4.77E-02		its OK	

Benzene

71-43-2

Hazard Summary

Benzene is found in the air from emissions from burning coal and oil, gasoline service stations, and motor vehicle exhaust. Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidence of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. EPA has classified benzene as known human carcinogen for all routes of exposure.

Please Note: The main sources of information for this fact sheet are the Agency for Toxic Substances and Disease Registry's (ATSDR's) [Toxicological Profile for Benzene \(1\)](#) and EPA's [Integrated Risk Information System \(IRIS\) \(4\)](#), which contains information on the health effects of benzene including the unit cancer risk for inhalation exposure.

Uses

- Benzene is used as a constituent in motor fuels; as a solvent for fats, waxes, resins, oils, inks, paints, plastics, and rubber; in the extraction of oils from seeds and nuts; and in photogravure printing. It is also used as a chemical intermediate. Benzene is also used in the manufacture of detergents, explosives, pharmaceuticals, and dyestuffs. (1,2,6)

Sources and Potential Exposure

- Individuals employed in industries that manufacture or use benzene may be exposed to the highest levels of benzene. (1)
- Benzene is found in emissions from burning coal and oil, motor vehicle exhaust, and evaporation from gasoline service stations and in industrial solvents. These sources contribute to elevated levels of benzene in the ambient air, which may subsequently be breathed by the public. (1)
- Tobacco smoke contains benzene and accounts for nearly half the national exposure to benzene. (1)
- Individuals may also be exposed to benzene by consuming contaminated water. (1)

Assessing Personal Exposure

- Measurement of benzene in an individual's breath or blood or the measurement of breakdown products in the urine (phenol) can estimate personal exposure. However, the tests must be done shortly after exposure and are not helpful for measuring low levels of benzene. (1)

Health Hazard Information

Acute Effects:

- Coexposure to benzene with ethanol (e.g., alcoholic beverages) can increase benzene toxicity in humans. (1)

- Neurological symptoms of inhalation exposure to benzene include drowsiness, dizziness, headaches, and unconsciousness in humans. Ingestion of large amounts of benzene may result in vomiting, dizziness, and convulsions in humans. (1)
- Exposure to liquid and vapor may irritate the skin, eyes, and upper respiratory tract in humans. Redness and blisters may result from dermal exposure to benzene. (1,2)
- Animal studies show neurologic, immunologic, and hematologic effects from inhalation and oral exposure to benzene. (1)
- Tests involving acute exposure of rats, mice, rabbits, and guinea pigs have demonstrated benzene to have **low** acute toxicity from inhalation, **moderate** acute toxicity from ingestion, and **low** or **moderate** acute toxicity from dermal exposure. (3)
- The reference concentration for benzene is 0.03 mg/m³ based on hematological effects in humans. The **RfC** is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive groups) that is likely to be without appreciable risk deleterious noncancer effects over a lifetime. (4)

Chronic Effects (Noncancer):

- Chronic inhalation of certain levels of benzene causes disorders in the blood in humans. Benzene specifically affects bone marrow (the tissues that produce blood cells). Aplastic anemia (a risk factor for acute nonlymphocytic leukemia), excessive bleeding, and damage to the immune system (by changes in blood levels of antibodies and loss of white blood cells) may develop. (1)
- In animals, chronic inhalation and oral exposure to benzene produces the same effects as seen in humans. (1)
- Benzene causes both structural and numerical chromosomal aberrations in humans. (1)
- EPA has established an oral Reference Dose (**RfD**) for benzene of 0.004 milligrams per kilogram per day (mg/kg/d) based on hematological effects in humans. The **RfD** is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk, but rather a reference point to gauge the potential for effects. At exposures increasingly greater than the **RfD**, the potential for adverse health effects increases. Lifetime exposure above the **RfD** does not imply that an adverse health effect would necessarily occur. (4)
- EPA has established a Reference Concentration (**RfC**) of 0.03 milligrams per cubic meter (0.03 mg/m³) for benzene based on hematological effects in humans. The **RfC** is an inhalation exposure concentration at or below which adverse health effects are not likely to occur. It is not a direct estimator of risk, but rather a reference point to gauge the potential for effects. At lifetime exposures increasingly greater than the reference exposure level, the potential for adverse health effects increases. (4)

Reproductive/Developmental Effects:

- There is some evidence from human epidemiological studies of reproductive and developmental toxicity of benzene, however the data do not provide conclusive evidence of a link between exposure and effect. (4) Animal studies have provided limited evidence that exposure to benzene may affect reproductive organs, however these effects were only observed at exposure levels over the maximum tolerated dose. (4)
- Adverse effects on the fetus, including low birth weight, delayed bone formation, and bone marrow damage, have been observed where pregnant animals were exposed to benzene by inhalation.(4)

Cancer Risk:

- Increased incidence of leukemia (cancer of the tissues that form white blood cells) has been observed in humans occupationally exposed to benzene. (1,4)
- EPA has classified benzene as a Group A, known human carcinogen. (4)
- EPA uses mathematical models, based on human and animal studies, to estimate the probability of a person developing cancer from breathing air containing a specified concentration of a chemical. EPA calculated a range of 2.2×10^{-6} to 7.8×10^{-6} as the increase in the lifetime risk of an individual who is continuously exposed to 1 µg/m³ of benzene in the air over their lifetime.

- EPA estimates that, if an individual were to continuously breathe the air containing benzene at an average of 0.13 to 0.45 $\mu\text{g}/\text{m}^3$ (1.3×10^{-4} to 4.5×10^{-4} mg/m^3) over his or her entire lifetime, that person would theoretically have no more than a one-in-a-million increased chance of developing cancer as a direct result of continuously breathing air containing this chemical. Similarly, EPA estimates that continuously breathing air containing 1.3 to 4.5 $\mu\text{g}/\text{m}^3$ (1.3×10^{-3} to 4.5×10^{-3} mg/m^3) would result in not greater than a one-in-a-hundred thousand increased chance of developing cancer, and air containing 13 to 45 $\mu\text{g}/\text{m}^3$ (1.3×10^{-2} to 4.5×10^{-2} mg/m^3) would result in not greater than a one-in-ten thousand increased chance of developing cancer. For a detailed discussion of confidence in the potency estimates, please see IRIS.(4)
- EPA has calculated an oral cancer slope factor ranging from 1.5×10^{-2} to 5.5×10^{-2} ($\text{mg}/\text{kg}/\text{d}$)⁻¹ that is an extrapolation from inhalation dose-response data. (4)

Physical Properties

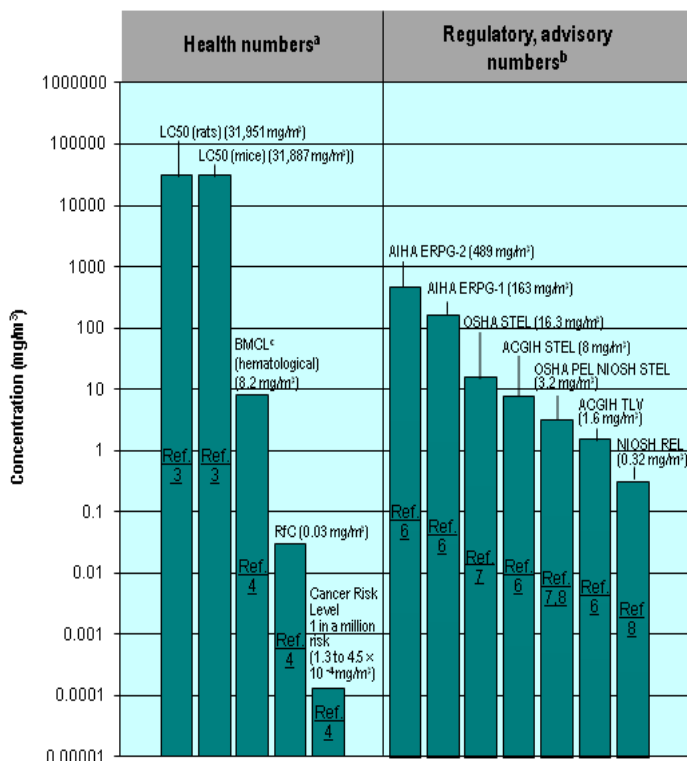
- The chemical formula for benzene is C_6H_6 , and it has a molecular weight of 78.11 g/mol. (4) Benzene occurs as a volatile, colorless, highly flammable liquid that dissolves easily in water. (1,7)
- Benzene has a sweet odor with an ASTDR reported odor threshold of 1.5 ppm (5 mg/m^3).
- The vapor pressure for benzene is 95.2 mm Hg at 25 °C, and it has a log octanol/water partition coefficient (log Kow) of 2.13. (1)

Conversion Factors (only for the gaseous form):

To convert concentrations in air (at 25°C) from ppm to mg/m^3 : $\text{mg}/\text{m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$. For benzene: 1 ppm = 3.19 mg/m^3 . To convert concentrations in air from $\mu\text{g}/\text{m}^3$ to mg/m^3 : $\text{mg}/\text{m}^3 = (\mu\text{g}/\text{m}^3) \times (1 \text{ mg}/1,000 \mu\text{g})$.

Health Data from Inhalation Exposure

Benzene



ACGIH STEL--American Conference of Governmental and Industrial Hygienists' short-term exposure limit.

ACGIH TLV--American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

AIHA ERPG--American Industrial Hygiene Association's emergency response planning guidelines. ERPG 1 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed up to one hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor; ERPG 2 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed up to one hour without experiencing or developing irreversible or other serious health effects that could impair their abilities to take protective action. The American Industrial Hygiene Association's detection and recognition odor thresholds for benzene are 61 ppm and 97 ppm, respectively.

LC₅₀ (Lethal Concentration₅₀)--A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

NIOSH REL--National Institute of Occupational Safety and Health's recommended exposure limit; NIOSH--recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

NIOSH STEL--NIOSH's short term exposure limit; NIOSH recommended exposure limit for a 15-minute period.

OSHA PEL--Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

OSHA STEL--Occupational Safety and Health Administration's short-term exposure limit.

The health and regulatory values cited in this graph were obtained in April 2009.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers

are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH, ACGIH, and AIHA numbers are advisory.

^c The BMCL (statistical lower confidence limit on the concentration at the benchmark concentration, which is the concentration producing a specified change in a response rate that is considered a critical effect) was used as the point of departure for the RfC derivation. The BMCL for benzene is for hematological effects (reduction in absolute lymphocyte count) in humans (4).

Summary created in April 1992, updated in January 2000 and January 2012.

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Benzene. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 2007.
 2. M. Sittig. Handbook of Toxic and Hazardous Chemicals and Carcinogens. 2nd ed. Noyes Publications, Park Ridge, NJ. 1985.
 3. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
 4. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Benzene. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 2009.
 5. California Environmental Protection Agency (CalEPA). Air Toxics Hot Spots Program Risk Assessment Guidelines: Part III. Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels. SRP Draft. Office of Environmental Health Hazard Assessment, Berkeley, CA. 1999.
 6. The Merck Index. An Encyclopedia of Chemicals, Drugs, and Biologicals. 11th ed. Ed. S. Budavari. Merck and Co. Inc., Rahway, NJ. 1989.
 7. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.
 8. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations. 29 CFR 1910.1000. 1998.
 9. National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
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Cadmium Compounds (A)

Hazard Summary

The main sources of cadmium in the air are the burning of fossil fuels such as coal or oil and the incineration of municipal waste. The acute (short-term) effects of cadmium in humans through inhalation exposure consist mainly of effects on the lung, such as pulmonary irritation. Chronic (long-term) inhalation or oral exposure to cadmium leads to a build-up of cadmium in the kidneys that can cause kidney disease. Cadmium has been shown to be a developmental toxicant in animals, resulting in fetal malformations and other effects, but no conclusive evidence exists in humans. An association between cadmium exposure and an increased risk of lung cancer has been reported from human studies, but these studies are inconclusive due to confounding factors. Animal studies have demonstrated an increase in lung cancer from long-term inhalation exposure to cadmium. EPA has classified cadmium as a Group B1, probable human carcinogen.

Please Note: The main sources of information for this fact sheet are EPA's Integrated Risk Information System (IRIS) (6), which contains information on oral chronic toxicity and the RfD, and the carcinogenic effects of cadmium including the unit cancer risk for inhalation exposure, and the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Cadmium (1).

Uses

- Most cadmium used in the United States today is obtained as a byproduct from the smelting of zinc, lead, or copper ores. (1)

Cadmium is used to manufacture pigments and batteries and in the metal-plating and plastics industries. (1)

Sources and Potential Exposure

- The largest sources of airborne cadmium in the environment are the burning of fossil fuels such as coal or oil, and incineration of municipal waste materials. Cadmium may also be emitted into the air from zinc, lead, or copper smelters. (1)
- For nonsmokers, food is generally the largest source of cadmium exposure. Cadmium levels in some foods can be increased by the application of phosphate fertilizers or sewage sludge to farm fields. (1)
- Smoking is another important source of cadmium exposure. Smokers have about twice as much cadmium in their bodies as do nonsmokers. (1)

Assessing Personal Exposure

- The amount of cadmium present in blood or urine can be measured by atomic absorption spectrophotometry and used as an indication of cadmium exposure. (1)
- A more precise method, called neutron activation analysis, can be used to measure cadmium concentrations in the liver or kidney. (1)

Health Hazard Information

Acute Effects:

- Acute inhalation exposure to high levels of cadmium in humans may result in effects on the lung, such as bronchial and pulmonary irritation. A single acute exposure to high levels of cadmium can result in long-lasting impairment of lung function. (1,3,4)
- Cadmium is considered to have high acute toxicity, based on short-term animal tests in rats. (5)

Chronic Effects (Noncancer):

- Chronic inhalation and oral exposure of humans to cadmium results in a build-up of cadmium in the kidneys that can cause kidney disease, including proteinuria, a decrease in glomerular filtration rate, and an increased frequency of kidney stone formation. (1,3,4)
- Other effects noted in occupational settings from chronic exposure of humans to cadmium in air are effects on the lung, including bronchiolitis and emphysema. (1,3,4)
- Chronic inhalation or oral exposure of animals to cadmium results in effects on the kidney, liver, lung, bone, immune system, blood, and nervous system. (1,3)
- The Reference Dose (RfD) for cadmium in drinking water is 0.0005 milligrams per kilogram per day (mg/kg/d) and the RfD for dietary exposure to cadmium is 0.001 mg/kg/d; both are based on significant proteinuria in humans. The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk, but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfD, the potential for adverse health effects increases. Lifetime exposure above the RfD does not imply that an adverse health effect would necessarily occur. (6)
- EPA has high confidence in both RfDs based primarily on a strong database for cadmium toxicity in humans and animals that also permits calculation of pharmacokinetic parameters of cadmium absorption, distribution, metabolism, and elimination. (6)
- EPA has not established a Reference Concentration (RfC) for cadmium. (6)
- The California Environmental Protection Agency (CalEPA) has established a chronic reference exposure level of 0.00001 milligrams per cubic meter (mg/m³) for cadmium based on kidney and respiratory effects in humans. The CalEPA reference exposure level is a concentration at or below which adverse health effects are not likely to occur. (7)

Reproductive/Developmental Effects:

- Limited evidence exists for an association between inhalation exposure and a reduction in sperm number and viability in humans. (1)
- Human developmental studies on cadmium are limited, although there is some evidence to suggest that maternal cadmium exposure may result in decreased birthweights. (1)
- Animal studies provide evidence that cadmium has developmental effects, such as low fetal weight, skeletal malformations, interference with fetal metabolism, and impaired neurological development, via inhalation and oral exposure. (1,3,4)
- Limited animal data are available, although some reproductive effects, such as decreased reproduction and testicular damage, have been noted following oral exposures. (1)

Cancer Risk:

- Several occupational studies have reported an excess risk of lung cancer in humans from exposure to inhaled cadmium. However, the evidence is limited rather than conclusive due to confounding factors. (1,3,6)
- Animal studies have reported cancer resulting from inhalation exposure to several forms of cadmium, while animal ingestion studies have not demonstrated cancer resulting from exposure to cadmium compounds. (1,3,6)
- EPA considers cadmium to be a probable human carcinogen (cancer-causing agent) and has classified it as a Group B1 carcinogen. (6)

- EPA uses mathematical models, based on animal studies, to estimate the probability of a person developing cancer from breathing air containing a specified concentration of a chemical. EPA calculated an inhalation unit risk estimate of $1.8 \times 10^{-3} (\mu\text{g}/\text{m}^3)^{-1}$. EPA estimates that, if an individual were to continuously breathe air containing cadmium at an average of $0.0006 \mu\text{g}/\text{m}^3$ ($6 \times 10^{-7} \text{mg}/\text{m}^3$) over his or her entire lifetime, that person would theoretically have no more than a one-in-a-million increased chance of developing cancer as a direct result of breathing air containing this chemical. Similarly, EPA estimates that continuously breathing air containing $0.006 \mu\text{g}/\text{m}^3$ ($6 \times 10^{-6} \text{mg}/\text{m}^3$) would result in not greater than a one-in-a-hundred thousand increased chance of developing cancer, and air containing $0.06 \mu\text{g}/\text{m}^3$ ($6 \times 10^{-5} \text{mg}/\text{m}^3$) would result in not greater than a one-in-ten thousand increased chance of developing cancer. For a detailed discussion of confidence in the potency estimates, please see IRIS. (6)

Physical Properties

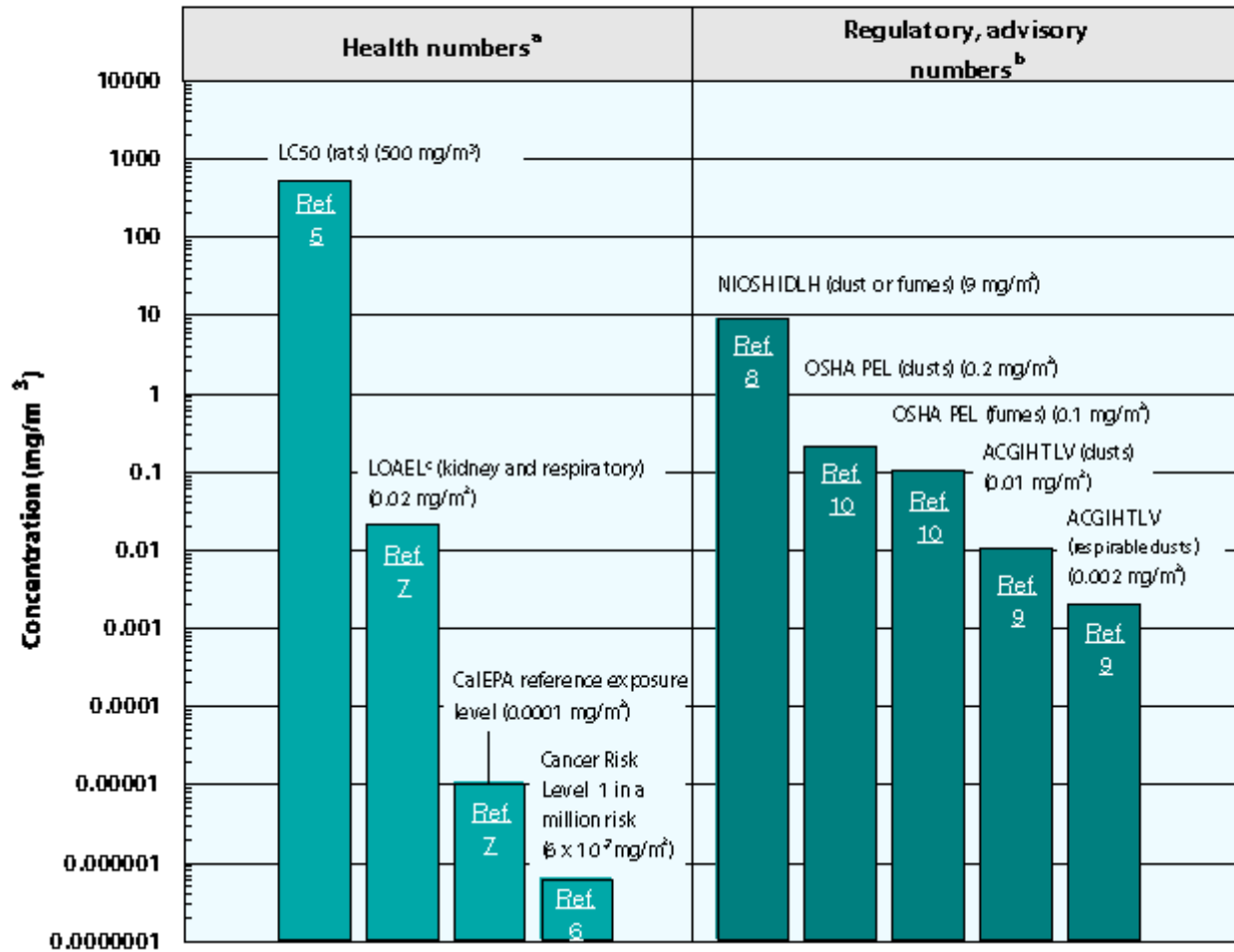
- Cadmium is a soft silver-white metal that is usually found in combination with other elements. (1)
- Cadmium compounds range in solubility in water from quite soluble to practically insoluble. (1)
- The chemical symbol for cadmium is Cd and the atomic weight is 112.41 g/mol. (1)

Conversion Factors (only for the gaseous form):

To convert concentrations in air (at 25°C) from ppm to mg/m^3 : $\text{mg}/\text{m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$. For cadmium: $1 \text{ ppm} = 4.6 \text{ mg}/\text{m}^3$. To convert concentrations in air from $\mu\text{g}/\text{m}^3$ to mg/m^3 : $\text{mg}/\text{m}^3 = (\mu\text{g}/\text{m}^3) \times (1 \text{ mg}/1000 \mu\text{g})$.

Health Data from Inhalation Exposure

Cadmium



ACGIH TLV--American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

LC₅₀ (Lethal Concentration₅₀)--A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

NIOSH IDLH--National Institute of Occupational Safety and Health's immediately dangerous to life and health; NIOSH concentration representing the maximum level of a pollutant from which an individual could escape within 30 minutes without escape-impairing symptoms or irreversible health effects.

OSHA PEL--Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in December 1999.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH and ACGIH numbers are advisory.

^c The LOAEL is from the critical study used as the basis for the CalEPA chronic reference exposure level.

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Cadmium. Draft for Public Comment. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1997.
2. U.S. Environmental Protection Agency. Deposition of Air Pollutants to the Great Waters. First Report to Congress. EPA-453/R-93-055. Office of Air Quality Planning and Standards, Research Triangle Park, NC. 1994.
3. E.J. Calabrese and E.M. Kenyon. Air Toxics and Risk Assessment. Lewis Publishers, Chelsea, MI. 1991.
4. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, [online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
5. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, [online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
6. U.S. Environmental Protection Agency. [Integrated Risk Information System \(IRIS\) on Cadmium](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
7. [California Environmental Protection Agency \(CalEPA\)](#). Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels. Draft for Public Comment. Office of Environmental Health Hazard Assessment, Berkeley, CA. 1997.
8. National Institute for Occupational Safety and Health (NIOSH). [Pocket Guide to Chemical Hazards](#). U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
9. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.
10. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations. 29 CFR 1910.1000. 1998.

A. * This fact sheet discusses cadmium and cadmium compounds. Most of the information is on cadmium, except in those cases where there are differences in toxicity between cadmium and cadmium compounds. In these cases, information on the cadmium compound is presented.

Summary created in April 1992, updated in January 2000.

Arsenic Compounds

Hazard Summary

Arsenic, a naturally occurring element, is found throughout the environment. For most people, exposure to arsenic, including to inorganic arsenic compounds, occurs through their diet. Acute (short-term), high-level inhalation exposure to inorganic arsenic has resulted in respiratory effects (cough, dyspnea, chest pain), gastrointestinal effects (nausea, diarrhea, abdominal pain), and central and peripheral nervous system effects. Chronic (long-term) inhalation exposure to inorganic arsenic in humans is associated with skin, cardiovascular, and neurological effects. Acute oral exposure to inorganic arsenic has resulted in effects on the digestive tract, respiratory tract, central nervous system (CNS), cardiovascular system, liver, and blood and has resulted in death. Chronic oral exposure to elevated levels of inorganic arsenic has resulted in gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, hyperpigmentation, and liver and kidney damage in humans. EPA has concluded that inorganic arsenic is a human carcinogen. Evidence from human studies suggests that exposure to inorganic arsenic by inhalation may result in lung cancer, while exposure by ingestion may result in nonmelanoma skin cancer and bladder, kidney, liver, and lung cancers.

Arsine is a gas consisting of arsenic and hydrogen. It is extremely toxic to humans and can result in general malaise, headaches, apprehension, giddiness, shivering, thirst, vomiting, and abdominal pains with vomiting within a few hours of exposure. Arsine can be fatal if inhaled in sufficient quantities. EPA has not classified arsine for carcinogenicity.

Please Note:

- This fact sheet has a particular focus on inorganic arsenic compounds, including the gaseous arsenic compound arsine. The main sources of toxicity information for this fact sheet are EPA's Integrated Risk Information System (IRIS), which contains information on the carcinogenic effects of inorganic arsenic, including the unit cancer risk for inhalation exposure, and on effects of arsine; as well as the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Arsenic.

Uses

- Inorganic arsenic is primarily used as a preservative to make wood resistant to rot and decay, although the use for certain residential items, such as decks and picnic tables, has been phased out. Inorganic arsenic is still used for this purpose in industrial applications. (1)
- The use of arsenic in agricultural or commercial pesticide applications has been restricted and is most recently limited to organic arsenic compounds in a limited number of approved uses. (1)
- Arsenic and its compounds have been used as alloy additives; in electronic devices, such as smartphones; in veterinary medicines; in pigment production; in glass manufacturing; as bronzing or decolorizing agents; in textile printing; in tanning; and other uses. (1,2)
- Until the 1940s, inorganic arsenic was used as a therapeutic agent in the treatment of various diseases, such as leukemia, psoriasis, and chronic bronchial asthma. Inorganic arsenic may still be used in homeopathic or folk remedies in the United States and other countries, and its use has reemerged in an FDA-approved treatment for

a specific type of leukemia. (1)

- Arsine is a gas that has much more limited usage than the other inorganic compounds. The use of arsine is primarily in electronics and semiconductor components manufacturing, organic syntheses, and lead–acid storage battery manufacturing. (2)

Sources and Potential Exposure

- Inorganic arsenic is found throughout the environment; it is released into the air by volcanoes, the weathering of arsenic–containing minerals and ores, and commercial and industrial processes. (1)
- General population exposure occurs through ingestion of contaminated drinking water or food. For most people, diet is the largest source of arsenic exposure, with smaller intakes from drinking water and air. Grains, produce, fish, and shellfish are significant sources of arsenic exposure via food. High arsenic levels have been found in fish and shellfish; however, arsenic in fish and shellfish exists primarily as two forms of organic arsenic (i.e., “fish arsenic”) that are essentially nontoxic. Inorganic arsenic compounds are the predominant forms to which people are exposed. (1)
- Elevated levels of inorganic arsenic may be present in soil, either from natural mineral deposits or contamination from human activities, which may lead to dermal or ingestion exposure. (1)
- Workers at metal smelting facilities and nearby residents may be exposed to above–average inorganic arsenic levels from arsenic released into the air. (1,2)
- Other sources of inorganic arsenic exposure include burning wood treated with an arsenical wood preservative or dermal contact with wood treated with arsenic. (1)
- Arsine is formed when arsenic comes in contact with an acid. Most exposures to arsine have occurred after unintentional formation of arsine in the workplace of chemical, smelting, and refining industries. (2,9)

Assessing Personal Exposure

- Arsenic can be measured in blood, urine, hair, and fingernails. Measurement of inorganic arsenic in the urine is the best way to determine recent exposure (within the previous 1 to 2 days), while measuring inorganic arsenic in hair or fingernails can detect high–level exposures that occurred over the prior 6 to 12 months. (1)

Health Hazard Information

Acute Effects:

- Inorganic Arsenic (other than arsine)
 - Workers inhaling very high levels of arsenic over a short period have experienced respiratory tract symptoms (cough, chest pain, dyspnea, pulmonary edema), gastrointestinal effects (nausea, diarrhea, abdominal pain), and central and peripheral nervous system effects (peripheral neuropathy, frank encephalopathy). (1,2)
 - Ingestion of high levels inorganic arsenic over a short period has resulted in death. Acute oral exposure to lower levels has resulted in effects on the digestive tract (constriction of the throat, dysphagia, nausea, vomiting, watery diarrhea), respiratory tract (respiratory distress, hemorrhagic bronchitis), CNS (encephalopathy, weakness, delirium), cardiovascular system (hypotension, shock), the liver (increased enzymes and size), and blood (anemia, leukopenia). (1,2)
- Arsine
 - Inhaling high levels of arsine over very short periods has resulted in death; a half–hour exposure to 25 to 50 parts per million (ppm) can be lethal. (2,3)
 - Acute arsine poisoning can cause pulmonary edema, massive hemolysis with subsequent hemolytic anemia, and can cause kidney, liver, and heart damage. (2)
 - The major effects from short–term exposure to lower levels of arsine include headaches, vomiting,

abdominal pains, and effects on the blood, including hemolytic anemia, hemoglobinuria, and jaundice; these effects can lead to kidney failure. (2,3)

Chronic Effects (Noncancer):

- Inorganic Arsenic (other than arsine)
 - Chronic inhalation exposure of humans to elevated levels of inorganic arsenic has been associated with effects on the cardiovascular system and skin (including dermatitis, conjunctivitis, pharyngitis and rhinitis) and with nerve damage. (1,2,4)
 - EPA has not established a reference concentration (RfC) for inhalation exposure to inorganic arsenic. (4)
 - The California Environmental Protection Agency (CalEPA) has established a chronic inhalation reference exposure level (REL) of 0.000015 milligrams per cubic meter (0.000015 mg/m³) estimated from an epidemiologic study indicating decreased intellectual function in 10-year-old children exposed to elevated arsenic in drinking water and assumptions for exposure and risk from inhalation exposure. The CalEPA REL is a concentration at or below which adverse health effects are not likely to occur. It is not a direct estimator of risk, but rather a reference point to gauge the potential effects. At lifetime exposures increasingly greater than the REL, the potential for adverse health effects increases. (4)
 - Chronic oral exposure of humans to elevated levels of inorganic arsenic has been associated with effects on the gastrointestinal system, blood, skin, eyes, lungs, heart, CNS, liver, and kidneys. Such effects include anemia, peripheral neuropathy, skin lesions, hyperpigmentation, gangrene of the extremities, vascular lesions, and liver or kidney damage. (1,4).
 - Some studies have reported an association between elevated arsenic levels in drinking water and neurocognitive or behavioral test results of school age children. (1)
 - Animal studies have reported effects on the blood, liver, and kidneys from oral exposure to inorganic arsenic. (1,4)
 - The EPA reference dose (RfD) for inorganic arsenic is 0.0003 milligrams per kilogram body weight per day (mg/kg/d) based on effects on the skin (hyperpigmentation and keratosis) and possible vascular effects reported in epidemiologic studies of exposure to contaminated drinking water . The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. (4)
 - EPA has medium confidence in the study on which the RfD for inorganic arsenic was based because although an extremely large number of people were included in the assessment (>40,000), the doses were not well characterized, and other contaminants were present. While extensive, the supporting human toxicity database is somewhat flawed; therefore, EPA has assigned medium confidence to the RfD. (4)
- Arsine
 - Long-term occupational exposure to arsine can damage skin and nerves and can affect the circulatory and hematopoietic systems and result in hemolytic anemia. At higher exposures, it may damage the spleen and kidney. (2, 3)
 - The EPA RfC for arsine is 0.00005 mg/m³ based on effects on the blood and spleen, including hemolysis, abnormal red blood cell morphology, and increased spleen weight in rats, mice, and hamsters. (3)
 - EPA has assigned medium confidence to the RfC based on medium confidence in the database. While there were three inhalation animal studies and a developmental/reproductive study, there were no data available on human exposure. However, EPA has high confidence in the animal studies on which the RfC is based because the sample sizes were adequate, statistical significance was reported, concentration dose-response relationships were documented, three species were investigated, and both a no-observed-adverse-effect level (NOAEL) and a lowest-observed-adverse-effect level (LOAEL) were identified. (3)

Reproductive/Developmental Effects:

- Inorganic Arsenic
 - Studies have reported an association between maternal exposure to elevated arsenic levels in drinking water and low birth weights, neonatal death, and infant mortality. (1)
 - Ingested inorganic arsenic can cross the placenta in humans, exposing the fetus to the chemical. (1)
 - Oral animal studies have reported inorganic arsenic to produce developmental effects in offspring, including birth defects and neurobehavioral deficits. (1)
- Arsine
 - Human studies have indicated higher than expected spontaneous abortion rates in women in the microelectronics industry who were exposed to arsine. However, these studies have several limitations, including small sample size and exposure to other chemicals in addition to arsine. (3)
 - A National Toxicology Program (NTP) study found no adverse developmental effects in offspring of pregnant rats and mice exposed to arsine. (6)

Cancer Risk:

- Inorganic Arsenic
 - Human occupational studies have shown that inhalation exposure to inorganic arsenic increases the risk of lung cancer. (1,4)
 - Ingestion of inorganic arsenic in humans has been associated with an increased risk of nonmelanoma skin cancer and an increased risk of bladder, liver, kidney and lung cancers. (1,4)
 - No animal inhalation studies reporting cancer effects from inorganic arsenic exposure were identified. Most oral animal studies have not shown an association between inorganic arsenic exposure and cancer; however, a study in mice involving exposure to inorganic arsenic in drinking water reported an increased risk of lung tumors. (1)
 - EPA has concluded that inorganic arsenic is a human carcinogen. (4)
 - EPA used a mathematical model with data from an occupational study of arsenic-exposed copper smelter workers to estimate the probability of a person developing cancer from continuously breathing air containing a specified concentration of inorganic arsenic. EPA calculated an inhalation unit risk estimate of 4.3×10^{-3} per $\mu\text{g}/\text{m}^3$. EPA estimates that, if an individual were to continuously breathe air containing inorganic arsenic at an average of $0.0002 \mu\text{g}/\text{m}^3$ ($2 \times 10^{-7} \text{ mg}/\text{m}^3$) over their entire lifetime, the person would theoretically have no more than a one-in-a-million increased chance of developing cancer as a direct result. Similarly, EPA estimates that continuously breathing air containing $0.002 \mu\text{g}/\text{m}^3$ ($2 \times 10^{-6} \text{ mg}/\text{m}^3$) would result in not greater than a one-in-a-hundred thousand increased chance of developing cancer, and air containing $0.02 \mu\text{g}/\text{m}^3$ ($2 \times 10^{-5} \text{ mg}/\text{m}^3$) would result in not greater than a one-in-ten thousand increased chance of developing cancer. For a detailed discussion of confidence in the potency estimates, please see IRIS. (4)
 - EPA has calculated an oral cancer slope factor of 1.5 per $\text{mg}/\text{kg}/\text{d}$ for inorganic arsenic. The oral cancer slope factor is an estimate of the increased cancer risk from ingestion of 1 mg inorganic arsenic per kg body weight per day over a lifetime. (4)
- Arsine
 - EPA has not classified arsine for carcinogenicity. (3)
 - No cancer inhalation studies in humans or animals were available for arsine. (1)

Physical Properties

- Inorganic arsenic is a naturally occurring element in the earth's crust. (1)

- Pure inorganic arsenic is a gray-colored metal. Arsenic combined with elements such as oxygen, chlorine, and sulfur forms inorganic arsenic; inorganic arsenic compounds include arsenic pentoxide, arsenic trioxide, and arsenic acid. (1)
- The chemical symbol for arsenic is As, and it has a molecular weight of 74.92 g/mol. (2)
- The chemical formula for arsine is AsH₃, and it has a molecular weight of 77.95g/mol. (2)
- Arsine is an extremely flammable, colorless gas with a slight garlic-like odor. (2)
- Arsenic combined with carbon and hydrogen forms organic arsenic; organic arsenic compounds include arsanilic acid, arsenobetaine, and dimethylarsinic acid. (1)

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m³:

$$mg/m^3 = (ppm) \times (\text{molecular weight of the compound}) / (24.45).$$

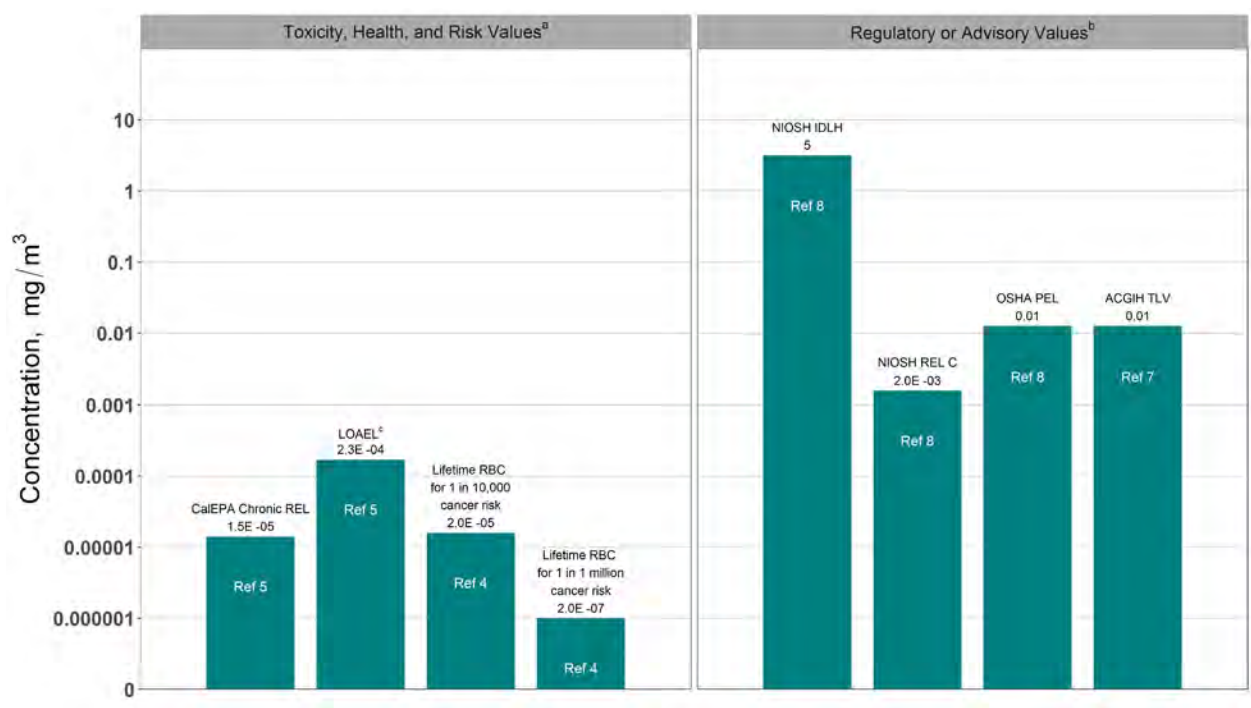
For inorganic arsenic: 1 ppm = 3.06 mg/m³.

For arsine: 1 ppm = 3.19 mg/m³

To convert concentrations in air from µg/m³ to mg/m³:

$$mg/m^3 = (\mu g/m^3) \times (1 \text{ mg}/1,000 \mu g)$$

Health Data from Inhalation Exposure (Inorganic Arsenic)



ACGIH TLV — American Conference of Governmental Industrial Hygienists threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

LOAEL (Lowest-Observed-Adverse-Effect Level) — The lowest dose or concentration at which there was an observed toxic or adverse effect of a target organism distinguished from a normal or untreated organism of the same species.

CalEPA Chronic REL — California EPA Office of Environmental Health Hazard Assessment (OEHHA) chronic reference exposure level (REL) is the concentration at or below which no adverse health effect is anticipated for a lifetime exposure.

NIOSH IDLH — National Institute for Occupational Safety and Health's immediately dangerous to life or health concentration; IDLH values are established (1) to ensure that a worker can escape from a given contaminated environment in the event of failure of the respiratory protection equipment and (2) to indicate a maximum level

above which only a highly reliable breathing apparatus, providing maximum worker protection, is permitted.

NIOSH REL C (ceiling value) — NIOSH's recommended exposure limit ceiling; the concentration that should not be exceeded at any time.

OSHA PEL — Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect, averaged over a normal 8-hour workday or a 40-hour workweek.

RBC (cancer risk-based concentration) — A calculated concentration of a chemical in air to which continuous exposure over a lifetime is estimated to be associated with a risk of contracting cancer not greater than the specified probability (e.g., 1-in-1 million).

^aToxicity, Health, and Risk numbers are toxicological values from animal testing or risk assessment values developed by EPA.

^bRegulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH, ACGIH, and AIHA numbers are advisory.

^cThe concentration presented here is the LOAEL (calculated from the oral level) from the critical study used as the basis for the CalEPA chronic REL.

Summary updated April 2021.

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Arsenic. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 2007. And Addendum to the Toxicological Profile for Arsenic. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 2016. <https://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=22&tid=3>
2. Pohanish, R.P. Sittig's Handbook of Toxic and Hazardous Chemicals and Carcinogens. Seventh Edition. Elsevier Inc. Oxford, UK and Cambridge, MA USA. 2017. <https://www.elsevier.com/books/sittigs-handbook-of-toxic-and-hazardous-chemicals-and-carcinogens/pohanish/978-0-323-38968-6>
3. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Arsine. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. Last revised 3/01/1994. https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=672
4. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Arsenic. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. Last revised 9/01/1991. https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=278
5. California Environmental Protection Agency (CalEPA). Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels. Office of Environmental Health Hazard Assessment, Berkeley, CA. 2008 (updated July 2014). <https://oehha.ca.gov/media/downloads/crn/appendixd1final.pdf>
6. National Toxicology Program. 1990. Abstract for TER87038. Arsine: Absence of Developmental Toxicity in Rats and Mice. <https://ntp.niehs.nih.gov/testing/types/dev/abstracts/ter87038/ter87038.html>
7. American Conference of Governmental Industrial Hygienists (ACGIH). 2021 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 2021. <https://www.acgih.org/science/tlv-bei-guidelines/>
8. National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 2020. <http://www.cdc.gov/niosh/npg/>
9. National Center for Environmental Health. Centers for Disease Control and Prevention. Cincinnati, OH. 2018. <https://emergency.cdc.gov/agent/arsine/facts.asp>

Lead Compounds

Hazard Summary

Lead is used in the manufacture of batteries, metal products and ammunition. Exposure to lead can occur from breathing contaminated air in or near workplaces that process lead or lead materials, as well as from incidentally ingesting dust or paint chips in houses with lead-based paint. Lead can cause effects on the blood, as well as the nervous, immune, renal and cardiovascular systems. Early childhood and prenatal exposures are associated with slowed cognitive development, learning deficits and other effects. Exposure to high amounts of lead can cause gastrointestinal symptoms, severely damage the brain and kidneys, and may cause reproductive effects. Large doses of some lead compounds have caused cancer in lab animals.

Please Note: The main sources of information for this fact sheet are EPA's Air Quality Criteria for Lead (1), EPA's Integrated Risk Information System (IRIS) (5), and the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Lead. (2)

Uses

- The primary use of lead is in the manufacture of batteries. (1,2)
- Lead is also used in the production of lead alloys and metal products, such as sheet lead, solder (but no longer in food cans), and pipes, and in, ammunition, cable covering, and other products. Its use in ceramic glazes, paint and pipe solder has been dramatically reduced. (1,2) Tetraethyl
- lead was used in gasoline to increase the octane rating until lead additives were phased out and eventually banned from use in on-road gasoline in the U.S. by the EPA by 1996. Leaded gasoline is still used for propeller-driven aircraft and some race cars. (1,2)

Sources and Potential Exposure

- Human exposure to lead occurs through a combination of inhalation and oral exposure, with inhalation generally contributing a greater proportion of the dose for occupationally exposed groups, and the oral route generally contributing a greater proportion of the dose for the general population. The effects of lead are the same regardless of the route of exposure (inhalation or oral) and are correlated with internal exposure, as blood lead levels. For this reason, blood lead levels are often used to characterize exposure.
- In the past, the largest source of lead in the atmosphere has been from leaded gasoline combustion, but with the phase-down of lead in gasoline, air lead levels have decreased considerably. Currently, the largest sources of airborne emissions are metals industries, including lead smelters and iron and steel production, manufacturing industries and waste incineration.(1,2)
- Exposure to lead can also occur from food and soil. Children are at particular risk to lead exposure since they commonly put hands, toys, and other items in their mouths, which may come in contact with lead-containing dust and dirt.(1,2)
- Lead-based paints were commonly used until 1978 and flaking paint, paint chips, and weathered paint powder may be a major source of lead exposure, particularly for children.(1,2)
- Lead in drinking water is due primarily to the presence of lead in certain older pipes, solder, and fixtures. A diet that is nutritionally adequate in calcium and iron may decrease the absorbed dose of lead.(1,2)
- Exposure to lead may also occur in the workplace, such as mining, lead smelting and refining industries, steel and iron factories, and battery manufacturing plants.(1,2)
- Lead has been listed as a pollutant of concern to EPA's Great Waters Program due to its persistence in the environment, potential to bioaccumulate, and toxicity to humans and the environment.(3)

Assessing Personal Exposure

- Once taken into the body, lead distributes throughout the body in the blood and is accumulated in the bones. (1,2)
- The amount of lead in the blood can be measured to assess exposure to lead. (1,2)
- The level of lead in the blood is measured in micrograms per deciliter ($\mu\text{g}/\text{dL}$).
- Exposure to lead can also be evaluated by measuring erythrocyte protoporphyrin (EP), a component of red blood cells known to increase when the amount of lead in the blood is high. This method was commonly used to screen children for potential lead poisoning. (2)
- Methods to measure lead in teeth or bones by X-ray fluorescence techniques are not widely available. Such methods are used in research studies to assess cumulative exposure.(1,2)

Health Hazard Information

Noncancer Effects:

- Studies of humans as well as laboratory animal studies have reported effects on the blood, kidneys, and nervous, immune, and cardiovascular systems. (1,2,3)
- Ingestion of large amounts of lead can produce gastrointestinal symptoms, including colic, constipation, abdominal pain, anorexia and vomiting.
- Severe brain and kidney damage can occur in children after exposures resulting in blood lead levels between 70 and 100 $\mu\text{g}/\text{dL}$ and in adults at blood lead levels between 100 and 120 $\mu\text{g}/\text{dL}$ (3)
- Anemia has been reported after exposure resulting in blood lead levels of 40 to 70 $\mu\text{g}/\text{dL}$ in children and blood lead levels of 50 to 80 $\mu\text{g}/\text{dL}$ in adults. (1,2)

- Other effects from chronic lead exposure in humans include effects on blood pressure and kidney function, immune system effects and interference with vitamin D metabolism. (1,2,3)
- Lead also affects the nervous system in occupational-exposed adults. Neurological symptoms have been reported in workers with blood lead levels of 40 to 60 $\mu\text{g}/\text{dL}$, and slowed nerve conduction in peripheral nerves in adults occurs at blood lead levels of 30 to 40 $\mu\text{g}/\text{dL}$. (2) Children
- are particularly vulnerable to the neurotoxic effects of lead. Exposure to low levels of lead early in life have been linked to effects on IQ, learning, memory, and behavior. (1,2)
- Exposure to lead during pregnancy has been associated with toxic effects on the human fetus, including increased risk of preterm delivery, low birthweight, and impaired mental development, including decreased IQ scores. These effects on mental development have been noted at maternal blood lead levels of 10 to 15 $\mu\text{g}/\text{dL}$ and somewhat lower. (1,2)
- Studies on male lead workers have reported severe depression of sperm count and decreased function of the prostate and/or seminal vesicles and suggests an impact on male fertility at blood lead levels of above 40–45 $\mu\text{g}/\text{dL}$. (1,2,3)
- Human studies are inconclusive regarding the association between lead exposure and other birth defects, while animal studies have shown a relationship between high lead exposure and birth defects. (1,2)

Cancer Risk:

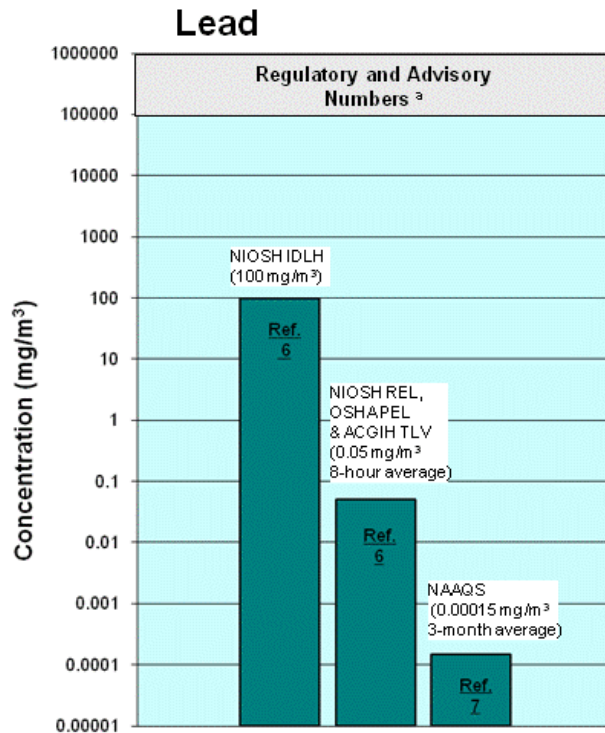
- Human studies are inconclusive regarding lead exposure and an increased cancer risk. Animal studies have reported kidney tumors in rats and mice exposed to lead via the oral route. (1,2,5)
- EPA has considered lead to be a probable human carcinogen, and, under more recent assessment guidelines, it would likely be classified as likely to be carcinogenic to humans.(1,5)

Physical Properties

- Lead is a naturally occurring, bluish-gray metal that is found in small quantities in the earth's crust, predominately in lead ore, the most important of which is galena. (1,2)
- Lead is present in a variety of compounds such as lead acetate, lead chloride, lead chromate, lead nitrate, and lead oxide. (1,2)
- Pure lead is insoluble in water; however, the lead compounds vary in solubility from insoluble to water soluble. (2)
- The chemical symbol for lead is Pb and the atomic weight is 207.2 g/mol. (2)
- The vapor pressure for lead is 1.77 mm Hg at 1000 °C. (2)

Conversion Factors (only for the gaseous form):

To convert concentrations of lead in gaseous compounds in air (at 25°C) from ppm to mg/m^3 : $\text{mg}/\text{m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$. For lead: $1 \text{ ppm} = 8.5 \text{ mg}/\text{m}^3$.



ACGIH TLV--American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

NIOSH REL--National Institute of Occupational Safety and Health's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

NIOSH IDLH -- NIOSH's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

NAAQS-- National Ambient Air Quality Standards. EPA sets NAAQS that protect public health and the environment for six commonly found pollutants: ozone, particle pollution, nitrogen oxides, sulfur dioxide, carbon monoxide and lead. The NAAQS for lead is 0.15 $\mu\text{g}/\text{m}^3$. The rolling 3-month average of lead in total suspended particles may not exceed this level.

OSHA PEL--Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

The regulatory and advisory values cited in this factsheet were obtained in September 2011. Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA and NAAQS numbers are regulatory, whereas NIOSH and ACGIH numbers are advisory.

Summary created in April 1992, updated September 2011

References

1. U.S. Environmental Protection Agency. Air Quality Criteria for Lead (2006) Final Report. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-05/144aF-bF, 2006.<http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=158823#Download>
2. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Lead (Update). Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 2007.
3. Agency for Toxic Substances and Disease Registry (ATSDR). Medical Management Guidelines for lead. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 2007.<http://www.atsdr.cdc.gov/MMG/MMG.asp?id=1203&tid=22>
4. U.S. Environmental Protection Agency. Deposition of Air Pollutants to the Great Waters. First Report to Congress. EPA-453/R-93-055. Office of Air Quality Planning and Standards, Research Triangle Park, NC. 1994.

5. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Lead and Compounds (Inorganic). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. Last revised 2004.
6. National Institute for Occupational Safety and Health (NIOSH). NIOSH Pocket Guide to Chemical Hazards. <http://www.cdc.gov/niosh/npg/npg.html>. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 2007.
7. U.S. Environmental Protection Agency. National Ambient Air Quality Standards for Lead. 73 FR 66964. November 12, 2008.

Manganese Compounds

Hazard Summary

Manganese is naturally occurring in the environment. Manganese is essential for normal physiologic functioning in humans and animals, and exposure to low levels of manganese in the diet is considered to be nutritionally essential in humans. Chronic (long-term) exposure to high levels of manganese by inhalation in humans may result in central nervous system (CNS) effects. Visual reaction time, hand steadiness, and eye-hand coordination were affected in chronically-exposed workers. A syndrome named manganism may result from chronic exposure to higher levels; manganism is characterized by feelings of weakness and lethargy, tremors, a mask-like face, and psychological disturbances. Respiratory effects have also been noted in workers chronically exposed to manganese bearing particles by inhalation.

Please Note: The main sources of information for this fact sheet are the Agency for Toxic Substances and Disease Registry's (ATSDR's) *Toxicological Profile for Manganese* (1) and the EPA's Integrated Risk Information System (IRIS). (3)

Uses

- Metallic manganese is used primarily in steel production to improve hardness, stiffness, and strength. It is also used in carbon steel, stainless steel, and high-temperature steel, along with cast iron and superalloys. (1)
- Manganese compounds have a variety of uses. Manganese dioxide is used in the production of dry-cell batteries, matches, fireworks, and the production of other manganese compounds. (1)
- Manganese chloride is used as a catalyst in the chlorination of organic compounds, in animal feed, and in dry-cell batteries, while manganese sulfate is used as a fertilizer, livestock nutritional supplement, in glazes and varnishes, and in ceramics. (1)
- Potassium permanganate is used for water purification purposes in water and waste-treatment plants. (1)

Sources and Potential Exposure

- Manganese is a naturally occurring substance found in many types of rock and soil; it is ubiquitous in the environment and found in low levels in water air, soil, and food. (1)

- Because manganese is a natural component of the environment, people are always exposed to low levels of it in water, air, soil, and food. Manganese is routinely contained in groundwater, drinking water and soil at low levels. (1)
- The primary source of manganese intake is through diet. The average manganese levels in various media are as follows: levels in drinking water are approximately 0.004 parts per million (ppm); average air levels are approximately 0.02 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$); levels in soil range from 40 to 900 ppm. (1)
- The average adult daily intake from food is estimated to be approximately 4 milligrams per day (mg/d). Other adult daily intake estimates range from 2 to 9 mg/d. (1)
- Manganese can also be released into the air by iron and steel production plants, power plants, and coke ovens, as well as mining activities. (1)
- The inhalation of air contaminated with particulate matter containing manganese is the primary source of excess manganese exposure for the general population in the United States. Populations living in close proximity to mining activities and industries using manganese may be exposed by inhalation to high levels of manganese in dust. Workers in these industries are especially vulnerable to exposure to manganese dust. (1)
- Manganese concentrations in soil may be elevated when the soil is in close proximity to a mining source or industry using manganese and may therefore pose a risk of excess exposure to children who ingest contaminated soil. Manganese is ubiquitous in drinking water in the United States. (1)
- The compounds most often encountered in the environment and the workplace are those containing inorganic manganese in the Mn(II), Mn(III), or Mn(IV) oxidation states. (1)
- People who smoke tobacco or inhale second-hand smoke are typically exposed to manganese at levels higher than those not exposed to tobacco smoke. (1)

Assessing Personal Exposure

- Tests are available for measuring manganese in blood, urine, hair, or feces. As manganese is naturally present in the body, some manganese is always found in these materials. In addition, excess manganese is usually removed from the body within a few days, making it difficult to measure past exposure to manganese. (1)

Health Hazard Information

Acute Effects:

- No reports of effects in humans following acute (short-term) effects of exposure to manganese are available.
- Acute inhalation studies in mice and rats have shown that exposure to high concentrations of manganese dusts can cause an inflammatory response of the lung, which can lead to impaired lung function. However, this response is characteristic of nearly all inhalable particulate matter and is not dependent on the manganese content in the particle. (1)

Chronic Effects (Noncancer):

- Chronic exposure to manganese at low levels is nutritionally essential in humans. The recommended daily intake of manganese is 2 to 5 mg/d for adults and adolescents. (1)
- No cases of manganese deficiency have been observed in the general population. However, manganese deficiency in animals has been associated with impaired growth, skeletal abnormalities, impaired reproductive function in females, and testicular degeneration in males. (1)
- Chronic inhalation exposure of humans to manganese results primarily in effects on the nervous system. Slower visual reaction time, poorer hand steadiness, and impaired eye–hand coordination were reported in several studies of workers occupationally exposed to manganese dust in air. (1,3,5)
- Chronic inhalation exposure of humans to high levels may result in a syndrome called manganism and typically begins with feelings of weakness and lethargy and progresses to other symptoms such as gait disturbances, clumsiness, tremors, speech disturbances, a mask–like facial expression, and psychological disturbances. (1,3)
- Other chronic effects reported in humans from inhalation exposure to manganese–bearing particles are respiratory effects such as an increased incidence of cough, bronchitis, difficulty breathing during exercise, and an increased susceptibility to infectious lung disease. (1,3)
- The Agency for Toxic Substances and Disease Registry (ATSDR) has established a chronic minimal risk level (MRL) for manganese more recently than the assessment in which EPA derived a reference concentration. The MRL is 0.0003 mg/m³ for manganese in respirable dust based on neurological effects in humans, such as reaction time, eye–hand coordination and hand steadiness. The ATSDR chronic MRL is a daily human exposure concentration at or below which adverse health effects are not likely to occur given chronic exposures of 365 days or longer. (1)

Reproductive/Developmental Effects:

- Reproductive effects, such as impotence and loss of libido, have been noted in male workers afflicted with manganism from occupational exposure to high levels of manganese by inhalation. (1)
- Animal studies have reported decreased activity levels and a decrease in pup weight in the offspring of mice exposed to manganese by inhalation. (1)
- Animal studies have reported degenerative changes in the seminiferous tubules leading to sterility from intratracheal instillation of high doses of manganese (experimentally delivering the manganese directly to the trachea). In young animals exposed to manganese orally, decreased testosterone production and retarded growth of the testes were reported. (1)
- Some studies suggest that exposure of children to high levels of manganese in drinking water may result in effects on behavior and cognitive function. (1)

Cancer Risk:

- No studies are available on the carcinogenic effects in humans or animals after inhalation exposure to inorganic or organic manganese. (1)
- A National Toxicology Program (NTP) study, in which laboratory animals were exposed to manganese in their food, reported “equivocal evidence of carcinogenic activity for manganese sulfate monohydrate in male and female mice and no evidence in rats”. (1,3)

- EPA has classified manganese as Group D, not classifiable as to carcinogenicity in humans. (3)

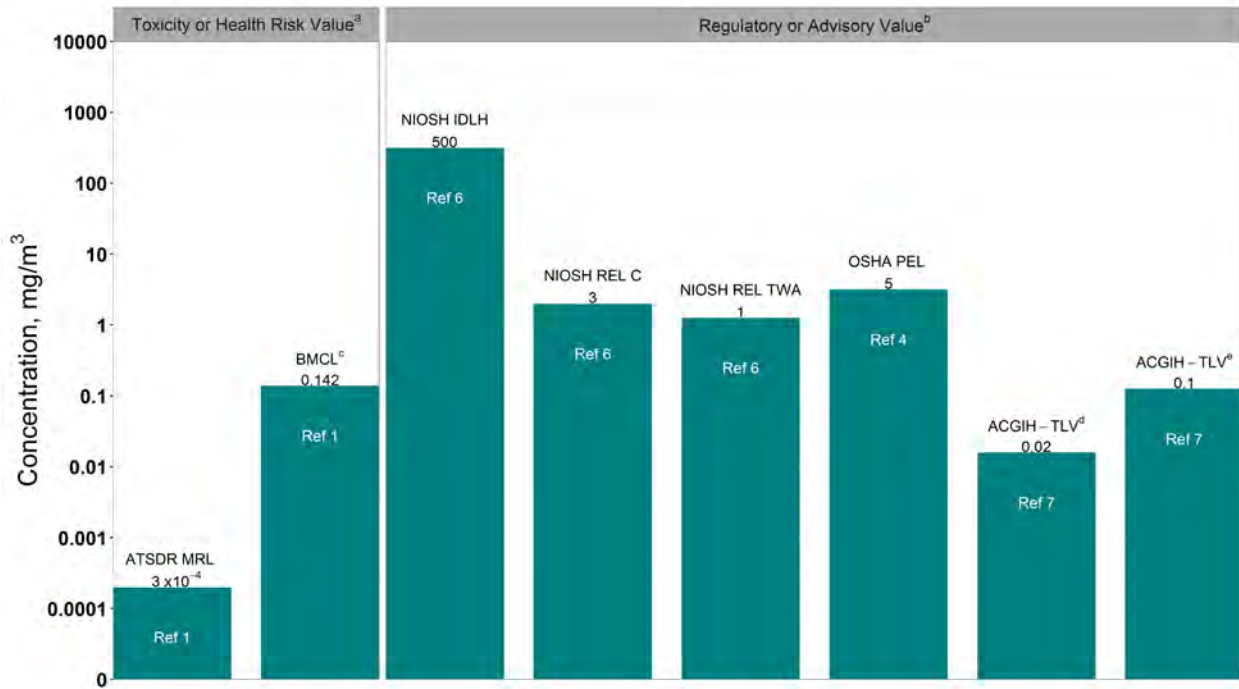
Physical Properties

- Manganese is a combustible, lustrous, brittle, silvery, soft metal that forms compounds in the environment with chemicals such as oxygen, sulfur, and chlorine. (1,2)
- Manganese compounds are solids that do not evaporate; however, small dust particles can become suspended in air. (1)
- The chemical symbol for manganese is Mn, and elemental manganese has an atomic weight of 54.94 g/mol. (2)

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m³: $mg/m^3 = (ppm) \times (molecular\ weight\ of\ the\ compound) / (24.45)$. For manganese: 1 ppm = 2.25 mg/m³. To convert concentrations in air from µg/m³ to mg/m³: $mg/m^3 = (\mu g/m^3) \times (1\ mg / 1,000\ \mu g)$.

Health Data from Inhalation Exposure



ATSDR MRL--Agency for Toxic Substances and Disease Registry's Minimum Risk Level, which is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects over a specified duration of exposure.

ACGIH TLV--American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

BMCL--benchmark dose concentration lower confidence limit.

NIOSH IDLH--NIOSH's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

NIOSH REL TWA--NIOSH recommended exposure limit for an 8- or 10-h time-weighted average exposure.

NIOSH REL C--NIOSH recommended ceiling exposure limit.

OSHA PEL--Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-hour workday or a 40-hour workweek.

^aHealth numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^bRegulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH and ACGIH numbers are advisory.

^cThis BMCL is from the critical study used as the basis for the ATSDR chronic MRL.

^dACGIH TLV for respirable fraction.

^eACGIH TLV for inhalable fraction.

Summary created in April 1992, updated in July 2016

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Manganese. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 2012. <http://www.atsdr.cdc.gov/toxprofiles/index.asp>
2. Pohanish, R.P. Sittig's Handbook of Toxic and Hazardous Chemicals and Carcinogens. 6th ed. Elsevier Inc. Oxford, UK and Waltham, MA USA. 2012
3. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Manganese. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. Last revised 12/1/1993. <http://www.epa.gov/iris>
4. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations. 29 CFR 1910.1000. 1998. https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10075&p_table=STANDARDS
5. U.S. Department of Health and Human Services. Hazardous Substances Databank (HSDB, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 2015. <http://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
6. National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. U.S. Department of Health and Human Services, Public Health Service, Centers for

Disease Control and Prevention. Cincinnati, OH. 2015. 2015.

<http://www.cdc.gov/niosh/npg/>

7. American Conference of Governmental Industrial Hygienists (ACGIH). 2015 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices. Cincinnati, OH. 1999

2,2,4-Trimethylpentane

540-84-1

Hazard Summary

2,2,4-Trimethylpentane is released to the environment through the manufacture, use, and disposal of products associated with the petroleum and gasoline industry. During an accident, 2,2,4-trimethylpentane penetrated the skin of a human which caused necrosis of the skin and tissue in the hand and required surgery. No other information is available on the acute (short-term) effects in humans. Irritation of the lungs, edema, and hemorrhage have been reported in rodents acutely exposed by inhalation and injection. No information is available on the chronic (long-term), reproductive, developmental, or carcinogenic effects of 2,2,4-trimethylpentane in humans. Kidney and liver effects have been observed in rats chronically exposed via gavage (experimentally placing the chemical in the stomach) and inhalation. EPA has not classified 2,2,4-trimethylpentane with respect to potential carcinogenicity.

Please Note: The main sources of information for this fact sheet are the Hazardous Substances Data Bank (HSDB) (1), a database of summaries of peer-reviewed literature, and Patty's Industrial Hygiene and Toxicology. (2)

Uses

- 2,2,4-Trimethylpentane is used in determining octane numbers of fuels, in spectrophotometric analysis, as a solvent and thinner, and in organic syntheses. (1,4)

Sources and Potential Exposure

- 2,2,4-Trimethylpentane is released to the environment through the manufacture, use, and disposal of products associated with the petroleum and gasoline industry. Automotive exhaust and evaporative emissions are important sources of 2,2,4-trimethylpentane. The general public may be exposed by the inhalation of ambient air. (1)
- Occupational exposure may occur by inhalation during the refining of petroleum and during the use and disposal of petroleum products and gasoline. (1)

Assessing Personal Exposure

- No information was located regarding the measurement of personal exposure to 2,2,4-trimethylpentane.

Health Hazard Information

Acute Effects:

- During an accident, 2,2,4-trimethylpentane penetrated the skin of a human which caused necrosis of the skin and tissue in the hand and required surgery. No other information is available on the acute effects in humans. (1)
- Irritation of the lungs, edema, and hemorrhage have been reported in rodents acutely exposed by inhalation and injection. (1,2)
- Central nervous system (CNS) depression has been reported in mice following acute inhalation exposure. (1)

Chronic Effects (Noncancer):

- No information is available on the chronic effects of 2,2,4-trimethylpentane in humans.
- Kidney and liver effects have been observed in rats chronically exposed via gavage and inhalation. (1)
- EPA has not established a Reference Concentration (RfC) or a Reference Dose (RfD) for 2,2,4-trimethylpentane. (3)

Reproductive/Developmental Effects:

- No information is available on the reproductive or developmental effects of 2,2,4-trimethylpentane in humans or animals.

Cancer Risk:

- No information is available on the carcinogenic effects of 2,2,4-trimethylpentane in humans or animals.
- EPA has not classified 2,2,4-trimethylpentane with respect to potential carcinogenicity. (3)

Physical Properties

- A common synonym for 2,2,4-trimethylpentane is isooctane. (4)
- The chemical formula for 2,2,4-trimethylpentane is C_8H_{18} , and its molecular weight is 114.22 g/mol. (4)
- 2,2,4-Trimethylpentane occurs as a colorless, highly flammable, mobile liquid that is practically insoluble in water. (1,4)
- 2,2,4-Trimethylpentane smells like gasoline; the odor threshold has not been established. (1,4)
- The vapor pressure for 2,2,4-trimethylpentane is 40.6 mm Hg at 21 °C. (1,2)

Note: There are very few health or regulatory/advisory numbers for 2,2,4-trimethylpentane, thus a graph has not been prepared for this compound. The health information cited in this factsheet was obtained in December 1999.

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m^3 : $mg/m^3 = (ppm) \times (\text{molecular weight of the compound}) / (24.45)$. For 2,2,4-trimethylpentane: 1 ppm = 4.67 mg/m^3 .

Summary created in April 1992, updated January 2000

References

1. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
2. G.D. Clayton and F.E. Clayton, Eds. Patty's Industrial Hygiene and Toxicology. Volume IIB. 3rd revised ed. John Wiley & Sons, New York. 1981.
3. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on 2,2,4-Trimethylpentane. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
4. The Merck Index. An Encyclopedia of Chemicals, Drugs, and Biologicals. 11th ed. Ed. S. Budavari. Merck and Co. Inc., Rahway, NJ. 1989.

Carbon disulfide

75-15-0

Hazard Summary

Exposure to carbon disulfide occurs mainly in the workplace. Acute (short-term) inhalation exposure of humans to carbon disulfide has caused changes in breathing and chest pains. Nausea, vomiting, dizziness, fatigue, headache, mood changes, lethargy, blurred vision, delirium, and convulsions have also been reported in humans acutely exposed by inhalation. Neurologic effects, including behavioral and neurophysiological changes, have been observed in chronic (long-term) human and animal inhalation studies. Reproductive effects, such as decreased sperm count and menstrual disturbances, have been observed in humans exposed to carbon disulfide by inhalation. Animal studies support these findings. EPA has not classified carbon disulfide for human carcinogenicity.

Please Note: The main sources of information for this fact sheet are the Agency for Toxic Substances and Disease Registry's (ATSDR's) [Toxicological Profile for Carbon disulfide \(1\)](#) and EPA's [Integrated Risk Information System \(IRIS\) \(5\)](#), which contains information on oral chronic toxicity and the RfD and inhalation chronic toxicity and the RfC.

Uses

- Carbon disulfide is used predominantly in the manufacture of rayon, cellophane, and carbon tetrachloride. (1,2)
- Carbon disulfide is also used to produce rubber chemicals and pesticides. (1,2)

Sources and Potential Exposure

- The main route of exposure to this compound is in the workplace. Workers in plants that use carbon disulfide in their manufacturing processes have a high degree of exposure potential. (1)
- Releases of carbon disulfide from industrial processes are almost exclusively to the air; individuals in proximity to these sites may be exposed. Concentrations of carbon disulfide in urban/suburban areas were measured at about 65 parts per trillion (ppt) and in rural areas at about 41 ppt. (1,2)
- Carbon disulfide has been detected in some samples of drinking water. (1)
- Low amounts of carbon disulfide may be emitted naturally from volcanoes and marshes. (1)

Assessing Personal Exposure

- Carbon disulfide breaks down into other chemical substances after it enters the body. Medical tests can measure levels of these substances in urine and blood, but the tests are not reliable indicators of total exposure. (1)

Health Hazard Information

Acute Effects:

- Acute inhalation exposure of humans caused changes in breathing and some chest pains during an accidental release of carbon disulfide. (1)
- Nausea, vomiting, dizziness, fatigue, headache, mood changes, lethargy, blurred vision, delirium, and

convulsions have also been reported in humans acutely exposed by inhalation. (3)

- Brain chemistry changes and sensory and motor nerve conduction alterations were observed in rats acutely exposed to carbon disulfide by inhalation. (1)
- Animal studies show transitory effects associated with the target organ toxicity (central nervous system (CNS), blood, liver, eyes) seen from chronic exposure. (1)
- Tests involving acute exposure of rats, mice, and rabbits have shown carbon disulfide to have low acute toxicity from inhalation and moderate acute toxicity by ingestion. (4)

Chronic Effects (Noncancer):

- Neurotoxic effects have been observed in chronic human and animal inhalation studies. Behavioral and neurophysiological changes, reduced nerve conduction velocity, peripheral neuropathy, and polyneuropathy have been observed in chronically exposed workers. (1,2,5)
- An increased incidence of coronary heart disease has been observed in an epidemiological study of workers who chronically inhaled carbon disulfide in the workplace. Concomitant exposure to other chemicals and a failure to control for other coronary heart disease risk factors have been noted with this study. An increased incidence of angina has been reported in another occupational study. (1,2)
- Muscle pain, headaches, and general fatigue have been reported by workers chronically exposed to carbon disulfide in the air. (1,3)
- Ocular effects have been observed in chronically exposed workers. (1)
- Workers who handled fibers made from a polymer solution in carbon disulfide developed blisters and eczematous lesions on their hands. (1,3)
- Chronic inhalation exposure has been observed to affect the CNS, blood, liver, and kidneys in animals. (1)
- The Reference Concentration (RfC) for carbon disulfide is 0.7 milligrams per cubic meter (mg/m³) based on neurological effects in humans. The RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfC, the potential for adverse health effects increases. Lifetime exposure above the RfC does not imply that an adverse health effect would necessarily occur. (5)
- EPA has medium confidence in the study on which the RfC was based because it is well designed and conducted, uses adequate numbers of subjects, and is well supported by other occupational studies examining the same effect; however, considerable uncertainty exists regarding the exposure histories of the cohorts examined; medium confidence in the database because a considerable number of well-conducted occupational studies have defined the effects of carbon disulfide in humans; however, a significant question remains regarding the possibility of developmental effects in humans; and consequently medium confidence in the RfC. (5)
- The Reference Dose (RfD) for carbon disulfide is 0.1 milligrams per kilogram body weight per day (mg/kg/d) based on fetal toxicity/malformations in rabbits. (5)
- EPA has medium confidence in the study on which the RfD was based because this study was a well-designed multispecies study that provided adequate toxicologic endpoints; medium confidence in the database because it contains supportive reproductive and epidemiologic studies; and, consequently, medium confidence in the RfD. (5)

Reproductive/Developmental Effects:

- Reproductive effects, such as decreased sperm count and decreased libido in men and menstrual disturbances in women, have been reported from occupational settings involving inhalation exposure to carbon disulfide. (1-3)
- Developmental effects, including skeletal and visceral malformations, embryotoxicity, and functional and behavioral disturbances, have been observed in several animal studies across a wide exposure range. (2)
- Pharmacokinetic studies indicate that carbon disulfide and its metabolites cross the placenta and localize in the target organs of the fetus (brain, blood, liver, and eyes). (1)

Cancer Risk:

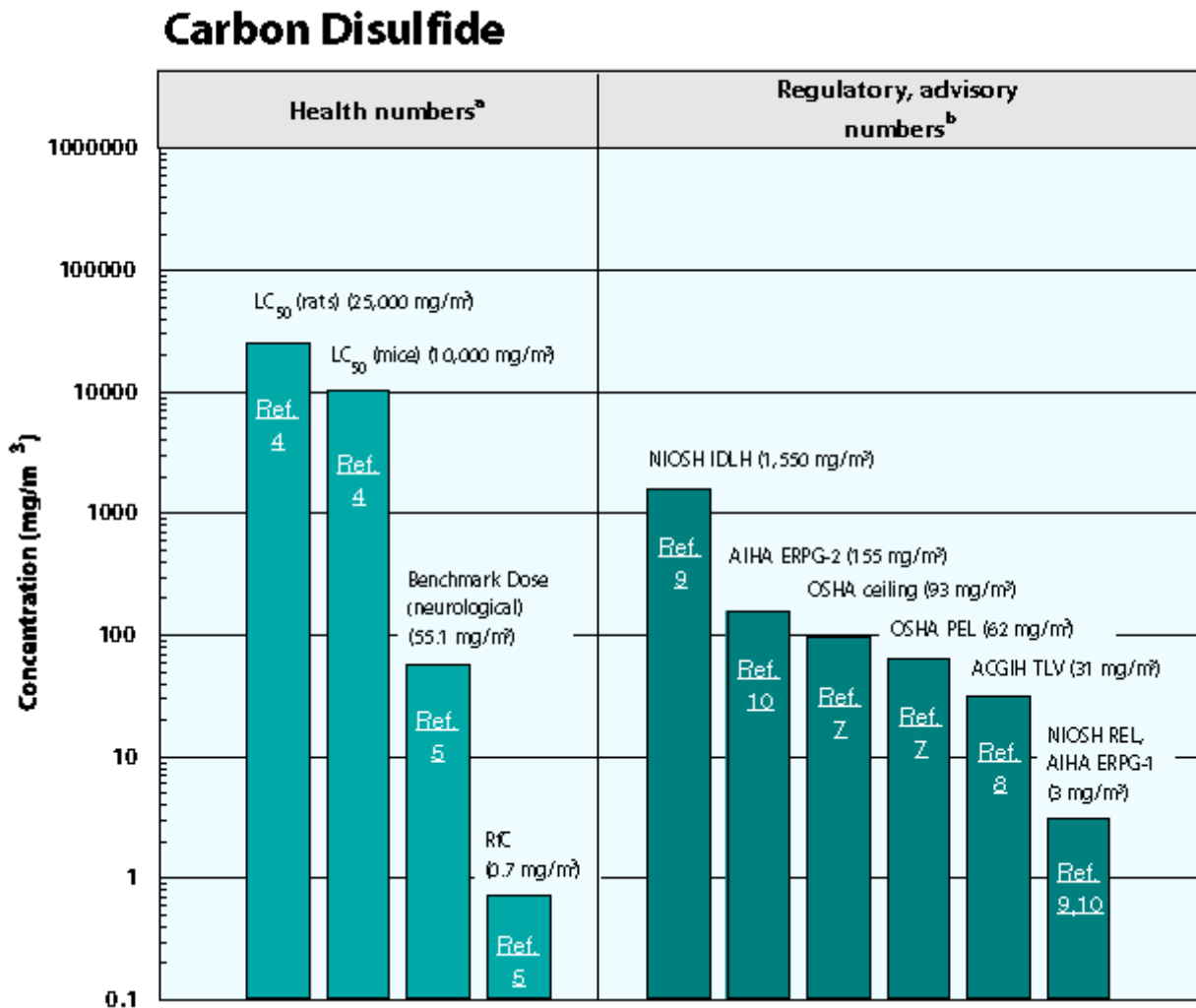
- In a study of workers exposed by inhalation to carbon disulfide and other solvents, an increased incidence of lymphatic leukemia was reported. However, there were many confounding factors in this study, making it difficult to interpret the results. (1,2)
- EPA has not classified carbon disulfide for human carcinogenicity. (5)

Physical Properties

- The chemical formula for carbon disulfide is CS₂, and its molecular weight is 76.14 g/mol. (1,8)
- Pure carbon disulfide occurs as a colorless liquid that is not very soluble in water; impure carbon disulfide is yellowish. Carbon disulfide evaporates rapidly at room temperature and is flammable. (1,8)
- Pure carbon disulfide has a sweet, pleasant, chloroform-like odor, with an odor threshold of 0.05 mg/m³. Commercial grades of carbon disulfide have a foul odor, smelling like rotten eggs. (1)
- The vapor pressure for carbon disulfide is 352.6 mm Hg at 25 °C, and its log octanol/water partition coefficient (log K_{ow}) is 1.84 to 2.16. (1)

To convert concentrations in air (at 25 °C) from ppm to mg/m³: $mg/m^3 = (ppm) \times (\text{molecular weight of the compound}) / (24.45)$. For carbon disulfide: 1 ppm = 3.1 mg/m³. To convert concentrations in air from µg/m³ to mg/m³: $mg/m^3 = (\mu g/m^3) \times (1 \text{ mg} / 1,000 \mu g)$.

Health Data from Inhalation Exposure



ACGIH TLV --American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

AIHA ERPG --American Industrial Hygiene Association's emergency response planning guidelines. ERPG 1 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed up to one hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor; ERPG 2 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed up to one hour without experiencing or developing irreversible or other serious health effects that could impair their abilities to take protective action.

LC₅₀ (Lethal Concentration₅₀) --A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

NIOSH IDLH -- National Institute of Occupational Safety and Health's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

NIOSH REL --NIOSH's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

OSHA PEL --Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

OSHA PEL ceiling --Occupational Safety and Health Administration's permissible exposure limit ceiling value; the concentration of a substance that should not be exceeded at any time.

The health and regulatory values cited in this factsheet were obtained in December 1999.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH, ACGIH, and AIHA numbers are advisory.

^c This benchmark dose is from the critical study used as the basis for the RfC.

Summary created in April 1992, updated in January 2000.

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Carbon disulfide(Update). Public Health Service, U.S. Department of Health and Human Services, Atlanta. 1996.
2. U.S. Environmental Protection Agency. Health and Environmental Effects Profile for Carbon disulfide. EPA/600/x-86/155. Environmental Criteria and Assessment Office, Office of Health and Environmental Assessment, Office of Research and Development, Cincinnati, OH. 1986.
3. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, [online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
4. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, [online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
5. U.S. Environmental Protection Agency. [Integrated Risk Information System \(IRIS\) on Carbon disulfide](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
6. The Merck Index. An Encyclopedia of Chemicals, Drugs, and Biologicals. 11th ed. Ed. S. Budavari. Merck and Co. Inc., Rahway, NJ. 1989.
7. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards,

- Toxic and Hazardous Substances. Code of Federal Regulations. 29 CFR 1910.1000. 1998.
8. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.
 9. National Institute for Occupational Safety and Health (NIOSH). [Pocket Guide to Chemical Hazards](#). U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
 10. American Industrial Hygiene Association (AIHA). The AIHA 1998 Emergency Response Planning Guidelines and Workplace Environmental Exposure Level Guides Handbook. 1998.
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Chromium Compounds

Hazard Summary

Chromium occurs in the environment primarily in two valence states, trivalent chromium (Cr III) and hexavalent chromium (Cr VI). Exposure may occur from natural or industrial sources of chromium. Chromium III is much less toxic than chromium (VI). The respiratory tract is also the major target organ for chromium (III) toxicity, similar to chromium (VI). Chromium (III) is an essential element in humans. The body can detoxify some amount of chromium (VI) to chromium (III).

The respiratory tract is the major target organ for chromium (VI) toxicity, for acute (short-term) and chronic (long-term) inhalation exposures. Shortness of breath, coughing, and wheezing were reported from a case of acute exposure to chromium (VI), while perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, and other respiratory effects have been noted from chronic exposure.

Human studies have clearly established that inhaled chromium (VI) is a human carcinogen, resulting in an increased risk of lung cancer. Animal studies have shown chromium (VI) to cause lung tumors via inhalation exposure.

Please Note: The main sources of information for this fact sheet are EPA's Integrated Risk Information System (IRIS) (7), which contains information on inhalation chronic toxicity and the [RfC](#) and oral chronic toxicity and the [RfD](#), and the carcinogenic effects of chromium including the unit cancer risk for inhalation exposure, EPA's Toxicological Review of Trivalent Chromium and Toxicological Review of Hexavalent Chromium (3), and the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Chromium. (1)

Uses

- The metal chromium is used mainly for making steel and other alloys. (1)
- Chromium compounds, in either the chromium (III) or chromium (VI) forms, are used for chrome plating, the manufacture of dyes and pigments, leather and wood preservation, and treatment of cooling tower water. Smaller amounts are used in drilling muds, textiles, and toner for copying machines. (1)

Sources and Potential Exposure

- Chromium is a naturally occurring element in rocks, animals, plants, soil, and volcanic dust and gases. (1)
- Chromium occurs in the environment predominantly in one of two valence states: trivalent chromium (Cr III), which occurs naturally and is an essential nutrient, and hexavalent chromium (Cr VI), which, along with the less common metallic chromium (Cr 0), is most commonly produced by industrial processes. (1)
- Chromium (III) is essential to normal glucose, protein, and fat metabolism and is thus an essential dietary element. The body has several systems for reducing chromium (VI) to chromium (III). This chromium (VI) detoxification leads to increased levels of chromium (III). (1)
- Air emissions of chromium are predominantly of trivalent chromium, and in the form of small particles or aerosols. (1,2)
- The most important industrial sources of chromium in the atmosphere are those related to ferrochrome production. Ore refining, chemical and refractory processing, cement-producing plants, automobile brake lining and catalytic converters for automobiles, leather tanneries, and chrome pigments also contribute to the atmospheric burden of chromium. (3)
- The general population is exposed to chromium (generally chromium [III]) by eating food, drinking water, and inhaling air that contains the chemical. The average daily intake from air, water, and food is estimated to be less than 0.2 to 0.4 micrograms (μg), 2.0 μg , and 60 μg , respectively. (1)
- Dermal exposure to chromium may occur during the use of consumer products that contain chromium,

such as wood treated with copper dichromate or leather tanned with chromic sulfate. (1)

- Occupational exposure to chromium occurs from chromate production, stainless-steel production, chrome plating, and working in tanning industries; occupational exposure can be two orders of magnitude higher than exposure to the general population. (1)
- People who live in the vicinity of chromium waste disposal sites or chromium manufacturing and processing plants have a greater probability of elevated chromium exposure than the general population. These exposures are generally to mixed chromium (VI) and chromium (III). (1)

Assessing Personal Exposure

- Laboratory tests can detect chromium in the blood, urine, and hair of exposed individuals. (1,5)
- In many cases analysis is done for total chromium because it is difficult to differentiate between chromium VI and chromium III in tests. (1)

Health Hazard Information

Acute Effects:

Chromium VI

- Chromium (VI) is much more toxic than chromium (III), for both acute and chronic exposures. (1,3,4)
- The respiratory tract is the major target organ for chromium (VI) following inhalation exposure in humans. Shortness of breath, coughing, and wheezing were reported in cases where an individual inhaled very high concentrations of chromium trioxide. (1,4)
- Other effects noted from acute inhalation exposure to very high concentrations of chromium (VI) include gastrointestinal and neurological effects, while dermal exposure causes skin burns in humans. (1,4,5)
- Ingestion of high amounts of chromium (VI) causes gastrointestinal effects in humans and animals, including abdominal pain, vomiting, and hemorrhage. (1)
- Acute animal tests have shown chromium (VI) to have **extreme** toxicity from inhalation and oral exposure. (1,6)

Chromium III

- Chromium (III) is an essential element in humans, with a daily intake of 50 to 200 µg/d recommended for adults. (1)
- Acute animal tests have shown chromium (III) to have **moderate** toxicity from oral exposure. (1,6)

Chronic Effects (Noncancer)

Chromium VI

- Chronic inhalation exposure to chromium (VI) in humans results in effects on the respiratory tract, with perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, asthma, and nasal itching and soreness reported. (1,4,5)
- Chronic human exposure to high levels of chromium (VI) by inhalation or oral exposure may produce effects on the liver, kidney, gastrointestinal and immune systems, and possibly the blood. (1,4,5)
- Rat studies have shown that, following inhalation exposure, the lung and kidney have the highest tissue levels of chromium. (1,4,5)
- Dermal exposure to chromium (VI) may cause contact dermatitis, sensitivity, and ulceration of the skin. (1,4,5)

- The Reference Concentration (RfC) for chromium (VI) (particulates) is 0.0001 mg/m³ based on respiratory effects in rats. The RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfC, the potential for adverse health effects increases. Lifetime exposure above the RfC does not imply that an adverse health effect would necessarily occur. (7)
- EPA has medium confidence in the RfC for chromium VI (particulates) based on medium confidence in the study on which it was based because of uncertainties regarding upper respiratory tract, reproductive, and renal effects resulting from the exposures. (7)
- The Reference Concentration (RfC) for chromium (VI) (chromic acid mists and dissolved Cr (VI) aerosols) is 0.000008 mg/m³ based on respiratory effects in humans. (7)
- EPA has low confidence in the RfC based on low confidence in the study on which the RfC for chromium (VI) (chromic acid mists and dissolved Cr (VI) aerosols) is based. This is because of (1) the uncertainties regarding the exposure characterization and the role of direct contact for the critical effect; and (2) low confidence in the supporting studies which are equally uncertain regarding the exposure characterization. (7)
- The Reference Dose (RfD) for chromium (VI) is 0.003 mg/kg/d based on the exposure at which no effects were noted in rats exposed to chromium in the drinking water. (7)
- EPA has low confidence in the RfD based on: low confidence in the study on which the RfD for chromium (VI) was based because a small number of animals were tested, a small number of parameters were measured, and no toxic effects were noted at the highest dose tested; and low confidence in the database because the supporting studies are of equally low quality and developmental endpoints are not well studied. (7)

Chromium III

- Although data from animal studies have identified the respiratory tract as the major target organ for chronic chromium exposure, these data do not demonstrate that the effects observed following inhalation of chromium (VI) particulates are relevant to inhalation of chromium (III). (8)
- EPA has not established an RfC for chromium (III). (8)
- The RfD for chromium (III) is 1.5 mg/kg/d based on the exposure level at which no effects were observed in rats exposed to chromium (III) in the diet. (8)
- EPA has low confidence in the RfD based on: low confidence in the study on which the RfD for chromium (III) was based due to the lack of explicit detail on study protocol and results; and low confidence in the database due to the lack of high-dose supporting data. (8)

Reproductive/Developmental Effects:

Chromium VI

- Limited information on the reproductive effects of chromium (VI) in humans exposed by inhalation suggest that exposure to chromium (VI) may result in complications during pregnancy and childbirth. (1)
- Animal studies have not reported reproductive or developmental effects from inhalation exposure to chromium (VI). Oral studies have reported severe developmental effects in mice such as gross abnormalities and reproductive effects including decreased litter size, reduced sperm count, and degeneration of the outer cellular layer of the seminiferous tubules. (1,4)

Chromium III

- No information is available on the reproductive or developmental effects of chromium (III) in humans.

(3)

- A study of mice fed high levels of chromium (III) in their drinking water has suggested a potential for reproductive effects, although various study characteristics preclude a definitive finding. (3)
- No developmental effects were reported in the offspring of rats fed chromium (III) during their developmental period. (1,3)

Cancer Risk:

Chromium VI

- Epidemiological studies of workers have clearly established that inhaled chromium is a human carcinogen, resulting in an increased risk of lung cancer. Although chromium-exposed workers were exposed to both chromium (III) and chromium (VI) compounds, only chromium (VI) has been found to be carcinogenic in animal studies, so EPA has concluded that only chromium (VI) should be classified as a human carcinogen. (1,7)
- Animal studies have shown chromium (VI) to cause lung tumors via inhalation exposure. (1,5)
- EPA has classified chromium (VI) as a Group A, known human carcinogen by the inhalation route of exposure. (7)
- EPA used a mathematical model, based on data from an occupational study of chromate production workers, to estimate the probability of a person developing cancer from continuously breathing air containing a specified concentration of chromium. EPA calculated an inhalation unit risk estimate of $1.2 \times 10^{-2} (\mu\text{g}/\text{m}^3)^{-1}$. EPA estimates that, if an individual were to continuously breathe air containing chromium at an average of $0.00008 \mu\text{g}/\text{m}^3$ ($8 \times 10^{-8} \text{mg}/\text{m}^3$) over his or her entire lifetime, that person would theoretically have no more than a one-in-a-million increased risk of developing cancer. Similarly, EPA estimates that continuously breathing air containing $0.0008 \mu\text{g}/\text{m}^3$ ($8 \times 10^{-7} \text{mg}/\text{m}^3$) would result in not greater than a one-in-a-hundred thousand increased risk of developing cancer during one's lifetime, and air containing $0.008 \mu\text{g}/\text{m}^3$ ($8 \times 10^{-6} \text{mg}/\text{m}^3$) would result in not greater than a one-in-ten-thousand increased risk of developing cancer during one's lifetime. For a detailed discussion of confidence in the potency estimates, please see IRIS. (7)

Chromium III

- No data are available on the carcinogenic potential of chromium (III) compounds alone. (1,8)
- EPA has classified chromium (III) as a Group D, not classifiable as to carcinogenicity in humans. (8)
- EPA has stated that "the classification of chromium (VI) as a known human carcinogen raises a concern for the carcinogenic potential of chromium (III)". (8)

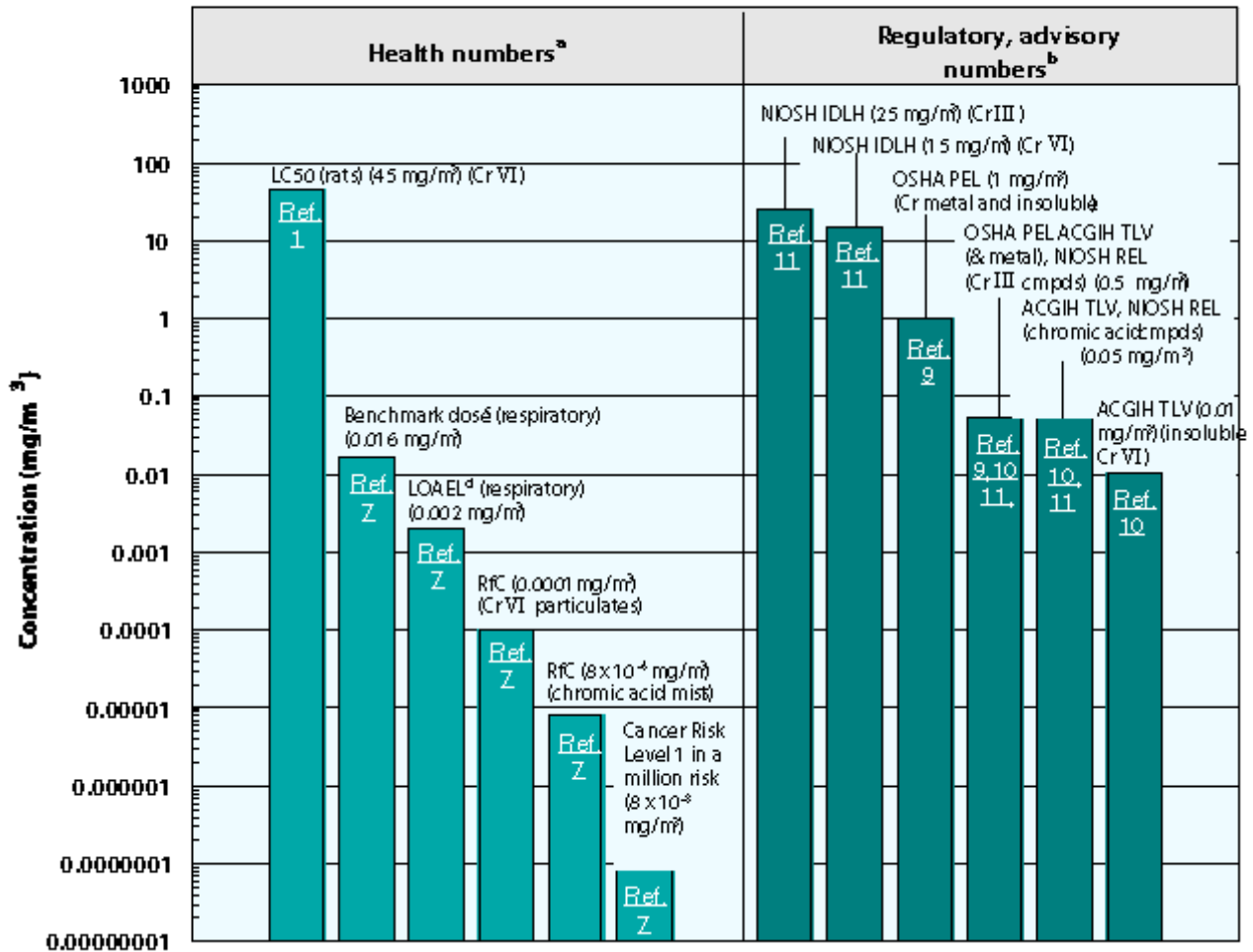
Physical Properties

- The metal, chromium (Cr), is a steel-gray solid with a high melting point and an atomic weight of 51.996 g/mol. Chromium has oxidation states ranging from chromium (-II) to chromium (+VI). (1)
- Chromium forms a large number of compounds, in both the chromium (III) and the chromium (VI) forms. Chromium compounds are stable in the trivalent state, with the hexavalent form being the second most stable state. (1)
- The chromium (III) compounds are sparingly soluble in water and may be found in water bodies as soluble chromium (III) complexes, while the chromium (VI) compounds are readily soluble in water. (1)

Conversion Factors (only for the gaseous form):

To convert concentrations in air (at 25°C) from ppm to mg/m^3 : $\text{mg}/\text{m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$. For chromium: $1 \text{ ppm} = 2.12 \text{ mg}/\text{m}^3$. To convert concentrations in air from $\mu\text{g}/\text{m}^3$ to mg/m^3 : $\text{mg}/\text{m}^3 = (\mu\text{g}/\text{m}^3) \times (1 \text{ mg}/1,000 \mu\text{g})$.

Chromium



ACGIH TLV--American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

LC₅₀ (Lethal Concentration₅₀)--A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

NIOSH IDLH -- National Institute of Occupational Safety and Health's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

NIOSH REL--NIOSH's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

OSHA PEL--Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect

averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in December 1999.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH and ACGIH numbers are advisory.

^c The benchmark dose is from the critical study used as the basis for the EPA's RfC for Cr(VI) particulates.

^d The LOAEL is from the critical study used as the basis for the EPA's RfC for chromic acid mists and dissolved Cr (VI) aerosols.

Summary created in April 1992, updated in January 2000

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Chromium. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1998.
2. SAIC. PM/Toxics Integration: Addressing Co-Control Benefits. Submitted to U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC. 1998.
3. U.S. Environmental Protection Agency. Toxicological Review of Trivalent Chromium. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1998.
4. U.S. Environmental Protection Agency. Toxicological Review of Hexavalent Chromium. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1998.
5. World Health Organization. Chromium. Environmental Health Criteria 61. Geneva, Switzerland. 1988.
6. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
7. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Chromium VI. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
8. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Chromium III. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
9. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations. 29 CFR 1910.1000. 1998.
10. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices. Cincinnati, OH. 1999.
11. National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.

Cobalt Compounds

Hazard Summary

Cobalt is a natural element found throughout the environment. Acute (short-term) exposure to high levels of cobalt by inhalation in humans and animals results in respiratory effects, such as a significant decrease in ventilatory function, congestion, edema, and hemorrhage of the lung. Respiratory effects are also the major effects noted from chronic (long-term) exposure to cobalt by inhalation, with respiratory irritation, wheezing, asthma, pneumonia, and fibrosis noted. Cardiac effects, congestion of the liver, kidneys, and conjunctiva, and immunological effects have also been noted in chronically-exposed humans. Cobalt is an essential element in humans, as a constituent of vitamin B₁₂. Human studies are inconclusive regarding inhalation exposure to cobalt and cancer, and the one available¹² oral study did not report a correlation between cobalt in the drinking water and cancer deaths. EPA has not classified cobalt for carcinogenicity.

Please Note: The main sources of information for this fact sheet are the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Cobalt (1) and California Environmental Protection Agency's Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels. (5)

Uses

- Cobalt is used to make superalloys (alloys that maintain their strength at high temperatures approaching their melting points) and in pigment manufacture. (1,5)

Sources and Potential Exposure

- Cobalt is a natural element found throughout the environment; the general population may be exposed to cobalt in the air, drinking water, and food. (1,5)
- The average concentration of cobalt in ambient air in the United States is approximately 0.0004 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). However, higher levels have been detected; in one industrial area, levels of 0.61 $\mu\text{g}/\text{m}^3$ were measured. (1)
- A study found average cobalt levels in drinking water of 2 micrograms per liter ($\mu\text{g}/\text{L}$), but values up to 107 $\mu\text{g}/\text{L}$ have been reported. (1)
- The average daily intake of cobalt from food is estimated to be 5 to 40 $\mu\text{g}/\text{d}$. (1)
- Occupational exposure to cobalt may occur, particularly in workers in the hard metal industry. (1)

Assessing Personal Exposure

- Cobalt can be measured in the urine and the blood, for periods up to a few days after the exposure. (1)

Health Hazard Information

Acute Effects:

- Acute exposure to high levels of cobalt by inhalation in humans and animals results in respiratory effects, such as a significant decrease in ventilatory function, congestion, edema, and hemorrhage of the lung. (1)
- Acute animal tests in rats have shown cobalt to have **extreme** toxicity from inhalation exposure, and **moderate** to **high** toxicity from oral exposure. (1,2)

Chronic Effects (Noncancer):

- Cobalt is an essential element in humans and animals as a constituent of vitamin B₁₂. Cobalt has also been used as a treatment for anemia, because it stimulates red blood cell production. (1)²
- Chronic exposure to cobalt by inhalation in humans results in effects on the respiratory system, such as respiratory irritation, wheezing, asthma, decreased lung function, pneumonia, and fibrosis. (1,5)
- Other effects noted in humans from inhalation exposure to cobalt include cardiac effects, such as functional effects on the ventricles and enlargement of the heart, congestion of the liver, kidneys, and conjunctiva, and immunological effects that include cobalt sensitization, which can precipitate an asthmatic attack in sensitized individuals. (1,3)
- Cardiovascular effects (cardiomyopathy) were observed in people who consumed large amounts of beer over several years time containing cobalt sulfate as a foam stabilizer. The effects were characterized by cardiogenic shock, sinus tachycardia, left ventricular failure, and enlarged hearts. The beer drinkers ingested cobalt at an average concentration of 0.04 milligrams per kilogram per day (mg/kg/d) to 0.14 mg/kg/d. (1,3)
- Gastrointestinal effects (nausea, vomiting, and diarrhea), effects on the blood, liver injury, and allergic dermatitis have also been reported in humans from oral exposure to cobalt. (1)
- Animal studies have reported respiratory, cardiovascular, and central nervous system (CNS) effects, decreased body weight, necrosis of the thymus, and effects on the blood, liver, and kidneys from inhalation exposure to cobalt. (1,3)
- EPA has not established a Reference Concentration (RfC) or a Reference Dose (RfD) for cobalt.
- The California Environmental Protection Agency (CalEPA) has established a chronic reference exposure level of 0.000005 milligrams per cubic meter (mg/m³) for cobalt based on respiratory effects in rats and mice. The CalEPA reference exposure level is a concentration at or below which adverse health effects are not likely to occur. It is not a direct estimator of risk, but rather a reference point to gauge the potential effects. At lifetime exposures increasingly greater than the reference exposure level, the potential for adverse health effects increases. (5)
- ATSDR has established an intermediate inhalation minimal risk level (MRL) of 0.00003 mg/m³ based on respiratory effects in rats. The MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse noncancer health effects over a specified duration of exposure. (1)

Reproductive/Developmental Effects:

- No information is available on the reproductive or developmental effects of cobalt in humans via inhalation exposure. In one oral study, no developmental effects on human fetuses were observed following treatment of pregnant women with cobalt chloride. (1)
- Animal studies, via inhalation exposure, have reported testicular atrophy, a decrease in sperm motility, and a significant increase in the length of the estrus cycle, while oral studies have reported stunted growth and decreased survival of newborn pups. These effects on the offspring occurred at levels that also caused maternal toxicity. (1,5)

Cancer Risk:

- Limited data are available on the carcinogenic effects of cobalt. In one study on workers that refined and processed cobalt and sodium, an increase in deaths due to lung cancer was found for workers exposed only to cobalt. However, when this study was controlled for date of birth, age at death, and smoking habits, the difference in deaths due to lung cancer was found to not be statistically significant. In another study assessing the correlation between cancer deaths and trace metals in water supplies in the United States, no correlation was found between cancer mortality and the level of cobalt in the water. (1)
- In a study by the National Toxicology Program (NTP), cobalt sulfate heptahydrate exposure via inhalation resulted in increased incidences of alveolar/bronchiolar tumors in rats and mice. (9)
- In an animal study, inhalation of cobalt over a lifetime did not increase the incidence of tumors in hamsters. (1,4)

- Cobalt, via direct injection under the muscles or skin, has been reported to cause tumors at the injection site in animals. (1,4)
- EPA has not classified cobalt for carcinogenicity.

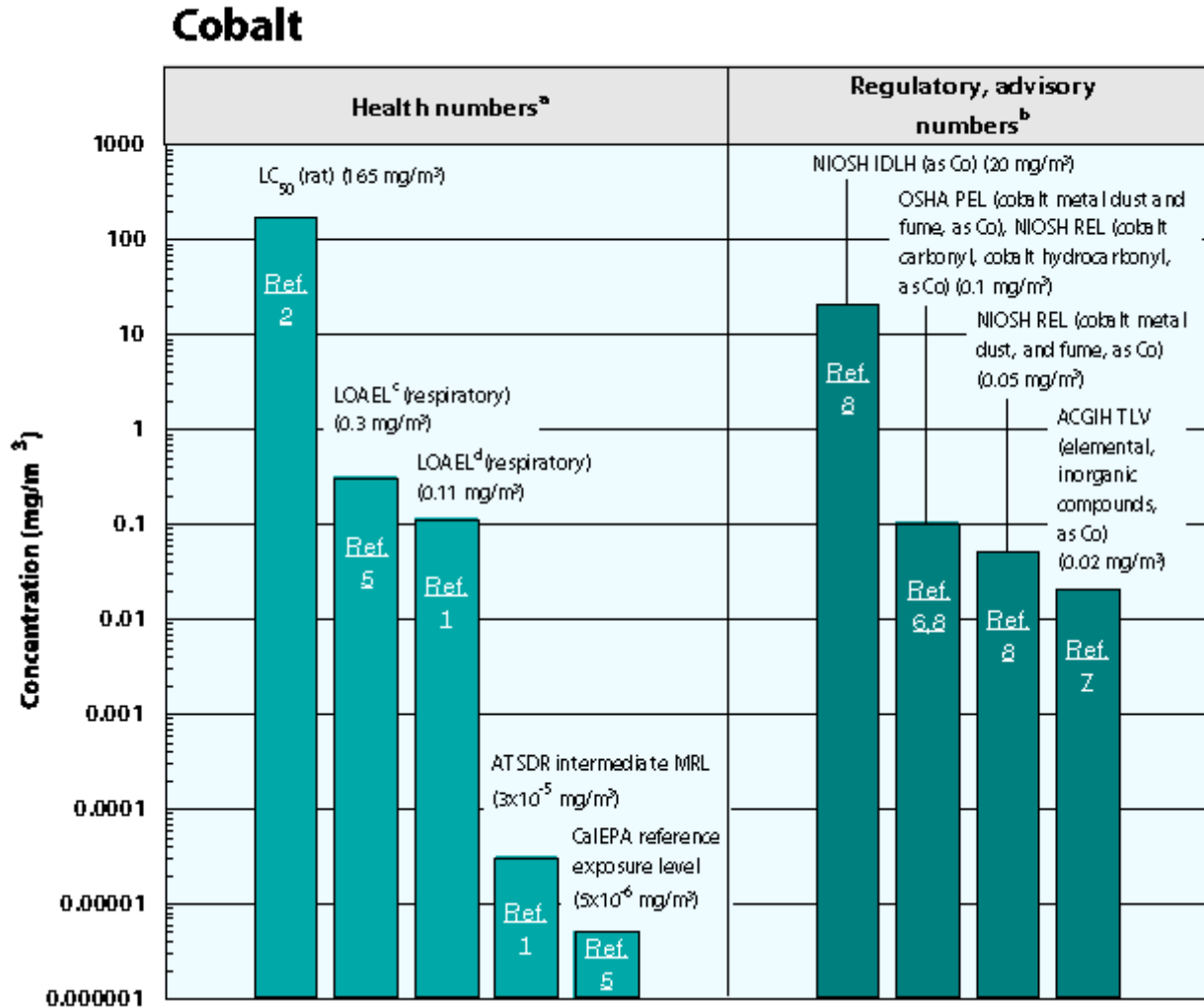
Physical Properties

- Cobalt usually occurs in the environment in association with other metals such as copper, nickel, manganese, and arsenic. (1)
- Pure cobalt is a steel-gray, shiny, hard metal that is insoluble in water. (1)
- The chemical symbol for cobalt is Co, and the atomic weight is 58.93 g/mol. (1,5)

Conversion Factors:

To convert concentrations in air (at 25°C) from ppm to mg/m^3 : $\text{mg}/\text{m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$. For cobalt: $1 \text{ ppm} = 2.4 \text{ mg}/\text{m}^3$.

Health Data from Inhalation Exposure



ACGIH TLV--American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

LC₅₀ (Lethal Concentration₅₀)--A calculated concentration of a chemical in air to which exposure for a specific

length of time is expected to cause death in 50% of a defined experimental animal population.

LOAEL--Lowest-observed-adverse-effect level.

NIOSH IDLH --National Institute of Occupational Safety and Health's immediately dangerous to life or health limit; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

NIOSH REL --NIOSH's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

OSHA PEL --Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in December 1999.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH and ACGIH numbers are advisory.

^c The LOAEL is from the critical study used as the basis for the CalEPA reference exposure level.

^d The LOAEL is from the critical study used as the for the ATSDR intermediate MRL.

Summary created in April 1992, updated in January 2000

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Cobalt. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1992.
2. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
3. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
4. E.J. Calabrese and E.M. Kenyon. Air Toxics and Risk Assessment. Lewis Publishers, Chelsea, MI. 1991.
5. California Environmental Protection Agency (CalEPA). Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels. Draft for Public Comment. Office of Environmental Health Hazard Assessment, Berkeley, CA. 1997.
6. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations. 29 CFR 1910.1000. 1998.
7. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.
8. National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
9. National Toxicology Program. Toxicology and Carcinogenesis Studies of Cobalt Sulfate Heptahydrate (CAS No. 10026-24-1) in F344/N Rats and B6C3F₁ Mice (Inhalation Studies). TR No. 471. U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, Bethesda, MD. 1998.

Ethylbenzene

100-41-4

Hazard Summary

Ethylbenzene is mainly used in the manufacture of styrene. Acute (short-term) exposure to ethylbenzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure to ethylbenzene by inhalation in humans has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethylbenzene. Limited information is available on the carcinogenic effects of ethylbenzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethylbenzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethylbenzene as a Group D, not classifiable as to human carcinogenicity.

Please Note: The main sources of information for this fact sheet are EPA's Integrated Risk Information System (IRIS) (5), which contains information on inhalation and oral chronic toxicity of ethylbenzene and the RfC, and oral chronic toxicity and the RfD, and the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Ethylbenzene. (1)

Uses

- Ethylbenzene is used primarily in the production of styrene. It is also used as a solvent, as a constituent of asphalt and naphtha, and in fuels. (1)

Sources and Potential Exposure

- In one study, ethylbenzene was detected in urban air at a median concentration of 0.62 parts per billion (ppb). The median level in suburban air was about 0.62 ppb, while the mean level measured in air in rural locations was about 0.13 ppb. (1)
- Ethylbenzene has been detected in indoor air at mean concentrations of approximately 1 ppb. The indoor levels tend to be higher than the ambient levels, due to the use of household products such as cleaning products or paints. (1)
- Occupational exposure to ethylbenzene occurs in factories that use ethylbenzene to produce other chemicals; for gas and oil workers; and for varnish workers, spray painters, and persons involved in gluing operations. (1)
- Exposure to ethylbenzene occurs from the use of consumer products, gasoline, pesticides, solvents, carpet glues, varnishes, paints, and tobacco smoke. (1)

Assessing Personal Exposure

- Laboratory tests can determine ethylbenzene exposure by measuring the breakdown products in the urine. (1)

Health Hazard Information

Acute Effects:

- Respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness, have been noted from acute inhalation exposure to ethylbenzene in humans. (1–3)
- Animal studies have reported central nervous system (CNS) toxicity; pulmonary effects; and effects on the liver, kidney, and eyes (irritation) from acute inhalation exposure to ethylbenzene. (1)
- Tests involving acute exposure of rats have shown ethylbenzene to have moderate toxicity from inhalation and oral exposure. (1,4)

Chronic Effects (Noncancer):

- Chronic exposure to ethylbenzene by inhalation in humans has shown conflicting results regarding its effects on the blood. In one study of workers occupationally exposed to ethylbenzene, effects on the blood were noted, while in another study, no adverse effects on the blood were seen. (1)
- In a 20-year study of humans occupationally exposed to ethylbenzene, no liver toxicity was noted. (1)
- Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethylbenzene. (1,3)
- The Reference Concentration (RfC) for ethylbenzene is 1 milligram per cubic meter (mg/m^3) based on developmental toxicity in rats and rabbits. The RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups), that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfC, the potential for adverse health effects increases. Lifetime exposure above the RfC does not imply that an adverse health effect would necessarily occur. (5)
- EPA has low confidence in the study on which the RfC was based because higher exposure levels may have provided more information on the potential for maternal toxicity and developmental effects; low confidence in the database because, although other studies have examined a variety of other endpoints (e.g., liver and lung), by histopathology in rats and mice, there are no chronic studies and no multigeneration developmental studies; and, consequently, low confidence in the RfC. (5)
- The Reference Dose (RfD) for ethylbenzene is 0.1 milligrams per kilogram body weight per day ($\text{mg}/\text{kg}/\text{d}$) based on liver and kidney toxicity in rats. (5)
- EPA has low confidence in the study on which the RfD was based because rats of only one sex were tested and the experiment was not of chronic duration; low confidence in the supporting database because other oral toxicity data were not found; and, consequently, low confidence in the RfD. (5)

Reproductive/Developmental Effects:

- No information is available on the developmental or reproductive effects of ethylbenzene in humans. (1)
- Animal studies have reported developmental effects, such as fetal resorptions, retardation of skeletal development, and an increased incidence of extra ribs in animals exposed to ethylbenzene via inhalation. (1,3,5)

Cancer Risk:

- The only available human cancer study monitored the conditions of workers exposed to ethylbenzene for 10 years, with no tumors reported. However, no firm conclusions can be made from this study because exposure information was not provided, and 10 years is insufficient for detecting long latency tumors in humans. (1)
- In a study by the NTP, exposure to ethylbenzene by inhalation resulted in a clearly increased incidence of kidney and testicular tumors in male rats, and a suggestive increase in kidney tumors in female rats, lung tumors in male mice, and liver tumors in female mice. (6)
- EPA has classified ethylbenzene as a Group D, not classifiable as to human carcinogenicity. (5)

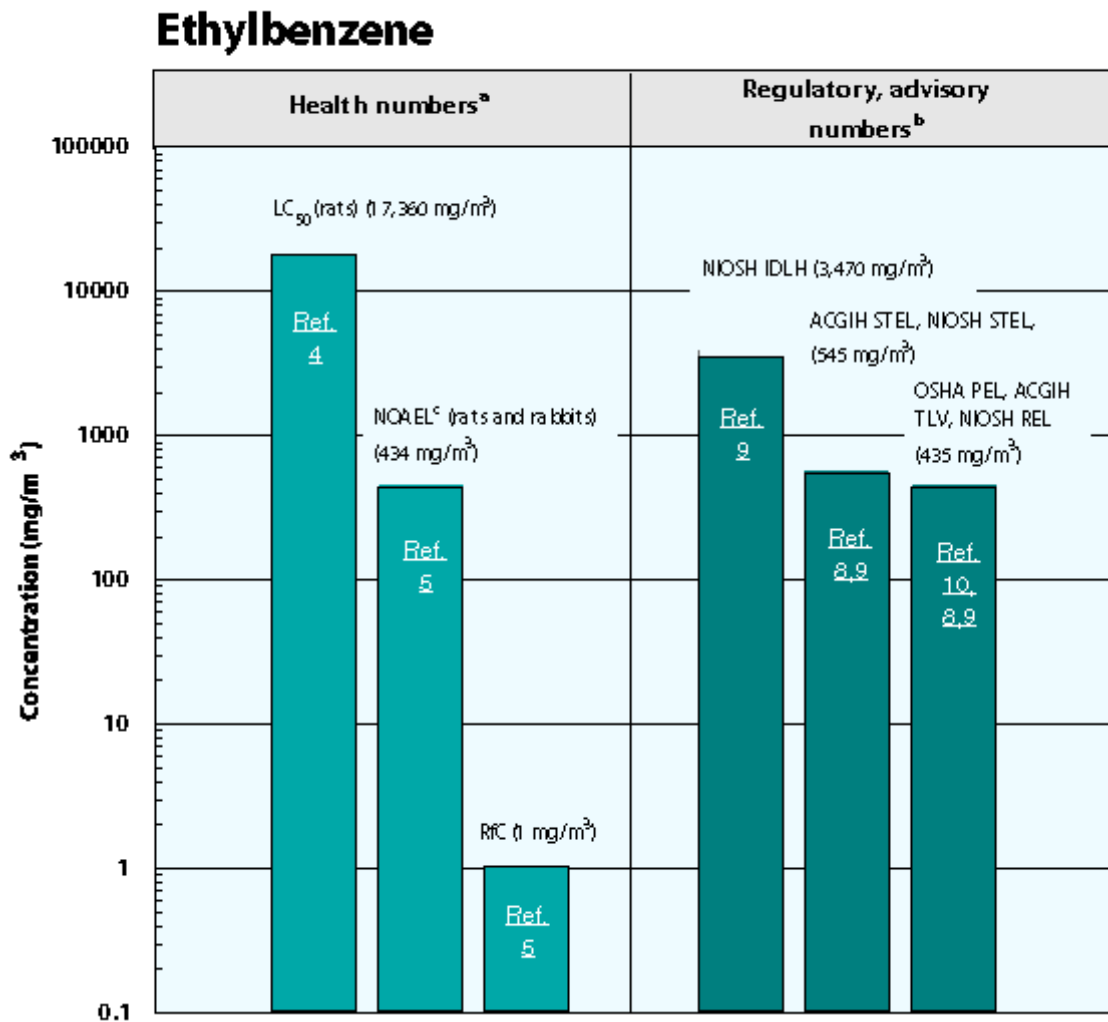
Physical Properties

- Ethylbenzene is a colorless liquid that smells like gasoline. (1)
- The odor threshold for ethylbenzene is 2.3 parts per million (ppm). (7)
- The chemical formula for ethylbenzene is C_8H_{10} , and the molecular weight is 106.16 g/mol. (1)
- The vapor pressure for ethylbenzene is 9.53 mm Hg at 25 °C, and its octanol/water partition coefficient ($\log K_{ow}$) is 3.13. (1)

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m^3 : $mg/m^3 = (ppm) \times (\text{molecular weight of the compound}) / (24.45)$. For ethylbenzene: 1 ppm = 4.34 mg/m^3 .

Health Data from Inhalation Exposure



ACGIH STEL --American Conference of Governmental and Industrial Hygienist's threshold limit value short-term exposure limit; a 15-minute TWA exposure which should not be exceeded at any time during a workday.

ACGIH TLV -- ACGIH's threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

LC₅₀ (Lethal Concentration ₅₀)--A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

NIOSH IDLH --National Institute of Occupational Safety and Health immediately dangerous to life and health; NIOSH concentration representing the maximum level of a pollutant from which an individual could escape within 30 minutes without escape-impairing symptoms or irreversible health effects.

NIOSH REL --NIOSH's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-

weighted-average exposure and/or ceiling.

NIOSH STEL --NIOSH's recommended short-term exposure limit; a 15-minute TWA exposure which should not be exceeded at any time during a workday.

NOAEL --No-observed-adverse-effect level.

OSHA PEL --Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

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^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH and ACGIH numbers are advisory.

^c NOAEL is from the critical study used as the basis for the EPA RfC.

Summary created in April 1992, updated January 2000

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Ethylbenzene (Update). Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1999.
2. E.J. Calabrese and E.M. Kenyon. Air Toxics and Risk Assessment. Lewis Publishers, Chelsea, MI. 1991.
3. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, [online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
4. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, [online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
5. U.S. Environmental Protection Agency. [Integrated Risk Information System \(IRIS\) on Ethylbenzene](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
6. National Toxicology Program. [Toxicology and Carcinogenesis Studies of Ethylbenzene \(CAS No. 100-41-4\) in F344/N Rats and B6C3F1 Mice \(Inhalation Studies\)](#). TR No. 466. U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, Bethesda, MD. 1999.
7. J.E. Amore and E. Hautala. Odor as an aid to chemical safety: Odor thresholds compared with threshold limit values and volatilities for 214 industrial chemicals in air and water dilution. *Journal of Applied Toxicology*, 3(6):272-290. 1983.
8. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.
9. National Institute for Occupational Safety and Health (NIOSH). [Pocket Guide to Chemical Hazards](#). U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
10. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations. 29 CFR 1910.1000. 1998.

Hexane

110-54-3

Hazard Summary

Hexane is used to extract edible oils from seeds and vegetables, as a special-use solvent, and as a cleaning agent. Acute (short-term) inhalation exposure of humans to high levels of hexane causes mild central nervous system (CNS) effects, including dizziness, giddiness, slight nausea, and headache. Chronic (long-term) exposure to hexane in air is associated with polyneuropathy in humans, with numbness in the extremities, muscular weakness, blurred vision, headache, and fatigue observed. Neurotoxic effects have also been exhibited in rats. No information is available on the carcinogenic effects of hexane in humans or animals. EPA has classified hexane as a Group D, not classifiable as to human carcinogenicity.

Please Note: The main source of information for this fact sheet is EPA's Integrated Risk Information System (IRIS) (5), which contains information on inhalation chronic toxicity of hexane and the Reference Concentration (RfC). Another secondary source used is the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Hexane. (6)

Uses

- The main use of hexane is as a solvent to extract edible oils from seed and vegetable crops (e.g., soybeans, peanuts, corn). (6)
- Commercial grades of hexane are used as solvents for glues (rubber cement, adhesives), varnishes, and inks. (3,6)
- Hexane is also used as a cleaning agent (degreaser) in the printing industry. (6)
- Hexane is used as the liquid in low temperature thermometers. (2,6,8)

Sources and Potential Exposure

- The most probable route of human exposure to hexane is by inhalation. Individuals are most likely to be exposed to hexane in the workplace. Monitoring data indicate that hexane is a widely occurring atmospheric pollutant. (1,2)

Assessing Personal Exposure

- Laboratory tests can detect a breakdown product of hexane in urine. (6)

Health Hazard Information

Acute Effects:

- Acute inhalation exposure of humans to high levels of hexane causes mild CNS depression. CNS effects include dizziness, giddiness, slight nausea, and headache in humans. (1-3)
- Acute exposure to hexane vapors may cause dermatitis and irritation of the eyes and throat in humans. (2)
- Acute animal tests in rats have demonstrated hexane to have low acute toxicity from inhalation and ingestion exposure. (4)

Chronic Effects (Noncancer):

- Chronic inhalation exposure to hexane is associated with sensorimotor polyneuropathy in humans, with numbness in the extremities, muscular weakness, blurred vision, headache, and fatigue observed. (1,2,5-7)
- Rats, chronically exposed by inhalation, have exhibited neurotoxic effects. (5,6)
- Mild inflammatory, erosive, and degenerative lesions in the olfactory and respiratory epithelium of the nasal cavity have been observed in mice chronically exposed by inhalation. Pulmonary lesions have also been observed in chronically exposed rabbits. (5,6)
- The Reference Concentration (RfC) for hexane is 0.2 milligrams per cubic meter (mg/m^3) based on neurotoxicity in humans and epithelial lesions in the nasal cavity in mice. The RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfC, the potential for adverse health effects increases. Lifetime exposure above the RfC does not imply that an adverse health effect would necessarily occur. (5)
- EPA has medium confidence in the epidemiological study on which the RfC was based because the lowest-observed-adverse-effect level (LOAEL) in this study was based on neurotoxicology, and this endpoint is supported by numerous other subchronic inhalation studies in animals and by human occupational studies; medium confidence in the database because of the lack of long-term inhalation studies and appropriate reproductive studies; and, consequently, medium confidence in the RfC. (5)
- EPA has not established a Reference Dose (RfD) for hexane. (5)
- EPA has calculated a provisional RfD of 0.06 milligrams per kilogram body weight per day ($\text{mg}/\text{kg}/\text{d}$) based on neurological and reproductive effects in rats. The provisional RfD is a value that has had some form of Agency review but is not on IRIS. (10)

Reproductive/Developmental Effects:

- No information is available on the reproductive or developmental effects of hexane in humans.
- Testicular damage has been observed in male rats exposed to hexane via inhalation. (5)
- Teratogenic effects were not observed in the offspring of rats chronically exposed via inhalation in several studies. (3,5,8)

Cancer Risk:

- No information is available on the carcinogenic effects of hexane in humans or animals.
- EPA has classified hexane as a Group D, not classifiable as to human carcinogenicity, based on a lack of data concerning carcinogenicity in humans and animals. (3,5)

Physical Properties

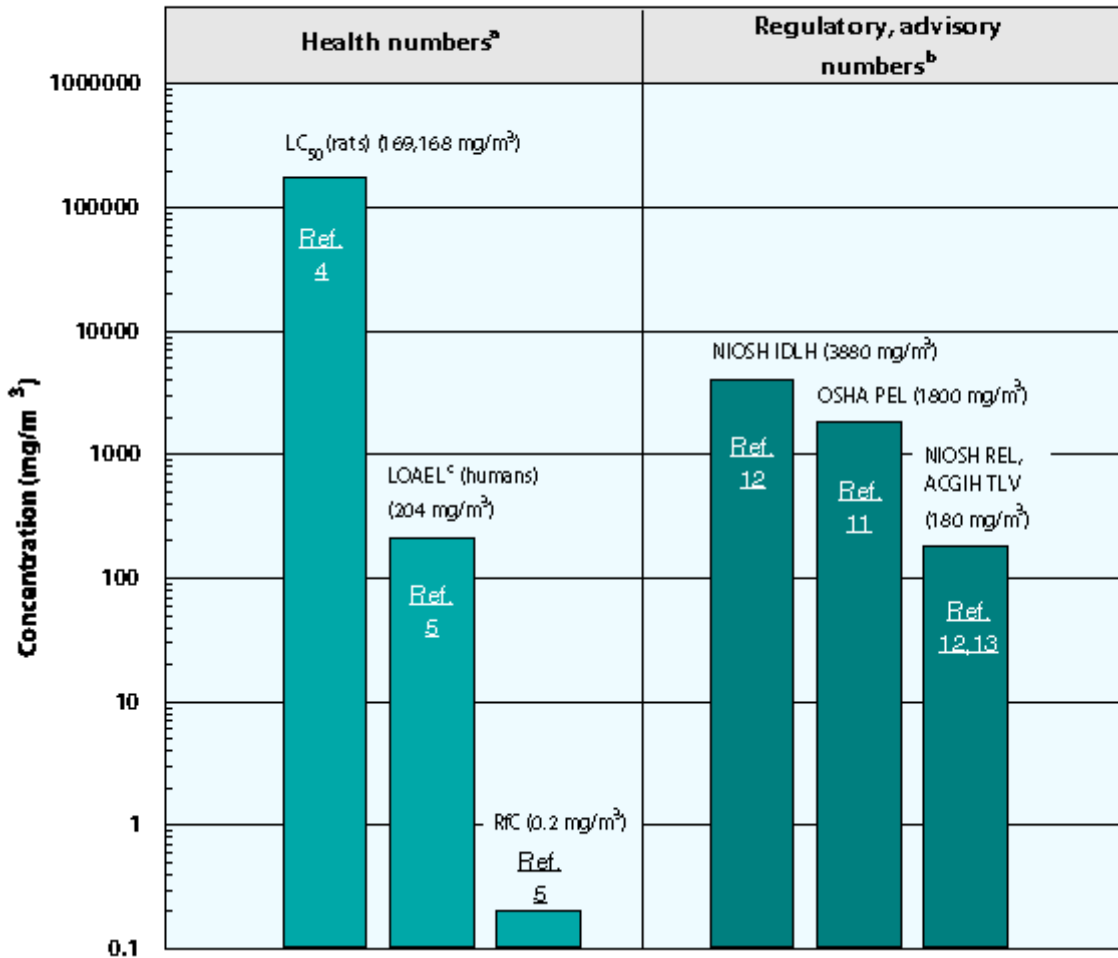
- The chemical formula for hexane is C_6H_{14} , and its molecular weight is 86.17 g/mol. (8)
- Hexane is a colorless volatile liquid that is insoluble in water and highly flammable. (2,8)
- The odor threshold for hexane is 130 parts per million (ppm), with a faint peculiar odor reported. (8,9)
- The vapor pressure for hexane is 150 mm Hg at 25 °C. (3)

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m^3 : $\text{mg}/\text{m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$. For hexane: 1 ppm = 3.53 mg/m^3 .

Health Data from Inhalation Exposure

Hexane



ACGIH TLV--American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect.

LC₅₀ (Lethal Concentration₅₀)--A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

NIOSH REL--National Institute of Occupational Safety and Health's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

NIOSH IDLH -- NIOSH's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

OSHA PEL--Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

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^c The LOAEL is from the critical study used as the basis for the EPA RfC.

References

1. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
2. M. Sittig. Handbook of Toxic and Hazardous Chemicals and Carcinogens. 2nd ed. Noyes Publications, Park Ridge, NJ. 1985.
3. U.S. Environmental Protection Agency. n-Hexane Health Advisory. Office of Drinking Water, Washington, DC. 1987.
4. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
5. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on n-Hexane. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
6. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Hexane. Draft for Public Comment. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1997.
7. E.J. Calabrese and E.M. Kenyon. Air Toxics and Risk Assessment. Lewis Publishers, Chelsea, MI. 1991.
8. The Merck Index. An Encyclopedia of Chemicals, Drugs, and Biologicals. 11th ed. Ed. S. Budavari. Merck and Co. Inc., Rahway, NJ. 1989.
9. J.E. Amore and E. Hautala. Odor as an aid to chemical safety: Odor thresholds compared with threshold limit values and volatilities for 214 industrial chemicals in air and water dilution. *Journal of Applied Toxicology*, 3(6):272-290. 1983.
10. U.S. Environmental Protection Agency. Health Effects Assessment Summary Tables. FY 1997 Update. Solid Waste and Emergency Response, Office of Emergency and Remedial Response, Cincinnati, OH. EPA/540/R-97-036. 1997.
11. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations. 29 CFR 1910.1000. 1998.
12. National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
13. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.

Methyl Bromide (Bromomethane)

74-83-9

Hazard Summary

Methyl bromide is used as a fumigant and pesticide. Exposure may occur during fumigation activities. Methyl bromide is highly toxic. Studies in humans indicate that the lung may be severely injured by the acute (short-term) inhalation of methyl bromide. Acute and chronic (long-term) inhalation of methyl bromide can lead to neurological effects in humans. Neurological effects have also been reported in animals. Degenerative and proliferative lesions in the nasal cavity developed in rats chronically exposed to methyl bromide by inhalation. Chronic inhalation exposure of male animals has resulted in effects on the testes at high concentrations. EPA has classified methyl bromide as a Group D, not classifiable as to human carcinogenicity.

Please Note: The main sources of information for this fact sheet are EPA's Integrated Risk Information System (IRIS) (3), which contains information on inhalation chronic toxicity of methyl bromide and the [RfC](#), oral chronic toxicity and the [RfD](#), and the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Bromomethane. (1) Other secondary sources include The Merck Index (7) and EPA's Health Effects Assessment for Bromomethane. (5)

Uses

- The primary use of methyl bromide is as a fumigant in soil to control fungi, nematodes, and weeds; in space fumigation of food commodities (e.g., grains); and in storage facilities (such as mills, warehouses, vaults, ships, and freight cars) to control insects and rodents. (2,7,10)

Sources and Potential Exposure

- In most places, levels of methyl bromide in the air are usually < 0.025 parts per billion (ppb). Industrial areas have higher levels (ranging up to 1.2 ppb) because of releases from chemical factories. (1) Workers
- who fumigate homes and fields may be exposed to high levels of methyl bromide if proper safety precautions are not followed. (1)
- Trace amounts of methyl bromide have been detected in drinking water. (2)
- Some methyl bromide is formed naturally by algae or kelp in the ocean. (1)

Assessing Personal Exposure

- The main breakdown product of methyl bromide (the bromide ion) can be measured in blood samples; this test is useful only if it is done within 1 to 2 days following exposure. (1)

Health Hazard Information

Acute Effects:

- Studies in humans indicate that the lung may be most severely injured by the acute inhalation exposure of methyl bromide. Breathing high concentrations of methyl bromide may cause pulmonary edema, impairing respiratory function. (1,3)

- Acute exposure by inhalation of methyl bromide frequently leads to neurological effects in humans. Symptoms of acute exposure in humans include headaches, dizziness, fainting, apathy, weakness, confusion, speech impairment, visual effects, numbness, twitching, and tremors; in severe cases paralysis and convulsions are possible. Acute exposure may produce delayed effects. Symptoms may improve without treatment in less serious cases. (1,3)
- Methyl bromide is irritating to the eyes, skin, and mucous membranes of the upper respiratory tract. Dermal exposure to methyl bromide can cause itching, redness, and blisters in humans. (1)
- Kidney damage has been observed in humans who have inhaled high levels of methyl bromide. (1)
- Inhalation of methyl bromide may cause the liver to become swollen and tender, but no significant injury to the liver has been observed in humans. (1)
- Injury to the heart has been observed in mice and rats exposed to high concentrations of methyl bromide by inhalation. (1,3)
- Tests involving acute exposure of rats and mice have demonstrated methyl bromide to have high acute toxicity from inhalation and oral exposure. (4)

Chronic Effects (Noncancer):

- Data from an occupational study suggest that mild functional neurological impairment may result in humans chronically exposed to methyl bromide by inhalation exposure, but this is not conclusive due to concurrent exposure to other chemicals and inadequate quantitation of exposure levels and durations. (1,3,5)
- Neurological effects, including lethargy, forelimb twitching, tremors, and paralysis, have also been observed in animal studies. (3,6)
- Degenerative and proliferative lesions in the nasal cavity developed in rats chronically exposed to methyl bromide by inhalation. (3)
- The Reference Concentration (RfC) for methyl bromide is 0.005 milligrams per cubic meter (mg/m^3) based on degenerative and proliferative lesions of the olfactory epithelium of the nasal cavity. The RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfC, the potential for adverse health effects increases. Lifetime exposure above the RfC does not imply that an adverse health effect would necessarily occur. (3)
- EPA has medium confidence in the study on which the RfC was based because even though the study was well conducted, it did not identify a no-observed-adverse-effect level (NOAEL); high confidence in the database because there is a chronic inhalation study in two species supported by subchronic inhalation studies in several species and because data are available on the developmental and reproductive effects of bromomethane as well as its pharmacokinetics following inhalation exposure; and, consequently, high confidence in the RfC. (3)
- The Reference Dose (RfD) for methyl bromide is 0.0014 milligrams per kilogram body weight per day ($\text{mg}/\text{kg}/\text{d}$) based on epithelial hyperplasia of the forestomach in rats. (3)
- EPA has medium confidence in the study on which the RfD was based because it used the preferred route of administration for derivation of an oral RfD, the study was adequately conducted, and the determination of epithelial hyperplasia of the forestomach was independently confirmed; medium confidence in the database; and, consequently, medium confidence in the RfD. (3)

Reproductive/Developmental Effects:

- No information is available on the reproductive or developmental effects of methyl bromide in humans.
- Information from animal studies suggest that methyl bromide does not cause birth defects and does not interfere with normal reproduction except at high exposure levels. (1)
- Chronic inhalation exposure of male animals has resulted in effects on the testes at high concentrations. (1,3)

- Inhalation exposure of animals during gestation has not resulted in significant developmental effects, even when there was severe maternal toxicity. (1,3,5)

Cancer Risk:

- In a human mortality study, a higher incidence of death from testicular cancer was identified in men occupationally exposed to methyl bromide. However, methyl bromide could not be established as the causative agent because the individuals in the study were exposed to a wide variety of brominated chemicals. (1,3,5)
- There was no evidence of carcinogenic activity in mice in a National Toxicology Program (NTP) chronic inhalation study. (6)
- EPA has classified methyl bromide as a Group D, not classifiable as to human carcinogenicity, based on inadequate human and animal data. (3,5)

Physical Properties

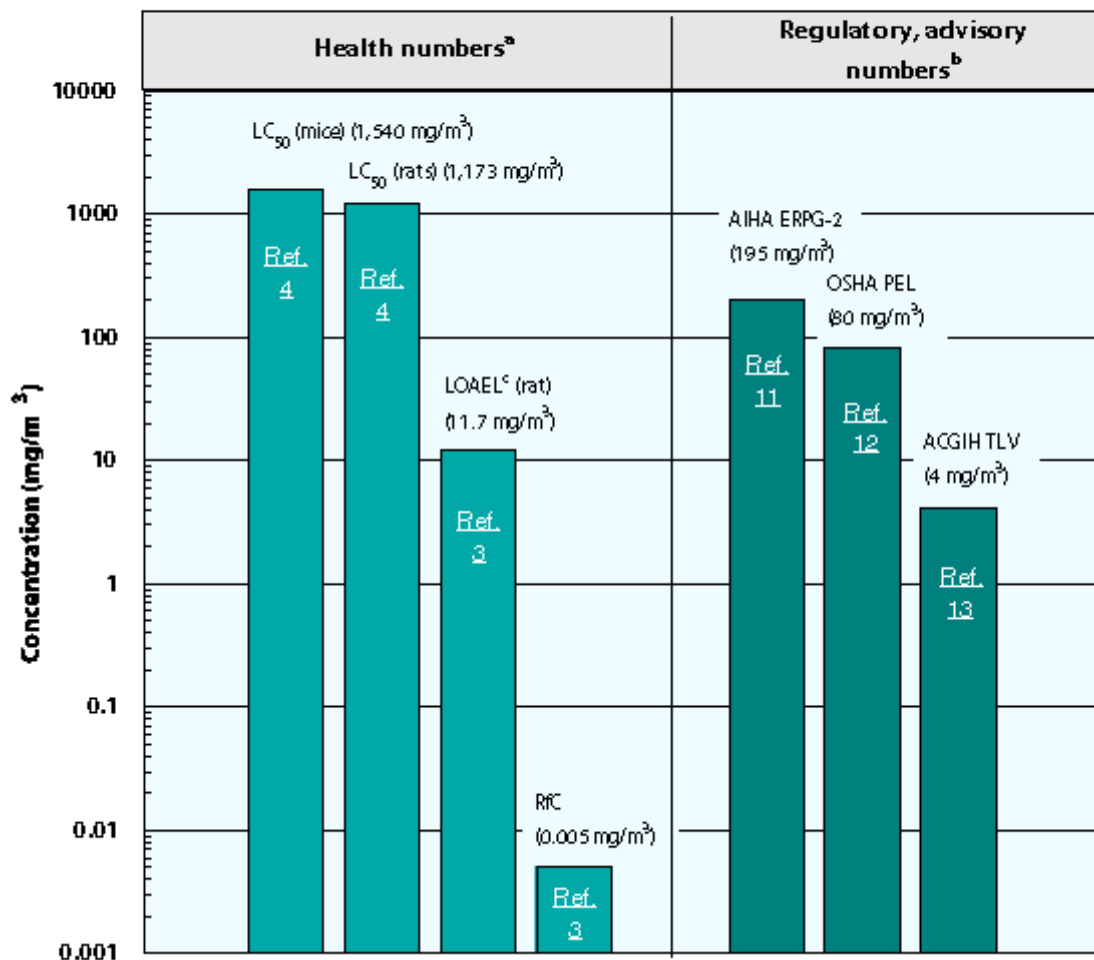
- The chemical formula for methyl bromide is CH_3Br , and it has a molecular weight of 94.95 g/mol. (7)
 - Methyl bromide occurs as a colorless and highly volatile gas that is slightly soluble in water. (7,8)
 - Methyl bromide is practically odorless but has a sweetish chloroform-like odor at high concentrations with an odor threshold of 80 mg/m^3 . (3,7,9)
 - The vapor pressure for methyl bromide is 1,420 mm Hg at 20 °C, and it has a log octanol/water partition coefficient ($\log K_{ow}$) of 1.1. (1)
-

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m^3 : $\text{mg}/\text{m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$. For methyl bromide: 1 ppm = 3.9 mg/m^3 .

Health Data from Inhalation Exposure

Methyl Bromide



AIHA ERPG--American Industrial Hygiene Association's emergency response planning guidelines. ERPG 2 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed up to one hour without experiencing or developing irreversible or other serious health effects that could impair their abilities to take protective action.

ACGIH TLV--American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect.

LC₅₀ (Lethal Concentration₅₀)--A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

LOAEL--Lowest-observed-adverse-effect level.

OSHA PEL--Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in December 1999.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas ACGIH and AIHA numbers are advisory.

^c This LOAEL is from the critical study used as the basis for the EPA RfC.

References

Summary created in April 1992, updated January 2000

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Bromomethane. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1992.
2. U.S. Environmental Protection Agency. Bromomethane Health Advisory. Office of Drinking Water, Washington, DC. 1989.
3. U.S. Environmental Protection Agency. [Integrated Risk Information System \(IRIS\) on Bromomethane](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
4. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
5. U.S. Environmental Protection Agency. Health Effects Assessment for Bromomethane. EPA/600/8-88/022. Environmental Criteria and Assessment Office, Office of Health and Environmental Assessment, Office of Research and Development, Cincinnati, OH. 1988.
6. National Toxicology Program. [Toxicology and Carcinogenesis Studies of Methyl Bromide \(CAS No. 74-83-9\) in B6C3F1 Mice \(Inhalation Studies\)](#). Technical Report No. TR-385. 1992.
7. The Merck Index. An Encyclopedia of Chemicals, Drugs, and Biologicals. 11th ed. Ed. S. Budavari. Merck and Co. Inc., Rahway, NJ. 1989.
8. International Agency for Research on Cancer (IARC). IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans: Some Halogenated Hydrocarbons and Pesticide Exposures. Volume 41. World Health Organization, Lyon. 1986.
9. U.S. Department of Health and Human Services. Hazardous Substances Data Bank ([HSDB, online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
10. M. Sittig. Handbook of Toxic and Hazardous Chemicals and Carcinogens. 2nd ed. Noyes Publications, Park Ridge, NJ. 1985.
11. American Industrial Hygiene Association (AIHA). The AIHA 1998 Emergency Response Planning Guidelines and Workplace Environmental Exposure Level Guides Handbook. 1998.
12. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations 29 CFR 1910.1000. 1998.
13. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.

Methyl Chloride (Chloromethane)

METHYL CHLORIDE (CHLOROMETHANE)

74-87-3

Hazard Summary

Low levels of methyl chloride occur naturally in the environment. Higher levels may occur at chemical plants where it is made or used. Acute (short-term) exposure to high concentrations of methyl chloride in humans has caused severe neurological effects. Methyl chloride has also caused effects on the heart rate, blood pressure, liver, and kidneys in humans. Chronic (long-term) animal studies have shown liver, kidney, spleen, and central nervous system (CNS) effects. Inhalation studies have demonstrated that methyl chloride causes reproductive effects in male rats, with effects such as testicular lesions and decreased sperm production. Human cancer data are limited. EPA has classified methyl chloride as a Group D carcinogen (not classifiable as to human carcinogenicity).

Please Note: The main source of information for this fact sheet is the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Chloromethane. (1) Other secondary sources include the Hazardous Substances Data Bank (HSDB) (2), a database of summaries of peer-reviewed literature, and the Registry of Toxic Effects of Chemical Substances (RTECS) (3), a database of toxic effects that are not peer reviewed.

Uses

- Methyl chloride is used mainly in the production of silicones where it is used to make methylate silicon. It is also used in the production of agricultural chemicals, methyl cellulose, quaternary amines, and butyl rubber and for miscellaneous uses including tetramethyl lead. (1)
- Methyl chloride was used widely in refrigerators in the past, but generally this use has been taken over by newer chemicals such as Freon. (1,8)

Sources and Potential Exposure

- Methyl chloride is formed in the oceans by natural processes (e.g., marine phytoplankton) and from biomass burning in grasslands and forested areas (e.g., forest fires); it has been detected at low levels in air all over the world. (1)
- Other sources of exposure to methyl chloride include cigarette smoke, polystyrene insulation, and aerosol propellants; home burning of wood, coal, or certain plastics; and chlorinated swimming pools. (1)
- Methyl chloride is also present in some lakes and streams and has been found in drinking water at very low levels. (1)
- Occupations that present a higher risk of exposure include building contracting, metal industries, transportation, car dealers, and service-station attendants. (1)

Assessing Personal Exposure

- There is no known reliable medical test to determine exposure to methyl chloride. (1)

Health Hazard Information

Acute Effects:

- In humans, brief exposures to high levels of methyl chloride can have serious effects on the nervous system, including convulsions, and coma. Other effects include dizziness, blurred or double vision, fatigue, personality changes, confusion, tremors, uncoordinated movements, slurred speech, nausea, and vomiting. These symptoms develop within a few hours after exposure and may persist for several months.(1)
- Effects on heart rate, the liver, and kidneys have also been reported in humans following acute inhalation exposures to methyl chloride. (1)
- Numerous acute inhalation exposure studies have identified the liver and kidney as target organs in rats and mice; the central nervous system (CNS) as a target system in rats, mice, and dogs; spleen effects in mice; and endocrine effects in rats. (1,2)
- Tests involving acute exposure of rats and mice have shown methyl chloride to have moderate acute toxicity. (3)

Chronic Effects (Noncancer):

- No information is available regarding the chronic effects of methyl chloride in humans. (1)
- Chronic animal studies have shown that the liver, kidney, spleen, and CNS were the target of methyl chloride toxicity. Animals that breathed air containing methyl chloride gained weight more slowly than animals exposed to air. (1)
- EPA's Reference Concentration (RfC) for methyl chloride is 0.09 milligrams per cubic meter (mg/m^3). EPA has not established a Reference Dose (RfD) for methyl chloride. (4)

Reproductive/Developmental Effects:

- No studies were located concerning developmental or reproductive effects of methyl chloride in humans.(1) Several inhalation studies have demonstrated that methyl chloride causes reproductive effects in animals,
- with effects such as testicular lesions, disrupted spermatogenesis, and decreased sperm production in male rats. Delayed fetal development was noted in rats exposed to the same concentration of methyl chloride that resulted in maternal toxicity. (1)

Cancer Risk:

- Information regarding carcinogenicity in humans after exposure to methyl chloride is limited. An epidemiological study of butyl rubber workers showed no statistically significant increase in the rate of death due to cancer in this population. An elevated mortality from all cancers and for lung cancer was reported among a group of Icelandic fishermen who had been exposed to methyl chloride for two days in 1963. (1)
- In animal studies, kidney tumors were reported in one study of male mice. (1)
- EPA has classified methyl chloride as a Group D carcinogen (not classifiable as to human carcinogenicity). (5)

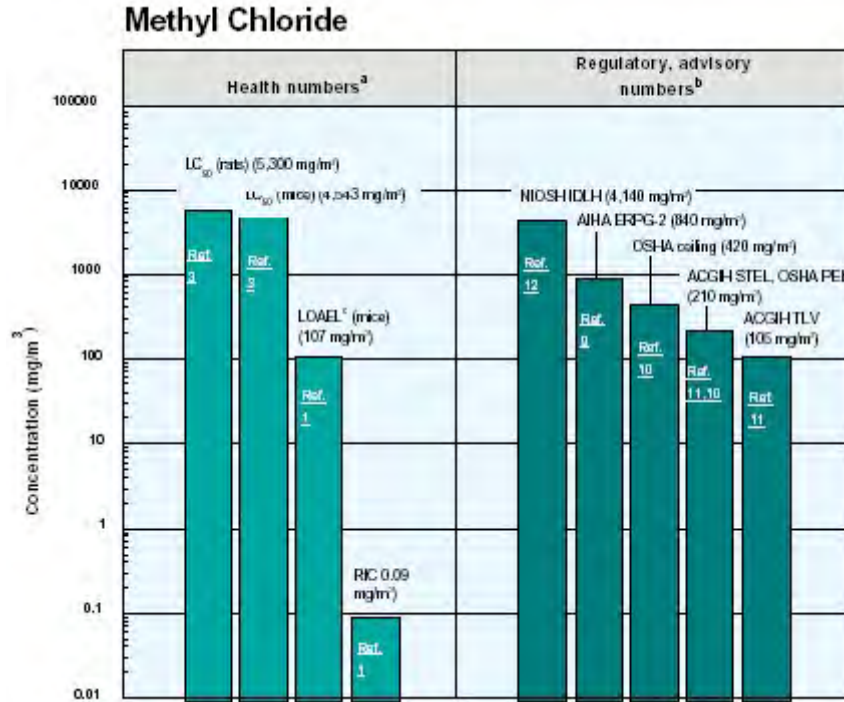
Physical Properties

- Methyl chloride is a colorless gas with a faint sweet smell and an odor threshold of 10 ppm. (1)
 - Methyl chloride is soluble in water. (6)
 - The chemical formula for methyl chloride is CH_3Cl , and it has a molecular weight of 50.49 g/mol. (1)
 - The vapor pressure for methyl chloride is 4,310 mm Hg at 25 °C, and the log octanol/water partition coefficient ($\log K_{ow}$) is 0.91. (1,7)
-

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m^3 : $\text{mg}/\text{m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$. For methyl chloride: $1 \text{ ppm} = 2.1 \text{ mg}/\text{m}^3$. To convert concentrations in air from $\mu\text{g}/\text{m}^3$ to mg/m^3 : $\text{mg}/\text{m}^3 = (\mu\text{g}/\text{m}^3) \times (1 \text{ mg}/1,000 \mu\text{g})$.

Health Data from Inhalation Exposure \



ACGIH STEL --American Conference of Governmental and Industrial Hygienists' short-term exposure limit; 15-min time-weighted-average exposure that should not be exceeded at any time during a workday even if the 8-h time-weighted-average is within the threshold limit value.

ACGIH TLV --ACGIH's threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

AIHA ERPG --American Industrial Hygiene Association's emergency response planning guidelines. ERPG 2 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed up to one hour without experiencing or developing irreversible or other serious health effects that could impair their abilities to take protective action.

LC₅₀ (Lethal Concentration₅₀) --A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

LOAEL --lowest observed adverse effect level.

NIOSH IDLH -- National Institute of Occupational Safety and Health's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

OSHA PEL --Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

OSHA ceiling value --OSHA's permissible exposure limit ceiling value; the concentration of a substance that should not be exceeded at any time.

The health and regulatory values cited in this factsheet were obtained in December 1999.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH, ACGIH, and AIHA numbers are advisory.

^c The LOAEL is from the critical study used as the basis for the ATSDR chronic MRL.

References

Summary created in April 1992, updated January 2000

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Chloromethane (Update). U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1998.
2. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, [online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
3. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, [online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
4. U.S. Environmental Protection Agency. [Integrated Risk Information System \(IRIS\)](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
5. U.S. Environmental Protection Agency. Health Effects Assessment Summary Tables. FY 1997 Update. Solid Waste and Emergency Response, Office of Emergency and Remedial Response, Cincinnati, OH. EPA/540/R-97-036. 1997.
6. R.C. Weast and M.J. Astle, Eds. CRC Handbook of Chemistry and Physics. CRC Press, Inc., 63rd ed., Boca Raton, FL. 1982.
7. U.S. Environmental Protection Agency. [Assessment Tools for the Evaluation of Risk \(ASTER, online database\)](#). Environmental Research Laboratory, Duluth, MN. 1993.
8. The Merck Index. An Encyclopedia of Chemicals, Drugs, and Biologicals. 11th ed. Ed. S. Budavari. Merck and Co. Inc., Rahway, NJ. 1989.
9. American Industrial Hygiene Association (AIHA). The AIHA 1998 Emergency Response Planning Guidelines and Workplace Environmental Exposure Level Guides Handbook. 1998.
10. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations 29 CFR 1910.1000. 1998.
11. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.
12. National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.

Naphthalene

91-20-3

Hazard Summary

Naphthalene is used in the production of phthalic anhydride; it is also used in mothballs. Acute (short-term) exposure of humans to naphthalene by inhalation, ingestion, and dermal contact is associated with hemolytic anemia, damage to the liver, and neurological damage. Cataracts have also been reported in workers acutely exposed to naphthalene by inhalation and ingestion. Chronic (long-term) exposure of workers and rodents to naphthalene has been reported to cause cataracts and damage to the retina. Hemolytic anemia has been reported in infants born to mothers who "sniffed" and ingested naphthalene (as mothballs) during pregnancy. Available data are inadequate to establish a causal relationship between exposure to naphthalene and cancer in humans. EPA has classified naphthalene as a Group C, possible human carcinogen.

Please Note: The main sources of information for this fact sheet are the EPA's Toxicological Review of Naphthalene (7) and the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Naphthalene. (1)

Uses

- The primary use for naphthalene is in the production of phthalic anhydride. However, o-xylene is replacing naphthalene as the preferred raw material for phthalic anhydride production. (1)
- Other uses of naphthalene include carbamate insecticides, surface active agents and resins, as a dye intermediate, as a synthetic tanning agent, as a moth repellent, and in miscellaneous organic chemicals. (1,2)

Sources and Potential Exposure

- Individuals may be exposed to naphthalene through the use of mothballs. (1)
- Workers may be occupationally exposed to naphthalene during its manufacture and use, especially in coal-tar production, wood preserving, tanning, or ink and dye production. (1)
- Naphthalene is released to the air from the burning of coal and oil and from the use of mothballs. Coal tar production, wood preserving, and other industries release small amounts. (1)
- Typical air concentrations of naphthalene in cities are about 0.18 parts per billion (ppb). (1)
- Naphthalene has also been detected in tobacco smoke. (1)

Assessing Personal Exposure

- Naphthalene or its breakdown products can be measured in fat, urine, and feces. These tests cannot be used to find out how much exposure occurred and require special equipment not routinely available in a doctor's office. (1)

Health Hazard Information

Acute Effects:

- Acute exposure of humans to naphthalene by inhalation, ingestion, and dermal contact is associated with hemolytic anemia, damage to the liver, and, in infants, neurological damage. Symptoms of acute exposure include headache, nausea, vomiting, diarrhea, malaise, confusion, anemia, jaundice, convulsions, and coma. (1,2,6,7)
- Cataracts have been reported in humans acutely exposed to naphthalene by inhalation and ingestion. Cataracts have also been reported in animals following acute oral exposure. (6,7,9)
- Tests involving acute exposure of rats, mice, rabbits, and guinea pigs have demonstrated naphthalene to have moderate to high acute toxicity from ingestion and low to moderate acute toxicity from dermal exposure. (3)

Chronic Effects (Noncancer):

- Chronic exposure of workers to naphthalene has been reported to cause cataracts and retinal hemorrhage. (2,4,5,6,7)
- Chronic inflammation of the lung, chronic nasal inflammation, hyperplasia of the respiratory epithelium in the nose, and metaplasia of the olfactory epithelium were reported in mice chronically exposed to naphthalene via inhalation. (1,6,7)
- Rats, rabbits, and mice chronically exposed to naphthalene via ingestion have developed cataracts and degeneration of the retina. (2,5,6,7)
- Diarrhea, lethargy, hunched posture, rough coats, decreased body weight, and lesions in the kidneys and thymus were observed in rats and mice chronically exposed via gavage (experimentally placing the chemical in the stomach). (2,6,7)
- EPA has calculated a Reference Concentration (RfC) of 0.003 milligrams per cubic meter (mg/m^3) for naphthalene based on nasal effects in mice. The RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfC, the potential for adverse health effects increases. Lifetime exposure above the RfC does not imply that an adverse health effect would necessarily occur. (6,7)
- EPA has medium confidence in the RfC based on: 1) medium confidence in the principal study because adequate numbers of animals were used, severity of nasal effects increased at higher exposure concentrations, high mortality, and hematological evaluation not conducted beyond 14 days; and 2) low to medium confidence in the database because there are no chronic or subchronic inhalation studies in other animal species and there are no reproductive or developmental inhalation studies. (6,7)
- The Reference Dose (RfD) for naphthalene is 0.02 milligrams per kilogram body weight per day ($\text{mg}/\text{kg}/\text{d}$) based on decreased body weight in male rats. (6,7)
- EPA has low confidence in the RfD based on: 1) high confidence in the principal study because adequate numbers of animals were included and experimental protocols were adequately designed, conducted, and reported; and 2) low confidence in the database because of the lack of adequate chronic oral data, dose-response data for hemolytic anemia, and two-generation reproductive toxicological studies. (6,7)

Reproductive/Developmental Effects:

- Hemolytic anemia has been reported in infants born to mothers who "sniffed" and ingested naphthalene (as mothballs) during pregnancy. The mothers themselves were anemic, but to a lesser extent than the infants. (5,6,7)
- Signs of maternal toxicity (e.g., decreased body weight and lethargy) but no fetal effects were reported in rats and rabbits exposed to naphthalene via gavage. (6,7)
- Maternal toxicity (increased mortality and reduced weight gain) and fetotoxicity (reduced number of live pups per litter) were observed in mice exposed via gavage. (2,6,7)

Cancer Risk:

- Workers occupationally exposed to vapors of naphthalene and coal tar developed laryngeal carcinomas or neoplasms of the pylorus and cecum. However, this study is inadequate because there were no controls, exposure levels were not determined, and subjects were exposed to complex mixtures containing other demonstrated carcinogens. (2,5,6,7)
- Di-, tri-, and tetramethyl naphthalene contaminants of coal tar were found to be carcinogenic when applied to the skin of mice, but naphthalene alone was not. (2,5)
- An increased number of alveolar/bronchiolar adenomas and carcinomas were reported in female mice exposed by inhalation. (1,6,7)
- No carcinogenic responses were reported in rats exposed to naphthalene in their diet and by injection. (2,5,6)
- EPA has classified naphthalene as a Group C, possible human carcinogen. (6,7)

Physical Properties

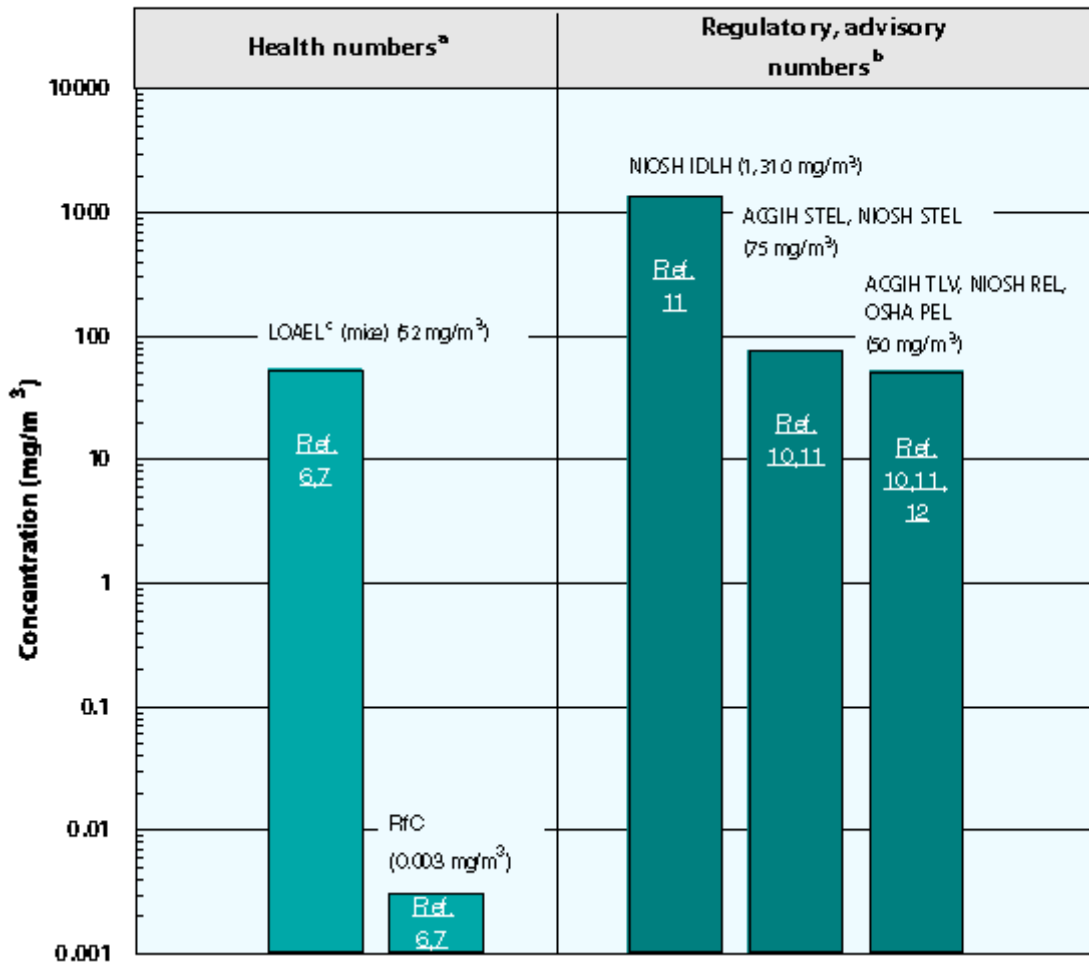
- The chemical formula for naphthalene is $C_{10}H_8$, and its molecular weight is 128.19 g/mol. (1) Naphthalene
- occurs as a white solid or powder that is insoluble in water. (1,8)
- Naphthalene has a strong, mothball odor, with an odor threshold of 0.44 mg/m^3 (0.084 parts per million, ppm). (1,9)
- The vapor pressure for naphthalene is 0.087 mm Hg at 25 °C, and its log octanol/water partition coefficient ($\log K_{ow}$) is 3.29. (1)

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m^3 : $\text{mg/m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$. For naphthalene: $1 \text{ ppm} = 5.24 \text{ mg/m}^3$.

Health Data from Inhalation Exposure

Naphthalene



ACGIH TLV--American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

ACGIH STEL--American Conference of Governmental and Industrial Hygienists' threshold limit value short-term exposure limit; a 15-minute TWA exposure which should not be exceeded at any time during a workday.

LOAEL--Lowest observed adverse effect level.

NIOSH REL--National Institute of Occupational Safety and Health's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

NIOSH IDLH -- NIOSH's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

NIOSH STEL--NIOSH's recommended short-term exposure limit; a 15-minute TWA exposure which should not be exceeded at any time during a workday.

OSHA PEL--Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in December 1999.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH and ACGIH numbers are advisory.

^c This LOAEL is from the critical study used as the basis for the EPA RfC.

References

Summary created in April 1992, updated in January 2000

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Naphthalene (Update). Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1995.
2. U.S. Environmental Protection Agency. Health and Environmental Effects Profile for Naphthalene. EPA/600/x-86/241. Environmental Criteria and Assessment Office, Office of Health and Environmental Assessment, Office of Research and Development, Cincinnati, OH. 1986.
3. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
4. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
5. U.S. Environmental Protection Agency. Health Effects Assessment for Naphthalene. EPA/540/1-86/014. Environmental Criteria and Assessment Office, Office of Health and Environmental Assessment, Office of Research and Development, Cincinnati, OH. 1986.
6. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Naphthalene. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
7. U.S. Environmental Protection Agency. Toxicological Review of Naphthalene (CAS No. 91-20-3) in Support of Summary Information on the Integrated Risk Information System (IRIS). National Center for Environmental Assessment, Cincinnati, OH. 1998.
8. The Merck Index. An Encyclopedia of Chemicals, Drugs, and Biologicals. 11th ed. Ed. S. Budavari. Merck and Co. Inc., Rahway, NJ. 1989.
9. J.E. Amore and E. Hautala. Odor as an aid to chemical safety: Odor thresholds compared with threshold limit values and volatilities for 214 industrial chemicals in air and water dilution. *Journal of Applied Toxicology*, 3(6):272-290. 1983.
10. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.
11. National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
12. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations 29 CFR 1910.1000. 1998.

Nickel Compounds

Hazard Summary

Nickel occurs naturally in the environment at low levels. Nickel is an essential element in some animal species, and it has been suggested it may be essential for human nutrition. Nickel dermatitis, consisting of itching of the fingers, hands, and forearms, is the most common effect in humans from chronic (long-term) skin contact with nickel. Respiratory effects have also been reported in humans from inhalation exposure to nickel. Human and animal studies have reported an increased risk of lung and nasal cancers from exposure to nickel refinery dusts and nickel subsulfide. Animal studies of soluble nickel compounds (i.e., nickel carbonyl) have reported lung tumors. EPA has classified nickel refinery dust and nickel subsulfide as Group A, human carcinogens, and nickel carbonyl as a Group B2, probable human carcinogen.

Please Note: The main sources of information for this fact sheet are EPA's Integrated Risk Information System (IRIS) (2), which contains information on oral chronic toxicity and the RfD, and the carcinogenic effects of nickel including the unit cancer risk for inhalation exposure, EPA's Health Assessment Document for Nickel (1), and the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Nickel. (6)

Uses

- Nickel is used for nickel alloys, electroplating, batteries, coins, industrial plumbing, spark plugs, machinery parts, stainless-steel, nickel-chrome resistance wires, and catalysts. (1,6)
- Nickel carbonyl has severely limited use in nickel refining. (1)

Sources and Potential Exposure

- Nickel is a natural element of the earth's crust; therefore, small amounts are found in food, water, soil, and air. (6)
- Food is the major source of nickel exposure, with an average intake for adults estimated to be approximately 100 to 300 micrograms per day ($\mu\text{g}/\text{d}$). (1,6)
- Individuals also may be exposed to nickel in occupations involved in its production, processing, and use, or through contact with everyday items such as nickel-containing jewelry and stainless steel cooking and eating utensils, and by smoking tobacco. (1)
- Nickel is found in ambient air at very low levels as a result of releases from oil and coal combustion, nickel metal refining, sewage sludge incineration, manufacturing facilities, and other sources. (2,6)
- Given its high instability, nickel carbonyl exposure is extremely rare.

Assessing Personal Exposure

- Laboratory tests can detect nickel in blood, urine, feces, and hair samples. (1,6)

Health Hazard Information

Acute Effects:

- One person exposed to an extremely high level of nickel by inhalation suffered severe damage to the lungs and kidneys. (6)
- Gastrointestinal distress (e.g., nausea, vomiting, diarrhea) and neurological effects were reported in workers who drank water on one shift that was contaminated with nickel as nickel sulfate and nickel chloride. (1,6)
- Pulmonary fibrosis and renal edema were reported in humans and animals following acute (short-term) exposure to nickel carbonyl. (1)
- Acute animal tests in rats have shown nickel compounds to exhibit acute toxicity values ranging from low to high. The soluble compounds, such as nickel acetate, were the most toxic, and the insoluble forms, such as nickel powder, were the least toxic. (6)

Chronic Effects (Noncancer):

- Dermatitis is the most common effect in humans from chronic dermal exposure to nickel. Cases of nickel dermatitis have been reported following occupational and non-occupational exposure, with symptoms of eczema (rash, itching) of the fingers, hands, wrists, and forearms. (1,2,6,7)
- Chronic inhalation exposure to nickel in humans also results in respiratory effects, including a type of asthma specific to nickel, decreased lung function, and bronchitis. (6,7)
- Animal studies have reported effect on the lungs and immune system from inhalation exposure to soluble and insoluble nickel compounds (nickel oxide, subsulfide, sulfate heptahydrate). (1,6)
- Soluble nickel compounds are more toxic to the respiratory tract than less soluble compounds. (6)
- EPA has not established a Reference Concentration (RfC) for nickel. (2,3,4,5)
- The Reference Dose (RfD) for nickel (soluble salts) is 0.02 milligrams per kilogram body weight per day (mg/kg/d) based on decreased body and organ weights in rats. The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk, but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfD, the potential for adverse health effects increases. Lifetime exposure above the RfD does not imply that an adverse health effect would necessarily occur. (5)
- EPA has medium confidence in the RfD due to: (1) low confidence in the study on which the RfD for nickel (soluble salts) was based because, although it was properly designed and provided adequate toxicological endpoints, high mortality occurred in the controls; and (2) medium confidence in the database because it provided adequate supporting subchronic studies, one by gavage and the other in drinking water, but inadequacies in the remaining reproductive data. (5)
- Nickel is an essential nutrient for some mammalian species, and has been suggested to be essential for human nutrition. By extrapolation from animal data, it is estimated that a 70-kg person would have a daily requirement of 50 µg per kg diet of nickel. (6)
- The California Environmental Protection Agency (CalEPA) has calculated a chronic inhalation reference exposure level of 0.00005 milligrams per cubic meter (mg/m³) for nickel based on respiratory and immune system effects reported in rats exposed to a soluble nickel salt. The CalEPA reference exposure level is a concentration at or below which adverse health effects are not likely to occur. (7)
- ATSDR has calculated a chronic-duration inhalation MRL of 0.0002 mg/m³ for nickel based on respiratory effects reported in rats exposed to a soluble nickel salt. The MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse noncancer health effects over a specified duration of exposure. (6)

Reproductive/Developmental Effects:

- No information is available regarding the reproductive or developmental effects of nickel in humans. (6)

- Animal studies have reported reproductive and developmental effects, such as a decreased number of live pups per litter, increased pup mortality, and reduction in fetal body weight, and effects to the dam from oral exposure to soluble salts of nickel. (5,6)
- Sperm abnormalities and decreased sperm count have been reported in animals exposed to nickel nitrate orally and nickel oxide by inhalation, respectively. (6)

Cancer Risk:

Nickel Salts

- Nickel sulfate via inhalation and nickel acetate in drinking water were not carcinogenic in either rats or mice. (6)
- EPA has not evaluated soluble salts of nickel as a class of compounds for potential human carcinogenicity. (5)

Nickel Refinery Dust and Nickel Sub sulfide

- Human studies have reported an increased risk of lung and nasal cancers among nickel refinery workers exposed to nickel refinery dust. Nickel refinery dust is a mixture of many nickel compounds, with nickel subsulfide being the major constituent. (3,4,6)
- Animal studies have also reported lung tumors from inhalation exposure to nickel refinery dusts and to nickel subsulfide. (3,4)
- EPA has classified nickel refinery dust and nickel subsulfide as Group A, human carcinogens. (3,4)
- EPA uses mathematical models, based on animal studies, to estimate the probability of a person developing cancer from breathing air containing a specified concentration of a chemical. EPA calculated an inhalation unit risk estimate of $2.4 \times 10^{-4} (\mu\text{g}/\text{m}^3)^{-1}$ for nickel refinery dusts. EPA estimates that, if an individual were to continuously breathe air containing nickel refinery dusts at an average of $0.004 \mu\text{g}/\text{m}^3$ ($4 \times 10^{-6} \text{mg}/\text{m}^3$) over his or her entire lifetime, that person would theoretically have no more than a one-in-a-million increased chance of developing cancer as a direct result of breathing air containing this chemical. Similarly, EPA estimates that continuously breathing air containing $0.04 \mu\text{g}/\text{m}^3$ would result in not greater than a one-in-a-hundred thousand increased chance of developing cancer, and air containing $0.4 \mu\text{g}/\text{m}^3$ would result in not greater than a one-in-ten thousand increased chance of developing cancer. For a detailed discussion of confidence in the potency estimates, please see IRIS. (3)
- For nickel subsulfide, EPA calculated an inhalation unit risk estimate of $4.8 \times 10^{-4} (\mu\text{g}/\text{m}^3)^{-1}$. EPA estimates that, if an individual were to continuously breathe air containing this nickel compound at an average of $0.002 \mu\text{g}/\text{m}^3$ ($2 \times 10^{-6} \text{mg}/\text{m}^3$) over his or her entire lifetime, that person would theoretically have no more than a one-in-a-million increased chance of developing cancer as a direct result of breathing air containing this chemical. Similarly, EPA estimates that continuously breathing air containing $0.02 \mu\text{g}/\text{m}^3$ would result in not greater than a one-in-a-hundred thousand increased chance of developing cancer, and air containing $0.2 \mu\text{g}/\text{m}^3$ would result in not greater than a one-in-ten thousand increased chance of developing cancer. (4)

Nickel Carbonyl

- Nickel carbonyl has been reported to produce lung tumors in rats exposed via inhalation. (2)
- EPA has classified nickel carbonyl as a Group B2, probable human carcinogen. (2)

Physical Properties

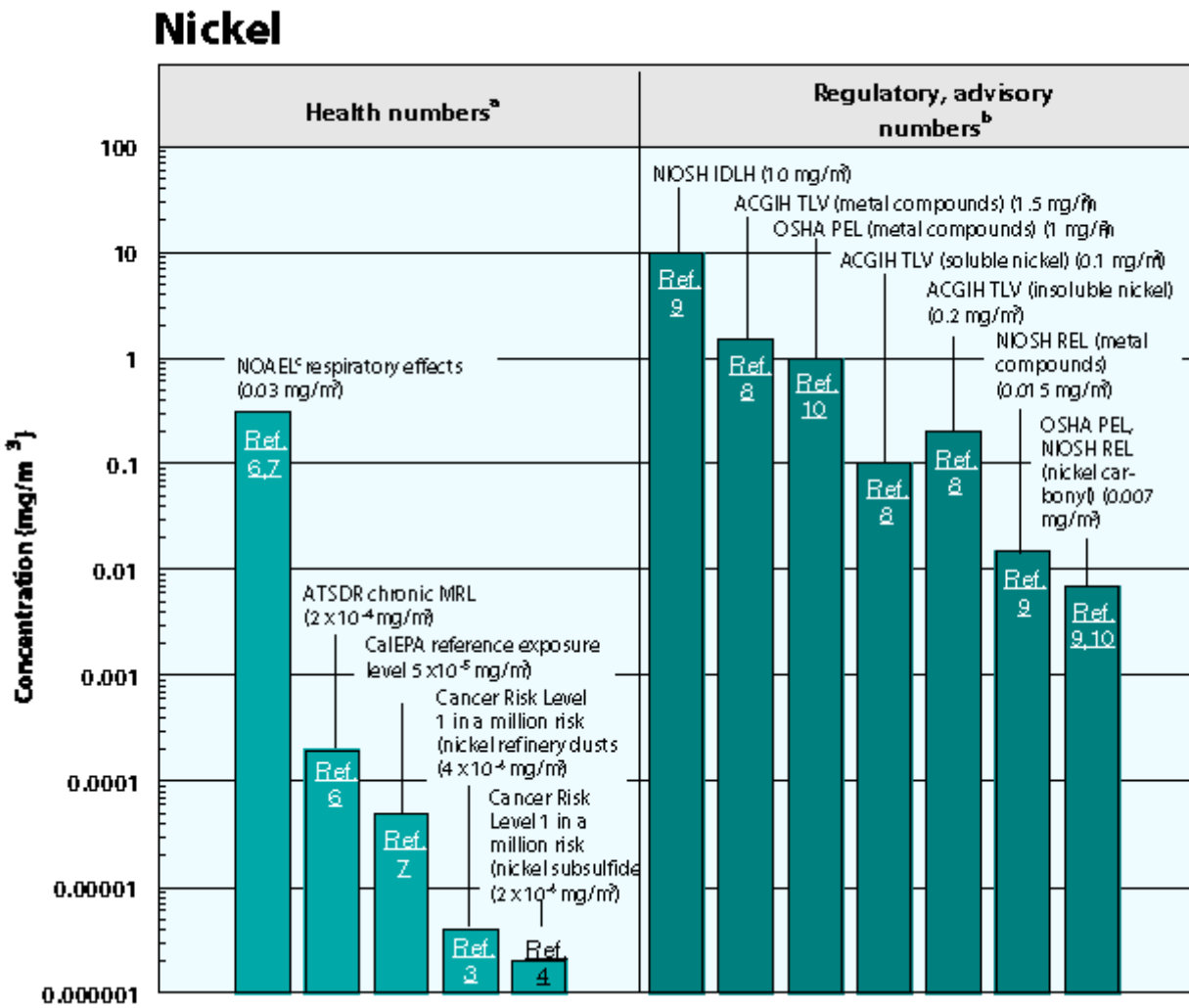
- Nickel is a silvery-white metal that is found in nature as a component of silicate, sulfide, or arsenide ores. (1)

- In the environment, nickel is found primarily combined with oxygen or sulfur as oxides or sulfides. (1)
- Each form of nickel exhibits different physical properties. (1,6)
- Soluble nickel salts include nickel chloride, nickel sulfate, and nickel nitrate. (6)
- Nickel carbonyl, a highly unstable form, is not found naturally and decomposes rapidly. (1)
- The chemical symbol for nickel is Ni, and it has an atomic weight of 58.71 g/mol. (1)

Conversion Factors (only for the gaseous form):

To convert concentrations in air (at 25°C) from ppm to mg/m³: $\text{mg/m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$. For nickel: 1 ppm = 2.4 mg/m³. To convert concentrations in air from µg/m³ to mg/m³: $\text{mg/m}^3 = (\mu\text{g/m}^3) \times (1 \text{ mg} / 1,000 \mu\text{g})$.

Health Data from Inhalation Exposure



ACGIH TLV--American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

NIOSH REL--National Institute of Occupational Safety and Health's recommended exposure limit; NIOSH--recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

NIOSH IDLH -- NIOSH's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

OSHA PEL -- Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in December 1999.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH and ACGIH numbers are advisory.

^c The NOAEL is from the critical study used as the basis for both the ATSDR chronic MRL and CalEPA chronic reference exposure level.

Summary created in April 1992, updated January 2000

References

1. U.S. Environmental Protection Agency. Health Assessment Document for Nickel. EPA/600/8-83/012F. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1986.
2. U.S. Environmental Protection Agency. [Integrated Risk Information System \(IRIS\) on Nickel Carbonyl](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
3. U.S. Environmental Protection Agency. [Integrated Risk Information System \(IRIS\) on Nickel Refinery Dust](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
4. U.S. Environmental Protection Agency. [Integrated Risk Information System \(IRIS\) on Nickel Subsulfide](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
5. U.S. Environmental Protection Agency. [Integrated Risk Information System \(IRIS\) on Nickel, Soluble Salts](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
6. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Nickel (Update). Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1997.
7. [California Environmental Protection Agency \(CalEPA\)](#). Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels. Draft for Public Comment. Office of Environmental Health Hazard Assessment, Berkeley, CA. 1997.
8. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices. Cincinnati, OH. 1999.
9. National Institute for Occupational Safety and Health (NIOSH). [Pocket Guide to Chemical Hazards](#). U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
10. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations 29 CFR 1910.1000. 1998.

Phosphorus

7723-14-0

Hazard Summary

White phosphorus is used in the manufacture of munitions, pyrotechnics, explosives, smoke bombs, in artificial fertilizers, and rodenticides. White phosphorus is extremely toxic to humans, while other forms of phosphorus are much less toxic. Acute (short-term) oral exposure to high levels of white phosphorus in humans is characterized by three stages: the first stage consists of gastrointestinal effects; the second stage is symptom-free and lasts about two days; the third stage consists of a rapid decline in condition with gastrointestinal effects, plus severe effects on the kidneys, liver, cardiovascular system, and central nervous system (CNS). Inhalation exposure has resulted in respiratory tract irritation and coughing in humans. Chronic (long-term) exposure to white phosphorus in humans results in necrosis of the jaw, termed "phossy jaw." EPA has classified white phosphorus as a Group D, not classifiable as to human carcinogenicity.

Please Note: The main sources of information for this fact sheet are EPA's Integrated Risk Information System (IRIS) (5), which contains information on oral chronic toxicity and the RfD, and the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for White Phosphorus. (4)

Uses

- Most phosphorus is used in the production of phosphoric acid and phosphates, which are used in the fertilizers industry. (4)
- White phosphorus is used in the manufacture of munitions, pyrotechnics, explosives, smoke bombs, in artificial fertilizers, rodenticides, phosphor bronze alloy, semiconductors, electroluminescent coating, and chemicals. (1,4)

Sources and Potential Exposure

- Occupational exposure to white phosphorus may occur for workers in the munitions and other industries. (1)
- Exposure may also occur during the military use of white phosphorus-containing munitions. (4)

Assessing Personal Exposure

- No information is available on the assessment of personal exposure to white phosphorus.

Health Hazard Information

Acute Effects:

- Acute oral exposure to high levels of white phosphorus in humans is characterized by three stages: the first stage consists of gastrointestinal effects; the second stage is symptom-free and lasts about 2 days; the third stage consists of a rapid decline in condition with severe gastrointestinal (vomiting, abdominal cramps and pain), kidney, liver, cardiovascular, and CNS effects. (1,2,4)
- Acute inhalation exposure has resulted in respiratory tract irritation and coughing in humans. (4)

- Respiratory, liver, and kidney effects have been reported in animals acutely exposed to white phosphorus smoke via inhalation. (4)
- Dermal exposure to white phosphorus in humans may result in severe burns, which are necrotic, yellowish, fluorescent under ultraviolet light, and have a garlic-like odor. (1)
- Acute animal tests in rats and mice have shown white phosphorus to have **extreme** acute toxicity from oral exposure. (3)

Chronic Effects (Noncancer):

- Chronic exposure to white phosphorus in humans results in necrosis of the jaw, termed "phossy jaw." Progressive symptoms begin as a local inflammation or irritation and proceed to swelling, ulceration, and destruction of the jawbone with perforation to the sinus or nasal cavities and externally to the cheek. (1,2,4,5,9)
- In one occupational study, anemia and leukopenia were observed. (4)
- Animal studies have reported effects on the blood from inhalation exposure to white phosphorus. (2)
- The Reference Dose (RfD) for white phosphorus is 0.00002 milligrams per kilogram body weight per day (mg/kg/d) based on reproductive effects (parturition mortality and forelimb hair loss in rats). The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfD, the potential for adverse health effects increases. Lifetime exposure above the RfD does not imply that an adverse health effect would necessarily occur. (5)
- EPA has low confidence on the study on which the RfD was based because it does not provide unequivocal evidence of an adverse effect at the doses tested and lacked adequate assessment of developmental indices; low confidence in the database because studies indicate significant white phosphorus-related body weight and/or bone changes, but they have design deficiencies that lower the confidence in the reported observations; and, consequently, low confidence in the RfD. (5)
- EPA has not established a Reference Concentration (RfC) for white phosphorus. (5)
- The California Environmental Protection Agency (CalEPA) has calculated an inhalation reference exposure level of 0.00007 milligrams per cubic meter (mg/m³) based on a route to route extrapolation of EPA's RfD. The CalEPA reference exposure level is a concentration at or below which adverse health effects are not likely to occur. (9)
- ATSDR has calculated an acute inhalation minimal risk level (MRL) of 0.02 mg/m³ for white phosphorus smoke based on respiratory effects in humans. The MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse noncancer health effects over a specified duration of exposure. (4)

Reproductive/Developmental Effects:

- No information is available on the reproductive or developmental effects of white phosphorus in humans.
- An animal study reported a high maternal mortality rate from oral exposure to white phosphorus. (5)

Cancer Risk:

- No information is available on the carcinogenic effects of white phosphorus in humans or animals. (5)
- EPA has classified white phosphorus as a Group D, not classifiable as to human carcinogenicity. (5)

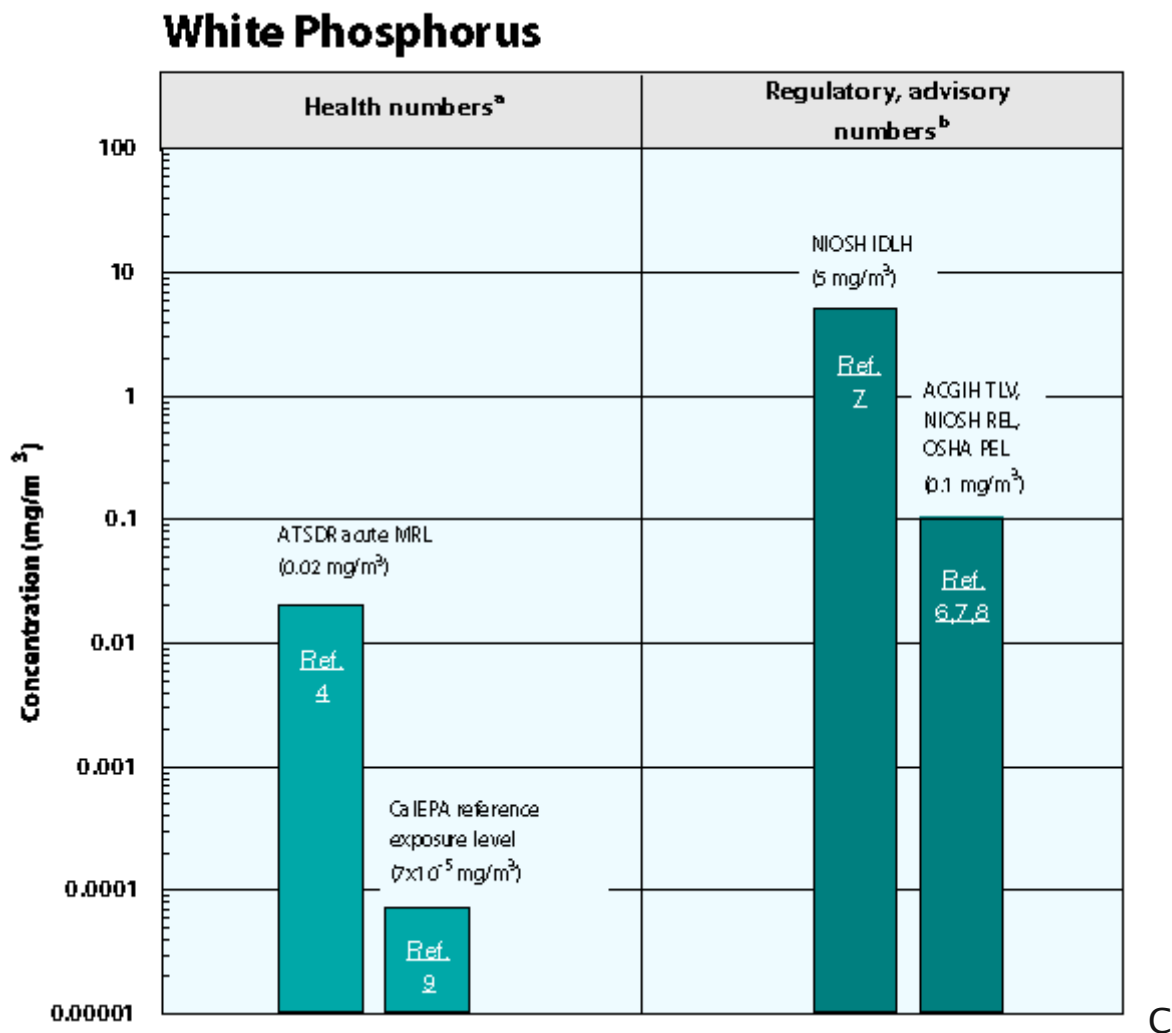
Physical Properties

- White or yellow white phosphorus is either a yellow or colorless, volatile crystalline solid that darkens when exposed to light and ignites in air to form white fumes and greenish light. (1)
- The chemical symbol for white phosphorus is P; the vapor has the formula P_4 and the molecular weight is 124.0 g/mol. (2)
- White phosphorus has a garlic-like odor. (4)
- The vapor pressure for white phosphorus is 0.026 mm Hg at 20 °C and the log octanol water partition coefficient (log Kow) is 3.08. (2,4)

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m^3 : $mg/m^3 = (ppm) \times (\text{molecular weight of the compound}) / (24.45)$. For white phosphorus: 1 ppm = 5.1 mg/m^3 .

Health Data from Inhalation Exposure



ACGIH TLV -- American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

NIOSH IDLH -- National Institute of Occupational Safety and Health's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

NIOSH REL --NIOSH's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

OSHA PEL --Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in December 1999.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH and ACGIH numbers are advisory.

Summary created in April 1992, updated January 2000

References

1. M. Sittig. Handbook of Toxic and Hazardous Chemicals and Carcinogens. 2nd ed. Noyes Publications, Park Ridge, NJ. 1985.
2. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, [online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
3. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, [online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
4. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for White Phosphorus. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1997.
5. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on White Phosphorus. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
6. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.
7. National Institute for Occupational Safety and Health (NIOSH). [Pocket Guide to Chemical Hazards](#). U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
8. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations 29 CFR 1910.1000. 1998.
9. California Environmental Protection Agency (CalEPA). Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels. Draft for Public Comment. Office of Environmental Health Hazard Assessment, Berkeley, CA. 1997.

Selenium Compounds

Hazard Summary

Selenium is a naturally occurring substance that is toxic at high concentrations but is also a nutritionally essential element. Hydrogen selenide is the most acutely toxic selenium compound. Acute (short-term) exposure to elemental selenium, hydrogen selenide, and selenium dioxide by inhalation results primarily in respiratory effects, such as irritation of the mucous membranes, pulmonary edema, severe bronchitis, and bronchial pneumonia. Epidemiological studies of humans chronically (long-term) exposed to high levels of selenium in food and water have reported discoloration of the skin, pathological deformation and loss of nails, loss of hair, excessive tooth decay and discoloration, lack of mental alertness, and listlessness. Epidemiological studies have reported an inverse association between selenium levels in the blood and cancer occurrence and animal studies have reported that selenium supplementation, as sodium selenate, sodium selenite, and organic forms of selenium, results in a reduced incidence of several tumor types. The only selenium compound that has been shown to be carcinogenic in animals is selenium sulfide, which resulted in an increase in liver tumors from oral exposure. EPA has classified elemental selenium as a Group D, not classifiable as to human carcinogenicity, and selenium sulfide as a Group B2, probable human carcinogen.

Please Note: The main sources of information for this fact sheet are EPA's Integrated Risk Information System (IRIS) (4), which contains information on oral chronic toxicity and the RfD, and the carcinogenic effects of selenium, the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Selenium (1), and EPA's Drinking Water Criteria Document for Selenium. (2)

Uses

- Selenium is used in the electronics industry; the glass industry; in pigments used in plastics, paints, enamels, inks, and rubber; as a catalyst in the preparation of pharmaceuticals; in antidandruff shampoos (selenium sulfide); and as a constituent of fungicides. (1)
- Selenium is also used as a nutritional feed additive for poultry and livestock, in pesticide formulations, and as an accelerator and vulcanizing agent in rubber production. (1)

Sources and Potential Exposure

- Food is the primary source of exposure to selenium, with an estimated selenium intake for the U.S. population ranging from 0.071 to 0.152 milligrams per day (mg/d). (1)
- Humans are usually exposed to very low levels of selenium in₃ air, with an average selenium concentration estimated to be below 10 nanograms per cubic meter (ng/m³). (1)
- Drinking water usually contains selenium at very low levels (usually less than 0.01 milligrams per liter [mg/L]). However, occasionally, higher levels of selenium may be found in drinking water, usually in areas where high levels of selenium in soil contribute to the selenium content of the water. (1)
- Occupational exposure to selenium in the air may occur in the metal industries, selenium-recovery processes, painting, and special trades. (1)

Assessing Personal Exposure

- Selenium can be measured in the blood, urine, and fingernails or toenails of exposed individuals. (1)

Health Hazard Information

Acute Effects:

- Acute exposure of humans via inhalation to selenium compounds (selenium dioxide, hydrogen selenide) results primarily in respiratory effects. Acute inhalation exposure to elemental selenium dust results in irritation of the mucous membranes in the nose and throat, producing coughing, nosebleeds, dyspnea, bronchial spasms, bronchitis, and chemical pneumonia. (1)
- Gastrointestinal effects including vomiting and nausea; cardiovascular effects; neurological effects such as headaches and malaise; and irritation of the eyes were reported in humans acutely exposed to selenium compounds via inhalation. (1)
- Acute human exposure to selenium compounds via the oral route has resulted in pulmonary edema and lesions of the lung; cardiovascular effects such as tachycardia; gastrointestinal effects including nausea, vomiting, diarrhea, and abdominal pain; effects on the liver; and neurological effects such as aches, irritability, chills, and tremors. (1,2)
- "Blind staggers" disease is a disease in livestock that results from acute consumption of plants high in selenium. It is characterized by impaired vision, aimless wandering behavior, reduced consumption of food and water, and paralysis. (1,2,4)
- Acute animal tests in rats, mice, and guinea pigs, have shown hydrogen selenide to have **extreme** toxicity from inhalation exposure, sodium selenite to have **extreme** toxicity from oral exposure, and elemental selenium to have **low** toxicity from oral exposure. (1,3)

Chronic Effects (Noncancer):

- No information is available on the chronic effects of selenium in humans from inhalation exposure.
- In epidemiological studies of populations exposed to high levels of selenium in food and water, discoloration of the skin, pathological deformation and loss of nails, loss of hair, excessive tooth decay and discoloration, garlic odor in breath and urine, lack of mental alertness, and listlessness were reported. (1,2)
- "Alkali disease" is a disease in livestock resulting from chronic consumption of high levels of selenium; it is characterized by hair loss, deformation and sloughing of the hooves, erosion of the joints of the bones, anemia, and effects on the heart, kidney, and liver. (1,2)
- EPA has not established a Reference Concentration (RfC) for selenium. (4)
- The California Environmental Protection Agency (CalEPA) has calculated a chronic reference exposure level of 0.02 milligrams per cubic meter (mg/m^3) for selenium and selenium compounds based on clinical selenosis in humans, and a chronic reference exposure level of $0.00008 \text{ mg}/\text{m}^3$ for hydrogen selenide based on respiratory effects in guinea pigs. The CalEPA reference exposure level is a concentration at or below which adverse health effects are not likely to occur. (5)
- The Reference Dose (RfD) for selenium is 0.005 milligrams per kilogram body weight per day ($\text{mg}/\text{kg}/\text{d}$) based on clinical selenosis in humans. The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups), that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfD, the potential for adverse health effects increases. Lifetime exposure above the RfD does not imply that an adverse health effect would necessarily occur. (4)
- EPA has medium confidence in the study on which the RfD was based; although this is a human epidemiological study in which a sizable population with sensitive subpopulations was studied, there are still several possible interactions that were not fully accounted for (e.g., fluoride intake and protein status). Also, except for clinical signs of selenosis, there are no other reliable indicators, biochemical or clinical, of selenium toxicity. EPA ranked confidence in the database as high because many animal studies and epidemiologic studies support the principal study, and high confidence in the RfD based upon support of the critical study and the high level of confidence in the database. (5)
- Selenium is an essential element in human nutrition, with recommended daily allowances of 0.070 mg/d for men, 0.055 mg/d for women, and $8.7 \times 10^{-4} \text{ mg}/\text{kg}/\text{d}$ for infants. (1)
- Two diseases, "Keshan disease" and "Kashin-Beck disease" have been reported in humans in selenium-deficient populations in China. Keshan disease is characterized by heart failure, cardiac enlargement,

abnormalities of EKG, and cardiogenic shock. Kashin–Beck disease, which occurs primarily in children between the ages of 5 and 13 years, is characterized by atrophy, degeneration, and necrosis of cartilage tissue. (1,2)

- Some epidemiological studies have suggested that selenium deficiency may contribute to cardiovascular disease in humans. However, these studies are inconclusive due to confounding factors. (1,2)

Reproductive/Developmental Effects:

- No information is available on the developmental or reproductive effects of selenium in humans. (1)
- The consumption of high levels of selenium in the diet by pigs, sheep, and cattle has been shown to interfere with normal fetal development and to produce fetal malformations. (1,2)
- Sodium selenate, administered in the drinking water to mice, did not result in birth defects, but did result in an increased incidence of fetal deaths and a high proportion of runts, while chronic exposure of mice to selenium in the diet has been shown to affect their fertility and to reduce the viability of the offspring of pairs that are able to breed. (1,2)

Cancer Risk:

- In one study of workers exposed to selenium (form not specified) over a 26–year period, no statistically significant increase in cancer deaths was reported. (1)
- Human studies have reported that patients with cancer, particularly gastrointestinal cancer, prostate cancer, or Hodgkin's lymphoma, had significantly lower selenium levels in the blood than healthy patients. (1,2,4)
- Epidemiological studies that used the selenium concentration in crops as an indicator of dietary selenium have generally reported an inverse association between selenium levels and cancer occurrence. (1,2,4)
- Animal studies have reported that selenium supplementation, as sodium selenate, sodium selenite, and organic forms of selenium, results in a reduced incidence of several tumor types. (1,2,4)
- The only selenium compound that has been shown to be carcinogenic in animals is selenium sulfide, which resulted in an increase in liver tumors in rats and mice and lung tumors in female mice from oral exposure. Selenium sulfide is a pharmaceutical compound used in anti-dandruff shampoos and is very different than the inorganic or organic selenium compounds found in foods and the environment. (1,2,4)
- EPA has classified elemental selenium as a Group D, not classifiable as to human carcinogenicity, and selenium sulfide as a Group B2, probable human carcinogen. (4)

Physical Properties

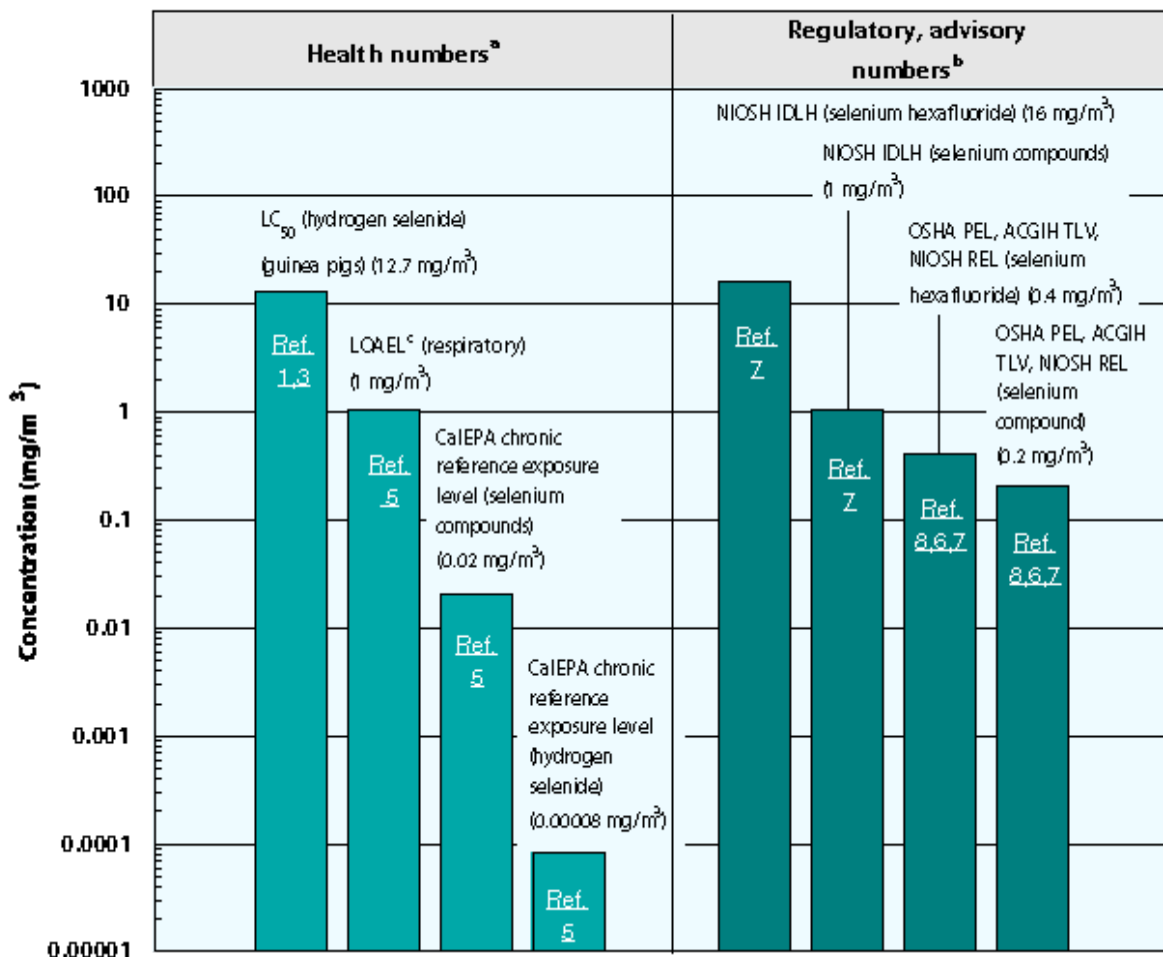
- Selenium is a naturally occurring substance that is widely distributed in the earth's crust and is commonly found in sedimentary rock. (1)
- Selenium is usually combined with other compounds in the environment, such as sulfide minerals or with silver, copper, lead, and nickel. (1)
- The chemical symbol for selenium is Se, the atomic weight is 78.96 g/mol, and the vapor pressure is 1 mm Hg at 356 °C. (1)
- Hydrogen selenide is a selenium compound that exists as a colorless gas at room temperature. (1)
- The chemical formula for hydrogen selenide is H₂Se, the molecular weight is 80.98 g/mol, and the vapor pressure is 9,120 mm Hg at 30.8 °C. (1)

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m³: $\text{mg/m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$. For hydrogen selenide: 1 ppm = 3.31 mg/m³; For selenium hexafluoride, 1 ppm = 7.89 mg/m³.

Health Data from Inhalation Exposure

Selenium



ACGIH TLV--American Conference of Governmental and Industrial Hygienists' threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

LC₅₀ (Lethal Concentration₅₀)--A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

NIOSH IDLH--National Institute of Occupational Safety and Health's immediately dangerous to life or health value; the maximum environmental concentration of a contaminant from which one could escape within 30 minutes without any escape-impairing symptoms or irreversible health effects.

NIOSH REL--NIOSH's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

OSHA PEL--Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in December 1999.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH and ACGIH numbers are advisory.

^c This LOAEL is from the critical study used as the basis for the CalEPA chronic reference exposure level for hydrogen selenide.

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Selenium (Update). Public Health Service, Department of Health and Human Services, Atlanta, GA. 1996.
2. U.S. Environmental Protection Agency. Final Draft for the Drinking Water Criteria Document for Selenium. Criteria and Standards Division. Office of Drinking Water, Washington, D.C. 1986.
3. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
4. U.S. Environmental Protection Agency. [Integrated Risk Information System \(IRIS\) on Selenium and Compounds](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
5. [California Environmental Protection Agency \(CalEPA\)](#). Air Toxics Hot Spots Program Risk Assessment Guidelines: Part III. Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels. SRP Draft. Office of Environmental Health Hazard Assessment, Berkeley, CA. 1999.
6. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.
7. National Institute for Occupational Safety and Health (NIOSH). [Pocket Guide to Chemical Hazards](#). U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
8. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations. 29 CFR 1910.1000. 1998.

Styrene

100-42-5

Hazard Summary

Styrene is primarily used in the production of polystyrene plastics and resins. Acute (short-term) exposure to styrene in humans results in mucous membrane and eye irritation, and gastrointestinal effects. Chronic (long-term) exposure to styrene in humans results in effects on the central nervous system (CNS), such as headache, fatigue, weakness, and depression, CSN dysfunction, hearing loss, and peripheral neuropathy. Human studies are inconclusive on the reproductive and developmental effects of styrene; several studies did not report an increase in developmental effects in women who worked in the plastics industry, while an increased frequency of spontaneous abortions and decreased frequency of births were reported in another study. Several epidemiologic studies suggest there may be an association between styrene exposure and an increased risk of leukemia and lymphoma. However, the evidence is inconclusive due to confounding factors. EPA has not given a formal carcinogen classification to styrene.

Please Note: The main sources of information for this fact sheet are EPA's Integrated Risk Information System (5), which contains information on inhalation and oral chronic toxicity of styrene and the RfC and the RfD, and the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Styrene. (1)

Uses

- Styrene is used predominately in the production of polystyrene plastics and resins. Styrene is also used as an intermediate in the synthesis of materials used for ion exchange resins and to produce copolymers. (1)

Sources and Potential Exposure

- Indoor air is the principal route of styrene exposure for the general population. Average indoor air levels of styrene are in the range of 1 to 9 $\mu\text{g}/\text{m}^3$, attributable to emissions from building materials, consumer products, and tobacco smoke. (1)
- Ambient air in urban locations contains styrene at average concentrations of 0.29 to 3.8 $\mu\text{g}/\text{m}^3$, while styrene in rural and suburban air has been measured at 0.28 to 0.34 $\mu\text{g}/\text{m}^3$. (1)
- Occupational exposure to styrene occurs in the reinforced plastics industry and polystyrene factories. (1)

Assessing Personal Exposure

- Laboratory tests can determine styrene by measuring the breakdown products in the urine. However, these tests are only useful for detecting very recent exposures. (1)

Health Hazard Information

Acute Effects:

- Acute exposure to styrene in humans results in respiratory effects, such as mucous membrane irritation, eye irritation, and gastrointestinal effects. (1,2)
- Tests involving acute exposure of rats and mice have shown styrene to have **low** to **moderate** toxicity by inhalation and oral exposure. (3)

Chronic Effects (Noncancer):

- Chronic exposure to styrene in humans results in effects on the CNS, with symptoms such as headache, fatigue, weakness, depression, CNS dysfunction (reaction time, memory, visuomotor speed and accuracy, intellectual function), and hearing loss, peripheral neuropathy, minor effects on some kidney enzyme functions and on the blood. (1–3)
- Animal studies have reported effects on the CNS, liver, kidney, and eye and nasal irritation from inhalation exposure to styrene. (1)
- Liver, blood, kidney, and stomach effects have been observed in animals following chronic oral exposure.(5)
- The Reference Concentration (RfC) for styrene is 1 milligram per cubic meter (mg/m^3) based on CNS effects in occupationally exposed workers. The RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfC, the potential for adverse health effects increases. Lifetime exposure above the RfC does not imply that an adverse health effect would necessarily occur. (5)
EPA has medium confidence in the study on which the RfC was based because, although the study documents concentration–response relationships of CNS effects in a relatively small worker population, the results are consistent with a number of other studies showing central effects in chronically exposed worker populations; medium to high confidence in the database because the chronic laboratory animal studies addressing noncancer endpoints were not available, although a number of human exposure studies support the choice of critical effect; and, consequently, medium confidence in the RfC. (5)
The Reference Dose (RfD) for styrene is 0.2 milligrams per kilogram body weight per day ($\text{mg}/\text{kg}/\text{d}$) based on red blood cell and liver effects in dogs. (5)
EPA has medium confidence in the principal study on which the RfD was based because it was well done and the effect levels seem reasonable, but the small number of animals/sex/dose prevents a higher confidence; medium confidence in the database because it offers strong support, but lacks a bona fide full-term chronic study; and, consequently, medium confidence in the RfD. (5)

Reproductive/Developmental Effects:

- Human studies have not reported an increase in developmental effects in women who worked in the plastics industry, while an increased frequency of spontaneous abortions and a decreased frequency of births were reported in a study on the reproductive effects of styrene in humans. However, these studies are not conclusive, due to the lack of exposure data and confounding factors. (1,2)
- Animal studies have not reported developmental or reproductive effects from inhalation exposure to styrene. (1)
- Lung tumors have been observed in the offspring of orally exposed mice. (12)

Cancer Risk:

- Several epidemiologic studies suggest that there may be an association between styrene exposure and an increased risk of leukemia and lymphoma. However, the evidence is inconclusive due to multiple chemical exposures and inadequate information on the levels and duration of exposure. (1,2,7,12)
- Animal cancer studies have produced variable results and provide limited evidence for carcinogenicity.(7)
- IARC has classified styrene as a Group 2A, probably carcinogenic to humans. (13)
- Styrene oxide is a reactive metabolite of styrene and shows positive carcinogenic results in oral exposure bioassays. Styrene oxide has been detected in workers exposed to styrene. IARC has classified this metabolite as a Group 2A, probable human carcinogen. (7,12)
- EPA does not have a carcinogen classification for styrene. (5)

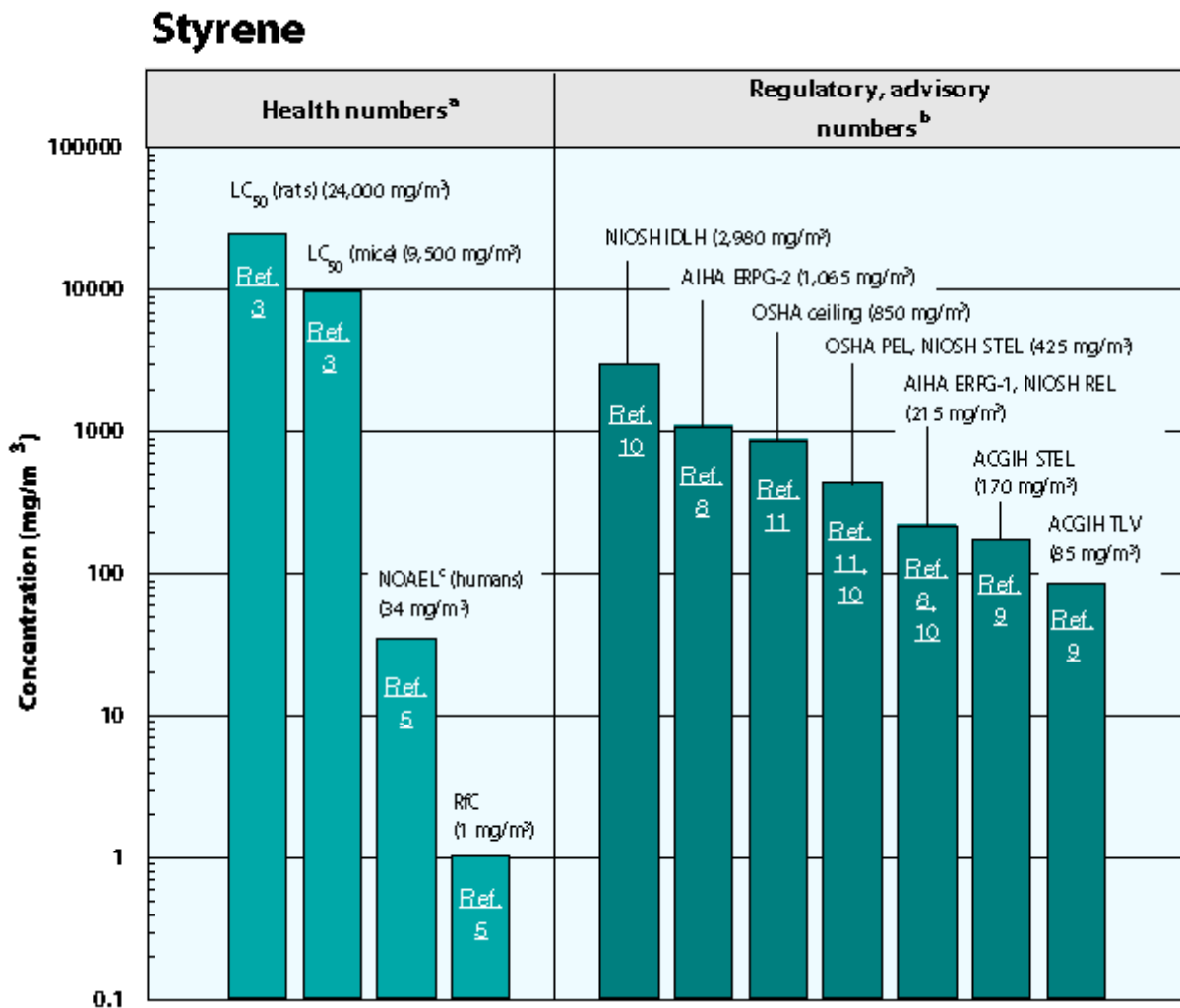
Physical Properties

- Styrene is a colorless liquid that has a sweet smell. (1)
- The odor threshold for styrene is 0.32 parts per million (ppm). (6)
- The chemical formula for styrene is C_8H_8 , and the molecular weight is 104.16 g/mol. (1)
- The vapor pressure for styrene is 5 mm Hg at 20 °C, and its octanol/water partition coefficient ($\log K_{ow}$) is 2.95. (1)

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m^3 : $mg/m^3 = (ppm) \times (\text{molecular weight of the compound}) / (24.45)$. For styrene: 1 ppm = 4.26 mg/m^3 .

Health Data from Inhalation Exposure



AIHA ERPG --American Industrial Hygiene Association's emergency response planning guidelines. ERPG 1 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed up to one hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor; ERPG 2 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed up to one hour without experiencing or developing irreversible or other serious health effects that could impair their abilities to take protective action.

ACGIH STEL --American Conference of Governmental and Industrial Hygienists' short-term exposure limit; a 15-minute TWA exposure which should not be exceeded at any time during a workday.

ACGIH TLV --ACGIH's threshold limit value expressed as a time-weighted average; the concentration of a substance

to which most workers can be exposed without adverse effects.

LC₅₀ (Lethal Concentration₅₀)--A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

NIOSH IDLH -- National Institute of Occupational Safety and Health's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

NIOSH REL--NIOSH's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

NIOSH STEL--NIOSH's recommended short-term exposure limit; a 15-minute TWA exposure which should not be exceeded at any time during a workday.

NOAEL--No-observed-adverse-effect level.

OSHA ceiling --Occupational Safety and Health Administration's permissible exposure limit ceiling value; the concentration of a substance that should not be exceeded at any time.

OSHA PEL--OSHA's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in December 1999.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH, ACGIH, and AIHA numbers are advisory.

^c This NOAEL is from the critical study used as the basis for the EPA RfC.

References

Summary created in April 1992, updated in January 2000

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Styrene. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1992.
2. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, [online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
3. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, [online database](#)). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
4. E.J. Calabrese and E.M. Kenyon. Air Toxics and Risk Assessment. Lewis Publishers, Chelsea, MI. 1991.
5. U.S. Environmental Protection Agency. [Integrated Risk Information System \(IRIS\) on Styrene](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
6. J.E. Amore and E. Hautala. Odor as an aid to chemical safety: Odor thresholds compared with threshold limit values and volatilities for 214 industrial chemicals in air and water dilution. *Journal of Applied Toxicology*, 3(6):272-290. 1983.
7. Memorandum from Robert J. Huggett, PhD, AA for Office of Research and Development to Mary D. Nichols, AA for Air and Radiation, US EPA, on Classification of Styrene. July 19, 1995. Available in Docket No. A-91-64, phone 202-260-7548, and on the Technology Transfer Network BBS, modem number 919-541-5742, TELNET ttnbbs.rtpnc.epa.gov.
8. American Industrial Hygiene Association (AIHA). The AIHA 1998 Emergency Response Planning Guidelines and Workplace Environmental Exposure Level Guides Handbook. 1998.
9. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.
10. National Institute for Occupational Safety and Health (NIOSH). [Pocket Guide to Chemical Hazards](#). U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.

11. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations 29 CFR 1910.1000. 1998.
12. International Agency for Research on Cancer (IARC). IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1 to 42. Supplement 7. World Health Organization. Lyon, France. 1987.
13. International Agency for Research on Cancer (IARC). IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Styrene, Styrene-7,8-oxide, and Quinoline, Volume 121. World Health Organization. Lyon, France. 2019.

Toluene

108-88-3

Hazard Summary

Toluene is added to gasoline, used to produce benzene, and used as a solvent. Exposure to toluene may occur from breathing ambient or indoor air affected by such sources. The central nervous system (CNS) is the primary target organ for toluene toxicity in both humans and animals for acute (short-term) and chronic (long-term) exposures. CNS dysfunction and narcosis have been frequently observed in humans acutely exposed to elevated airborne levels of toluene; symptoms include fatigue, sleepiness, headaches, and nausea. CNS depression has been reported to occur in chronic abusers exposed to high levels of toluene. Chronic inhalation exposure of humans to toluene also causes irritation of the upper respiratory tract and eyes, sore throat, dizziness, and headache. Human studies have reported developmental effects, such as CNS dysfunction, attention deficits, and minor craniofacial and limb anomalies, in the children of pregnant women exposed to high levels of toluene or mixed solvents by inhalation. EPA has concluded that there is inadequate information to assess the carcinogenic potential of toluene.

Please Note: The main sources of information for this fact sheet are EPA's Integrated Risk Information System (IRIS) (2), which contains information on inhalation chronic toxicity of toluene and the [RfC](#), oral chronic toxicity and the [RfD](#), and the carcinogenic effects of toluene, and the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Toluene. (1)

Uses

- The major use of toluene is as a mixture added to gasoline to improve octane ratings. Toluene is also used to produce benzene and as a solvent in paints, coatings, synthetic fragrances, adhesives, inks, and cleaning agents. (1)
- Toluene is also used in the production of polymers used to make nylon, plastic soda bottles, and polyurethanes and for pharmaceuticals, dyes, cosmetic nail products, and the synthesis of organic chemicals. (1)

Sources and Potential Exposure

- The highest concentrations of toluene usually occur in indoor air from the use of common household products (paints, paint thinners, adhesives, synthetic fragrances and nail polish) and cigarette smoke. The deliberate inhalation of paint or glue may result in high levels of exposure to toluene, as well as to other chemicals, in solvent abusers. (1)
- Toluene exposure may also occur in the workplace, especially in occupations such as printing or painting, where toluene is frequently used as a solvent. (1)
- Automobile emissions are the principal source of toluene to the ambient air. Toluene may also be released to the ambient air during the production, use, and disposal of industrial and consumer products that contain toluene. (1)
- Levels of toluene measured in rural, urban, and indoor air averaged 1.3, 10.8, and 31.5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), respectively. (1)

Assessing Personal Exposure

- Toluene and its breakdown products can be detected in the blood or urine to determine whether or not exposure has occurred. Metabolites measured in the urine are not specific to toluene, and testing must occur within 12 hours of exposure. (1)

Health Hazard Information

Acute Effects:

- The CNS is the primary target organ for toluene toxicity in both humans and animals for acute and chronic exposures. CNS dysfunction (which is often reversible) and narcosis have been frequently observed in humans acutely exposed to low or moderate levels of toluene by inhalation; symptoms include fatigue, sleepiness, headaches, and nausea. CNS depression and death have occurred at higher levels of exposure. (1)
- Cardiac arrhythmia has also been reported in humans acutely exposed to toluene. (1)
- Following the ingestion of toluene a person died from a severe depression of the CNS. Constriction and necrosis of myocardial fibers, swollen liver, congestion and hemorrhage of the lungs, and tubular kidney necrosis were also reported. (1)
- Acute exposure of animals to toluene has been reported to affect the CNS as well as to decrease resistance to respiratory infection. (1)
- Acute animal tests in rats and mice have demonstrated toluene to have low acute toxicity by inhalation or oral exposure. (1)

Chronic Effects (Noncancer):

- CNS depression has been reported to occur in chronic abusers exposed to high levels of toluene. Symptoms include drowsiness, ataxia, tremors, cerebral atrophy, nystagmus (involuntary eye movements), and impaired speech, hearing, and vision. Neurobehavioral effects have been observed in occupationally exposed workers. (1,2)
- Effects on the CNS have also been observed in studies of animals chronically exposed by inhalation. (1,2)
- Chronic inhalation exposure of humans to toluene causes irritation of the upper respiratory tract and eyes, sore throat, dizziness, headache, and difficulty with sleep. (1,2)
- Inflammation and degeneration of the nasal and respiratory epithelium and pulmonary lesions have been observed in rats and mice chronically exposed to high levels of toluene by inhalation. (1)
- Mild effects on the kidneys and liver have been reported in solvent abusers chronically exposed to toluene vapor. However, these studies are confounded by probable exposure to multiple solvents. (1,2)
- Slight adverse effects on the liver, kidneys, and lung and high-frequency hearing loss have been reported in some chronic inhalation studies of rodents. (1)
- The Reference Concentration (RfC) for toluene is 5 milligrams per cubic meter (5 mg/m³) based on neurological effects in humans. The RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfC, the potential for adverse health effects increases. Lifetime exposure above the RfC does not imply that an adverse health effect would necessarily occur. (2)
- EPA has high confidence in the RfC, the studies on which the RfC was based, and in the overall toluene database. There are many high quality chronic human studies available including a subset of studies presenting a cluster of NOAELs for neurological effects below reported LOAELs for all available endpoints. In addition, there are numerous supportive animal studies including those showing reproductive and developmental effects at doses higher than that identified as the point of departure. (2)
- The Reference Dose (RfD) for toluene is 0.08 milligrams per kilogram body weight per day (0.08 mg/kg/d) based on increased kidney weight in rats. (2)
- EPA has medium confidence in the study on which the RfD was based because it was considered an adequate gavage study of subchronic duration. The confidence in the database is also medium because of

a lack of chronic oral data, and a lack of adequate data on endpoints of potential concern for toluene including neurotoxicity . For these reasons, there is medium confidence in the RfD. (2)

Reproductive/Developmental Effects:

- CNS dysfunction, attention deficits, minor craniofacial and limb anomalies, and developmental delay were observed in the children of pregnant women exposed to toluene or to mixed solvents during solvent abuse. Growth retardation and dysmorphism were reported in infants of another study. However, these studies were confounded by exposure to multiple chemicals. (1,2)
- Children born to toluene abusers have exhibited temporary renal tubular acidosis. (1)
- Paternal exposure (in which the mothers had no occupational exposure to toluene but the fathers did) increased the odds ratio for spontaneous abortions; however, these observations cannot be clearly ascribed to toluene because of the small number of cases evaluated and the large number of confounding variables. An increased incidence of spontaneous abortions was also reported among occupationally exposed women. However, these studies are not conclusive due to many confounding variables. (1)
- Several inhalation studies have shown toluene to be a developmental toxicant, but not a reproductive toxicant, in rodents. (1)

Cancer Risk:

- Available studies in workers have reported limited or no evidence of the carcinogenic potential of toluene. Similarly, the few available epidemiological studies have failed to demonstrate increased risk of cancer due to inhalation exposure to toluene. However, these studies were limited due to the size of the study population and lack of historical monitoring data. (1)
- Chronic inhalation exposure of rats did not produce an increased incidence of treatment-related neoplastic lesions. (1,2)
- Under the Guidelines for Carcinogen Risk Assessments (US. EPA, 2005), the EPA considers that there is inadequate information to assess the carcinogenic potential of toluene. (2)

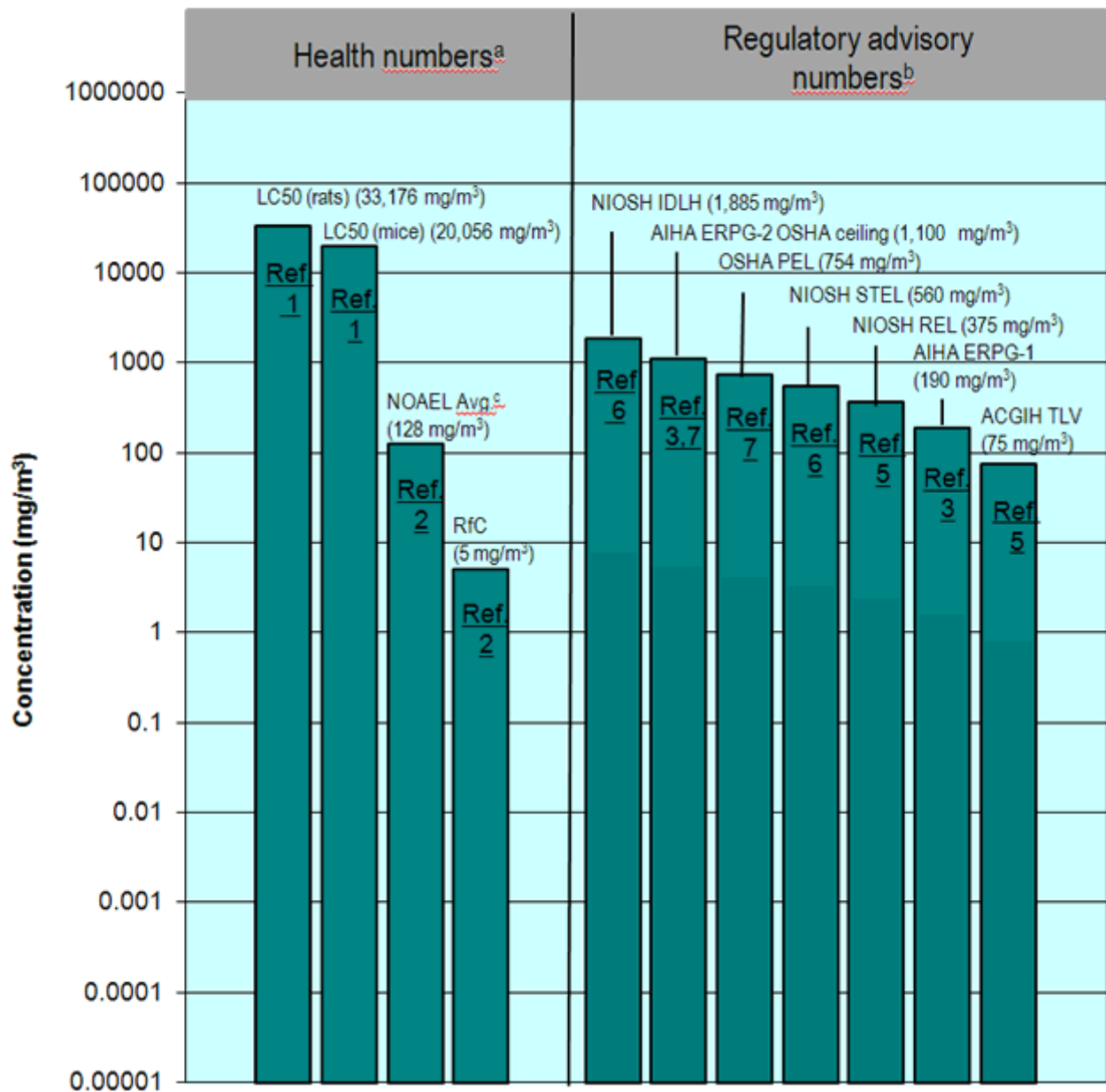
Physical Properties

- The chemical formula for toluene is $C_6H_5CH_3$, and its molecular weight is 92.15 g/mol. (1)
 - Toluene occurs as a colorless, flammable, refractive liquid, that is slightly soluble in water. (1)
 - Toluene has a sweet, pungent odor, with an odor threshold of 2.9 parts per million (ppm). (1,4)
 - The vapor pressure for toluene is 28.4 mm Hg at 25 °C, and its log octanol/water partition coefficient ($\log K_{ow}$) is 2.69. (1)
-

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m^3 : $mg/m^3 = (ppm) \times (\text{molecular weight of the compound}) / (24.45)$. For toluene: $1 \text{ ppm} = 3.77 \text{ mg}/m^3$.

Health Data from Inhalation Exposure



AIHA ERPG --American Industrial Hygiene Association's emergency response planning guidelines. ERPG 1 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed up to one hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor; ERPG 2 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed up to one hour without experiencing or developing irreversible or other serious health effects that could impair their abilities to take protective action.

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LC₅₀ (Lethal Concentration₅₀) --A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

LOAEL --Lowest-observed-adverse-effect level.

NIOSH IDLH -- National Institute of Occupational Safety and Health's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

NIOSH REL --NIOSH's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-

weighted-average exposure and/or ceiling.

NIOSH STEL --NIOSH's recommended short-term exposure limit; a 15-minute TWA exposure which should not be exceeded at any time during a workday.

OSHA ceiling --Occupational Safety and Health Administration's permissible exposure limit ceiling value; the concentration of a substance that should not be exceeded at any time.

OSHA PEL --OSHA's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in September 2005.

^a Health numbers are toxicological numbers from human studies, animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH, ACGIH, and AIHA numbers are advisory.

^c This NOAEL average from several co-critical studies was used as the basis for the EPA RfC.

References

Summary created in April 1992, updated in July 2012

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Toluene. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 2000.
2. U.S. Environmental Protection Agency. *Integrated Risk Information System (IRIS) on Toluene*. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 2005.
3. American Industrial Hygiene Association (AIHA). *The AIHA 2010 Emergency Response Planning Guidelines and Workplace Environmental Exposure Level Guides Handbook*. 1998.
4. J.E. Amoores and E. Hautala. Odor as an aid to chemical safety: Odor thresholds compared with threshold limit values and volatilities for 214 industrial chemicals in air and water dilution. *Journal of Applied Toxicology*, 3(6):272-290. 1983.
5. American Conference of Governmental Industrial Hygienists (ACGIH). *2009 Guide to Occupational Exposure Values*. Cincinnati, OH. 2009.
6. National Institute for Occupational Safety and Health (NIOSH). *Pocket Guide to Chemical Hazards*. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
7. Occupational Safety and Health Administration (OSHA). *Occupational Safety and Health Standards, Toxic and Hazardous Substances*. Code of Federal Regulations 29 CFR 1910.1000. 1998.

Xylenes ^(A) (Mixed Isomers)

o-XYLENE
m-XYLENE
p-XYLENE

1330-20-7, 95-47-6, 108-38-3, 106-42-3

Hazard Summary

Commercial or mixed xylene usually contains about 40–65% m-xylene and up to 20% each of o-xylene and p-xylene and ethylbenzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity.

Please Note: The main sources of information for this fact sheet are EPA's Integrated Risk Information System (IRIS) (6), which contains information on oral chronic toxicity and the RfD, and the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Xylenes. (1)

Uses

- Mixed xylenes are used in the production of ethylbenzene, as solvents in products such as paints and coatings, and are blended into gasoline. (1)

Sources and Potential Exposure

- Mixed xylenes are distributed throughout the environment; they have been detected in air, rainwater, soils, surface water, sediments, drinking water, and aquatic organisms. (1)
- Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. (1)
- Ambient air concentrations of mixed xylenes in urban areas of the United States range from 0.003 to 0.38 milligrams per cubic meter (mg/m^3). (1)
- Mixed xylenes have also been detected at low levels in indoor air; xylenes have been widely used in home use products such as synthetic fragrances and paints. One study reported concentrations of m- and p-xylene ranging from 0.010 to 0.047 mg/m^3 . (1)
- Levels of mixed xylenes in drinking water have been reported to range from 0.2 to 9.9 micrograms per liter ($\mu\text{g}/\text{L}$), with mean concentrations of less than 2 $\mu\text{g}/\text{L}$. (1)
- Occupational exposure to mixed xylenes may occur at workplaces where mixed xylenes are produced and used as industrial solvents. (1)
- Xylene exposure may be to any of the three isomers or to mixtures of the isomers. (1)

Assessing Personal Exposure

- Exposure to mixed xylenes may be determined by measuring the breakdown products of mixed xylenes in the urine or by measuring levels of xylene in blood or exhaled breath. (1)

Health Hazard Information

Acute Effects:

- Human and animal data show that all xylene isomers or xylene mixtures produce similar effects, although specific isomers may not be equally potent in producing the effects. (1)
- Acute inhalation exposure to mixed xylenes in humans has been associated with dyspnea and irritation of the nose and throat; gastrointestinal effects such as nausea, vomiting, and gastric discomfort; mild transient eye irritation; and neurological effects such as impaired short-term memory, impaired reaction time, performance decrements in numerical ability, and alterations in equilibrium and body balance. (1–3)
- Acute dermal exposure in humans results in transient skin irritation and dryness and scaling of the skin. (1–3)
- Acute inhalation exposure to a mixture of toluene and xylenes resulted in more than additive respiratory and neurological toxicity in humans and animals. (1)
- Acute animal studies have reported respiratory, cardiovascular, CNS, liver, and kidney effects from inhalation exposure to mixed xylenes. (1)
- Acute animal tests in rats and mice have shown mixed xylenes to have **low** to **moderate** toxicity from inhalation exposure and **moderate** toxicity from oral exposure. (4,5)

Chronic Effects (Noncancer):

- Chronic exposure of humans to mixed xylenes, as seen in occupational settings, has resulted primarily in neurological effects such as headache, dizziness, fatigue, tremors, incoordination, anxiety, impaired short-term memory, and inability to concentrate. Labored breathing, impaired pulmonary function, increased heart palpitation, severe chest pain, abnormal EKG, and possible effects on the kidneys have also been reported. (1,2)
- Mixed xylenes have not been extensively tested for chronic effects, although animal studies show effects on the liver and CNS from inhalation and oral exposures and effects on the kidneys from oral exposure to mixed xylenes. (1)
- The Reference Dose (RfD) for mixed xylenes is 2 milligrams per kilogram body weight per day (mg/kg/d) based on hyperactivity, decreased body weight, and increased mortality in rats, and the provisional RfD for m- and o-xylenes is also 2 mg/kg/d. EPA has not established an RfD for p-xylene. The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfD, the potential for adverse health effects increases. Lifetime exposure above the RfD does not imply that an adverse health effect would necessarily occur. The provisional RfDs are values that have had some form of Agency review, but do not appear on IRIS. (6,10)
- EPA has medium confidence in the study on which the RfD was based because it was a well-designed study in which adequately sized groups of two species were tested over a substantial portion of their lifespan, comprehensive histology was performed, and a no-observed-adverse-effect level (NOAEL) was defined; but clinical chemistries, blood enzymes, and urinalysis were not performed; medium confidence in the database because although supporting data exist for mice, and teratogenicity and fetotoxicity data are available with positive results at high oral doses, a lowest-observed-adverse-effect level (LOAEL) for chronic oral exposure has not been defined; and, consequently, medium confidence in the RfD. (6)
- EPA has not established a Reference Concentration (RfC) for mixed xylenes or any isomers. (6)
- ATSDR has calculated a chronic inhalation minimal risk level (MRL) of 0.4 mg/m³ (0.1 parts per million [ppm]) for mixed xylenes based on neurological effects in occupationally exposed workers. The MRL is an

estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse noncancer health effects over a specified duration of exposure. (1)

Reproductive/Developmental Effects:

- Several human studies examined exposure to organic solvents (including mixed xylenes) and developmental effects. An increased potential for spontaneous abortions among the wives of occupationally exposed men was reported. However, no conclusions can be drawn from these studies because they all involved concurrent exposure to multiple chemicals. (1)
- Mixed xylenes have been shown to produce developmental effects, such as an increased incidence of skeletal variations in fetuses, delayed ossification, fetal resorptions, and decreased fetal body weight in animals via inhalation exposure. Some studies observed maternal toxicity as well. (1-3)

Cancer Risk:

- No information is available on the carcinogenic effects of mixed xylenes in humans. (1)
- An increase in tumors was not reported in rats or mice exposed to mixed xylenes via gavage (experimentally placing the chemical in the stomach). Other animal studies have reported equivocal results. (1,3,6)
- EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity. (6)

Physical Properties

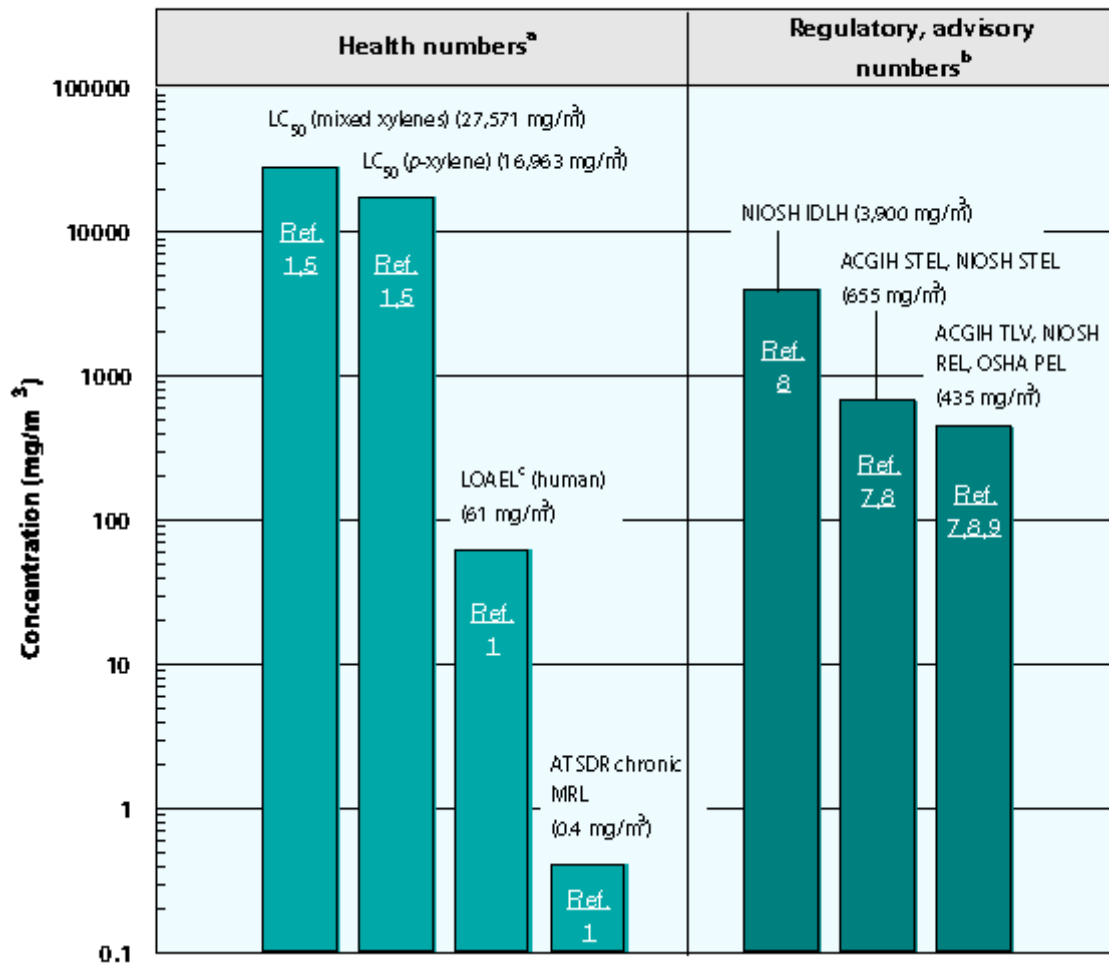
- m-, o-, and p-Xylene are the three isomers of xylene; commercial or mixed xylene usually contains about 40-65% m-xylene and up to 20% each of o- and p-xylene and ethylbenzene. (1)
- Mixed xylenes are colorless liquids that are practically insoluble in water and have a sweet odor. (1)
- The odor threshold for m-xylene is 1.1 ppm. (4)
- The chemical formula for mixed xylenes is C₈H₁₀, and the molecular weight is 106.16 g/mol. (1)
- The vapor pressure for mixed xylenes is 6.72 × 10⁻⁸ m Hg at 21 °C, and the log octanol/water partition coefficient (log K_{ow}) is 3.123.20. (1)

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m³: $\text{mg/m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$. For xylenes: 1 ppm = 4.34 mg/m³. To convert concentrations in air from µg/m³ to mg/m³: $\text{mg/m}^3 = (\mu\text{g/m}^3) \times (1 \text{ mg} / 1,000 \mu\text{g})$.

Health Data from Inhalation Exposure

Xylenes



ACGIH STEL --American Conference of Governmental and Industrial Hygienists' short-term exposure limit; 15-min time-weighted-average exposure that should not be exceeded at any time during a workday even if the 8-h time-weighted-average is within the threshold limit value.

ACGIH TLV --ACGIH's threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.

LC₅₀ (Lethal Concentration₅₀) --A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

LOAEL -- Lowest observed adverse effect level.

NIOSH IDLH -- National Institute of Occupational Safety and Health's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

NIOSH REL --NIOSH's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

NIOSH STEL --NIOSH's recommended short-term exposure limit; a 15-minute TWA exposure which should not be exceeded at any time during a workday.

OSHA PEL --Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in December 1999.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b

^b Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH and ACGIH numbers are advisory.

^c This LOAEL is from the critical study used as the basis for the ATSDR chronic inhalation MRL.

Summary created in April 1992, updated in January 2000

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Xylenes (Update). Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1995.
2. E.J. Calabrese and E.M. Kenyon. Air Toxics and Risk Assessment. Lewis Publishers, Chelsea, MI. 1991.
3. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
4. J.E. Amoores and E. Hautala. Odor as an aid to chemical safety: Odor thresholds compared with threshold limit values and volatilities for 214 industrial chemicals in air and water dilution. *Journal of Applied Toxicology*, 3(6):272-290. 1983.
5. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
6. U.S. Environmental Protection Agency. *Integrated Risk Information System (IRIS) on Xylenes*. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
7. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 1999.
8. National Institute for Occupational Safety and Health (NIOSH). *Pocket Guide to Chemical Hazards*. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
9. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations 29 CFR 1910.1000. 1998.
10. U.S. Environmental Protection Agency. Health Effects Assessment Summary Tables. FY 1997 Update. Office of Research and Development, Office of Emergency and Remedial Response, Washington, DC. EPA/540/R-97-036. 1997.

A. * This fact sheet refers to the mixture of all three isomers of mixed xylenes as "mixed mixed xylenes" and the isomers by their individual isomer names.



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January 10, 2020

E-mail and Overnight Mail

City of Howell
Board of Zoning Appeals
c/o Timothy R. Schmitt
611 E. Grand River
Howell, Michigan 48843

Re: 645 Lucy Road--New Scrap Processing Facility/Request for Variances

Dear Board Members:

I am writing to reflect the position of several property owners identified below in opposition to the request of Padnos Iron and Metal (“Applicant”) for variances to: (1) allow a scrap metal shredding operation to occur outdoors rather than entirely enclosed in a building as required by the City’s Zoning Ordinance; and (2) permit the use of gravel for outdoor storage areas and vehicular travel on the site instead of a hard surface (asphalt) required by the Zoning Ordinance. As explained below, the Applicant cannot meet the requirements for either variance, whether the variances are characterized as use or dimensional variances.

A. Background—The Property, Zoning and Master Plan

The Property at issue consists of 3 parcels—tax parcel 06-100-002 is approximately 11 acres and has been used as a salvage yard by Applicant’s predecessor in interest; tax parcel 06-300-005 is approximately 5 acres and appears to have also been used in part for the existing salvage yard; and tax parcel 06-100-005 is approximately 40 acres. This latter crescent-shaped property is vacant and was formerly owned by the City (the “City Parcel”). See aerial depicting property locations attached as **Appendix 1**. Applicant proposes to expand the salvage operations onto the City Parcel and install, among other things, a massive metal processing facility (the “Metal Shredder”). Access to the Property is located on Lucy Road, an unpaved, narrow public road.

The Applicant’s Property is zoned I-2 or general industrial. But it is surrounded by a variety of different land uses and zoning classifications. The entire eastern boundary of the property abuts land in Genoa Township. A portion of the abutting land is zoned General Commercial in Genoa Township while the remainder of abutting land in Genoa is zoned public recreation. On the other

side of the public recreation property there are single-family homes along Chilson Road on land zoned for residential use. Most of the land on the west side of Lucy Road across from the proposed scrap metal shredding operation is vacant and is owned by Marion Township, but located in the City and is zoned for single-family residential use by the City. There are a mixture of uses, including industrial, commercial and residential, located north of the Property up to Grand River. To the south between the Applicant's Property and I-96, there is land zoned light industrial. The crescent shape City Parcel wraps around a former, now closed City landfill along Lucy Road.

Not only is there a diverse mixture of surrounding land uses to consider, but there are other unique circumstances involving these properties that should be addressed. The City Parcel was obtained by the City from Genoa Township through a Contract for Conditional Transfer of Property under Michigan Public Act 425 (the "Genoa Act 425 Agreement"), a copy of which is included in **Appendix 2**. The City Parcel was originally envisioned to be a City park. That Agreement states that the purpose of the land transfer was for the City to provide municipal city and water services to the area in order to create jobs and additional development. Indeed, the Agreement provides that it was intended to foster "quality economic development to benefit the respective communities." (Appendix 2.)

The Genoa Act 425 Agreement also contained a commitment by Howell to protect adjacent residential properties in Genoa Township from adverse impacts of development. More specifically paragraph 6 states:

That the CITY shall use the powers of its existing zoning ordinance to afford reasonable protection to residential properties located in the TOWNSHIP adjacent to the area being transferred to the CITY. As part of this commitment, the CITY shall use its existing site plan review powers to buffer industrial and commercial uses from TOWNSHIP residential uses.

The City's recently adopted 2015 Master Plan is consistent with its commitment to Genoa with respect to future development of Applicant's Property (more particularly the former City Property). The Property is included in the so-called "Loop Road Area." This area is specifically planned as an "employment district." The Master Plan states that the "Eastern portions of the area is partially developed as industrial. The City has the opportunity to further develop this portion of the Loop Road Area as an employment district with a focus on sustainability of development." Master Plan at p. 78. The Master Plan goes on to explain that the "Loop Road area has significant development potential which will bring economic growth and sustainability focus to the Howell area. The City recognizes that the challenges posed by the Study will require comprehensive planning and innovative design to accomplish the vision for the destination and employment district." Master Plan, at p. 80. As explained below, the City has yet to rise up to the challenges

posed by and vision of its Master plan, as well as completely ignored its contractual obligations to Genoa Township and others.¹

B. Applicant's Proposed Massive Metal Shredding Operation

After acquiring the Property earlier in 2019, the Applicant submitted a request for special land use and site plan approval to expand the existing salvage yard and connect it to the City Parcel and construct or erect a massive outdoor metal shredder to process scrap metal materials, including automobiles. The metal shredder will be 65 feet high and located adjacent to a 46 foot masonry control structure. The shredder and new building would be located on the City Parcel near the Genoa Township property line and close to single-family residences along Chilson Road. According to the application for special use approval, the shredder “is a processing facility that will size and sort a variety of mixed incoming ferrous scrap items.”

Because of the potential negative impacts of such an operation, it is not permitted as of right even in the I-2 district, but rather requires special land use approval as a salvage yard under Section 4.06 of the Zoning Ordinance. More important, the Zoning Ordinance mandates that “**all industrial processes involving the use of equipment for cutting, compressing or packaging shall be conducted within a completely enclosed building.**” (Emphasis added.)

Because of the potential adverse impacts of a special land use, Michigan law requires that the City hold a public hearing on the use. Further, the approval of a special land use must comply with standards “that insure that the land use or activity authorized shall be compatible with adjacent uses of land, the natural environment and the capacities of public services and facilities affected by the land use. The standards shall also insure that the land use or activity is consistent with the public health, safety and welfare of the local unit of government.” MCL 125.3504(2).

The Planning Commission held a public hearing on the site plan and special land use request on November 20, 2019. Dozens of people appeared to speak in opposition to the special land use, including the Township Manager from Genoa Township, who expressed concerns about the significant impact on neighboring properties related to noise, traffic, truck turning movements, the lack of approved sewer and water service, and potential violation of the Genoa Act 425 Agreement. See meeting minutes attached as **Appendix 3**. Others commented on the poor condition of Lucy Road to service such an intense operation—Lucy Road being a narrow, unpaved, and poorly maintained road—as well as noise, vibration, pollution and traffic issues also associated with the use. Based upon information submitted by the Applicant, the metal shredder can process

¹ Howell also entered into an Act 425 Agreement with Marion Township in 1987 regarding nearby property which provides in paragraph 6 the same kind of protections for residential properties as imposed in the Genoa Act 425 Agreement. And, as stated above, Marion owns substantial acreage directly across Lucy Road from the Property at issue, which is zoned single-family residential by the City.

approximately 160 gross tons per hour, which, in more graphic terms, could be 80 cars/hour. The Applicant did not submit a traffic report and its disclosures regarding traffic, particularly the number of heavy trucks that would use and tear up unpaved Lucy Road, were vague at best. While it appears from the site plan that the shredder operation might be located in a wetland area, no wetland information was provided and no environmental impact statement was presented.

It should have been clear that this most intense industrial operation—which was not permitted as of right in any zoning district; located in the midst of a variety of zoning districts, including residential; which may be in violation of contractual commitments with two adjacent communities; and is not consistent with the goals and objectives for this land as set forth in the City’s recently adopted Master Plan—was not appropriate. Yet the Planning Commission approved the special land use by a vote of 5 to 2. It did so without making any findings of fact as required by the City’s Zoning Ordinance and the Michigan Zoning Enabling Act.

While that decision by the Planning Commission is not before this Zoning Board, even more incredulous, the Applicant wants to conduct this operation in violation of the bedrock protective standard that forms an integral part of the approved use—that it be conducted within a completely enclosed building. Further, while the City’s Zoning Ordinance requires that material storage areas and service drives be paved with a hard service, the Applicant seeks a variance from that requirement as well. This paving requirement is clearly intended to reduce dust and noise from the operation and the impact of any leakage or spill of chemicals. As explained below, the Applicant cannot satisfy the requirements for a variance and the request should be denied.

C. The Variance Requests Should Be Denied

The first consideration this Board must make is whether the variances requested are more in the nature of use or dimensional variances. While we believe that the variance to eliminate the requirement that the operation be conducted entirely within a building is properly characterized as a use variance, the request fails to meet the standards for either type of variance as described below.

“Non-use [or dimensional] variances are not concerned with the use of the land but, rather, with changes in a structure’s area, height, setback, and the like.” *Grabow v Macomb Twp*, 270 Mich App 222, 226 (2006). Such variances typically involve setback requirements, landscaping restrictions, lot coverage, height regulations, parking, access, etc. Use variances, on the other hand, “permit the use of the land which the zoning ordinance otherwise proscribes.” *Grabow*. In this case, the requirement that the operations be conducted within a completely closed building is integrally related to the use and described as part of the use itself in the Zoning Ordinance. It goes to the heart of the use. This should be compared to other dimensional regulations that appear elsewhere in the Zoning Ordinance applicable to all uses within the Zoning Ordinance, such as height and setbacks. In this case, it is clear that the request to operate the shredder outside of an enclosed building is properly characterized as a use variance while the request to avoid the paving requirement would be more in the nature of a non-use or dimensional variance.

1. The request to operate the shredder outside of an enclosed building fails to meet the requirements for a use variance.

In order to obtain a use variance, the Applicant must demonstrate **unnecessary hardship** and each of the following: (a) that the property cannot be reasonably used for the purposes permitted in the zoning district; (b) that the appeal results from the unique circumstance peculiar to the property and not from general neighborhood conditions; (c) that the use requested by the variance would not alter the essential character of the area; and (d) that the alleged hardship has not been created by any person having an interest in the property. City Zoning Ord. at 12.04 (e). None of the criteria can be met here.

The Property can plainly be used for purposes permitted in the zoning district. There are numerous other industrial and business uses permitted on the Property. The proposed use is not one permitted as of right and the Applicant has no entitlement to the use, particularly to an entitlement of the use in a manner that varies from the key protective conditions established in the Zoning Ordinance. There is no evidence presented that the equipment cannot be enclosed within a building. To the contrary, there are companies that specialize in constructing enclosures for scrap metal and automobile shredders and there are locations throughout the country where such shredding equipment has been enclosed. *See Appendix 4* hereto.

But even if that were not the case, then this particular Property is not a suitable site for such an operation, being surrounded by lands zoned residential, commercial and recreational. One of the key considerations for a special land use is its **location** within a zoning district. See Zoning Ordinance at Section 3.03(e). If the requirements of the Ordinance designed to protect neighboring properties cannot be met at a particular location, the use should more appropriately be located in the heart of a heavy industrial district, surrounded by other heavy industrial land uses and zoning. If no such land is available in Howell, there are numerous other more appropriate locations in southeast Michigan.

Moreover, there is nothing unique or peculiar to the Property that supports the variance request. It is a large, relatively flat parcel of land. Indeed, there is an important factor here that is unique to the Property that supports denial of the variance—that the land was obtained from a neighboring community and is the subject of commitments to that community regarding the mutual objectives for its future use and protections of other remaining residential properties in the adjacent community.

Further the use would alter the essential character of the area. While there are industrial uses scattered in the area, there are also various other non-industrial uses and the City has a vision for the area as set forth in its Master Plan. Expanding this most intense and impactful use on 40 acres of land alters the essential planned character of the area and would plainly impact and discourage the other mixed uses desired by the City. While the site has historically been used as a scrap metal salvage yard, the addition of a scrap metal and automobile shredder is a significant change in

intensity of use, as well as environmental and community impacts. Scrap metal and automobile shredding operations, such as that proposed for this site are known to cause harmful air emissions, fires and explosions, water and soil contamination, excessive noise and vibrations as well as increased truck and vehicular traffic. (See **Appendix 5**). Without an enclosure as required by the Zoning Ordinance, these environmental and community impacts will go largely unabated. As indicated above, the Planning Commission in considering and approving a special land use permit for this facility, made no findings of fact, did little to no independent research on the potential impacts posed by a scrap metal and automobile shredder and instead, relied on unsupported statements and assurances of the Applicant.

This proposed use is a significant change in intensity from prior uses and will undoubtedly change the essential character of the area. There are many other less impactful industrial uses that could be placed on this Property that would not discourage further development of other nearby properties and would create the employment opportunities sought by the City as set forth in its Master Plan. Indeed, Marion Township, the owner of the residential zoned property on the west side of Lucy Road across from the proposed new operations, is in the process of seeking appraisals for valuing the land for potential sale for residential development. Applicant's project, most particularly if developed in a manner that avoids the protection of a building and paved road and laydown surfaces, could impact the value and marketability of that residential land and may even discourage residential developers from pursuing development.

Finally, the last criteria has no application to the circumstances here. This criteria applies where there are unique features on the Property that physically prevent or interfere with compliance with a requirement. No such unique features exist here.

In sum, there is no "unnecessary hardship" here that would justify the Applicant's failure to comply with the most important use criteria intended to mitigate harm from noise, dust, vibration, odor and other external impacts of operating such heavy equipment in the district.

2. The request to operate the shredder outside of an enclosed building and not pave outdoor storage and vehicular access areas fails to satisfy the requirements for dimensional variances.

In order to obtain a dimensional variance, the Applicant must demonstrate **practical difficulty** and meet at least each of the following requirements: (a) the restrictions unreasonably prevent the owner from using the property for a permitted purpose or would render conformity unnecessarily burdensome; (b) the variance would do substantial justice to the Applicant as well as other property owners in the district; (c) the plight of the property owner is due to the unique circumstances of the property; and (d) the alleged hardship has not been created by any person presently having an interest in the property. City Zoning Ord. at 12.04 (e). A showing of mere inconvenience is not sufficient to justify a variance. *Nat'l Boatland, Inc. v Farmington Hills Zoning Bd of Appeals*, 146



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Mich App 380, 389-391 (1985). It should be self-evident that these requirements cannot be satisfied.

Again, as stated in more detail above, the Applicant is not prevented from the using the Property for a permitted purpose. There is nothing that prevents the owner from complying with the requirements mandated for even allowing this special land use on the Property. The owner can pave the areas required under the ordinance and enclose the shredder in a building. While the Applicant may try to argue that such requirements are unnecessarily expensive, that is not a proper basis upon which to grant a variance.

The paving requirement is in the Ordinance for specific purposes and there is no basis to conclude that they are not necessary or useful here. Paving reduces the noise and dust generated by heavy truck traffic and equipment utilizing the site. It allows better control of environmental hazards, including spills, that may accompany the operation. This is even more important given the site's proximity to wetland areas.

There is certainly no basis to conclude that the variances would do substantial justice to surrounding property owners. In fact, just the opposite would occur. Rather than enclose the operation and pave the required parts of the site, adjacent property owners would now be exposed to more noise, odor, vibration, dust and environmental hazards and other impacts than they would have if the ordinance requirements were satisfied, let alone the negative impact such an improperly exposed use and operation could have on the value, marketability and future uses of their properties. Such operations are known to experience significant fire and environmental hazards which are described more fully in the appeal of the special land use filed by Livingston County Catholic Charities with this Board and the materials supporting that appeal, all of which are incorporated herein by reference.

As explained above, there are no unique circumstances regarding this Property that justify the variances. There is more than sufficient room and no topography or natural features that would prevent or interfere with complying with the requirements of the Zoning Ordinance.

For the reasons stated above and the other materials submitted and included in the record, we respectfully request that the Board deny the requested variances. This letter has been approved and authorized by the following neighbors and interested parties—Livingston County Catholic Charities, Matem, LLC, Genoa Township and Marion Township. We appreciate your consideration of this information.

DyKEMA

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Sincerely,

DYKEMA GOSSETT, PLLC



Alan M. Greene

cc: Brad Strader, MKSK Planning
Mike Archinal, Genoa Township
Mark T. Robinson, Livingston County Catholic Charities
Jamie K. Stewart, Esq.
Bob Hanvey, Marion Township

APPENDIX 1

APPENDIX 1



Livingston County, Michigan
Information Technology Department
G.I.S. Division 517.548.3230



Padnos Parcels



Marion Twp



Genoa Twp



City of Howell



Orthophoto's Flown Spring 2016
Printed October 16, 2019
Parcel lines are an approximation only.
Not intended for survey purposes.



Livingston County, Michigan
 Information Technology Department
 G.I.S. Division 517.548.3230

Legend

- Soil areas which include wetland soils
- Wetlands as identified on NWI & MIRIS maps
- Wetlands as identified on NWI & MIRIS maps & soil areas which include wetland soils


225 112.5 0 225 450 675
 Feet

Enter Map Title

Digitized from Spring 2015
 Aerial photography
 Parcel lines as a representation only.
 Not intended for survey purposes.

APPENDIX 2

APPENDIX 2


 * 2010R-011881 *
2010R-011881
 RECORDED ON
 04/16/2010 04:49:37PM
 SALLY REYNOLDS
 REGISTER OF DEEDS
 LIVINGSTON COUNTY, MI 48843
 RECORDING: 20.00
 REVENUE: 1.00
 PAGES: 7

7

CITY OF HOWELL – GENOA CHARTER TOWNSHIP
CONTRACT FOR CONDITIONAL TRANSFER OF PROPERTY
PUBLIC ACT 425 OF 1984

This contract made on the 21st day of December, 2009 between the City of Howell, a Michigan Municipal Corporation, 611 E. Grand River Avenue, Howell, MI 48843 (hereinafter referred to as "CITY") and the Genoa Charter Township, a Michigan Charter Township, 2911 Dorr Road, Brighton, Michigan 48116 (hereinafter referred to as "TOWNSHIP").

WHEREAS, the CITY and TOWNSHIP have considered the factors contained in Section 3 of Act 425 of 1984, as amended (MCL 124.23), and desire, through cooperation, to foster quality economic development to benefit the respective communities and to bring about enhancement of tax base, providing municipal sewer and/or water services to the area involved, create needed jobs and the probability of additional development in the area would be greatly increased; and

WHEREAS, the only feasible way to provide these economic enhancements is to be through a cooperative contract between the TOWNSHIP and the CITY to provide that this area come under the jurisdiction of the CITY; and

WHEREAS, the CITY and TOWNSHIP have carefully considered the factors required by Section 3 of Public Act 425 of 1984; and

WHEREAS, the TOWNSHIP and CITY wish to cooperate to encourage economic development for the area and enhance the financial stability of both the TOWNSHIP and CITY;

NOW THEREFORE, by authority of Act 425 of the Public Acts of 1984 and in consideration of the promises, covenants and conditions hereinafter set forth, the parties agree as follows:

1. That the TOWNSHIP consents in advance to the transfer of parcels within the following described area to the CITY:

(See attached legal descriptions)

2. That the CITY agrees to accept the transfer of parcels within the above described area for any purpose allowed under Public Act 425 of 1984, as amended, upon execution of this agreement and filing of this agreement with the office of the Great Seal for the State of Michigan. The City shall make available the usual CITY services to said property, including municipal

04-16-10 16:47 RCND

sewer and water services.

3. Following transfer, the CITY shall have full jurisdiction, including the powers of taxation, over the transferred area in perpetuity.

4. In recognition of its role in the formulation of this agreement and its continuing involvement and responsibilities for the property, the CITY and TOWNSHIP agree that, commencing in the year in which the first transfer of property pursuant to this contract takes place, and every year thereafter during the term of this agreement, and subject to the terms of this agreement, the City shall pay to the Township two (2) mills all ad valorem property taxes, real and personal, which the CITY collects for its own general operating fund purposes only, and which are attributable to the transferred properties at the time limits required herein. The CITY shall transmit to the TOWNSHIP its share of such revenues annually on November 1st and shall, as part of its annual audit, provide the TOWNSHIP with an audited annual statement of such revenue. The CITY hereby guarantees the TOWNSHIP will receive no less revenue from the transferred parcels than that which it would have received each year from said parcels as if this agreement did not exist. The CITY agrees that any tax abatement granted to a parcel or to personal property shall not reduce the monies otherwise due and payable to the TOWNSHIP according to the above stated formula and the CITY alone shall bear the reduction in tax revenues because of its grant of tax abatements.

5. That no other assets or liabilities shall be divided between the CITY and the TOWNSHIP as a result of the transfer involved in this contract.

6. That the CITY shall use the powers of its existing zoning ordinance to afford reasonable protection to residential properties located in the TOWNSHIP adjacent to the area being transferred to the CITY. As part of this commitment, the CITY shall use its existing site plan review powers to buffer industrial and commercial uses from TOWNSHIP residential uses.

7. That the CITY agrees that it will not require the owners or property within the conditionally transferred areas whose properties are served as of the date of this agreement by adequately functioning septic disposal systems or potable water wells to connect to the City's wastewater treatment system or water supply system until either such existing system fails or the property is otherwise compelled to connect to the CITY'S systems by lawful order of the Livingston County Health Department, the State of Michigan Health Department, or the Michigan Department of Environmental Quality, whichever occurs first.

8. That in the event the CITY does not comply with the requirements of Paragraph 4 of this Contract, the TOWNSHIP shall notify the CITY in writing of exactly how the CITY has not complied with the requirements of Paragraph 4. Said notice shall be personally served on the Howell City Clerk and also personally served on the Howell City Mayor or the Howell City Manager. Failure of the CITY to comply with the requirements of Paragraph 4 within 180 days from the date said notice was served as described herein, shall, at its option, entitle the TOWNSHIP to the return of the transferred area. The remainder of the Contract provisions may

be enforced by the TOWNSHIP by means of other civil actions, including declaratory judgments and injunctive relief from the Livingston County Circuit Court.

9. That this Contract shall be recorded, within 30 days of the date of its execution, with the Michigan Secretary of State and the Livingston County Register of Deeds.

10. That all agreements and covenants contained herein are severable, and in the event any of them, with the exception of those contained in Paragraphs 1- 4, shall be held to be invalid by any court having subject matter jurisdiction, this Contract shall be interpreted as if such invalid agreements or covenants were not contained herein.

11. That this Contract shall continue in effect for a period of fifty (50) years from the date of execution of this Contract. At the end of this fifty (50) year period the transferred property shall continue to remain permanently in the jurisdiction of the CITY.

IN WITNESS WHEREOF:

CITY OF HOWELL

[Signature]
SHERYL ANNE BOAK
Notary Public, State of Michigan, County of Livingston
My Commission Expires July 6, 2015
Acting in the County of Livingston

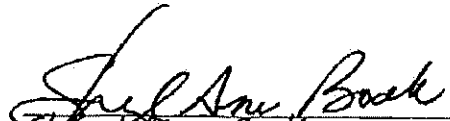
[Signature]
By: Geraldine Moen *Geraldine K. Moen*
Its Mayor *G.K. Moen*

[Signature]
SHERYL ANNE BOAK
Notary Public, State of Michigan, County of Livingston
My Commission Expires July 6, 2015
Acting in the County of Livingston

[Signature]
By: Jane Cartwright *Jane L. Cartwright*
Howell City Clerk


STATE OF MICHIGAN)
)ss
COUNTY OF LIVINGSTON)


On this 21 day of December, 2009, before me a Notary Public in and for said County, personally appeared Geraldine K. Moen and Jane L. Cartwright to me known to be the Mayor and City Clerk of the City of Howell, who being by me duly sworn, did say that they executed the foregoing City of Howell-Genoa Township contract for conditional transfer of property on behalf of the City of Howell by authority duly vested in them by the Howell City Charter.

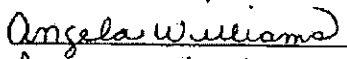

 Sheryl Anne Boak Notary Public
 Livingston County, Michigan
 My Commission expires: 7-6-2015


IN WITNESS WHEREOF:

GENOA CHARTER TOWNSHIP


 Amy D. Ruthig

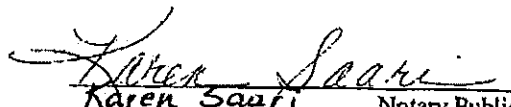

 By: Gary A. McCririe
 Its Supervisor


 ANGELA WILLIAMS


 By: Paulette A. Skalarus
 Its Clerk

STATE OF MICHIGAN)
)ss
 COUNTY OF LIVINGSTON)

On this 21st day of December, 2009, before me a Notary Public in and for said County, personally appeared Gary McCririe and Paulette A. Skalarus to me known to be the Supervisor and Clerk of the Genoa Charter Township, who being by me duly sworn, did say that they executed the foregoing City of Howell-Genoa Charter Township contract for conditional transfer of property on behalf of the Genoa Charter Township by authority duly vested in them by law.


 Karen Saari Notary Public
 Livingston County, Michigan
 My Commission expires: 10-4-2011

GENOA CHARTER TOWNSHIP/CITY OF HOWELL
425 AGREEMENT PROPERTY DESCRIPTIONS
(SEE PARAGRAPH 1)

1. Land in the Township of Genoa, Livingston County, Michigan described as: Beginning at the NW corner of Section 6, T2N, R5E, thence South 2403.2 feet along the West line of Section 6; thence South 80 deg 45' East 870.00 feet; thence South 519.00 feet to the East & West 1/4 line of Section 6; thence East 285.00 feet along the 1/4 line to the West line of the Ann Arbor Railroad right-of-way, North 5 deg 38' East 1168.8 feet; thence Northerly along the arc of a 3 deg 3' curve left a distance of 1110.9 feet along said railroad; thence North 28 deg 15' West 952.00 feet; thence West 594.00 feet along the Section line of Section 6 to the point of beginning, excepting therefrom the North 495.0 feet of the West 1/2 of the Northwest quarter of Section 6 West of the railroad, containing 60.7 acres of land, more or less.

Tax Code No. ~~4711~~06-100-005

2. Brockway Property (Liber 2039, Pages 0248-0249)

Land in the Township of Genoa, County of Livingston, State of Michigan, described as follows:

A part of the Northwest fractional 1/4 of Section 6, T2N, R5E, Michigan described as follows: Commencing at the Northwest Corner of Section 6; thence along the West line of said Section 6, and the centerline of Lucy Road, (66 foot wide Right of Way), due South, 2397.71 feet (previously recorded as 2403.2 feet), to the POINT OF BEGINNING of the Parcel to be described ; thence 78 deg 29' 40" E, 860.43 feet (previously record as S 80 deg 45' E, 870 feet); thence due South 521.08 feet (previously recorded as 519 feet); thence along the East-West 1/4 line of said Section 6, N 89 deg 42' 26" W, 574.99 feet (previously recorded as West 578 feet); thence along the Northerly line of the CSX Railroad (100 foot wide Right of Way), N 55 deg 42' 23" W, 324.58 feet (previously recorded as N 54 deg 40' W, 323 feet); thence along the West line of said Section 6, and the centerline of Lucy Road,, due North, 506.88 feet (previously recorded as 510.2 feet), to the point of beginning, containing 11.15 acres, more or less, and subject to the rights of the public over the existing Lucy Road. Also subject to any other easements or restrictions of record.

Part of Tax Code No. 4711-06-100-006

3. Wheelock Associates Limited Partnership Property (Liber 3731, Page 0121)

Land in the Township of Genoa, County of Livingston, State of Michigan, described as follows:

Outlot A of "Bachman's Subdivision", as recorded in Liber 7 of Plats, Page 14, Livingston County Records.

Tax Code No. 4711-06-101-002

4. Land in the Township of Genoa, County of Livingston, State of Michigan, described as follows:

Lots 1, 2, 3, 4, 5, 6, 7 of "Bachman's Subdivision", as recorded in Liber 7 of Plats, Page 14, Livingston County Records.

Tax Code No. 4711-06-101-003

Tax Code No. 4711-06-101-004

Tax Code No. 4711-06-101-005

Tax Code No. 4711-06-101-006

Any and all lands of Lots 1, 2, 3, 4, 5, 6, 7 of "Bachman's Subdivision" located in Oceola Township are not included in this agreement

5. All that part of Outlot B of "Bachman's Subdivision", as recorded in Liber 7 of Plats, Page 14, Livingston County Records, lying in Genoa Township.

Tax Code No. 4711-06-101-007

Tax Code No. 4711-06-101-008

6. Land in the Township of Genoa, County of Livingston, State of Michigan, described as follows:

All that part of the Northwest 1/4 of the Southwest 1/4 of Section 6, T2N R5E, South of the Pere Marquette Railroad and West of the Ann Arbor Railroad containing 24 acres of land, more or less.

Tax Code No. 4711-06-300-002

7. Property situated in the Township of Genoa, Livingston County, Michigan

Being part of the Southwest 1/4 of the Southwest fractional 1/4 of Section 6, Town 2 North, Range 5 East, Michigan, described as follows: Beginning at the Northwest corner of the Southwest 1/4 of the Southwest 1/4 of Section 6, Town 2 North, Range 5 East, Michigan; thence South 460 feet along the centerline of the highway; thence East to the Westerly right of way line of the railroad; thence Northerly along the Westerly right of way line of the railroad; thence Northerly along the Westerly right of way line of the railroad to the North line of the Southwest 1/4 of the Southwest fractional 1/4; thence Westerly along the North line of the Southwest 1/4 of the Southwest fractional 1/4 to the point of beginning

Commonly known as: 945 Lucy
Tax Number: 4711-06-300-003

8. Land in the Township of Genoa, County of Livingston, State of Michigan, to wit:

A part of the Southwest part of the Southwest fractional 1/4 of Section 6, Town 2 North, Range 5 East, Genoa Township, Livingston County, Michigan, described as: Beginning at the Southwest corner of said Section 6; thence North 386 feet along the centerline of highway; thence North 89 degrees 38 minutes East 225.97 feet; thence South 386 feet; thence South 89 degrees 38 minutes West 225.97 feet to the point of beginning, EXCEPTING THEREFROM that part conveyed for highway purposes in Liber 402, page 610, Livingston County Records.

Tax Code No. 4711-06-300-004

9. Parcel No. 1

Part of the Southwest fractional 1/4 of Section 6, T2N-R5E, Genoa Township, Livingston County, Michigan, more particularly described as follows: Commencing at the Southwest Corner of said Section 6; thence along the West line of said Section 6, the centerline of Lucy Road and the Genoa-Marion Township Line, N 00 deg 42' 43" W, 386.00 feet, to the Point of Beginning of the Parcel to be described; thence continuing along the said West line of said Section 6 and the centerline of Lucy Road, N 00 deg 42' 43" W, 338.90 feet; thence N 89 deg 31' 12" E, 913.51 feet; thence along the West Line of the Ann Arbor Railroad (100 feet wide) S 05 deg 10' 50" W, 724.32 feet; thence along the North line of I-96 (Limited Access Highway) N 84 deg 59' 30" W, 616.24 feet; thence along a line previously surveyed and monumented, N 00 deg 42' 43" W, 325.02 feet; thence along a line previously surveyed and monumented, S 88 deg 59' 48" W, 225.97 feet, to the Point of Beginning; Containing 12.10 acres of land, more or less, and subject to the rights of the public over the existing Lucy Road. Also subject to any other easements or restrictions of record.

Tax Code No. 4711-06-300-008

10. Land in Section 6, T2N, R5E, Genoa Township, Livingston County, State of Michigan, commencing at the West 1/4 corner of Section 6; thence East 266.60 feet to the Easterly right-of-way of the C & O Railroad and the point of beginning; thence Southeasterly along said right-of-way 892.00 feet, more or less, to the Westerly right-of-way of the Ann Arbor Railroad; thence Northeasterly along said right-of-way 505.00 feet more or less, to the East-West 1/4 line of Section 6; thence West 862.75 feet to the point of beginning, containing 4.25 acres more or less.

Tax Code No. 4711-06-300-009

Drafted by: Dennis L. Perkins, P.C., 105 E. Grand River, Howell MI 48843

Return to: Jane Cartwright, Howell City Clerk, 611 E. Grand River, Howell MI 48843

APPENDIX 3

APPENDIX 3

**City of Howell
Planning Commission
November 20, 2019
611 E. Grand River Avenue
Howell, MI 48843**

The regular meeting of the Planning Commission was called to order by Chairman Streng at 7:00 p.m.

COMMISSIONERS PRESENT: Paul Streng, Maryanne Vukonich, Mayor Nick Proctor, Robert Spaulding, Jan Lobur, Erin Britten and Chelsea Dantuma.

ALSO PRESENT: Community Development Director Timothy Schmitt and Administrative Assistant Tonya Hubbard.

Others in Attendance: City Attorney Dennis Perkins, Interim City Manager Erv Suida, Police Chief George Basar, DDA Director Kate Litwin, Myrl Hawkins, Carole Gardner, Shannon Bastian, Gary Jennings, Jonny Jirasek, Andrew Buckner, Mary Buckner, Dan Brockway, Mark Robinson, Donald Parker, Greg Tormanen, John Beale, Jane Thierfeldt, Deborah Tschirret, Scott Tschirret, John Gardner, Sharron Gardner, Lindsay Abbott, Laura Webber, Brent Bender, Gary Coulier, Paula Coulier, Sean Bradley, Karrie Martin, Jennifer Urbib, Bill Schuster, Chris Schuster, Suzi Snyder, Matthew Brunn, Michael Archinal, Paul Rogers, Jaclyn Jirasek, Richard Holcomb, Linda Holcomb, Duane Brown, Esther Brown, Joyce Fisher, Timothy Sullivan, Duane Stokes, Tammy Beal, Bella Sines, Kathryn Tuck, Mike Merritt, Eliza Merritt, Sandy Cortez, Don Cortez, Gary Emerick, Laura Toms, Clarkson Warden, Jeannette Ambrose, Michael Mulvahill, Scott Ryba, Kathy Ryba, Mike Archer, Mary Archer, Elizabeth Garvey, Jeff Hansen, Kelly Hansen, Penny Jones, Donna Kramer, Dennis Flynn, Dean Norton, Vern Brockway.

APPROVAL OF MINUTES, OCTOBER 16, 2019 REGULAR MEETING

MOTION by Lobur, SUPPORT by Proctor, "To approve the October 16, 2019 regular Planning Commission meeting minutes as presented." MOTION CARRIED (7-0).

CALL TO THE PUBLIC

None.

STAFF REPORT

Community Development Director Schmitt informed the commission that fliers for the Designing Great Neighborhoods kick off meeting will be going out soon with a meeting being held on December 2nd and encouraged them to attend as well as invite others. He added that Michigan State University is using this as a research project to look at new ways of public input.

The Redevelopment Ready Communities (RRC) consultants will be hosting a meeting and invites will be going out soon for the RRC Priority Site, the former Holkins lot.

Staff is actively working with the State of Michigan regarding the test results from Diamond Chrome; once the results are available, they will be shared with the community. A public meeting

is scheduled for November 21, 2019 at Parker Middle School to provide information on this issue and discuss next steps in the process.

Community Development Director Schmitt introduced Paul Rogers, a volunteer with the Howell Area Junior Baseball Association (HAJBA) who spoke on the updates to Bennett Field. Mr. Rogers outlined restoration plans including new concession stands, dugouts and correcting a drainage issue. Mr. Rogers explained that the use of signs and banners will be seasonal and will come down after the season ends. Chairman Streng recognized the work going into the project.

PUBLIC HEARING #19-31 – 645 LUCY ROAD – SITE PLAN & SPECIAL LAND USE – PADNOS IRON AND METAL

Chairman Streng introduced the agenda item and opened the public hearing at 7:11 p.m.

Community Development Director Schmitt stated the applicant is requesting an expansion to the existing salvage yard with the addition of an industrial shredder. The property is currently zoned I-2, General Industrial; the zoning of surrounding properties was also reviewed. The applicant will need Board of Zoning Appeals approval to allow for the outdoor shredding equipment and the use of gravel rather than asphalt or concrete for several outdoor storage areas. Mr. Schmitt presented staff concerns and stated the shredder will be screened very well by the natural terrain of the property and the former City landfill, which will remain in perpetuity. Concerns relating to air quality, noise control and traffic that staff received were also reviewed.

Keith Noblett, Padnos Iron & Metal, introduced his company, indicated they work to protect the environment, are in the process of obtaining storm water and air quality permits from the state, and reviewed their experience developing Brownfield sites. Mr. Noblett presented their inspection process including hazardous materials, training on fire prevention equipment, noise control noting the natural screening and decibel readings which are within the city's ordinance, and their commitment to direct traffic eastbound. The traffic count report on Lucy Road was also discussed and Mr. Noblett reviewed their operation in Holland, Michigan. Commissioners questioned the review by the Howell Area Fire Authority, truck traffic on Lucy Road and ordinance requirements as well as safety issues on enclosing the shredder.

Chairman Streng opened the floor for public comment.

- Don Parker, 502 Chandler, indicated this was a massive automotive shredder that would process 160 gross tons per hour and expressed concerns with noise, potential fire hazards, traffic, dust and hazardous material. Mr. Parker requested denial of the site plan and SLU which he believed would have a negative impact on downtown.
- Mark Robinson, Executive Director Catholic Charities, expressed concern with the potential noise and traffic associated with the outdoor shredder.
- Vern Brockway, 6503 Oak Grove, discussed concerns relating to vibration and noise, and also stated that Lucy Road can handle the weight and he was in favor of the use proposed by Padnos.

- Richard Holcomb, 940 Lucy, questioned the traffic, hours of operation, and if they would do anything about the condition of Lucy Road stating his biggest concern was that the road could not handle the heavy trucks.
- Mary Buckner, 964 Lucy, stated Lucy Road had deteriorated and was concerned there was not enough room on the site for the processing.
- Bella Signs, 840 Lucy, stated concerns with traffic on a dead end street, vibrations, air quality, and its effect on future housing values.
- Stephanie Miklos, 417 Fowler, expressed concern with traffic and potential fires.
- Andy Buckner, 964 Lucy, stated the viaduct is not wide enough for more traffic; when it floods Grand River it is down to one lane. Lucy Road needs a total rebuild to accommodate truck traffic.
- Dan Brockway, 386 Lucy, stated his support for the use proposed by Padnos however noted Lucy Road needs to be paved.
- Liza M, 603 E. Sibley, discussed air quality and potential carcinogens associated with this type of shredder.
- Scott Niblock, 139 Inverness, presented a risk vs. reward standpoint and stated he doesn't think the risk of problems is worth the reward of increased tax base for a gain of \$70,000.
- Jacklyn Jirasek, 617 N. Court, expressed concern with the effects on public health in the future, stated she doesn't trust state regulations and doesn't support the Padnos operation.
- Laura Webber, 550 W. Dieterle, noted concerns with noise, impact on the environment, and air quality.
- Mike Archinal, 551 Indian Oaks (Genoa Township Manager), questioned the distance between structures and the closest piece of equipment, the difference between the Lansing and Holland operations, traffic volumes, water/sewer service, and referenced the due diligence included in the 425 agreement between the City and Genoa Township
- Gerry Warden, 215 Livingston, discussed traffic and the impact of dust on the wetland.
- Gary Emerick, 933 Whitley Circle, stated the operation is not good for the community; air quality will hurt the festival population, and questioned why the shredder cannot be enclosed.
- Dean Norton, 420 Lakeshore Pointe, expressed concern with the processing of 160 tons of material per hour and questioned the number of cars per trailer, haulers used, additional noise from trucks themselves, and the impression the operation will have on visitors.
- Penny Jones, 304 W. Brooks, reiterated the same concerns and questioned why the public is just now hearing about it.
- Ron Zupko, 442 Browning, suggested more due diligence be completed to consider all factors before a decision is made.
- Gary Jennings, 550 Roselane, stated his opposition to the Padnos operation noting traffic and rail use.

Keith Noblett explained potential vibrations and the use of isolation pads. He further described the shredding process and noted the actual shredder is electric, loaders run on diesel. It is possible to process 160 tons per hour however it depends on regulations outlined in the state permit. He also discussed air quality, truck styles, the amount of outbound vehicles, the welding process used for repairs, and stated an enclosure is possible however not practical.

Discussion followed with Planning Commissioners on fire protection, the inspection process on inbound material, regulations on hours of the shredding operation, and on site storage.

- Elizabeth Garvey, 403 Lake, stated there was no commercial benefit to the City of Howell.
- Jennifer Urbin, 210 E. Grand River Apt. B, questioned torching and the effect on air quality, road problems and frost laws.
- Richard Lim, 2676 Laurel Ridge Lane, questioned Padnos world class terminology
- Candy Jones, 2066 Pine Ridge Meadow Ct., questioned air quality if the shredder was enclosed.
- Linda Holcomb, 940 Lucy, inquired about the zoning and proposed hours of operation.
- Carrie McClain, 619 N. State, questioned when the new technology was developed.
- Mike Archer, 178 Lakeshore Vista, expressed concern with traffic.
- Dennis Flynn, 2731 Laurel Ridge Lane, inquired about road frontage and the Latson Road exit.
- Lindsay Abbott, 666 Illinois, expressed her opposition to the request.
- Dan Lowe 2441 Norton, discussed extending water service and his opposition to the request.

Chairman Streng closed the public hearing at 9:05 pm.

Mayor Proctor talked about Padnos' competition and stated that traffic shouldn't worsen based on what Padnos is doing now on site and what traffic it is generating. Commissioner Spaulding questioned containing the equipment in a building, discussion followed on feasibility. Commissioner Lobur asked about BZA and the process. Further discussion occurred about how long the property and the area used for scrapping had been zoned industrial. Mayor Proctor noted the use was anticipated in this zoning district.

MOTION by Proctor, SUPPORT by Britten "To approve the Site Plan and Special Land Use application (#19-30) for 645 Lucy Road and the vacant property to the north, parcel ID numbers 4717-06-100-005, 4717-06-100-002, and 4717-06-300-005 to allow for an expansion of the existing salvage yard, including the addition of a new outdoor metal shredder, subject to the following conditions:

1. **The State of Michigan Air Quality permit shall be issued prior to any construction commencing on the site.**
2. **Board of Zoning Appeals approval to allow for the outdoor shredding equipment and the use of gravel rather than asphalt or concrete for several outdoor storage areas and vehicular maneuvering on the site.**
3. **The proposed construction and use shall meet all applicable ordinance standards.**
4. **Building permits shall be acquired for all work on the site.**
5. **No burning of any kind shall be permitted on site.**
6. **The applicant shall clarify the outdoor storage areas on the site plan and provide more details of what is proposed to be stored where.**
7. **No equipment and/or vehicles shall be visible from the adjacent property and/or roadway.**

8. **Semi-trailers and other similar vehicles may not be used as temporary storage facilities**
9. **The owners shall meet all the standards for Environmental Performance and Design Standards of Article 8 of the Zoning Ordinance.**
10. **Operation of the shredder shall be restricted to Monday through Friday 7:00 am to 5:00 pm.**
MOTION CARRIED (5-2) Members Spaulding and Vukouich opposed.

NEW BUSINESS

Chairman Streng suggested a resolution be drafted in appreciation of Deanna Robson. **MOTION** by Spaulding, **SUPPORT** by Proctor, “To draft a resolution in appreciation of Deanna Robson.” **MOTION CARRIED (7-0).**

ADJOURNMENT

MOTION by Spaulding, **SUPPORT** by Britten, “To adjourn the meeting at 9:30 p.m.” **MOTION CARRIED (7-0).**

Tonya Hubbard, Administrative Assistant

APPENDIX 4

APPENDIX 4

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Weather](#)[Michigan](#)[Sub:](#)[Sign In](#)[Search](#)

[GRAND RAPIDS](#)

Video: Scrapyard fire, smoke cover areas of Walker, Grand Rapids

Updated Apr 03, 2019;

Posted Aug 03, 2010

By [Heidi Fenton | hfenton@mlive.com](#)

Fire at scapyard

WALKER -- Billows of thick, black smoke clouded the air over parts of Walker and northeast Grand Rapids this afternoon, spreading over I-96 as curious travelers slowed to see the scrap fire at Louis Padnos Iron & Metal scapyard.

Near the site on Turner Avenue NW, the intersection was so thick with smoke that motorists pulled over to watch the blaze.

Firefighters from Walker and Grand Rapids worked to battle a fire deep inside a pile of scrap steel, sheet iron, car bodies and old appliances.



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Weather](#)[Michigan](#)[Sub:](#)[Sign In](#)[Search](#)

Walker Police Sgt. John Paasch said the fire was reported around 2:30 p.m. Grand Rapids firefighters were first on the scene, he said, and Walker firefighters immediately followed. Paasch said no one was injured in the blaze, but expected authorities to be on the scene into the evening.

Workers could be seen using trucks to pick apart the pile, digging in to find the source of the flames. Paasch said several "small explosions" had happened within the burning material while he was on the scene.

Allen Tomes, Padnos' director of operations, said the burning material was feed for a nearby shredder. Maintenance crews had been working inside that shredder, located west of the scrap pile, and noticed smoke shortly before authorities arrived.

Since scrap metal burns at such a high temperature, Tomes said he did not anticipate much of a financial loss from the day's events. Most of what burned, he said, was rubber and the insides of car bodies.

Tomes was not sure how the blaze started, but said it may have been due to ignitable fluids or the hot, humid temperatures.



"It could be somebody left a fuel tank inside a car," he said.

Tomes said employees are trained to make sure all the fuel is emptied before cars are

GRAND RAPIDS

Overnight fire was third blaze at Padnos scrap yard in Grandville

Updated Apr 03, 2019;
Posted Oct 07, 2011

By Julie Hoogland | jhoogland@mlive.com



Press file photo

GRANDVILLE -- Grandville firefighters spent four hours early today putting out a scrap metal fire at the Louis Padnos Iron and Metal Co. -- the third blaze at the Grandville processing facility within a year.

Heat-sensors and other surveillance tools were installed after the previous fires, but the equipment malfunctioned earlier this week because of a power surge, company spokesman Scott Wolters said.

FEATURED JOBS

Custodian

Bay-Arenac ISD

12.18.19 | Bay City, MI (48706)

**Structural Engineer, Fabricator /
Welder, Field Installer, Project
Manager, Inspector / Trainer, Material
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"We're at a loss ourselves to know what's causing it, but we don't think it's vandalism or arson," Wolters said.

The malfunction "happened at the worst possible time," he said.

Eighteen firefighters worked the scene, 3485 Viaduct St. SW, between 1 and 5 a.m., and firefighters are returning today to investigate, Grandville Fire Chief Michael May said.



"It was several large piles of scrap metal, but it wasn't nearly as spectacular as it looked," the chief said.

The fire did spark odor complaints from Jenison and Walker residents, but the materials are not hazardous, he said.

"I would not call it suspicious at this point, but the investigation is still pending," he said.

The piles that burned are car parts processed during the scrap metal recycling process, Wolters said.

He said the company will continue efforts to fix the facility's fire problem, which

temperatures is rising," he said.

"We're going to continue to have that system in place, and we'll review again why in the past year we've had a problem we weren't having previously."



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Flames shoot more than 80 feet into the air at Padnos yard in Walker

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Flames shoot more than 80 feet into the air at Padnos yard in Walker

Posted: 4:24 AM, Jul 01, 2016
Updated: 2:16 PM, Jul 01, 2016
By: [FOX 17 News](#)



FOX 17 Morning News

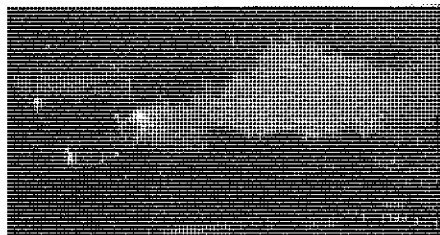


WALKER, Mich. -- Workers at Padnos Iron and Metal were moving scrap items into a shredder late Thursday night when a fire ignited that sent flames shooting 80 to 100 feet into the air. Walker fire units arrived shortly after midnight and had a difficult time due to layers of scrap metal in the ignited pile, said Walker Fire Department Battalion Chief Don Munn.

Rain helped a bit, but not much, and the wind changed direction several times as crews fought the fire, delaying their efforts against the blaze that much more. "When we would move a pile and we would start hitting on what's burning, then the wind would shift, and it would start the pile that we just moved on fire. So, we were kind of fighting ourselves," said Munn.

Even lightning worked against the firefighters, but Munn credited a dispatcher for helping with updates on the location of incoming storms.

There was nothing toxic in the scrap despite the presence of appliances and even vehicles. Padnos removes chemicals such as coolants and fuel from scrap before shredding it, Munn said.



Smoke and steam continues to billow hours after the fire began

All of the Padnos workers are accounted for, and there are no reported injuries.

Fire crews had several hours more of working on completely dousing the fire, said Munn at 5 a.m. One problem, he said, was that the scrap contained some magnesium, which spreads the fire when water hits it.

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Nearly 50 arrested in human trafficking sting near Metro Detroit

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Shooting in Grand Rapids leaves man in critical condition

Shooting in Grand Rapids leaves man in critical condition

GRAND RAPIDS

Smoke billowing from machine and scrap fire at Padnos recycling yard

Posted Oct 26, 2019



A U.S. 131 traffic camera at Leonard Street captured smoke from a metal recycling yard fire at 2125 Turner Ave. NW in Grand Rapids

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By [John Tunison](#) | jtunison@mlive.com

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WALKER, MI -- Fire crews were battling a scrap



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The fire was reported about 2:20 p.m. Saturday, Oct. 26.

Firefighters were told that a sorting machine in a yard caught fire, which then caught some surrounding scrap on fire.

Firefighters from Walker and Grand Rapids were at the scene.

Heavy smoke could be seen on a traffic camera at U.S. 131 at Leonard Street.

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The treatment of auto shredder residue today

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While approximately 75 percent (by weight) of a vehicle is recyclable, the EPA stated that an estimated 1 million tons of auto shredder residue could be recovered for fuel, saving \$20 million annually.

by [MAURA KELLER](#)

The auto recycling industry has become highly regulated in the U.S. by government environmental regulatory agencies, on the federal, state, county and municipal levels.

When end-of-life vehicles are recycled by shredding via shredder plants, there is a large amount of residue left over. Referred to as automotive shredder residue or ASR, it contains mostly non-metallic materials like plastics, rubber, wood, paper, textile, leather or glass. The primary organic and inorganic chemical constituents of concern found in ASR include: polychlorinated biphenyl (PCBs), metals such as lead and cadmium and total petroleum hydrocarbons (TPH). In addition, lower levels of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) may also be found.

Dan Flynn, litigation partner at Dinsmore and Shohl LLP, who focuses on OSHA matters, said there are a number of key issues and challenges pertaining to auto shredder residue faced by recyclers. The exact composition of ASR will vary based by vehicle, as well as the dismantling and recovery procedures of the salvage facility where the vehicle was shredded. If not properly stored and disposed of, toxic substances within the ASR may leach into surrounding soil and groundwater. And depending upon its composition, ASR may also be flammable.

“ASR can pose safety and environmental hazards that recyclers need to manage,” Flynn said. The biggest debate often associated with managing ASR is whether to dispose of the non-metallic ASR generated in recycling operations or whether the non-metallic ASR can be economically recycled for another use.

“OSHA standards play a role in how ASR is managed because the ASR often contains a number of contaminants regulated under OSHA’s general air contaminant standard – the z-listed contaminants – and chemical-specific standards, such as lead,” Flynn said. Recyclers that have robust safety and industrial hygiene programs, however, are generally able to ensure that all of their employees can manage ASR in a safe and healthful manner.

Over the years, recyclers have been able to move forward with plastic recycling operations with increasing certainty that the feedstock and operations will comply with EPA’s regulations.

“Recyclers are now coming up with various innovative ways to capture more of the ferrous and nonferrous metal from the recycling operations and ways to recycle the plastics found in ASR,” Flynn said.

Environmentally Speaking

ASR, also called auto fluff, has long been deposited into landfills, resulting in millions of tons of waste each year. According to the EPA, approximately 75 percent (by weight) of a vehicle is composed of metals that are recycled. The remainder – auto shredder fluff is disposed of primarily in landfills.

In fact, the U.S. EPA stated that approximately one million tons of ASR could be recovered for fuel, which would reduce carbon dioxide emissions and conserve around one million tons of coal each year, as well as avoid landfilling, resulting in an annual savings of \$20 million.

Of course, many hazardous chemicals are used in the manufacturing and maintenance of automobiles. According to the Blue Ridge Environmental Defense League in North Carolina, a review of ASR auto fluff by the Ecology Center in Michigan found several toxic contaminants in fluff. Studies completed by the German EPA and the U.S. EPA report that auto fluff contains mercury, lead, cadmium, chromium, arsenic, polyvinyl chloride and PCBs. The state of California considers auto fluff a hazardous waste requiring special disposal.

An EPA study of emissions from fires at ASR landfills and stockpiles, stated, “A number of these stockpiles have caught fire, resulting in the emission of numerous air pollutants.” This study concluded that, “substantial quantities of air pollutants are emitted.” and “cadmium, copper, lead and zinc were found in significant quantities.”

That’s why, the EPA is pushing vehicle manufacturers to design vehicles with recovery in mind and to reduce toxic and hazardous constituents in vehicle shredding.

The top environmental concerns are whether polychlorinated biphenyls (PCBs) potentially contained in the plastics found in ASR are excluded from the Toxic Substances Control Act (TSCA)’s regulations. The EPA banned the manufacture of PCBs in 1979 after research linked PCBs to cancer and other health threats to the immune, reproductive, nervous, and endocrine systems.

Section 6(e) of the Toxic Substances Control Act generally prohibits the manufacture, processing, distribution, and use of polychlorinated biphenyls (PCBs), but a list of “excluded PCB products” have been classified by EPA as suitable for use, processing, and distribution. Those products must typically have concentrations of PCBs less than 50 parts per million (40 C.F.R. pt. 761.20(a) and (c)).

“Recyclers can utilize the Voluntary Procedures for Recycling Plastics from Shredder Residue set forth by the Institute of Scrap Recycling Industries, Inc. and approved by the EPA,” Flynn said. “If recyclers choose to implement other procedures, they must be able to demonstrate that the feedstock and residue consists only of excluded polychlorinated biphenyls (PCB) products.”

Back in 2013, the EPA was approached by the Institute of Scrap Recycling Industries, Inc. regarding separation, recycling, use and distribution of recycled plastics from shredder residue recovered from metals recycling facilities. After finalizing an interpretation of regulations governing the management and recycling of polychlorinated biphenyls, the EPA provided interpretations that will allow for plastics to be recovered during the recycling process as long as the materials do not contain levels of PCBs exceeding 50 parts per million. This new interpretation may reduce the amount of ASR that is landfilled each year by more than one million tons and may also help improve the material recovery rate for end of life vehicles to more than 90 percent.

Specially, the EPA report stated, “EPA is adopting the generic 50 ppm exclusion for the processing, distribution in commerce, and use, based on the Agency’s determination that the use, processing, and distribution in commerce of products with less than 50 ppm PCB concentration will not generally present an unreasonable risk of injury to health or the environment.”

And on the state level, more attention is being paid to ASR regulations and recycling of ASR components. Recyclers and scientists have been searching for ways to recycle and reuse ASR. Currently several states allow the use of ASR as an alternative daily landfill cover, which limits odors and prevents trash from blowing away.

In Carroll, County, Indiana, for example, a new facility is taking shape whereby plastic components within ASR will be converted into diesel fuel. GEP Fuel & Energy Indiana and its partner U.S. Energy Logistics recently broke ground on the

\$350 million facility, which will house both a recycling center and a plastics-to-renewable diesel refinery. Local officials expect the facility to create more than 250 jobs by 2020.

At the Carroll County facility Camden Recycling, LLC will focus on recycling plastic car parts, making it the largest auto plastic recycling center in the country – and the first-ever in the U.S. to convert plastic into fuel.

Because ASR is full of plastics, which are made of petroleum, it also has the potential for use as a fuel supplement in cement kilns.

The California Department of Toxic Substances Control (DTSC) also has developed a method for processing ASR for use as fuel for cement kilns. According to the DTSC, the process results in a mix of ASR that has a heating value of about 13,240 Btu per pound, which is higher than most types of coal. The DTSC also found that processing and using all of California's ASR for cement kilns would save automobile recyclers and shredders \$20 million per year by avoiding landfill costs and would save cement manufacturers \$50 million each year through reduced energy costs.

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Richmond Scrap Metal Company Cited For Air Quality Violations After Toxic Fire

February 6, 2018 at 2:10 pm Filed Under: Air Quality Violation, Bay Area Air Quality Management, Fire, Richmond, Scrap Metal



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RICHMOND (CBS SF) — Two air quality violations have been leveled against a metals company after a fire broke out last week at its Richmond facility, Bay Area Air Quality Management District officials said Tuesday.

Sims Metal Management was issued a public nuisance violation and an illegal open burning violation after a fire Jan. 30 at its scrap metal recycling yard at 600 S. Fourth St.

Fines and penalties are under review and will be levied in the future, air district officials said.

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The fire started at about 5 p.m. and led to a shelter-in-place order for residents in the nearby area.

Elevated levels of benzene, a carcinogen, were found in the air near the fire and at an air pollution monitor at Point Richmond.

"The Air District is continuing to investigate this incident for all potential air quality violations in collaboration with Contra Costa Health Services and other agencies," district executive officer Jack Broadbent said in a statement.

Flames burned a large scrap metal pile, sending heavy black smoke into the air and resulting in air quality complaints from residents and local authorities.

Air district officials said that there were road closures and limited evacuations in addition to the shelter-in-place order, all of which prompted the public nuisance violation.

The violation for illegal burning was leveled against the company because it should have prevented the fire.

Dr. David Goldstein, Contra Costa Health Services deputy health officer, said it's difficult to say there was no negative health affects from the elevated levels of benzene.

But "the real concern would be long-term exposure" and the elevated levels did not last long enough for residents to be exposed to benzene "long-term," Goldstein said.

Sims Metal Management spokeswoman Jill Rodby said, "We will need to review the notices and work cooperatively with the agency to address its concerns."

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APPENDIX 5

APPENDIX 5

**Technical Support Document
for
Draft Air Emission Permit No. 14100076-101**

This technical support document (TSD) is intended for all parties interested in the draft permit and to meet the requirements that have been set forth by the federal and state regulations (40 CFR § 70.7(a)(5) and Minn. R. 7007.0850, subp. 1). The purpose of this document is to provide the legal and factual justification for each applicable requirement or policy decision considered in the preliminary determination to issue the draft permit.

1. General Information

1.1 Applicant and stationary source location

Table 1. Applicant and source address

Applicant/Address	Stationary source/Address (SIC Code: 5093)
EMR USA 143 Harding Ave Bellmawr, New Jersey 08031-2430	Northern Metals, LLC 13196 Hancock Street SE Becker, MN 55308
Contact: Thomas Swafford Phone: 651-328-8825	

1.2 Facility description

Northern Metals, LLC in Becker ("Permittee" or "facility") is a proposed scrap metal recycling facility. The facility will operate a shredder, associated ferrous processing equipment, a metal recovery plant (MRP), an end-of-life vehicle (ELV) process, and a community metals receiving center. The main sources of air emissions are the shredder, ferrous process, MRP, and fugitive dust from paved roads and material handling. The shredder, ferrous process, and MRP will be enclosed in buildings and controlled by particulate matter control devices. The shredder will also be controlled by a thermal oxidizer. Fugitive dust will be mitigated by sweeping, watering and other best management practices as required by the facility's fugitive dust control plan.

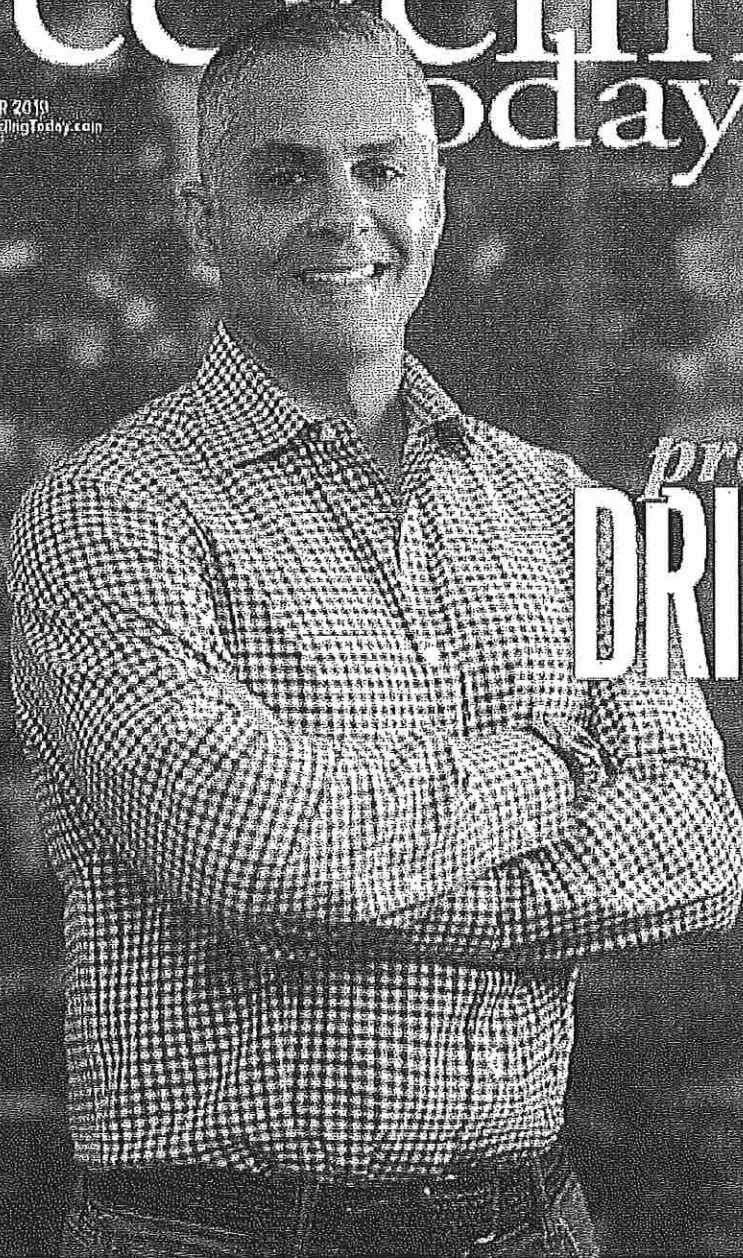
General description of the proposed process

1. **Scrap receiving.** Northern Metals will receive scrap by truck and occasionally by rail from contracted suppliers. Northern Metals will also receive scrap from the public through its community metals receiving center.
2. **Inspection and depollution.** Northern Metals' suppliers certify that their loads are free of hazardous or unacceptable materials. Hazardous or unacceptable materials are defined by the facility's feedstock control plan, which is Appendix C of the permit. Northern Metals will inspect all loads and segregate hazardous or unacceptable materials or reject loads that are found to contain hazardous or unacceptable materials. Northern Metals will also accept unprocessed vehicles at its ELV process. The ELV process will remove all fluids, refrigerants, batteries, lead-containing parts, catalytic converters, tires, mercury switches, and shredding hazards from the vehicle prior to shredding.
3. **Shredding.** Scrap that is free of hazardous and unacceptable materials will be loaded onto a conveyor using a crane and conveyed into the shredder building. The shredder will break down the scrap in to small pieces.
4. **Downstream ferrous processing.**

FERROUS SCRAP MARKETS TRENDED DOWNWARD IN 2019 | PAPER RECYCLING SUPPLEMENT | SCREEN MAINTENANCE ADVICE

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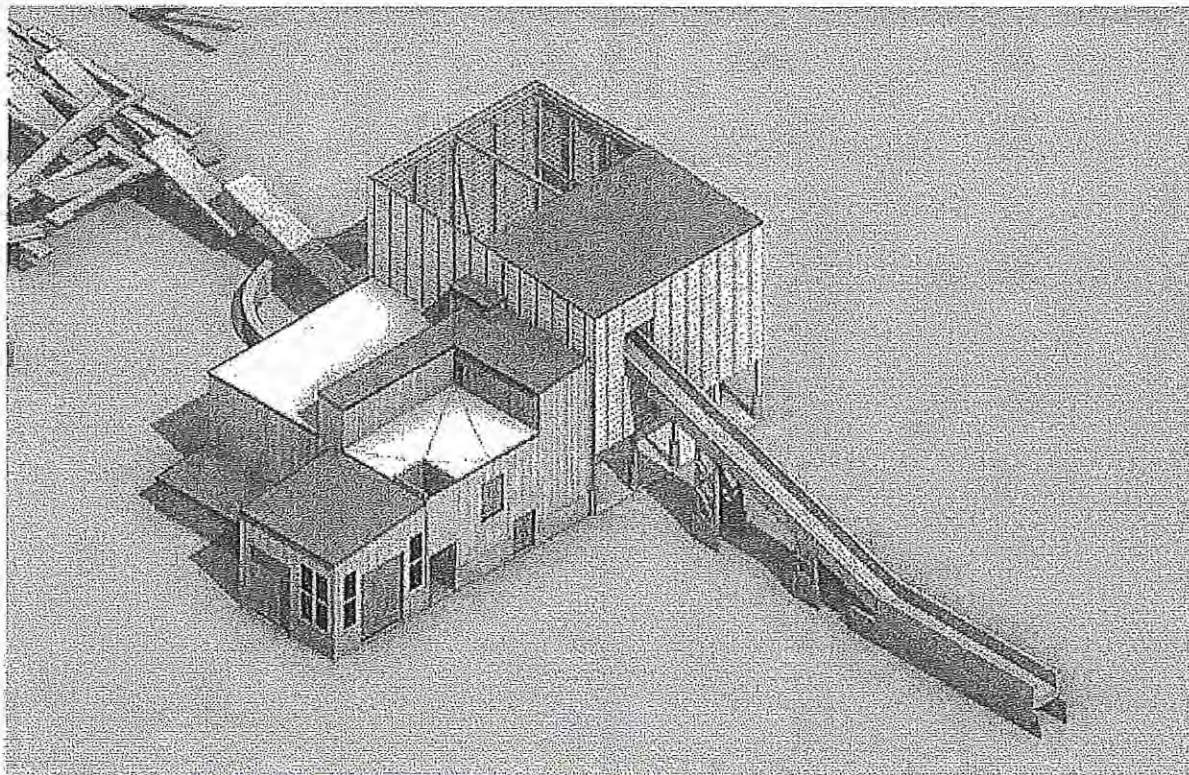
process
DRIVEN

Regency Technologies, headquartered in Sloss, Ohio, embraces process throughout its electronics recycling and reuse operations.

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A concept drawing of General Iron's enclosed auto shredder to be installed at its new yard on Chicago's south side.

City of Chicago, General Iron reach agreement on the company's relocation

General Iron to decommission its yard on the north side of Chicago.

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September 12, 2019



Posted by DeAnne Toto

Auto Shredding Ferrous Legislation & Regulations Nonferrous

The administration of Chicago Mayor Lori Lightfoot, working with Alderman Brian Hopkins and Alderman Susan Sadlowski-Garza, has provided an update on its efforts to work with scrap processor and auto shredder operator General Iron Industries Inc. regarding operations at its existing facility at 1909 North Clifton Ave., which will cease operations in 2020. In 2021, Reserve Management Group (RMG), Cleveland, will relocate the business to a new facility to be developed at that company's existing location on Chicago's south side.

"The agreement reached this week with General Iron will make way for an exit plan that will ensure the company continues to meet all regulatory standards and prioritizes protecting public health and the environment while it winds down operations at its north side facility," according to a press release issued by the Lightfoot administration.

The agreement is designed to increase transparency for the community and all stakeholders, establish clear expectations for the parties involved and set the stage for the transition from the company's current site to a new and expanded metal recycling plant in 2021, the news release states.

"The city's new agreement with General Iron will ensure the company meets all applicable environmental regulations and operating requirements under its current permit and will provide a clear timeline for its eventual relocation," says corporation counsel Mark Flessner.

The new agreement lays out a series of additional requirements for General Iron to fulfill to ensure a safe and manageable relocation and to maintain its operating agreement with the city. First, General Iron must continue to adhere to all applicable legal and environmental requirements. Second, the company must cease all metal recycling operations by Dec. 31, 2020, and post signage informing the public of the closure near the plant's entrances at least one month prior to ceasing operations. Finally, effective immediately, the company must provide traffic control to mitigate congestion during rush hour and manage truck congestion so as not to impede neighboring businesses.

"I accept the plan developed by both the city and General Iron to ensure my community and all stakeholders have a clear path forward on the decommissioning of the facility next year," says Alderman Brian Hopkins, 2nd Ward. "This agreement provides our community a clearer understanding of the plan for the company's transition, takes appropriate action to address the significant traffic congestion issues caused near the facility and will allow us to look ahead to focus on the priorities of the North Branch Corridor and the 2nd Ward."

As part of its move to a new south side facility, the company will adopt new environmental features at its new recycling facility, which will feature an enclosed auto shredder equipped with suction hood, high-efficiency filters, solar panels and air-monitoring technologies. The move also is expected to create new jobs for the community and make way for apprenticeship opportunities.

“After working alongside the city and General Iron to carefully review the company’s proposal, we are confident in the current plans to protect the environmental health of our community while allowing additional jobs for our residents,” says Alderman Susan Sadlowski-Garza, 10th Ward. “I commend the city of Chicago for taking the initiative to broker this agreement that will give all parties even greater assurance that the company will exhaust all environmental measures as part of its relocation and expansion to the 10th Ward.”

The company has taken steps to bolster its environmental practices and facility features by adding new equipment, including the first regenerative thermal oxidizer (RTO) and scrubber at a Chicago recycling facility in 2019. These features will be transferred to and placed into operation at the new site.

“We are grateful for the mayor and her team’s leadership in forging an appropriate compromise to support the continuity of the critical service that General Iron has performed for more than a century,” says Adam Labkon, vice president of General Iron. “We are excited that this new venture, led by RMG, will continue providing more than 100 jobs and critical metal recycling services.”

General Iron and RMG have a plan that will allow RMG to acquire all business and assets of General Iron at its Lincoln Park site. Both companies entered into a strategic agreement in July that will relocate the facility to its new location on the south side.

“We appreciate the city’s assistance in helping us to move forward with building a new, state-of-the-art facility to complement RMG’s existing recycling operations on the city’s south side,” says Steve Joseph, president of RMG. “We expect to create nearly 800 on- and off-site construction jobs, and we are committed to protecting the environment and public health and safety as the business transitions from the north side to our longtime southside home.”

To facilitate a productive partnership and continued cooperation, the city and General Iron have committed to an ongoing process allowing the parties to resolve issues or concerns during the transition, the press release notes.

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September 12, 2019



Posted by Kelly Maile

International Recycling News Financial

Dust Buster: Wilkinson to enclose shredder to quiet noise, trap emissions

By GARY LONG, The Brownsville Herald | Posted: Sunday, February 28, 2010 12:00 am

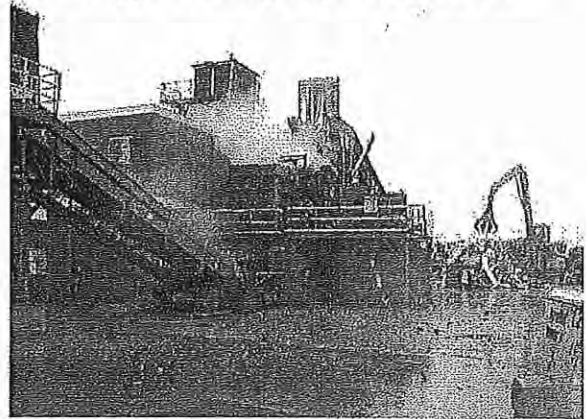
Construction is under way at Wilkinson Iron & Metal on a structure to enclose, quiet and contain emissions from a \$4 million metal shredder that has caused disruption at nearby Victoria Heights Elementary School.

The 70-foot by 45-foot building will be 50 feet tall and is designed to trap virtually all particulate emissions from the shredder, owner Jim Wilkinson said last week. The shredder has been operating since May at Wilkinson's scrap metal recycling yard at 3145 E. 14th St.

In October, Victoria Heights Principal Michael Moreno filed a complaint with the Texas Commission on Environmental Quality, concerned about the watery eyes and scratchy throats reported by students and staff at the school after the shredder started operating.

TCEQ monitored the school grounds and the Wilkinson yard from Oct. 23 to Nov. 23, concluding that the air contained a high enough concentration of iron oxide — essentially rust — to constitute a clean-air violation, according to the TCEQ report on its investigation.

The athletic fields and open-air gymnasium at Victoria Heights, 2801 E. 13th St., butt up against the Wilkinson yard. In addition to complaints about watery eyes and scratchy throats, coaches have said it's almost impossible to make themselves heard during outdoor athletics when the machine is running. Teachers complain it's hard to keep students focused on their lessons because of the noise.



Dust Buster: Wilkinson to enclose shredder to quiet noise, trap emissions

Metal shredding operations continue at Wilkinson Iron & Metal on E. 14th Street in Brownsville. Wilkinson is in the process of enclosing its \$4 million shredder with a soundproof building to cut down noise and trap emissions.

Moreno reported the noise situation to the BISD Police Department after an explosion, which appeared to come from the shredder, rocked the campus last fall.

Moreno said he was glad to hear that Wilkinson is taking steps to quiet the shredder and eliminate the mist of electric-smelling metallic dust that often wafts over his campus. He said fourth-graders at the school will take their TAKS writing test Wednesday and he hopes the machine will be quiet that day.

Last year Victoria Heights students scored high enough on the Texas Assessment of Knowledge and Skills to earn the Texas Education Agency's best rating of exemplary. They hope to repeat the performance this year.

At Wilkinson, contractors are sinking pilings 10 feet into the ground to hold posts for the building. Plans call for twin heavy-gauge tin walls six inches apart. Foam insulation will be pumped into the gap to soundproof the building, Wilkinson said.

"They're telling us the building will be up in 21 days," Wilkinson said. "It's supposed to eliminate 70 percent of the noise ... and all that dust will fall down inside that building. It should quiet us down, as well as keep the emissions down."

As a first step, Wilkinson has put up a 30-foot wall along its boundary with Victoria Heights to cut down some of the noise and dust.

Wilkinson said the shredder would have to shut down during construction of the enclosure. The lost production and the cost of the building represent a "substantial" expense that Wilkinson said he is glad to absorb to address public health and safety concerns.

Meanwhile, Moreno's original complaint to the TCEQ is "wending its way through the regulatory process," agency spokeswoman Andrea Morrow said. Eventually there will be an agreed order

between Wilkinson and the TCEQ stating what the two parties agree needs to be done to address the complaint. It likely will formalize what has by then already been done, she said.

The fact that Wilkinson took action on its own would act to minimize any fine assessed against the company, Morrow added.

Kelly VanMarter

From: David Allen <davo83@hotmail.com>
Sent: Wednesday, December 22, 2021 2:55 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Genoa Township Asphalt Plant

Hi-

I am asking, as a resident of Genoa Township, that you do not allow the rezoning to allow for an asphalt plant in our community.

This is a residential area with many families and children. The increased truck traffic, pollution, and potential water table contamination, has us all worried. We don't know how this will affect our health and we don't want that risk near our homes.

Additionally, many of us are spending a large percentage of our incomes on these homes. The mere presence of an asphalt plant immediately jeopardizes all of our home values. Values we've spent our entire working life building.

Please consider the Genoa township families that live here. Our health and well-being are more important than the revenue produced from an asphalt plant.

Please do the right thing and deny the rezoning request. You wouldn't want this in your backyard and neither do we.

Thank you for your time.

David Allen
5451 Mystic Lake Drive
Brighton MI 48116

Kelly VanMarter

From: Eda Biegas <ebiegas@gmail.com>
Sent: Wednesday, December 22, 2021 10:30 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Upcoming vote

To the board of trustees,

When I first learned that Capital Asphalt wants to build a asphalt mixing plant in Genoa Township I was shocked. I was surprised and angered for many reasons.

#1, I had not heard about this and the proposed zoning change.

#2, That the planning committee didn't reject this when it was first brought to them.

#3, That not one resident that I informed about this had any clue that this was a possibility.

#4, That any of our officials would consider putting our community's health and well-being in jeopardy.

As the news of the proposed asphalt plant is spreading, it is very clear how the residents of Genoa Township feel. We don't want it! The location is much to close to our neighborhoods and local businesses. Our health and well-being are at stake. This would also affect property values. The residents of Genoa Township elected the board of trustees to represent them! Please listen to us and vote NO on the rezoning and anything else that would allow the asphalt plant to locate in our community.

It is a great disappointment that this zoning change was recommended by the planning commission but now that it is in the hands of the board of trustees I am trusting all of you do right by the residents of Genoa Township. Please vote no!

Respectfully,
Eda and Robert Biegas
1950 Genoa Circle
734-751-8154

Kelly VanMarter

From: Beth <bethodea17@gmail.com>
Sent: Wednesday, December 22, 2021 9:34 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant

I am reaching out again to share my concerns regarding the proposed asphalt plant. The location is so close to and elementary school, the location our local junior football league plays, neighborhoods, and the area those visiting our town see first. Will other area junior programs even want to allow their teams to play In Howell so close to pollutants that cause poor air quality. What an eye sore would a huge towering piece of this plant be for our town. Not to mention the smells coming from it or the pollutants we all will be forced to breathe in if this is allowed to happen.

I urge the board to listen to the community and their concerns as you are a representative for the community. Take into consideration what those driving the expressway will see and think of this town seeing a towering asphalt plant. Please stand United with the citizens and do what is right and best for all. The asphalt plant is neither of those.

Thank you
Elizabeth O'Dea

Sent from my iPhone

Kelly VanMarter

From: suzieq48154 <suzieq48154@aol.com>
Sent: Thursday, December 23, 2021 6:33 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt plant

Follow Up Flag: Follow up
Flag Status: Flagged

Merry Christmas, I'm sending this out because we are moving to the area in January, and we are so excited, but then we also worried about the possibility of a asphalt plant being built so close to where we are moving.(rolling ridges) I hope you can put health and public safety ahead of economic's . Once again we wish you a merry Christmas and a happy new year.

Bob and Sue Cunningham

Sent from my iPhone

Kelly VanMarter

From: Dawn Mital <mitaldawn@gmail.com>
Sent: Thursday, December 23, 2021 9:24 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: No to Asphalt Plant

I urge you to support the community you represent and stand with us by voting against the asphalt proposal. Among many obvious concerns includes the air and odor pollution that will be created in our wonderful community. We will all be impacted terribly by this including residential homes and neighborhoods, retail businesses, a daycare center, and a hotel as well as the city of Howell, Brighton, Genoa Township and natural (and protected) environments and lakes. This plant would be a deterrent for new buyers purchasing property in Genoa, Howell and surrounding communities. This could impact property values negatively. I am extremely concerned if our represented leaders have thought long-term regarding the devastating effects from this decision, especially knowing full well that other townships in our radius have rejected this plant proposal.

A recent conversation with a neighbor, who is a retired environmental engineer from California, pointed out that plants like this in the west are usually built in the desert. This statement struck me. There are numerous plants already in a 40-mile radius--our community is indicating to you we do not want or need another!!!

I wish you a merry Christmas and a healthy new year.

Dawn and Ken Mital

Kelly VanMarter

From: John McCormick <mcghost1@icloud.com>
Sent: Friday, December 24, 2021 2:37 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Clean air in Livingston county.

Follow Up Flag: Follow up
Flag Status: Flagged

Good afternoon and Merry Christmas to each of you and your families. My name is John McCormick and I live with my wife Mary Wilt at 5695 East grand River in Genoa Township.

I would like to voice my concern into the possible construction of an Ashfault plant near our home. I am disabled in a wheelchair with extreme lung conditions as COPD asthma and Acute immune deficiencies.

If this plant is built near my home this is going to affect me going outside of my home to get fresh air and enjoy my home. I fear for the loss of others that have poor health such as myself and many that I know within Livingston County.

I grew up in Livingston County graduation from high school and in the class of 1981. I am very concerned about this as my children and my grandchildren all still live in Howell, Brighton, Hamburg, Fowlerville and Hartland all of my family are Livingston County residents.

Not only will this PLANT affect our health it will also affect ALL of our property values within the county of Livingston. I have contacted my entire class of 1981 that I graduated with as many of them are business owners in Livingston County as well as Howell and Brighton. My wife Mary Wilt grew up in our home and graduated in the Brighton class of 1979. This is our home and this is where we chose to raise our families we all stayed in Livingston County, and so have our grown children with their families. This is because we have all felt that Livingston county represented small-town USA.

Most of us are opposed to this type of construction going on around our families. I understand business as I have owned three different corporations myself prior to my disability.

Sometimes we have to think about the people that will be affected by our decisions rather than the money that could be generated from a plant like this. We do not want to be known as a toxic dumping ground on the residence and the environment that will ultimately affect not only the people but the wildlife As well as ovas well as our residential animals and livestock. The fallout from these toxins fallout and pollutants will eventually effect even our fish in our many lakes.

I have through the course of my years in business been asked to give lectures to epa seminars on the toxins involving air quality as my business was directly involving Quality indoor air .

Through my businesses
(SqueakyClean Ducts Inc.)

I have worked with the EPA and also at the time MDEQ . Once again I am very concerned about this and I will be contacting all of my resources to oppose this.

I understand we All Live and work in Livingston county. Let's think about our futures and those within our family and our neighbors before we just sign over our future .

Thank you for your time reading my comments. May you all be blessed with good health and have a beautiful Christmas and the best prosperous new year.

Respectively John McCormick

A resident of Genoa Township Livingston County Michigan

Sent from my iPhone

Kelly VanMarter

From: Carrie Thompson <thompscl@hotmail.com>
Sent: Sunday, December 26, 2021 11:48 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: NO PLANT

Follow Up Flag: Follow up
Flag Status: Flagged

Please don't pollute our beautiful area!!!
I don't want to move but many of us will if this plant gets built.

Get [Outlook for Android](#)

Kelly VanMarter

From: molson124@yahoo.com
Sent: Monday, December 27, 2021 10:21 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt plant

I am writing you about the proposed asphalt Plant. My family,my friends, my sub, and the subs all around us are against the plant. 80% of us are registered voters and we do vote. Do any of you want to take the chance of doing something against the will of people that vote? You may, most likely, be on the outside looking in next election.

Kelly VanMarter

From: pk000313 <pk000313@yahoo.com>
Sent: Tuesday, December 28, 2021 11:54 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: No to the asphalt plant

I reside in Genoa Township and I oppose the asphalt plant. Thank you for listening.

Kelly VanMarter

From: Julia Gemuend <juliagemuend@gmail.com>
Sent: Wednesday, December 29, 2021 1:11 PM
To: Bill Rogers; Diana Lowe; Jean Ledford; Jim Mortensen; Kelly VanMarter; Polly; Robin Hunt; Terry Croft
Cc: Jorden Gemuend
Subject: Thanks For All You Do!

Hi everyone,

My family and I live in Sunrise Park and are proud to call Genoa Township home! We wanted to take a moment to say thank you for all the hard work you do to represent us and make this such a great place to live and work!

We also wanted to ask that you please consider all of the citizen concern regarding the proposed asphalt plant off of Victory Drive. We are very concerned about how this business would impact the multiple neighborhoods and dozens of families living nearby.

I do understand that the proposed plant is “state of the art” and supposedly has less concerns for air quality and environmental impact. But if we allow this plant, we are trusting the regulating agencies, which are certainly overworked and understaffed, to be able to make sure that our township and citizens remain protected from the negative impacts of the plant. It would be much safer and smarter for us to turn down such a business. This is a growing and thriving area and we don’t need a business such as this, which belongs in a truly industrial area.

I did attend the December meeting and hope to also attend in January and February. Thank you very much for finding a larger venue for the meetings, so that all the citizens’ voices can be heard. You’re doing a great job and I appreciate how you’re handling this!

We hope that you’re having a wonderful holiday season and wish you a Happy New Year!

Thank you,
Julia & Jorden Gemuend

--

Thanks,
Julia

Kelly VanMarter

From: Brian Mowers <mowersemail@gmail.com>
Sent: Wednesday, December 29, 2021 2:34 PM
To: Kelly VanMarter
Subject: Asphalt Plant

Hello,

We are writing to voice our opposition for the possibility of an asphalt plant being located in close proximity to our subdivision, as well as various other subdivisions.

We are opposed to the toxic and noxious smell of the emissions from the plant. In addition to being linked to cancers and problems for people with asthma, the terrible smell is well known.

We moved to Howell to get away from this and are appalled that it is even being considered , particularly when the political connections and monetary trails are followed.

Please vote against any further possibility of this site being considered for an asphalt plant.

Thank you,

Sincerely,

Brian and Cathy Mowers

Sent from my iPad

Kelly VanMarter

From: Shooting sun <shootingsun@comcast.net>
Sent: Thursday, December 30, 2021 6:50 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant-Not in favor

Good Evening,

I am a longtime Howell resident and am opposed to the Asphalt Plant. I do not want this health blight on our community.

Please have the courage to say no to this proposal. Please listen to the people that you serve. Our health and future depend on it.

Thank you and Happy Holidays.

Sincerely,

Stephanie Miklos
(248) 756-6544

Kelly VanMarter

From: Kathy Olligschlager <kathyollie@icloud.com>
Sent: Friday, December 31, 2021 4:07 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt plant

Please do not allow the zoning for an asphalt plant so near our homes as it is an environmental and health detriment to us who live here. I am less than a half mile from this location along with my neighbors and the Lakeshore Village apartments behind us are just as close and they house many many people. This plant will adversely affect our health and our environment. Your help would be appreciated.

Thanks so much,
Kathleen Rodriguez
Joseph Rodriguez

Sent from my iPhone

Kelly VanMarter

From: Doug G <dmg7985@yahoo.com>
Sent: Saturday, January 1, 2022 2:35 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Cc: bmrobertson1016@gmail.com
Subject: Opposition of Asphalt Plant Proposal in Genoa Township.

Dear Genoa Township Board of Trustees

I am writing you today as a concerned residents of Genoa. We have recently learned about the proposal to build a new Asphalt plant less than a mile from our home. We strongly oppose this proposal as this would negatively impact our residents and community in multiple way. There are many homes, and businesses which are very close to the proposed site including ours and this brings concern to possible health risk for residents, workers, and consumers in the area. Property values for both residential and commercial will be negatively impacted if this plant gets approved. Local business risks to suffer as well. We see no benefit to the people and community by bringing an asphalt plant to Genoa. Jobs today are not a concern as there are already a shortage of workers all across the state of Michigan. Please stand with the people and help reject all proposals related to bringing an Asphalt plant to Genoa Township.

Thank you for your time
Douglas Gay & Brittany Robertson
2900 Beck Rd
313-647-2965
dmg7985@yahoo.com

Kelly VanMarter

From: Eric Fortner <hdodailyupdates@gmail.com>
Sent: Sunday, January 2, 2022 6:57 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter; fightforlivingston@gmail.com
Subject: Do NOT allow the building of an ASPHALT plant

Good evening Genoa Township board members,

I am writing to you today to strongly express my concerns over a proposed asphalt plant to be built off of Latson road in Howell. My wife and I live in the Woodland Spings neighborhood off of Hughes road directly off of Grand River, less than two miles from Grand River and Latson intersection.

We moved here in 2020, after falling in love with the community and trying to start a family. Under no circumstance would we have moved here if an Asphalt plant was near here or even being considered.

I fear my property value would greatly decrease as evidenced by documented losses in other neighborhoods after an asphalt plant has been built.

I gravely fear for the increased health risks having an Asphalt plant nearby spewing hazardous carcinogenic plumes into the air. And the smell - Forget about my beautifully landscaped yard, I would never be able to sit out in it during the summer or even open a window for that matter.

I am also very concerned about an increase in traffic so close on an already very congested corridor.

I do not want to move, but I promise that if this asphalt plant is approved, that is exactly what I will be forced to do for the sake of my health and my family. PLEASE do NOT allow this to happen, not here.

Sincerely,
Eric Fortner
1310 Woodland Springs Dr.
Howell, MI 48843

Kelly VanMarter

From: Work <nlwgrabowski@gmail.com>
Sent: Sunday, January 2, 2022 5:18 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Kelly VanMarter; Diana Lowe; Terry Croft; Jim Mortensen
Subject: Asphalt Plant - protest

>> Genoa Board,

>> My name is Nicole Grabowski. My husband (Chris), and I moved to Genoa Township in August 2019. We are parents to three special needs children. Two of my children have asthma to the extent they require daily steroids. One of our children has Autism.

>> We moved to Genoa Township for the health and safety of our children. Now the place we moved to for safety and health is planning to review a proposal to build and operate an asphalt plant.

>> The environmental byproducts of this facility will cause direct harm to my children's health. Not to mention the impact on hundreds of home values in the area. I can only assume that you are aware of the noxious odors and carcinogenic particles that are emitted from this type of facility!

>

>> If the township decides to approve the building of this plant, the Township is in effect turning a blind eye to the health and welfare of its residents.

>> We are begging the Genoa Township not to allow the asphalt plant to be built for the health of my family and all of the neighbors. There is a high percentage of children in the neighborhood.

>> Our governing body is charged with and responsible for ensuring the wellbeing of its residents. I am requesting that you look at the health of my children when reviewing this request.

>> Thank you

>> Chris and Nicole Grabowski

January 2, 2022

To whom it may concern,

We are writing to oppose the rezoning from IND to PID and I am against granting a special use permit for building an asphalt plant.

This plant would have severe effects on the community, including but not limited to:

- Disturbing delicate lake ecosystems
- Polluting air and water for wildlife
- Impacting our air quality and water
- Causing environmental degradation
- Stench and noxious fumes interrupting outdoor use
- Adversely impacting property and rent values
- Increasing dangerous truck traffic
- Damaging our roads
- Endangering school buses and young drivers
- Possibility of fuel explosions

Livingston County and Genoa Township are known for their quaint hometown feel. Over the past few years our communities have established their selves with wonderful artisans, unique shops and eateries. Residents move to our community in search of the good life. We currently are an environmentally sound and peaceful community. Our schools are some of the best in the state. We are abundant with lakes, wetlands, parks and nature trails. Why do we want to be known as industrial community, a community filled with toxins and chemicals, polluted air and water..... We just don't get it.

Maybe its time for the Genoa Township Board of Commissioners to decide whether they are for the people of our quiet community or are for industry and big business? We need a Township Board with a priority for preserving our community. The community gathered around the fight against the Gravel Pit development in our neighborhood. Now this.....who on the Township Board is having their pocket lined \$\$\$.

**The suitability of this location is decided by GENOA TOWNSHIP!!!
The Township can say NO to this --- DO NOT RE-ZONE!**

Sincerely concerned,

Michael Marko &
Theresa Coloske
5195 Glenway Drive
Brighton, MI 48116

Kelly VanMarter

From: Tarra Shimkus <tarrashimkus@hotmail.com>
Sent: Sunday, January 2, 2022 8:39 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Please read regarding the propose as asphalt plant.

Dear Genoa Township Board of Trustees.

Please, do not let this asphalt plant happen! Please, consider the impact it will have on our community. PLEASE! I'm a mom of four, two grown and two younger children. As a mother I'm asking you to please, make the right choice here. Be the ones who stand up for our community.

We have lived in Howell in a beautiful neighborhood for 21 years. Just 1.4 miles away from the proposed location. Lakeshore Pointe is a lakefront community with 2.5 miles of nature trails. 248 homes! Please, don't let the asphalt plant ruin this area. Please consider helping us stand up for this community.

Thank you,
Tarra Shimkus
102 Shorewood Lane
Howell, MI 48843
517-304-7608

Here are some concerning facts regarding how dangerous this could be for the health of our community. LSP is just 1.4 miles away from the proposed area for the Asphalt plant.

Volatile organic compounds (VOCs) are particles of dangerous substances emitted into the air after certain chemical reactions. They vaporize at room temperature, so they stay airborne indefinitely. Asphalt plants emit significant amounts of these gases, and living next to such plants can be hazardous to your health.

Asphalt plants are known to produce toxic air pollutants, including arsenic, benzene, formaldehyde, and cadmium, that may cause cancer, central nervous system problems, liver damage, respiratory problems and skin irritation.

How far away should you live from an asphalt plant?

The safe distance varies according to the type of industry, the emitted chemicals, and the speed and extent of the air pollutant emissions into the atmosphere, and could range from 3-3.5 km aerial distance

3.5 kilometers = 2.175 miles

LSP is 1.4 miles away form the proposed location.

Does an asphalt plant emit odor?

When the asphalt is heated and vented at the plant, the smell radiates out into the atmosphere which becomes the only thing people smell, giving asphalt plants a bad reputation and causing a problem for many producers.

Sent from my iPhone

Kelly VanMarter

From: Matthew Jaster <joered33@gmail.com>
Sent: Monday, January 3, 2022 4:53 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: No Asphalt Plant

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Genoa Township Trustees,

As I am working this evening and cannot attend the meeting in person, I wanted to send a quick note to discuss the proposed asphalt plant project off of Grand River. I live in the Woodland Springs subdivision off of Hughes and my family enjoys Lake Chemung, walking around the neighborhoods and bike riding in the area.

As a writer for manufacturing trade magazines, I visit a variety of manufacturing plants in many industries for my job. Most of these are off the beaten path, so to speak, or in very large industrial areas away from residential zones and shopping districts.

I am baffled and confused that a spot just off Grand River in Genoa Township near shopping, restaurants and residential homes is being considered for the proposed asphalt plant and would recommend looking into a new location. I do not see any benefit whatsoever to increased noise, pollution and traffic near an area that is already extremely busy thanks to Meijer, Walmart, McDonalds and Cleary University.

Most importantly, however, is the potential environmental impact on the area. There are many industrial areas around Mid-Michigan that would be a much better fit than the proposed location.

I ask that we look further into other options for the facility, perhaps somewhere else in Livingston County and AT THE VERY LEAST, we as a community discuss potential locations farther away from our commercial and residential communities. This seems like a common sense approach to solving this issue.

Please consider alternative options for this proposal,

Thank you for your time,
Matthew Jaster
Woodland Springs

Kelly VanMarter

From: Jennifer Krueger <msjennkrueger@outlook.com>
Sent: Monday, January 3, 2022 1:20 PM
To: Bill Rogers; Polly; robin@genoa.rog; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Opposition of Asphalt Plant

Dear Genoa Board of Directors,

I am writing to you today to express my opposition to the possibility of allowing an asphalt plant to be developed in our community. I live in the Ravines of Rolling Ridge subdivision at 3133 Stillriver Dr. and will be directly and negatively affected by the environmental pollution, the traffic patterns, and the impact upon my home's value that this project will cause. I moved to this area 18 years ago from Wayne County to remove myself and my family from this type of environment. Genoa is a beautiful area to be in and this project will not be an improvement to our community.

I also oppose the rezoning of the proposed properties currently being considered for this project. It should not be allowed to be rezoned for this type of industrial use. The heavier industrial type businesses are not acceptable for our beautiful township.

Please feel free to share with communication with any other communications you will be presenting at tonight's board meeting.

Kind regards,

Jennifer Krueger
3133 Stillriver Dr.
Howell, MI 48843
ACCA | Cecchetti Council of America
Member | Dance Masters of Michigan Chapter 4
Ballet Instructor | Maria's School of Dance, Fowlerville MI
734-377-8319

Be kind whenever possible. It is always possible. ~ Dalai Lama



Kelly VanMarter

From: Barb Leahy <barbie29@comcast.net>
Sent: Monday, January 3, 2022 5:04 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Please don't allow the asphalt plant!!

Follow Up Flag: Follow up
Flag Status: Flagged

What comes out of an Asphalt Plant?

Sources of emissions from Asphalt Plants are neither regulated nor monitored, and depending on the size of the asphalt operation, can release **300+ tons** of toxic air emissions annually.

Flawed Tests Underestimate Health Risks - pollutants that are released from a facility are estimated by computers and mathematical formulas rather than by actual stack testing

Did You Know?

- According to the National Institute for Occupational Safety and Health: *asphalt fumes are considered occupational carcinogens*
- The federal Environmental Protection Agency (EPA) states that, *Asphalt Fumes are Known Toxins*
- Even if an asphalt plant meets all air pollution standards, *people living nearby are still exposed to cancer-causing substances that can cause long-term damage* (DHHS)
- **Stagnant** air and local weather patterns often increase the level of exposure to local communities (downwind, low-lying and lake areas are most greatly affected)

Hello.

Sorry this picture came out so big!! I don't know how to make it smaller! 😞

My name is Barb Leahy. When my husband and I had to relocate 36 years ago, We picked Brighton and our neighborhood because it was a beautiful location. But now-We and other community members feel our homes, businesses and Schools are potentially being threatened. My husband and I are avid gardeners. I spend most of my time outside working in my gardens in the spring, summer and fall. We also enjoy spending time around our pool with our children and grandchildren. Odors from asphalt plants don't just smell bad- They are noxious, injurious to health And well being. That's why the smell of asphalt makes me feel sick. If I could smell those noxious fumes- I could no longer work outside. Or enjoy my gardens or my pool!! We would be forced to sell our beloved home that my husband and I have worked so hard on, and at a loss because our property value would be greatly reduced. Please Don't Make Me Have To Move. I LOVE My Home, it would break this retired grandma's heart!!!

I am truly trying to understand, fathom how any of you could approve this thing??!
I imagine you got a glossy pamphlet from the asphalt company claiming " Ohh It's Not That Bad?" I would expect you to do your own independent research on such an important decision. And I certainly hope it's not because somebody may be friends with the people who own the property for sale that wants to sell to the asphalt company. You Live Here Too!! Why would any of you agree to sell your friends and neighbors- Your community down the river?? Because that's what it feels like to us! Thousands of your neighbors are opposed to it for good reasons. I Implore You To Stop It! For the good of Livingston County. Sincerely,
Barb & Dave Leahy

Sent from my iPad

Kelly VanMarter

From: Neale Mason <nasmason@gmail.com>
Sent: Monday, January 3, 2022 7:55 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Genoa Twp against asphalt plant

Good Morning,

I am not going to be in attendance of any in person meetings due to our current pandemic . If there were a virtual option - I think you would get even more attendance.

I would like however to voice concern. WHY would Genoa Twp willingly want to place the health and safety of its residents at risk. Is money really trumping health ? What are the kickbacks of having this come into our community ?

I myself am a breast cancer survivor (diagnosed 2019) . It turns your world upside down and you're NEVER the same. Any ache and pain - I immediately wonder - if something is there again. I recently found out I also now have LUNG DISEASE due to the radiation treatment I received. I have shortness of breath due to scaring that will likely never go away . Because I had left side b/c - I had to undergo radiation 5 days a week for 6 weeks. You lay on a table with goggles, your nose pinched and made to hold your breath. Tell me - do you want family members, friends that you know to have to go through that?

Think of RoundUp - a somewhat common home pesticide for treating weeds. Now we find out - Oops.... not good and can cause cancer.

My husband has Diabetes Type 1 - he gets sick very easily and he is only 49. We can both get horrible headaches when we have the neighborhood near us burning leaves and the wind shifts - think of how that will be amplified with fumes from an asphalt plant .

I have lived in Genoa Twp since 2005 - I came from Ingham County near MSU and prior to that grew up in rural Shiawassee County. I liked the small town feel but enjoy the country and nature. We specifically selected our home for our back yard view of woods and nature - serenity. We are active outside during the spring , summer and fall - weeding, mowing and maintaining our property.

I know we are only (2) people - but please reconsider - this is NOT something we want in our community.

Regards,

Neale A Mason
517-881-1542

Kelly VanMarter

From: J. McD <tidylady1753@gmail.com>
Sent: Monday, January 3, 2022 10:00 AM
To: Bill Rogers; Diana Lowe; Jean Ledford; Jim Mortensen; Kelly VanMarter; Polly; Robin Hunt; Terry Croft
Subject: Black Lung City???

Follow Up Flag: Follow up
Flag Status: Flagged

First of all let me thank you for your service. It's appreciated.

It is hoped our members will do what is right for our residents of Genoa Township. If the plant is allowed in our community it should be renamed Black Lung City because it will be appropriate.

Every year I pay my real estate taxes on time. I have airborne allergies. I'm highly allergic and even dust is a problem. My community is Genoa Woods. I moved to Genoa Woods in 2009, the same year the builder pulled out and left our community unfinished with only 20 sold. 2013 another builder took over. I had to live with family out of state while the new builder was doing construction. Any dust kicked up was a health hazard for me. The builder finally finished construction a couple of months ago.

I was in the process of returning back to Michigan and I thought I would be able to return to my beautiful home until I heard about the plant. I was shocked, it stopped me suddenly.

Oh my gosh, why even consider the plant in the best township around??? If the plant goes in our great township it will be the worse township. What's in it for our township if the plant is approved? Whatever the reason does it justify the health risks of all its citizens?

Please think this through and let me know what you think is best for our township. Plans need to be made in the very near future. I and others have important decisions to make.

Respectfully,

Joyce McDonald of 1753 Genoa Circle.

--

Joyce McDonald
810-923-6689
tidylady1753@gmail.com

Kelly VanMarter

From: Madeline Mortimer <madeline.mortimer@gmail.com>
Sent: Monday, January 3, 2022 3:40 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terri@genoa.org; Diana Lowe; Kelly VanMarter
Subject: No Asphalt Plant Please

Follow Up Flag: Follow up
Flag Status: Flagged

Hello,

I am reaching out to share my concerns regarding the asphalt plant. We moved into our home two years ago and fell in love with our quite country neighborhood. We even have had family from big cities comment on how clean the air felt! Now I fear that an asphalt plant would seriously diminish air quality and property value. We would never have chosen this home and location if it was going to have a plant that close. We also just added a beautiful but medically complicated son to our family and I do not want his health to be affected. Please consider refusing the asphalt plant in our community. Thank you.

Madeline Garcia

Sent from my iPhone

Kelly VanMarter

From: Joe Shimkus <joeshimkus@hotmail.com>
Sent: Monday, January 3, 2022 3:03 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter; Bill Rogers
Subject: Please support denying the proposed Asphalt Plant
Attachments: impactedarea.jpg

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Genoa Township Board of Trustees.

Please do not approve the plan for the proposed asphalt plant or even the rezoning which would open the option to this type of development in the future. This plant does not fit in this area and would clearly have an impact on all residents and businesses, as well as the interest for future investments in the community. As the safe distance from such a plant for the toxins and smells is 2 miles, it is very concerning that such a plant is even being considered in this area. My neighborhood of 248 homes is completely within this 2 mile radius and certainly will be affected. I encourage all of you to look at a satellite map to put in perspective all the homes and businesses that will be impacted and move to deny this proposal.

Please don't let the asphalt plant ruin this area. Please consider helping us stand up for this community.

Thank you,
Joe Shimkus
102 Shorewood Lane
Howell, MI 48843
517-304-6339

Here are some concerning facts regarding how dangerous this could be for the health of our community, and my neighborhood which is only 1.4 miles away from the proposed area for the Asphalt plant:

Volatile organic compounds (VOCs) are particles of dangerous substances emitted into the air after certain chemical reactions. They vaporize at room temperature, so they stay airborne indefinitely. Asphalt plants emit significant amounts of these gases, and living next to such plants can be hazardous to your health.

Asphalt plants are known to produce toxic air pollutants, including arsenic, benzene, formaldehyde, and cadmium, that may cause cancer, central nervous system problems, liver damage, respiratory problems and skin irritation.

How far away should you live from an asphalt plant?

The safe distance varies according to the type of industry, the emitted chemicals, and the speed and extent of the air pollutant emissions into the atmosphere, and could range from 3-3.5 km aerial distance
3.5 kilometers = 2.175 miles

My neighborhood is 1.4 miles away from the proposed location.

Does an asphalt plant emit odor?

When the asphalt is heated and vented at the plant, the smell radiates out into the atmosphere which becomes the only thing people smell, giving asphalt plants a bad reputation and causing a problem for many producers.



Kelly VanMarter

From: Sue Vandemergel <vandemergel@sbcglobal.net>
Sent: Monday, January 3, 2022 3:21 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant

Follow Up Flag: Follow up
Flag Status: Flagged

I have live in Livingston County for over 45 years. First, off Brighton Road and wanted to stay in the county when we purchased our condo off Grand River. Back then Livingston County was a sleepy wonderful offshoot of the big city. With lots of green space, parks, lakes, wild animals but especially clean air. Of course we've grown since then but we have kept our county still with that same small time feeling. We have kept our parks, lakes, wild animals but mostly our clear air. We have not let big manufacturing come in and take away what we all moved here for and love. And we should not. I live less then 3 miles from the proposed site and I know it's will impact my way of life. From breathing fresh air to the value of my home. Do Not Vote for this Asphalt Plant to build here in our beautiful community. Do not ruin what we all love, Livingston County.

Thank you for your time,

Suzanne Vandemergel

Genoa Woods

Howell, Michigan

Livingston county

Sent from my iPad

Kelly VanMarter

From: Linda Verardi <minativegarden@gmail.com>
Sent: Tuesday, January 4, 2022 8:00 PM
To: Bill Rogers; Jim Mortensen; Polly; Terry Croft; Robin Hunt; Diana Lowe; Jean Ledford; Kelly VanMarter; fightforlivingston@gmail.com
Subject: Against Asphalt

Please note that my husband and I need your support in stopping the asphalt plant.

Please email us back to let us know if can we count on your support.

Linda Verardi and Werner Schipper
2947 E Schafer Rd
Howell 48843

Kelly VanMarter

From: s b <shelagh7@hotmail.com>
Sent: Wednesday, January 5, 2022 5:20 AM
To: Bill Rogers; Polly; robin@geoa.org; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant gets a NO from us

We just spent the past year building a new home in Genoa which we moved into a month ago because of the quality of life here; the rolling hills, the gorgeous view from my home, the ponds, trees and lakes. We did not spend our life savings on our forever home to have to fight a gravel pit literally in our backyard, trash collectors that won't pick up our trash, and now a freaking asphalt plant blowing toxic fumes in our direction. We have four young grandchildren growing up in Genoa and there are no words strong enough to tell you how violently opposed we are to the asphalt plant. No campaign contributions could ever be enough to justify polluting the beautiful township you are sworn to protect. Nothing - NOTHING - should be allowed in this township that doesn't serve the best interests of all the people in this community. Claiming that there's some kind of abandoned junkyard so that justifies polluting the air our children breathe is the lamest red herring I've ever heard. I literally laughed out loud at the absurdity.

We will never sit back and allow anyone to stay in office who puts campaign contributions or tax revenue over the health of our children and the quality of our lives and there are thousands just like us.

Vote no on this absurdity.

Tim & Shelagh Balogh

Kelly VanMarter

From: P Gilbert <plgilbert777@hotmail.com>
Sent: Thursday, January 6, 2022 4:01 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant - NO

Please listen to the people you represent and CANCEL the Asphalt plant.

Do you want to live near the plant with its increased traffic and wear & tear on our roads, not to mention the harsh chemicals used in the processing?

This is a terrible idea and never should have been considered.

It is also very concerning that the meeting to allow us to voice our grievances was cancelled.

Jacquelyn Jones
5435 Ivy Ct.
Howell MI 48843
248-568-5334
joneswsu@gmail.com

January 7, 2022

Bill Rogers, Supervisor
Genoa Township Board of Trustees
2911 Dorr Road
Brighton MI 48116
Sent via email to bill@genoa.org and First Class Mail

Re: Asphalt Plant and Re-Zoning to Allow for Same

To Whom It May Concern:

I ask that this letter be made part of the official packet for the next Township meeting (Feb. 3, 2022 or sooner if scheduled) and provided to all Trustees and appropriate personnel.

I am opposed to any Township approval which would allow for an asphalt plant or any re-zoning or modification to any zoning which would allow for same.

The Grand Oaks area near Latson and I-96/Grand River Avenue is one which not only includes some industrial use, but also a daycare center, (under construction) hotel, medical facilities, retail, and residential. An asphalt plant is not a use consistent with, conducive to, or appropriate for an area such as this for health, environmental, and quality of life reasons, and would potentially hinder developers from pursuing future (tax revenue generating) uses of the same nature. This facility would not draw additional residential use, which generates tax revenue for the Township which does not require tax abatement or other commercial considerations that can take away from possible funds for Township use for the good of the citizens who reside here.

Voting to allow such use or facility in Genoa Township is not in the best interest of my family and our continued health, safety, and quality of life here in Genoa Township, and I ask that the Trustees not continue to pursue this endeavor.

Sincerely,


Jacquelyn Jones

✓ cc: Michael Archinal, Township Manager (via email to mike@genoa.org and First Class Mail)

Kelly VanMarter

From: John Fillion <fillionco@comcast.net>
Sent: Saturday, January 8, 2022 10:18 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt plant vote yes

Follow Up Flag: Follow up
Flag Status: Flagged

We have been Genoa township residents for 21 years we believe the rezoning should go thru. That area needs that improvement. From a scrap yard to a well run asphalt company no brainer. Vote yes for the asphalt plant.

Sincerely

John and Susan Fillion
3864 Chilson rd.

Kelly VanMarter

From: John Palmer <johnpalmer1955@yahoo.com>
Sent: Sunday, January 9, 2022 3:27 PM
To: Bill Rogers; info; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; diann@genoa.org; Kelly VanMarter; Mike Archinal; JeanLedford; Jim Mortensen; tcroft
Subject: Proposed Asphalt Plant
Attachments: Trustee Message.pages

Follow Up Flag: Follow up
Flag Status: Flagged

First, for those of you that were COVID positive, I hope all is well with you and your family. I'm sure it was not pleasant, but going forward the hopefully positive news is you will be stronger to fight the next mutation.

I had planned on thanking you for your service to the Township in person and wanted to publicly remind everyone that the reason our community is such a wonderful place to live is because of the dedication and foresight you and those before you have demonstrated.

Please find attached the heartfelt words from not just myself, but those that would like to turn away the proposed asphalt plant.

Sincerely,

John B. Palmer
560 Black Oaks Trl
Howell, MI 48843

In regards to the those of us that DO NOT want the asphalt plant in Genoa Township, let me start by saying that we are not the enemy. We do not intend to be threatening or disruptive, but rather are concerned residents that are fearful of losing our way of life.

Many of us have lived here our whole life. I moved here because of the great reputation this community has. We love living here, we love our community and we love our way of life.

We love raising our children here, bringing our grand kids to play in our parks, run in our fields and swim in our lakes.

And we owe that to you. The Trustees and leadership of this Township have built this community. Even dating back to Bill Roger's parents, the Township leadership have built a great legacy. It is up to you to decide if that continues, or you destroy everything that you and those before you built. *Do not tarnish your legacy.*

Allowing an asphalt plant into this township will jeopardize that legacy. Do not let us become known as the wasteland of Livingston County.

There are hundreds of homes, numerous play areas, school yards and lakes that are in close proximity to this proposed asphalt plant.

Studies have shown that with an asphalt plant nearby, home values can drop more than 50% and nearly half of nearby residents show a deterioration in their personal health.

Ground water and air quality will be threatened by the emission spewed from such a facility.

Our children and grandchildren won't be safe playing in their schoolyards or swimming in our lakes.

Do not let *that* be your legacy.

The 2022 Genoa Township Master Plan states that we seek to enhance a sense of place. *"In doing so, the Township will welcome new development and redevelopment while striving to promote and protect the people, places and things that make Genoa Township distinctive to its residents, businesses and visitors."*

This asphalt plant will not do that. In fact, it will be a *repellent* to those things. We have empty store fronts up and down Grand River. What new business will move in with the smell of an asphalt plant nearby? With COVID many of our restaurants only have outside dining. What patron will eat underneath the stench of asphalt falling onto their food? What parent will allow their children or grandchildren to play in our parks... even at Township Hall? And does anyone think the existing Medical facility and hotel being built would have come here with an asphalt plant as a neighbor.

We speak as not just your constituents, we speak as your friends, your neighbors and your business partners. Please don't destroy our way of

**life. Don't threaten our water and air and please don't harm our children
and grandchildren.... *Don't destroy your legacy!***

Kelly VanMarter

From: Suhail Sayage <sayage@att.net>
Sent: Monday, January 10, 2022 4:21 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: The proposed asphalt plant

Follow Up Flag: Follow up
Flag Status: Flagged

I can not believe the Genoa Township planning commission though it was a great idea to approve a asphalt plant to be constructed in our community. I do understand that the owner of the property in question has ties to the township officials. But even with that, I would like to believe the health of our community members and environment is more important than the "good old boy network " in Genoa Township.

Do the right thing for this community, do not approve the construction of the asphalt plant.

Tracy Sayage

[Sent from AT&T Yahoo Mail on Android](#)

Kelly VanMarter

From: Jamie <mcvicke4@att.net>
Sent: Monday, January 10, 2022 10:43 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Say NO to asphalt plant-road risks

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Genoa Board of Trustees,

I hope that this email finds you well and you enjoyed the holiday season and Happy New Year.

As a resident of Genoa Township for the last 13 years, I am writing again (sent another concern email in December) to ask those of you with voting rights to please not allow the process of an asphalt plant to be brought to our community.

In addition to my previously emailed concerns of health risks that an industrial asphalt plant would bring to the community members and wildlife, I have high concerns on the imposed traffic and additional safety risks on the road during my commute in the area.

Having reviewed posts made by Capital Asphalt on their business Facebook page, showing disturbing lines of large trucks in a photo post captioned "all day" and seeing another photo of the release of emissions from a stack captioned "rise and shine" I'm disgusted to think this is what I would encounter and see daily in our community if your votes allow this to happen. An inspection report I found for the Lansing location says their business runs heavily from the end April-November from 6a to 6p (sometimes 8p if busy).

With Grand Oaks being the road they plan to use to lessen the traffic on Grand River, it does NOT promise other businesses impacted by the heavy truck flow would not change course onto Grand River. I cannot imagine that UPS or parents picking up/dropping children at the day care down the road would risk waiting lengthy amounts of time for a clear left turn from those businesses. Instead, I feel they would turn right to avoid the excessive truck traffic on Grand and go up to Grand River by Discount tire. The added truck flow will hurt the gas station and future hotel. I also imagine the patients leaving the medical facility will back up at the intersection light system with loads of trucks clogging it up all day and into peak traffic commuter hours. Additionally, living off of Latson, seeing how busy the road is now with growing businesses and additional subdivisions, we know that the asphalt company will utilize that path for jobs, as well as add traffic to M59. This company would not isolate only to using Grand Oaks Dr and I-96! We do not need added large load trucks clogging up our commutes and local roads on a daily basis 6a-6p (or 8p)!

Allowing an asphalt plant into the community is showing that it would bring more havoc and health and safety risks (adding traffic safety concerns) than it would bring benefits to the area. This company would be running long seasons and hours, clogging up our air and roads.

I ask again you vote to refuse to allow this to happen to the community, as you were elected to protect us and clearly this matter brings us all more risk and harm. We the people do NOT want this in our backyards!

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALY DIVISION
ACTIVITY REPORT: Scheduled Inspection

P019864238

FACILITY: Capital Asphalt	SRN / ID: P0198
LOCATION: 3008-S CANAL RD, LANESBORO	DISTRICT: Lansing
CITY: LANESBORO	COUNTY: LANTON
CONTACT: Ryan Thomas, Plant Operator	ACTIVITY DATE: 07/15/2020
STAFF: Michelle Lujbow	COMPLIANCE STATUS: Compliance
SUBJECT: Scheduled, announced compliance inspection, a PCE as part of an FCE.	SOURCE CLASS: SM OPT OUT
RESOLVED COMPLAINTS:	

Inspected by: Michelle Lujbow
Personnel Present (on-site and pre-inspection phone call): Ryan Thomas (rplantops@capitalasphaltllc.com), Plant Operator

Purpose: Conduct an announced, scheduled, partial compliance evaluation (PCE) inspection by determining compliance with Capital (formerly Superior) Asphalt's Opt-Out Permit No. 12-11A. The facility was last inspected August 2017. Much of the PCE was conducted prior to the inspection via review of records. Onsite work was kept to a minimum due to COVID-19 risks and restrictions.

This inspection was conducted as part of a full compliance evaluation (FCE). Particular attention was paid to the blue smoke capture system and the drum mixer (fugitive dust from seals), as these were two issues within the past year that had come up from drive-by complaints; these complaints had been addressed with the company at the time of receipt, but further review of these items during the inspection was necessary to ensure compliance.

Facility Background/Regulatory Overview: Capital Asphalt (Capital) is a hot mix asphalt facility that uses both recycled asphalt (RAP) and virgin aggregate in their mixes. R. Thomas started his position at Capital Asphalt in January 2020 and said that the only modifications to the plant that he knows of is replacement of the feeder belt, the screen on the scaledeck, and one of the belts to cold feeder #3.

R. Thomas said that asphalt production for the paving season for all asphalt plants generally starts at the end of April or beginning of May and usually runs through Nov 15th; however, the operating season is contingent upon the number of jobs that come in and the weather. Dave Moore, previous plant operator, had told him during the 2017 inspection that they don't like to pave in temperatures below 32°F. Operating hours also vary depending on the jobs that need to be done. R. Thomas said they typically operate from 8 a.m. to 8 p.m., although he said during peak operations, they will operate until 9 p.m. Since he has worked here they have not had to operate past 8 p.m.

Capital Asphalt will have crushing companies come out a few times a year to crush concrete as well as RAP. R. Thomas said Capital sells the crushed concrete for backfill, shoulder gravel, etc. RAP is crushed for their asphalt production. R. Thomas said that Lukazbek Excavating and Drainage, LLC (P0520) came out over the winter through March 1st to crush the concrete, and they plan to have this same crushing company out again within the next 30 days to crush RAP. The AQD has not received relocation notices for either of these crushing events and as such, follow-up will be conducted with Lukazbek to address any non-compliance issues, determine the days they will be at Capital Asphalt, and if time allows, conduct an inspection of Lukazbek's operations while at Capital. R. Thomas said that Capital installed water lines for crushers to hook up to when operating their crushing plant. Custom Crushing has also been out to Capital when it was under Superior Asphalt ownership and AQD received a dust complaint from their crushing operations. It was also noted at the time of the complaint that Custom Crushing had been operating an unpermitted crusher. A violation notice was issued to address the unpermitted crusher and fugitive dust issues.

Capital Asphalt is an opt-out facility for HAPs and reports to MAERS as a Fee Category B facility.

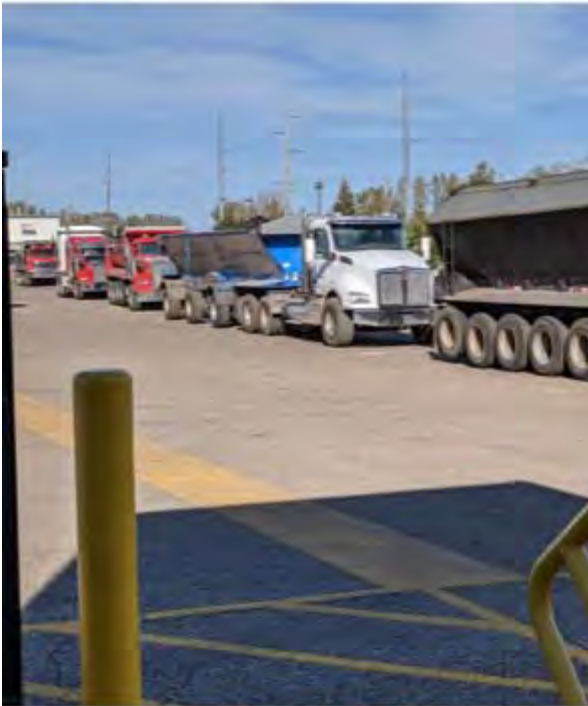
Inspection: Prior to the inspection day, R. Thomas informed me that production would be running through 8 a.m. on July 15, 2020 and as such, I planned to arrive prior to this time to ensure I could observe onsite operations. At approximately 7:40 a.m. on July 15, 2020 I arrived onsite. The plant was operating at this time; however, I was only able to view one truck being loaded before the 8 a.m. shutdown. When I arrived onsite I called R. Thomas on the phone to inform him that I was at the facility and would be looking at the list of items we had discussed over the phone the previous day. I made no in-person contact with R. Thomas during the inspection due to COVID-19 concerns. Records were provided electronically prior to the inspection day.

Table 1 contains a list of all permitted equipment onsite.

Table 1. Permitted equipment onsite.

Capital Asphalt LLC Oct 19, 2021

All day!



Call Now

Capital Asphalt LLC
Nov 18, 2021

Rise and shine asphalt nation! 🌞



~Jamie Schingeck
Hampton Ridge resident

Kelly VanMarter

From: Eda Biegas <ebiegas1@gmail.com>
Sent: Tuesday, January 11, 2022 4:09 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Please vote no to rezoning and the asphalt plant

To the board of trustees,

I am asking you to please vote no on the proposed rezoning that would make it possible for Capital Asphalt to build an asphalt mixing plant in Genoa Township.

This is not what the residents want in our community. Building an asphalt plant here would have a huge negative impact on our community. The location is much too close to residents and local businesses. The toxins and smells would certainly impact our health and quality of life. Our property values would decrease as well. Please do right by the residents and vote no at the January 7th meeting. Please keep Genoa Township a great place to live.

Thank you,

Robert Biegas
1950 Genoa Circle

Kelly VanMarter

From: KEVIN CROWE <helpmekev@comcast.net>
Sent: Wednesday, January 12, 2022 10:36 AM
To: Robin Hunt; dianna@genoa.org; Kelly VanMarter
Subject: Fwd: Asphalt Plant

Follow Up Flag: Follow up
Flag Status: Flagged

----- Original Message -----

From: KEVIN CROWE <helpmekev@comcast.net>
To: "polly@genoa.org" <polly@genoa.org>, "rolin@genoa.org" <rolin@genoa.org>, "jean@genoa.org" <jean@genoa.org>, "jim@genoa.org" <jim@genoa.org>, "terry@genoa.org" <terry@genoa.org>, "dianne@genoa.org" <dianne@genoa.org>
Date: 01/12/2022 10:29 AM
Subject: Fwd: Asphalt Plant

----- Original Message -----

From: KEVIN CROWE <helpmekev@comcast.net>
To: "bill@genoa.org" <bill@genoa.org>
Date: 01/11/2022 7:21 PM
Subject: Asphalt Plant

I moved to Hampton Ridge 18 years ago because of the great community. I certainly would not have moved if there was an asphalt plant so close. I cannot believe you would even consider approving this in our township. The health impacts will be tragic. Also, my property value is just returning to 2008 levels. I'm sure this wouldn't have gotten out of the planning commission if it were proposed to be within one mile of a commissioners' home. You are in your position to protect the citizens of this community. All of them! Please do not approve this asphalt plant!
Thank you,

Kevin Crowe
4169 Kirkway Ct.

Kelly VanMarter

From: Anna Dyszelski <arzraz99@hotmail.com>
Sent: Wednesday, January 12, 2022 3:51 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Please Vote No to the Asphalt Plant

I have a family with two young children, a girl who is 7 & a boy who is 4. I live 5 miles away from this location. For the safety of my family's health please vote no to the asphalt plant.

Thank you,
The Dyszelski Family

Get [Outlook for iOS](#)

Kelly VanMarter

From: Kyleigh Stevenson <kyleighstevenson18@gmail.com>
Sent: Wednesday, January 12, 2022 8:44 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: No to the Asphalt plant

Please reconsider the asphalt plant ! I vote no.

Thank you,
Kyleigh

Kelly VanMarter

From: KEVIN CROWE <helpmekev@comcast.net>
Sent: Thursday, January 13, 2022 3:28 PM
To: Bill Rogers
Subject: Asphalt Plant

Hearing of a possible asphalt plant approval shows that the planning commission should be fired. If approved, the board of Trustees should be recalled. Since we now know the planning commissioners don't have the best interest of the citizens they serve, please replace them. They can no longer be trusted to not screw over Genoa Township residents. Please, as trustees, don't approve this asphalt plant.

Thank you,

Kevin Crowe
4169 Kirkway Ct

Kelly VanMarter

From: michelle Black <blackfoot208@yahoo.com>
Sent: Friday, January 14, 2022 10:05 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Please stop the Asphalt Plant

Good morning - I'm sure you're getting many of these emails, but I still wanted to add my voice to the topic and ask that we please not allow the asphalt plant in our community. We all know the reasons, and I fear this will lead to a lot of people leaving, which is sad because it's a great area with great people. I know my family and I will not stick around if it happens. Thank you for your time!

- Loss of Property Value
- Known Toxins and Air Pollutants
- Health Impacts to Nearby Residents

Michelle Black

Kelly VanMarter

From: Rob Duquette <R.Duquette@hotmail.com>
Sent: Saturday, January 15, 2022 6:03 PM
To: Bill Rogers; polly@genoa.or; g robin@genoa.org; Jean Ledford; Jim Mortensen; Terry Croft; diana@geno.org; Kelly VanMarter
Cc: robert.l.duquette.civ@army.mil
Subject: My opposition to the proposed asphalt plant

Members of the board of trustees,

I am writing to you regarding the proposed asphalt plant in Genoa township

This is not something that we want here in beautiful Genoa township.

The property values have been shown to decrease by as much a 56% with the presence of an asphalt plant.

The environmental issues alone associated with an asphalt plant are of grave concern for people wildlife and children there is a preschool right around the corner Cleary university dorms and baseball field in the other direction This is not the right business that we want to have in Genoa township

I am adamantly opposed to this asphalt plant proposal and urge you to disapprove & halt and further action This project must not go though

Very Respectfully

Rob Duquette

3043 Stillriver Dr

Howell, Mi 48843

586 854 7852

Kelly VanMarter

From: DAWN HARDIN <dkhskate@comcast.net>
Sent: Saturday, January 15, 2022 1:02 AM
To: Kelly VanMarter
Subject: opposition asphalt plant

Dear Board of Trustee member,

I am a resident of Genoa Township in Livingston County and I am very concerned about the townships plan to rezone land to allow an asphalt plant. These decisions will have a lasting negative impact on our community, and we need to do more to fight it. The township website invites people into our community with this statement, "Lakes and wetlands, rolling hills and meadows, state parks and wildlife all abound in this beautiful community of country living" yet they are making decisions to destroy our very community.

The effect it will have on the environment and quality of life will be disastrous. It is proven that there are long-term adverse health effects, degraded air and water quality. Studies have shown asphalt plants release toxins and air pollution, impacting the health of residents. Even if the plant meets air pollution standards, people living nearby are still exposed to cancer-causing substances that can cause long-term damage (Department of Health & Human Services). Additionally, this plant would significantly decrease property values.

You have a duty to protect the public health, safety, general welfare, and property values of the citizens from potential adverse effects caused by certain industries. Please keep protecting our community by urging the Genoa Township Board of Trustees to turn down the zoning change for the asphalt plant. I want to live in a community where the environment is safe. It will make a difference in all of our lives.

Thank you for your support,

Dawn Harrigan-Hardin

5101 Richardson Road

Howell, MI 48843

Kelly VanMarter

From: Gary Kinneer <gkinneer@fastmail.com>
Sent: Saturday, January 15, 2022 6:39 PM
To: Terry Croft; Kelly VanMarter
Subject: Fwd: Asphalt Plant

Dear board,

We sincerely hope you deny approval for the proposed asphalt plant in Genoa Township. I don't think this type of manufacturing reflects the type of industries we should be trying to attract. We should be cultivating businesses that do not offend our sense of smell and hearing. We should be trying to attract high tech businesses. We do not need large asphalt trucks traversing our city streets. A plant like this promotes Howell as a low class community that attracts unattractive and dirty businesses. I doubt if Brighton would approve a plant of this type within or even close to their city boundaries. Approval of the plant would increase traffic and the wear and tear of our streets, which would have to be repaired at taxpayer expense.

Thank you for your consideration.

Gary and Linda Kinnee1272 Douglas Fir Dr
Howell. 810-772-8487

Kelly VanMarter

From: Janet Owoc <lovemytimeoff@icloud.com>
Sent: Saturday, January 15, 2022 7:20 PM
To: Kelly VanMarter
Subject: Fwd: Asphalt plant

>
> Hello,
>
> I am writing in the hopes that you will reconsider the location on the asphalt plant on Latson Road in Howell.
>
> My husband and I looked long and hard to relocate to our perfect retirement home. When I heard that a asphalt plant was going to be built so close to our residential location I could not believe it. I have spent my whole life working hard and taking good care of myself to soon be living by a cancer causing factory.
>
> There are many locations out away from residential areas.
>
> This will not be welcomed by myself and many of my neighbors.
>
> Thank you,
>
> Janet Owoc
> Howell Resident
>
> Sent from my iPad

Kelly VanMarter

From: Cindy Lee <cindyannlee@tx.rr.com>
Sent: Monday, January 17, 2022 10:24 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Concern About Asphalt Plant

Hello, Genoa Township Representatives: You know why we are reaching out. This plant would affect our quality of life including our health and well-being. We live on the windward side of Lake Chemung and our family has been in that location since 1915. We know the prevailing wind direction well and we also have overall concerns about the Township brand and the impact of this toxic plant. Moreover, we can't imagine that any benefit of its existence in our Township would outweigh its negative impact.

We implore you to do the right thing and vote it down. Thank you for keeping us safe.

David & Cindy Lee
854 Pathway Drive
Howell, MI 48843
817-846-1810 cell

Kelly VanMarter

From: Lira Lloyd <liralloyd@gmail.com>
Sent: Monday, January 17, 2022 7:18 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: No asphalt plant please

Hello,

I am writing to ask that you vote against the asphalt plant. This would be a horrible addition to our community! It is bad for our home values and the air we breathe. It is poison! Please, please DO NOT approve the asphalt plant.

Thank you,

Lira Lloyd

Resident of Genoa Township

Sent from my iPhone

Kelly VanMarter

From: Dawn Mital <mitaldawn@gmail.com>
Sent: Monday, January 17, 2022 8:50 AM
To: Bill Rogers; Kelly VanMarter; a@genoa.org; Diana Lowe; Terry Croft; Jean Ledford; Jim Mortensen; Ken Mital
Subject: Re: Asphalt Proposal

The attached opinion piece expresses the sentiment of the community you represent. I would add that we surely wouldn't want to deter from others choosing to move into our fine community by developing such an unhealthy eyesore. I urge you to remove the politics and support the citizens you represent by rejecting this proposal.

Dawn and Ken Mital

<https://thelivingstonpost.com/guest-opinion-asphalt-plant-doesnt-follow-genoas-master-plan/>

On Mon, Dec 6, 2021, 4:56 PM Dawn Mital <mitaldawn@gmail.com> wrote:

As more and more details have come to light to the community regarding this shady proposal, we urge you to reject the proposal. Not only the handling of this being 'underhanded' to the public but the neglect of concern to the surrounding environment and health of Livingston citizens is a huge concern. Your role is to represent the best interest of the community members and the overall best fit for our communities. This is and industry best fit for a rural area without surrounding neighborhoods .

Again, we urge you to reject!

Dawn and Ken Mital

Kelly VanMarter

From: Emily Underwood <underwood.em1@gmail.com>
Sent: Monday, January 17, 2022 5:51 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: When you know better you do better.

To quote Maya Angelou "When you know better..you do better" In business it means that you do the best you can do until you know better. Then, when you know better you do better.

After all the evidence that has been presented regarding the long term and i mean LONG TERM contamination that will without ANY doubt occur in geona township I find myself wondering... When they know better, will they do better.

At this point, every single one of you truly deep down, KNOWS better.

What a powerful position you have found yourself in.

Signed,
Emily Underwood
Geona Township Resident

Kelly VanMarter

From: mike lucas <mhallucas@yahoo.com>
Sent: Tuesday, January 18, 2022 1:51 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: DENY Capital Asphalt

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Genoa Township board members -

We, as residents of Genoa Township since 2003, are vehemently against the project put forth by Capital Asphalt to build an asphalt plant within our township. **We have 2 residential properties located within 1 mile north of the proposed site.** We are currently in the development phase of a new home on one of the properties, however, we may immediately stop that process and attempt to sell both properties due to the hazardous air discharged, unsightly stacks, decreased property values, smells, sounds, semi-truck traffic, etc. if this project is not denied by you. We doubt we would be alone in leaving this township, as no one would choose to live or visit a place even remotely close to such a toxic entity.

It is noted, in your own communications, that this company chose to seek rezoning via the Planned Development process which requires a benefit to the township. The benefit stated is, "...to install a road to allow trucks to access I-96 directly through Grand Oaks Drive thereby limiting traffic on Grand River Avenue." As is obvious, this is not a benefit to the township at all, as no member of this community will use that 'road' or gain any other benefit from having this plant in such close proximity to hospitals, shopping, dining, a university, residential housing, and other commercial enterprises. This is strictly a convenience for Capital Asphalt and nothing more than mere pandering to the board to curry favor. The fact is, there is **NO benefit** for the township or its residents at all!

In reviewing the township's master plan, nowhere in that document is there an expressed desire from any of the local stakeholders (residents, landowners, Planning Commission, or Township board) for such an entity. In fact, it is both implicitly and explicitly stated to the contrary. We could list, if that is what it takes to deny Capital Asphalt, on almost every page of that document, the stated importance of keeping Genoa Township's unique natural and rural characteristics. Of particular relevance, page 68 of the Master Plan states, "the Latson interchange is envisioned to be the premier exit for travelers along I-96: a destination they can get out of their vehicles to walk around, dine, and shop." This plant more than jeopardizes that vision, it eliminates that vision! It eliminates so many other possibilities and we can never get them back. No longer will people look to Genoa Township as a place that is comfortable, clean, and welcoming, let alone a place to stop and linger outside.

Given all that, it is greatly perplexing and shocking that this application has made it this far in the process. The thought that anyone, including the Planning Commission, could seriously consider this plant for our township - let alone approve and move the application to you - is truly mind-bending and disheartening. The statement by Commissioner Rauch that, "residential areas are not in the near vicinity to this site..." is offensive, ignorant, and patently false. You have to know that. Go to the site and see for yourself: look west and see residential housing and apartments less than a half-mile...see Clearly University where students live to the east...residential housing immediately to the north and south. How much nearer do residents have to be for him and you to understand this plant should not be approved for the proposed site? What about the employees at nearby business...does their health not matter? This plant will affect everyone negatively.

We urge you to uphold your duties as the voices of the residents of this township to DENY the rezoning request and all other future inquiries from Capital Asphalt and other similarly toxic companies. Genoa Township is a great place to live and work and you have a duty to ensure it stays that way.

Respectfully submitted,
Michael and Heather Lucas (residents of Ravines of Rolling Ridge subdivision...directly North of the proposed site)

Good afternoon,

I am again respectfully requesting a Zoom option for the upcoming February 7th meeting. Per the Michigan Township Association, this is completely allowed to accompany an in person meeting. While the agenda, packet and minutes are available, it does not allow the people quarantined, Covid positive or immunocompromised to interact and hear presentations or comments. While they are obviously allowed to email their comments, it makes the situation one sided. If the necessary tools to make this happen were available previous to this, then there shouldn't be any issue with ensuring that happens at the February meeting. Not doing so gives the appearance that you want the least amount of people showing opposition to the situation.

Hopefully someone can additionally answer why the Planning Commission takes a Declaration of Conflict of Interest before a meeting, but the Board of Trustees does not.

Hopefully you were able to hear the WHMI interview with our group representing the residents opposing this plant. We aren't a mob and definitely did not have the pitchforks in our cars for retrieval. Are we upset, most definitely upset and confused to boot. Confused as how anyone thinks this is a viable option for the Advanced Alloys location. Personally the more I think about it, the more frustrated I become, especially driving through the River Rouge area for work last week. That isn't Genoa, we don't need an asphalt plant lining our Township.

We have heard it be mentioned that if there are issues with the asphalt plant, the Board will address. How long has the "eyesore" as it's been referred to also known as Advanced Alloys been running without any interaction/requests for action to follow the ordinance? When was the last inspection by the Zoning Administrator to ensure continuing compliance with the below standards? Looking at the picture on the next page, I'm fairly certain that no inspections have happened recently.

(e) Salvage Yard shall comply with the following requirements:

(1) The property shall include at least six (6) acres.

(2) The salvage yard shall be enclosed on all sides by a solid wall or fence at least six (6) feet in height, maintained in good repair and free of handbills or other advertising except for approved signs. Non-transparent gates not exceeding forty-eight (48) feet in width shall be permitted in the enclosure.

(3) Vehicles or vehicle bodies shall be stored in rows with a minimum of twenty (20) foot continuous loop drives separating each row of vehicles.

(4) Vehicle parts shall not be stored, loaded, unloaded or dismantled outside the fence enclosing the salvage yard.

(5) No vehicle, vehicle bodies or other stored materials shall be visible from any residential use or district, business, or street, from a height at or below the top of the fence enclosing the yard.

(6) All batteries shall be removed from any vehicle, and all radiator and fuel tanks shall be drained prior to the vehicle being placed in the storage yard. Salvaged batteries, oil and other such substances shall be removed by a licensed disposal company or be stored in a manner which prevents leakage of battery fluid. No fluids removed from vehicles shall be applied as a dust control method.

(7) The front obscuring fence shall be setback the same distance as a building in the industrial zoning district, and all such fences shall be setback a minimum of five hundred (500) feet from any residential use or district.

(8) In order to protect surrounding areas, the crushing of vehicles or any part thereof shall be limited to daylight hours, provided that such activities shall not be conducted on Sundays or federally recognized holidays. GENOA TOWNSHIP ZONING ORDINANCE Industrial District 8-9

(9) The applicant must demonstrate that the activities of the salvage yard will comply with all state and federal regulations.

(10) The Planning Commission may impose other conditions which have a reasonable relationship to the health, safety and general welfare of Genoa Township. These conditions can include a provision for an annual inspection by the Zoning Administrator to ensure continuing compliance with the above standards



While I understand simply saying no isn't in the best interest of your positions, here are the valid reasons to say no.

8.01.01 Industrial District: The Industrial (IND) District is intended to primarily accommodate research, wholesale and warehouse activities and **light industrial operations** whose external, physical effects are restricted to the district and **in no manner affect in a detrimental way any of the surrounding districts.**

“Asphalt plants are considered a **heavy** industry, and they should not be established in areas designated for light industries.” Asphalt manufacturing companies in Michigan are considered synthetic minor sources of air pollution (“**Synthetic** minor Hazardous Air Pollutant (HAP) source” means a source that otherwise has the potential to emit HAPs in amounts that are at or above those for major sources of HAP in 40 CFR 63.2, but that have taken a restriction so that its PTE is less than such amounts for major sources.) What this means is if they were allowed to run 24 hours a day, 365 days they would be considered a major source. The regulations are in place because they are heavy industrial and high emissions. In addition, there are ways to conceal emissions which would otherwise constitute a violation of an applicable emission standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard that is based on the concentration of a pollutant in the gases discharged into the atmosphere. Who will be monitoring this? EGLE only gets involved if there are complaints, no inspections are made to ensure standards are being followed or tactics to conceal are being employed.

-Special use is required, but not mandatory to approve.

d. Access: All means of access to the property shall be from primary roads as classified by the Livingston County Road Commission as a Primary Road or have a right-of-way of at least eight six (86) feet.

Toddiem Drive 66' TD ROW

Max Height 30'

GENOA TOWNSHIP ZONING ORDINANCE

Sec. 8.03 DIMENSIONAL STANDARDS

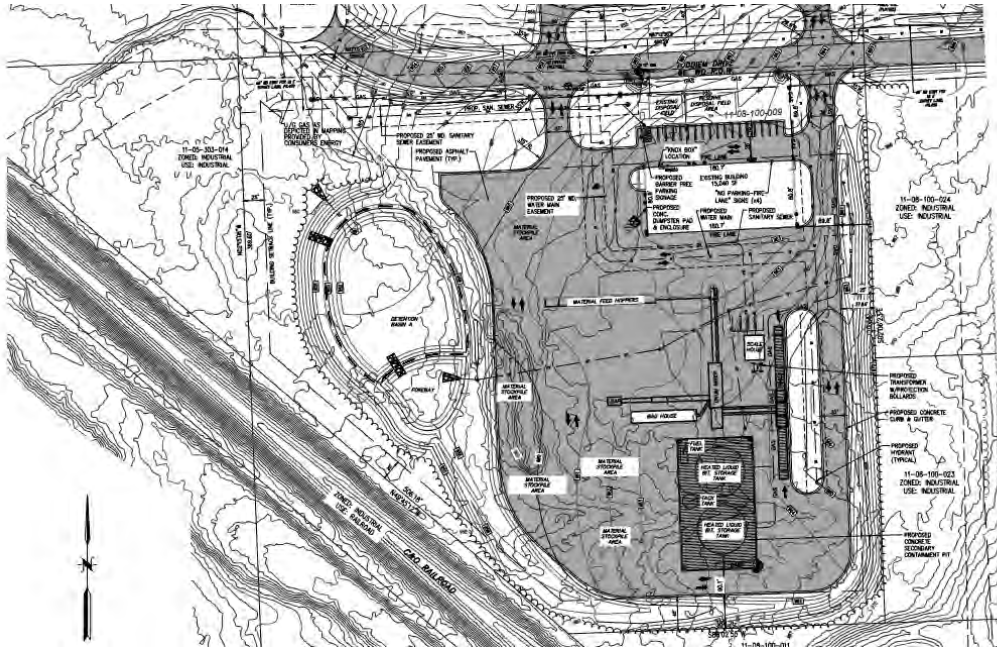
8.03.01 Industrial Schedule of Area and Bulk Requirements. All lots, buildings, structures and parking areas shall comply with the area height and bulk requirements in Table 8.03.01:

Table 8.03.01 DIMENSIONAL STANDARDS – INDUSTRIAL DISTRICT								
District	Min. Lot Area ^(a)	Min. Lot Width ^{(b)(c)}	Minimum Yard Setbacks – ^{(d)(e)(f)}				Max. Lot Coverage ^(g)	Max. Height ^(h)
			Front Yard ^{(g)(h)(i)(j)}	Side Yard	Rear Yard	Parking Lot		
Industrial District (IND)	1 acre	150 ft.	85 ft. if parking in the front yard 50 ft. if no parking in the front yard	25 ft. 50 ft. if adjacent to residential district	40 ft. 80 ft. if adjacent to residential district	20 ft. 10 ft. side and rear	40% bldg. 85% impervious surface	30 ft. 2 stories

(as amended 12/31/06)

Looking for exception to height ordinance over 2 times the max at 86'

(h) *Landscape Greenbelt: The front yard shall include a landscaped greenbelt as required by section 12.02.*



No greenbelt, in fact, most of the trees on the property will be destroyed.



(d) *Article 14, Parking and Loading-Unloading Standards, shall be adhered to for all parking.*

19 Parking spaces for an estimated 30 jobs possible, not including ownership vehicles
Parcel is under the required ordinance of 20 acres. The main parcel is almost half of that.

(c) Design Standards: Buildings shall utilize high quality architecture and landscaping that create a research and office-park environment with primary use of masonry material, such as brick, stone or split face block, and glass on buildings and landscaping along internal roadways and around the perimeter of the PID. Metal paneling and plain concrete masonry units shall constitute no more than twenty-five percent (25%) of the facades of buildings visible from the internal roadway or any adjoining public roadway. (as amended 12/31/06)

Design standards requiring high quality architecture including a maximum 25% metal panel shall be reduced to permit the existing building & proposed asphalt plant components and structures as set forth on the PID Plan.

Sec. 13.07 HAZARDOUS MATERIALS AND FUEL STORAGE Any use that involves fuel services and use or storage of large quantities of hazardous materials shall comply with the following requirements:

13.07.01 Above Ground Storage Tanks: Above ground storage tanks shall be limited to three hundred (300) gallon capacity, shall be located not less than seventy-five (75) feet from any occupied building or any lot line and shall be mounted on a solid concrete slab to prevent overturn and spilling;

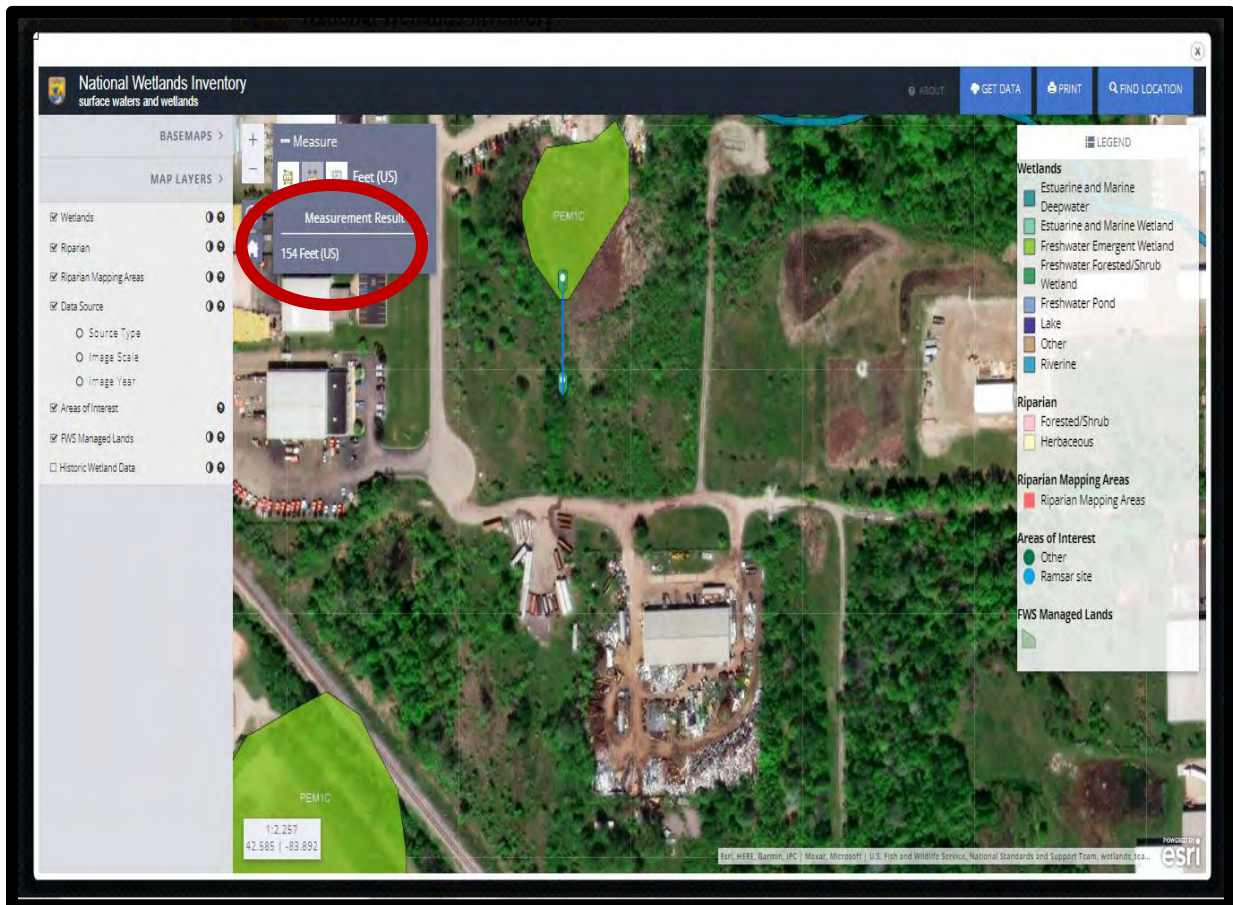
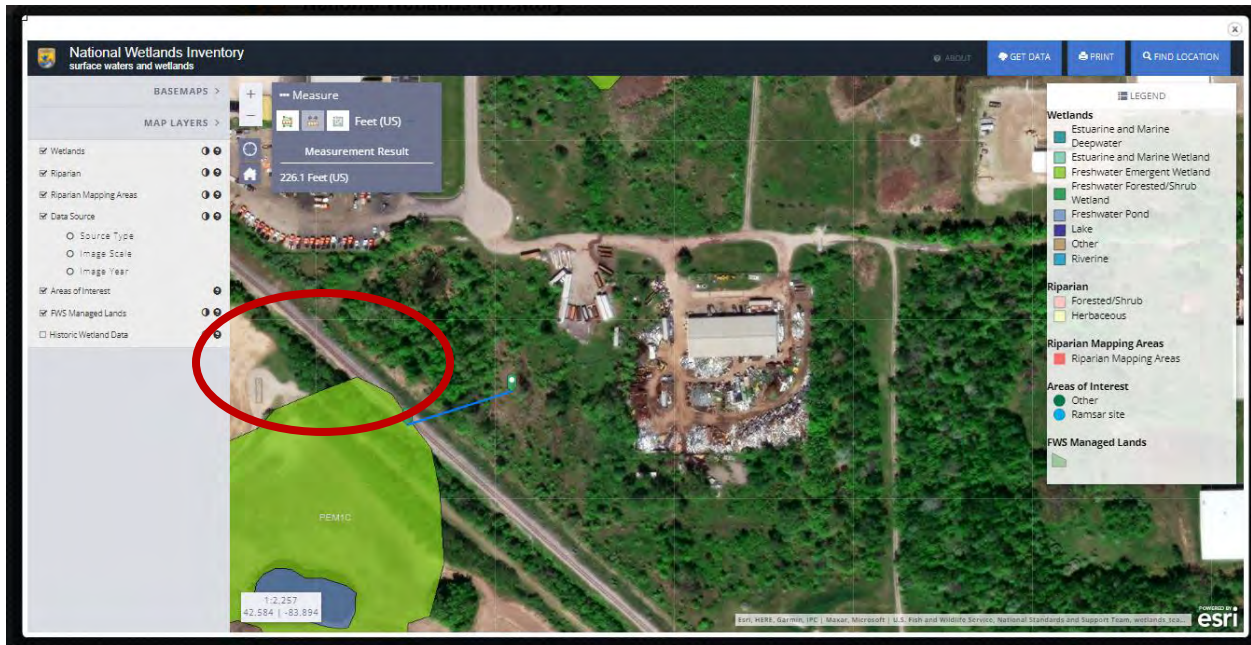
1. Fuel Storage Tank: 1,000 Gallons
2. Tack Storage Tank: 2,000 Gallons
3. Liquid Asphalt Tanks (2): 1,504,000 Gallons

Although Asphalt Plant fires/explosions are not common, are you willing to vote yes to create that risk within the Township?

Note pertaining to Soil Erosion and Sedimentation Control

This will require COMMERCIAL Soil Erosion and Sedimentation Control (SESC) Permit, nothing was mentioned in the permit pertaining to this application or the fact that due to the size a National Pollutant Discharge Elimination System (NPDES) Permit will need to be applied for. (PLEASE NOTE: Livingston County has enacted a Soil Erosion and Sediment Control Ordinance that is more restrictive than Part 91 of Act 451, as amended.

Mike Wilczynski, Pangea Environmental LLC speaks so much more eloquently on the topic of wetlands and will be forwarding detailed information that was entirely glossed over. There are however nationally recorded wetlands under 500 ft away from the proposed site. I didn't see this mentioned in Tetra Tech's or Desine's documents. (Maps on following page.) These require permits above local and state government.



If there are any questions as to will this affect residents and business owners...yes it will. Please vote no to ensure Genoa Township isn't the next McKinley Park.

McKinley Park asphalt plant fined after hundreds of complaints, owner is appealing
McKinley Park Asphalt is objecting to the \$4,000 fine after an inspector reported "odors of rotten eggs and fine particulate was blowing at me."
By Brett Chase | Jul 18, 2021, 5:08pm CDT

Illinois Attorney General Raoul looking into odor complaints around Chicago asphalt plant
The state's top prosecutor is concerned about more than 100 calls from neighbors reporting odors from a McKinley Park facility.
By Brett Chase | Jul 31, 2021, 1:15pm CDT

Chicago Sun-Times
News Sports More

Feds jump into McKinley Park asphalt plant fracas
Senators Durbin and Duckworth asked President Biden's EPA to oversee air pollution testing and oversight of MAT Asphalt, which prompted more than 100 odor complaints from neighbors in three years.
By Brett Chase | Jul 28, 2021, 6:00pm CDT

Amid Pandemic, Activists Push to Close McKinley Park
Some south, residents of McKinley Park on Chicago's Southwest Side have raised concerns that the MAT Asphalt plant is pushing back.

WATCH CHICAGO TONIGHT
online app facebook podcast

Kelly VanMarter

From: Andrew Barrett <abarrett@dt-law.com>
Sent: Wednesday, January 19, 2022 4:47 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Cc: Alycia Barrett
Subject: Asphalt Plant

Follow Up Flag: Follow up
Flag Status: Flagged

Hello,

I was disheartened to hear that an asphalt plant might be approved on February 7, 2022. The plant would be constructed 1.3 miles upwind of our house. One of the many problems with an asphalt plant is fugitive air emissions. A plant simply cannot control all of the particulate that goes into the air. For example, silica from the gravel dust comes off the gravel piles while loaded and unloaded (or even when the piles are static but the wind is moderate or high), and this silica dust cannot be captured by the plant. The dust is so small it passes right through the membrane of your lungs and can cause a number of chronic and irreversible conditions. <https://www.cancer.gov/about-cancer/causes-prevention/risk/substances/crystalline-silica>

Capital Asphalt will have a team trying to push this through. Correct me if I'm wrong, but their main talking points are their 'cutting edge technology' and 'full compliance with regulations'. However, it is well known that regulations are so far behind what medical science informs us. Lobbyists work to keep these regulations as least cumbersome as possible on the industry. On top of that, there will be the noxious smells in the entire area. Again, regardless of what they use to eliminate the smells coming from the stack, the hot mix being loaded in and out of trucks will generate enough fugitive emission to keep an ever-present smell of tar in the air.

You may be thinking: he lives 1.3 miles away – what's this guy's problem? A couple things...it is windy where we live and the wind blows from west to east. On a day with moderate wind speeds of 20 miles per hour, cancer causing dust will travel from the plant to our home in 3 minutes. The rear of our house faces west, and we will not be able to keep our windows open because the wind will deliver hot tar odor directly to our home.

Finally, and most importantly, I've included a picture of my 3 year old son, Oliver, who goes to school at Follow the Child on Latson (they also sent home fliers today and were outraged to hear of these plans). From age 3 until he moves from Genoa Township, he will be exposed to emissions every single day.

Please do not gamble the welfare of my family for this asphalt plant. Capital Asphalt can certainly find another location for the their plant.



On top of the health implications, I cannot think of a more surefire way to anger your constituents. I have not spoken to a single person who wants this plant to go in. Please do what is best for the community and vote this down.

Sincerely,

Andrew E. Barrett
Attorney



One Northwestern Plaza
28411 Northwestern Hwy.
Suite 600
Southfield, MI 48034

D: 248.979.9814
T: 248.549.3900
F: 248.593.5808

www.denenbertuffley.com

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Kelly VanMarter

From: Deborah Parks <captionit@sbcglobal.net>
Sent: Wednesday, January 19, 2022 12:23 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Stop the Asphalt Plant

Dear Representatives,

I am writing to let you know that I absolutely OPPOSE the proposed asphalt plant! Please do not allow this project to move forward as it will damage our beautiful community, harm residents' health, and lower property values. Vote NO!

Thank you,
Deborah Parks

Sent from [Mail](#) for Windows



Virus-free. www.avast.com

Kelly VanMarter

From: Nick Sherwood <nick@glSCO.com>
Sent: Wednesday, January 19, 2022 2:21 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt plant

Good afternoon,

I would like to voice my concerns about the proposed asphalt plant trying to pollute our county and township. Please vote no.

Nick Sherwood

Kelly VanMarter

From: DENNIS EDOFF <dme1376@comcast.net>
Sent: Thursday, January 20, 2022 2:07 PM
To: Kelly VanMarter
Subject: Asphalt Plant

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Kelly VanMarter, AICP,

A close friend of mine penned the following letter, and you responded that you would compile all the comments and emails you receive into a complete record of public comment. I agree with everything in his letter and ask that you please include this email with the complete record of public comment.

Dear Genoa Township Board:

We sincerely hope you deny approval for the proposed asphalt plant in Genoa Township. I don't think this type of manufacturing reflects the type of industries we should be trying to attract. We should be cultivating businesses that do not offend our sense of smell and hearing. We should be trying to attract high tech businesses. We do not need large asphalt trucks traversing our city streets. A plant like this promotes Howell as a low class community that attracts unattractive and dirty businesses. I doubt if Brighton would approve a plant of this type within or even close to their city boundaries. Approval of the plant would increase traffic and the wear and tear of our streets, which would have to be repaired at taxpayer expense.

Thank you for your consideration,

Dennis & Mary Edoff
628 Zion Ct.
Howell, MI 48843

810-333-6116

Kelly VanMarter

From: Roy Bailey <bailey77@msn.com>
Sent: Saturday, January 22, 2022 5:48 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: asphalt plant ----NO, NO, NO, NO!!!#####****!!!

Please be Advised,
NO, NO, NO, NO ASPHALT PLANT ----NOT IN TOWN...IT's a Health RISK!!!***
I don't know how to Implore you to think of this community's Health!!!
Respectfully,
Roy J. Bailey

Sent from [Mail](#) for Windows

Kelly VanMarter

From: Michael Lorence <milor1955@gmail.com>
Sent: Saturday, January 22, 2022 11:12 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; diana@genona.org; Kelly VanMarter
Subject: Proposed asphalt plant in Genoa Twp.

Genoa Twp. Board of Trustees:

You have been elected to represent the people of Genoa Twp., this community is now and always has been a "bedroom community". It is your job to make sure that it remains that way for generations to come, and to not allow our air and water (wells and lakes) to become polluted by this Asphalt plant.

Please vote **NO** when it comes time, and do not succumb to the pressure of a few and ignore the many, that is not how our democracy works. And remember Money is the root of all evil.

Michael & Julia Lorence.

Kelly VanMarter

From: Elaine Bono <idrivegm@att.net>
Sent: Sunday, January 23, 2022 6:53 AM
To: Kelly VanMarter
Subject: No asphalt plant

No new asphalt plant in Genoa Township!

I urge you to deny the proposed rezoning of parcels #4711-08-100-009 and 4711-05-303-015 from Industrial District (IND) to a Planned Industrial Development (PID) overlay district and the proposal of siting an asphalt plant in the township. I am alarmed that there seems to be no concern for the extreme impact on the greater community that asphalt plants have. To rely on state agencies that have been routinely underfunded, and to put the frontline defense of the community on an unprepared local township administrator to regulate this type of industry, is not only risky but naïve.

Asphalt production externalizes the cost of doing business onto the local community by exposing us to toxins and particulates affecting our health and the degradation of our land and water. Emissions typically coming from asphalt production include sulfur dioxide, nitrogen oxides, carbon monoxide, VOCs (volatile organic compounds), dioxin, lead, other toxic air contaminants, and particulates. Health effects range from headaches and coughing to lung, stomach, and skin cancers.

For the health and safety of our community, I urge you to deny the rezoning and any variances requested to allow the toxic practice of asphalt production in Genoa Township.

Vincent Bono

Howell

Sent from my iPhone

Kelly VanMarter

From: COLLEEN QUINN <cquinn4042@comcast.net>
Sent: Sunday, January 23, 2022 6:58 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Proposed Asphalt Plant

Dear Trustees,

We do not support the asphalt plant proposal for Genoa Township. We have sent detailed emails to that effect. We attended the brief Dec. 6 meeting. We also went to the Jan. 3 meeting only to find out it was cancelled (after calling in the afternoon and being told it was on). We were both prepared to speak at these meetings. We will be out of town for the Feb. 7 meeting, so unfortunately we are not able to speak during the call to the public.

Attached are our comments. We appreciate you taking the time to read and take them into consideration.

Colleen Statement:

I am against this project. This will have an adverse effect on the health of residents and the environment within at least 10 miles.

My husband, has severe COPD so your project would directly impact his health.

This project would negatively impact house values. A property value study documented losses of up to 56% because of the presence of a nearby asphalt plant. Why would you do this to our beautiful community?

According to the National Institute for Occupational Safety and Health: asphalt fumes are considered occupational carcinogens:

- The federal (**EPA**) states that, Asphalt Fumes are Known Toxins
- **Even if an asphalt plant meets all air pollution standards, people living nearby are still exposed to cancer-causing substances that can cause long-term damage**
- *Stagnant air and local weather patterns often increase the level of exposure to local communities (downwind, low-lying and lake areas are most greatly affected)*

Sources of emissions from Asphalt Plants are neither regulated nor monitored, and depending on the size of the operation, can release 300+ tons of toxic air emissions annually.

In Dec. I emailed you details about the 7 Deadly Fugitive Emissions that come from Asphalt Plants:

{Hydrogen sulfide (H₂S), Benzene (C₆H₆), Formaldehyde (CH₂O), Chromium, Polycyclic Aromatic Hydrocarbons, Cadmium, Arsenic}

I worked at GM for 36 years, the first 16 years of my career were spent at the Chevy Spring and Bumper plant in Livonia. They did chrome and nickel plating. I can tell you first hand and years later the devastating affect that Chromium and these toxins have on people. I have seen it.

I scanned the 339 pages of the Dec. meeting packet and observed that not a single citizen was in favor of this project. Why would Genoa vote for something that Tyrone and Hamburg turned down?

VOTE NO on this project!

Tim Statement:

We are against the proposed asphalt plant for many reasons. It will drive down property values, create issues with the current infrastructure (roads, traffic flow, etc.) and damage to the environment, especially air quality.

We have lived in Genoa Township for 26 years and wish to stay here for the remainder of our existence.

I have advanced COPD. My lungs function at 25% of what a normal person's lungs function at. I know the importance of clean air and that the long term effects of poor air quality are devastating.

My 30 years of working in a foundry are living proof that air quality is extremely important for a healthy life style.

We would hope that you would use your critical thinking skills and support those of us that see the devastation that an asphalt plant would create.

My quality of life is limited. The construction of this plant would further degrade what I now have. One thing I enjoy is sitting on our patio with our small pond. I fear this pleasure would be gone as I cannot subject myself to toxins from an asphalt plant. How sad would this be? I am sure I am not the only person with such issues.

If any of you are curious (you should be) about what advanced COPD is like; here is an example: Take a plastic bag, place it over your head and try breathing. Now, imagine emissions from an asphalt plant on top of this.

I implore you to vote NO on this and honor your oath of office and protect your constituents.

It was clear to us at the meeting on Dec.6, that the residents are vehemently opposed to this project. Please respect our wishes and deny this proposal.

Sincerely,

Tim and Colleen Quinn
Howell, MI

Kelly VanMarter

From: Heather VanderWal <vanderwalsix@gmail.com>
Sent: Monday, January 24, 2022 11:25 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plan

Good morning,

I am emailing to voice my concern and opposition to the potential asphalt company moving to Genoa Township. We are new residents to this area having moved here in July of 2021. The major reason we left Canton for Howell was for the quality of environment. We were looking for a more peaceful, natural lifestyle that you had to offer. We wanted to be able to see trees, stars, animals and have a quiet, healing environment. Obviously, we had to pay a significant amount to do so as housing rates in 2021 were rising continuously. Even with that against us, every day we are thankful we were able to move and we are so grateful for the blessing our new home has been to us.

An asphalt plant goes against every reason we moved here, and we hope you reconsider your recent change to the land use plan and vote against the approval of the asphalt plant moving to Genoa Township.

Thank you for your time and consideration.

Craig and Heather VanderWal
2107 Fisk Road, Howell MI 48843

Kelly VanMarter

From: Adam VanTassell
Sent: Friday, January 28, 2022 9:01 AM
To: Kelly VanMarter
Subject: Fwd:

Follow Up Flag: Follow up
Flag Status: Flagged

From: robred99 <robred99@aol.com>
Sent: Thursday, January 27, 2022 6:49:14 PM
To: info@genoa.org <info@genoa.org>
Subject:

Please distribute this email to all BOTs and add to the overhead display for the February 7, 2022 BOT meeting

Adding some "Lessons Learned(Things Gone Right/Things Gone Wrong)" observations to this Asphalt situation to capture for future improvements. I am sure other observations can be added to the below. Hopefully voted down, but a blessing that brings awareness of our Strengths, Weaknesses, Opportunities and Threats (SWOT). This is a way of analyzing the systems of an organization, even government system.

Weakness - Do we have a community regulation that protects the overall goals/objectives for "way of life" and "style of community" we want created. How do we prevent becoming a random collection of residential, retail and industrial structures and operations guided only by a zoning map. Do we want to retain the integrity as a "Town and Country" type community? An example; Boca Raton, Fl , a small city in Southeast FL has a regulation requiring all buildings and facades be of a Spanish Style for overall cohesiveness of the community. We are years behind that, but Genoa should be able to similarly be proactive putting regulations in place of how we want our community shaped before we grow, so we don't end up in the randomness that fell upon communities like Flint or Lansing.

Opportunity- We have found we need strong and complete township regulations backed up with County and State laws to stand up to organizations with big pockets. The asphalt company and land owners found the gaps in our regulations and using against us.

Assets - Federal and State Regulations The Townships (ours and neighboring ones that could reversely impact us) clearly need to be encouraged to review, define and make sure existing state and federal laws/regulation are not only incorporated into the township zoning, but ENFORCED.

THREAT - Will we have to fight another "asphalt like or heavy industrial" again. Either here or maybe in neighboring community where zoning regulations are not robust.

Threat - From the class action lawsuit in CA previously posted(it is one of many filed) across the USA, it's the failure ongoing monitoring and enforcement of laws that resulted in injury to citizens and devalued neighborhoods.

Weakness - If the elected Board members don't know or knowingly do not enforce existing higher level laws/regs within township ordinances, they could be setting the Township up for threat of legal issues from the asphalt company, landowner, citizen groups, neighboring townships, the county, or state.

What additional SWOTs have been observed? There needs to be a collective group brainstorming activity and address all areas.

Sent from my Verizon, Samsung Galaxy smartphon

Regards,
ROBIN Fischer

Kelly VanMarter

From: Matthew Sosnowski <matthew.sosnowski@comau.com>
Sent: Thursday, January 27, 2022 12:37 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: NO! to the asphalt plant

Vote no on the asphalt plant issue please.

--

Matt Sosnowski

3485 Pineridge Lane

Brighton MI 48116

Phone Cell 248 388 9933

e-mail matthew.sosnowski@comau.com

Kelly VanMarter

From: Judy Daubenmier <jdaubenm@gmail.com>
Sent: Friday, January 28, 2022 11:50 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: More Thoughts on Proposed Asphalt Plant

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Township Board,

I have written to you before about the proposed asphalt plant, but I had additional thoughts I wanted to share.

Last fall Genoa Township hosted an open house to solicit public comment on its master plan.

One segment asked what kind of “Gateway” we would like for the entrances to our township to solidify the township’s identity in visitors’ minds. The options were a piece of art, a building, a banner, a street, lighting, or landscaping.

I don’t remember which one I selected, but I know for sure none of the options was an 86-foot-high smokestack belching noxious odors and carcinogens.

And for good reason. That doesn’t fit with the vision laid out in the master plan for the area right next door to the plant. The existing master plan says the west Grand River area should be a regional retail and commercial area that would create a strong sense of community identity for Genoa. It would include shopping and restaurants.

Yet less than a month earlier, the Genoa Township Planning Commission had approved a zoning change that would allow an asphalt plant to be built in an area right next door to the envisioned regional retail and commercial area.

How could the planning commission have made such an oversight? Did it forget to compare the zoning request with what’s in its own master plan?

Genoa Township residents concerned about their community have found other oversights by the planning commission. These include:

--Wetlands on the site of the property may be subject to state regulation. Has a delineation of the wetlands been carried out as required by Part 303 of the Natural Resources Environmental Protection Act and an assessment made of the plant’s impact on them? The township has an ordinance regulating wetlands of at least 2 acres. Has a determination been made of the size of these wetlands? As they are located within 500 feet of surface water, they would fall under state regulation regardless of their size. But this issue is barely mentioned in the environmental impact statement.

--The plant plans to discharge groundwater from the site into the wetlands, and that requires a state permit – a Michigan Industrial Stormwater permit No. MIS110000. But no permit has been issued to allow the discharge of groundwater from the site into the wetlands.

--The environmental impact statement submitted in connection with the zoning is inadequate and fails to address both those issues in the necessary depth.

--The proposed plant violates the purpose of the master plan enterprise. As the existing master plan states, its purpose is to ensure a “logical development pattern while maintaining community character and protecting natural resources. ... (and to) ensure that Genoa Township remains a desirable community in which to live, work, or visit.” Nothing about the 86-foot tall smokestack emitting toxins will improve the quality of life in Genoa Township. Nothing is logical about putting this plant next to what is planned as a regional shopping and business center.

--The proposed plant is not an improvement over the existing use, despite the comments of one planning commissioner and the township supervisor. What’s there now, isn’t pretty, but it doesn’t stink, doesn’t emit toxins into the air, and doesn’t cause air pollution that will drop into our lakes.

--The existing use may be causing groundwater pollution, according to one planning commissioner. If so, why hasn’t this been addressed? Shouldn’t the township require it to be cleaned up before another development takes place?

The township board has the chance to fix these oversights on Feb. 7 when it can reject the rezoning for the plant.

As the master plan says, “Poor planning decisions are difficult to eliminate, most linger forever. The master plan can be viewed as a community blueprint for the future, a mechanism to help ensure each decision fits as part of the whole.”

The Genoa Township board should heed the guidance of its own master plan and recognize that this plant does not fit as part of the whole.

Cordially,

Judy Daubenmier

4490 Lakeshore Court

Brighton, MI 48116

Kelly VanMarter

From: m wilczynski <pangea52@yahoo.com>
Sent: Friday, January 28, 2022 12:30 PM
To: info; Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter; Amy Ruthig; Mike Archinal; Sharon Stone-Francis
Subject: Capital Asphalt proposed plant
Attachments: twpletterreport.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Please include our report regarding the environmental issues related to the proposed asphalt plant in the package to to Board and include in the public record.

Thank You.

Pangea Environmental, LLC
Mike Wilczynski
Certified Professional Geologist-Emeritus
Environmental Geology and Hydrogeology
248-318-4732



Pangea Environmental, LLC

Mike Wilezynski
Certified Professional Geologist
Pangea52@yahoo.com
248.3184732

January 27, 2022

Genoa Township
2911 Dorr Road
Brighton, MI 48116

RE: Capital Asphalt Environmental Review

Pangea Environmental, LLC was asked to perform a preliminary environmental assessment of the property being considered by Capital Asphalt for the location of a hot asphalt plant. The review consisted of an examination of readily available information including historical topographic maps from the archives of the US Geological Survey, historical aerial photography, various geological and maps of potential wetlands provided by websites maintained by the Michigan Dept. of Environment, Great Lakes and Energy (EGLE) and a cursory field visit.

The most notable feature are the potentially protected wetlands under Part 303 of the Natural Resources and Environmental Protection Act (NREPA).

The wetlands appear to be larger than indicated on the maps in EGLE Wetland Viewer. There is a disclaimer on the website that states the boundaries indicated on the maps are approximate and a field delineation is required by a wetland specialist.

We are asserting the wetlands are regulated because they occur within 500 ft of surface water in addition to appearing to be at least 5 acres in size. The wetland protection under Part 303 of NREPA is based on the Section 404 of the Federal Clean Water Act.

Only a cursory mention was made about wetlands in the environmental assessment submitted on behalf of Capital Asphalt. The review of the application material by the Township did not mention potentially protected wetlands either.

In addition to Part 303 of NREPA, Section 13 of the Genoa Township ordinance protects wetlands 2 acres in size and larger. A 25 ft setback from the wetlands is also required. This is impossible to determine until a wetland delineation is completed and reviewed by the township and EGLE Water Resources Division.

The proposed stormwater retention basins discharge to the wetlands. This requires a Part 303 Permit from EGLE Water Resources Division WRD), if the wetlands are regulated, as we assert.

The Part 303 Permitting process is not fast. There is a public comment period and a possible public meeting as part of the permitting process. There is no guarantee of getting the Part 303



Pangea Environmental, LLC

Mike Wilczynski
Certified Professional Geologist
Pangea52@yahoo.com
248.318.4732

Permit. The township approval should be delayed until all permits required under NREPA, including Part 303 (wetlands), are obtained.

We understand a Part 303 Permit application has been made and wetland delineation performed. This has not yet been shared at a public meeting. This information should be made part of the record and time allowed for a proper review by the township and the residents.

In addition to wetland and stormwater management issues, there are several wellhead protection zones nearby. These demonstrate the dependence of this area on groundwater for a water supply. There are shallow groundwater wells in the area and the proposed land use may impact the water supply through runoff and accidental releases. These do happen, even with new systems.

Other concerns include the stockpiles of aggregate that are kept on site. Sand and gravel contains silica, a carcinogenic mineral when inhaled. It also causes silicosis. The microscopic particles (PM2.5) are the most hazardous because they can get deep into the lungs and actually pass through the lung wall and enter the bloodstream.

The air quality permit granted by EGLE does not require the monitoring for offsite migration of airborne silica. The workers are protected under OSHA, but across the street and down the road there is no protection. There is a criteria for airborne silica, however, asphalt plants, as well as sand and gravel mines are exempt from having to monitor for it leaving the site. The silica is in addition to the other airborne contaminants released into the atmosphere.

In summary, there are environmental issues that have not been addressed, the most glaring is the lack of acknowledgement by the township of the potential for Federal and State regulated as well as Township regulated wetlands to be present on the parcels.

The use of the parcels for an asphalt plant is not fitting with the surrounding land uses. This proposed land use can have a detrimental effect on property values and occupancy. What is developing as a great commercial district, can be easily destroyed by one bad decision.

We are available to meet with the Township to present our information in more detail and answer questions, without charge.

Pangea Environmental, LLC
Mike Wilczynski
Certified Professional Geologist-Emeritus
Environmental Geology and Hydrogeology
248-318-4732

Kelly VanMarter

From: Leslie Baker <lcolbertbaker@gmail.com>
Sent: Sunday, January 30, 2022 11:28 PM
To: Kelly VanMarter
Subject: NO to the Asphalt Plant!

I am just learning of this proposed asphalt plant in Genoa and I do NOT want it here! First we're threatened with a gravel pit and now this! What in the world are you thinking? Get on the ball and do what's right for the citizens of our area and it's not an asphalt plant!

Shut this down immediately.

Leslie Baker

Kelly VanMarter

From: Eda Biegas <biegase@yahoo.com>
Sent: Sunday, January 30, 2022 11:43 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Vote no to the proposed zoning change. Vote no to the asphalt plant.

To the board of trustees,

Because of circumstances beyond our control, we won't be able to attend the February 7th meeting.

The people that are able to attend this very important meeting represent just a small fraction of the residents that are opposed to the ordinance change that would allow Capital Asphalt to build an asphalt plant in Genoa Township.

The residents do not want an asphalt plant in their community. It is very clear. We are angry that this is even a consideration. Please squash this proposal that would negatively affect our health, lifestyle, and property values!

Vote no to the zoning change, the asphalt plant and anything else that would affect the health and well-being of our community.

The Biegas family
1950 Genoa Circle

Kelly VanMarter

From: beth book <ht1956@aol.com>
Sent: Sunday, January 30, 2022 12:28 PM
To: Kelly VanMarter
Subject: From Beth

I'm Beth residing at Lakeshore Village Apartments
Read these horrible facts from 2003!!

Childhood Brain Cancers Near Asphalt Indust

Adapted from a present
Dr. Richard Weis
Blue Ridge Environmental D
January 2003

Health Problems

- Increased Cancer Rate
 - Over the last five years, very rare childho rates 11 times that expected in three cens untreated groundwater contaminated sites Salisbury.
 - The four cases were identified by a lone p actual cancer rate.
 - The ages of the children diagnosed with t
 - The rate of morbidity may be increasing: were diagnosed between 1995 and 2002. the previous seven years, between 1988 a

I STRONGLY oppose this rezoning for any asphalt plant. *This is NOT about money making opportunities! No room for justification.

Sent from my iPhone

Kelly VanMarter

From: James Carolan <jcarolan75@gmail.com>
Sent: Sunday, January 30, 2022 4:34 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant

I am a resident of Genoa Township, living at 1926 Genoa Cir, Howell, MI 48843. Please know that I am opposed to the asphalt plant.

Jim Carolan

Kelly VanMarter

From: April C <abski5@yahoo.com>
Sent: Sunday, January 30, 2022 6:46 PM
To: Kelly VanMarter
Subject: Asphalt plant

Dear Kelly,

My husband and I reside at 3242 Waverly Woods Lane in Howell. We adamantly oppose the asphalt plant. We feel this would be a terrible decision for our area. The proposed area is too close to homes, schools, daycare etc. We are currently unable to attend the meetings, but hope you will take our opinion into consideration.

Sincerely,

Bill and April Czerniawski

[Sent from Yahoo Mail on Android](#)

Kelly VanMarter

From: Vashaun DeBruyne <vmbaber22@yahoo.com>
Sent: Sunday, January 30, 2022 10:29 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Re: Asphalt Plant

I would also like to share this. Please do not let this plant in our community!!

Childhood Brain Cancers Near Asphalt Indust

Adapted from a present
Dr. Richard Weis
Blue Ridge Environmental D
January 2003

Health Problems

- Increased Cancer Rate
 - Over the last five years, very rare childho rates 11 times that expected in three cens untreated groundwater contaminated sites Salisbury.
 - The four cases were identified by a lone p actual cancer rate.
 - The ages of the children diagnosed with b
 - The rate of morbidity may be increasing: were diagnosed between 1995 and 2002. the previous seven years, between 1988 a

Vashaun DeBruyne

> On Jan 30, 2022, at 9:59 PM, Vashaun DeBruyne <vmbaber22@yahoo.com> wrote:

>

> Good evening-

>

> I am unable to attend the meeting on 2/7, however, I would like to voice my strong opinion opposing this asphalt plant. I have 3

small children and do NOT want this in our community. It is less than 2 miles from my home and I don't want my resale value being affected nor my family being subjected to toxic chemicals. Howell absolutely does not need this plant and it's a detriment to our community. It just floors me why we would even consider bringing something so nasty like this into our community. Shut it down please! No one wants this! Thank you for your time reading this.

>

> Vashaun DeBruyne

Kelly VanMarter

From: Vashaun DeBruyne <vmbaber22@yahoo.com>
Sent: Sunday, January 30, 2022 9:59 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant

Good evening-

I am unable to attend the meeting on 2/7, however, I would like to voice my strong opinion opposing this asphalt plant. I have 3 small children and do NOT want this in our community. It is less than 2 miles from my home and I don't want my resale value being affected nor my family being subjected to toxic chemicals. Howell absolutely does not need this plant and it's a detriment to our community. It just floors me why we would even consider bringing something so nasty like this into our community. Shut it down please! No one wants this! Thank you for your time reading this.

Vashaun DeBruyne

Kelly VanMarter

From: Bryan Funke <funkebr@gmail.com>
Sent: Sunday, January 30, 2022 8:40 PM
To: Bill Rogers; Diana Lowe; Jean Ledford; Jim Mortensen; Kelly VanMarter; Polly; Robin Hunt; Terry Croft
Cc: susan funke
Subject: Genoa Asphalt Plant

Hello,

I'm a concerned citizen of Livingston County and Genoa Twp up until very recently.

I'm am against this asphalt plant going up at this location and so near to child daycare, residential housing (including my mother's) and where it will be one of the main items that people see when coming into Howell.

Thank you,
Bryan Funke

Kelly VanMarter

From: jamie <jamie@uptownexchange.net>
Sent: Sunday, January 30, 2022 4:33 PM
To: Bill Rogers; Kelly VanMarter; Diana Lowe; Jean Ledford; Jim Mortensen; Terry Croft; Polly; Robin Hunt
Subject: PLANT

Not wanted here! Genoa opposes Asphalt plant.

Sent from my T-Mobile 5G Device

Kelly VanMarter

From: Alice Johnson <agrandma5350@gmail.com>
Sent: Sunday, January 30, 2022 9:29 PM
To: Bill Rogers; Diana Lowe; Jean Ledford; Jim Mortensen; Kelly VanMarter; Polly; Robin Hunt; Terry Croft
Subject: Say NO to Asphalt Plant

To the Genoa Twp,

My husband and I are residents that reside at 1898 Egret Point in Genoa Woods condominium. We moved to a condominium because my husband has COPD and is in heart failure. He was unable to maintain our home of 38 yrs. It was a tough decision. We have been very happy with our decision until I heard about the Asphalt Plant. I am afraid of the toxins that will develop in our air. This would be devastating for my husbands health. One of the few things we can enjoy is sitting out on the patio and porch. Please do NOT approve the asphalt plant, it does not belong here. Please do NOT approve.

Sincerely

Kenneth and Alice Johnson
1898 Egret Pointe
Howell, Mi 48843

Kelly VanMarter

From: Steven Linton <stevlint@att.net>
Sent: Sunday, January 30, 2022 4:28 PM
To: Kelly VanMarter
Subject: Asphalt Plant

My wife and I would like to go on record OPPOSING the building of an asphalt plant in our township. We live at 1800 Genoa Circle, Howell, Michigan 48843, Genoa Township. Thank you Steven & Sharon Linton

Kelly VanMarter

From: Silvana Z Long <silvanazlong@comcast.net>
Sent: Sunday, January 30, 2022 9:03 PM
To: Kelly VanMarter
Subject: NO to Asphalt Plant

Kelly,

I am a resident, residing at 1342 Elmhurst Drive and I oppose this Asphalt Plant as it would negatively impact the entire township and make it a less desirable place to live.

— Silvana Z Long

Kelly VanMarter

From: frances longe <franceslonge@icloud.com>
Sent: Sunday, January 30, 2022 1:56 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: No Asphalt Plant Please!

I am a new resident (Frances Longe) who just built our retirement home in Chestnut Springs in Genoa Township/Howell mailing. I am opposed to the proposed asphalt plant. Please do not ruin the beauty and air quality.

Thanks
Frances Longe
Franceslonge@aol.com

Kelly VanMarter

From: Alex Mishra <AlexMishra@hotmail.com>
Sent: Sunday, January 30, 2022 10:09 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant Zoning

Hello council members and associates.

My name is Alexander Mishra. I am a Genoa Township resident at 3499 Bauer Rd. I am writing to inform you of my great protest against the proposed rezoning of the parcel of land in Howell that would allow for the installation and operation of an asphalt plant.

The fact that this is even being considered is a complete atrocity of the council's morals. In the wake of manners such as the Flint water crisis the fact that a dramatic and well known source of air pollution is being considered in our area is beyond idiotic. Tyrone township showed that this company and facility are not wanted, so why is it even being considered in Genoa?

There are countless studies by both professional and amateur associations showing the negative effects on public health and the environment. Yet apparently theses studies and facts are being ignored for the citizens you are supposed to be representing? It is no secret that there some major conflicts of interest in this decision. I trust that the remaining members of the board will use their heads, not their wallets in this decision.

Regards,

Alexander Mishra
Genoa Twp. Citizen

Kelly VanMarter

From: julya8857@yahoo.com
Sent: Sunday, January 30, 2022 1:54 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt plant opposition

Hello,

My husband and I, John and Angela Palacios, own a home in Genoa Township at 4823 Stillmeadow Dr. Howell. We have lived here since 2007. We are strongly opposed to the asphalt plant. We are concerned it will affect property values in the area. If this is the case we would expect the township to proactively review and reduce State equalized values of homes within a several mile circle of this plant and reduce appropriately also reducing property taxes that we would pay.

We also feel that this is in opposition to all of the reasons we decided to live here. Your website states this yes best... GENOA TOWNSHIP is a charter township located in the heart of Livingston County, Michigan. Lakes and wetlands, rolling hills and meadows, state parks and wildlife all abound in this beautiful community of country living.

It puzzles me that this would even be considered. If this goes through I'm sure it will be a substantial monetary boon to the township so we would fight to have our property taxes reduced accordingly or we would consider moving out of the township. At the very least we would cease home improvement projects due to the reduced likelihood of recouperating home value upon sale. I don't think this is what you want your residents doing.

Thank you for taking the time to listen to a resident.

Angela Palacios

Kelly VanMarter

From: jsreuter <jsreuter@comcast.net>
Sent: Sunday, January 30, 2022 10:10 AM
To: Kelly VanMarter
Subject: Asphalt plant

My name is Janet Reuter and I live at 895 Menominee Dr Howell MI 48843. I don't want that stinky plant in my backyard. Please don't allow this to happen.

Thank you
Janet Reuter

Powered by Cricket Wireless

Kelly VanMarter

From: Lisa Sanchez <lisasanchez81@gmail.com>
Sent: Sunday, January 30, 2022 4:21 PM
To: Bill Rogers; Diana Lowe; Jean Ledford; Jim Mortensen; Kelly VanMarter; Polly; Robin Hunt; Terry Croft
Subject: asphalt plant

Hi,

As a resident of Genoa Township, I wanted to express my strong opposition to the proposed asphalt plant. I have my master's degree in Environmental Health Sciences and I'm a Registered Environmental Health Specialist. I understand the grave health risks that such a plant would pose. The health risks would far outweigh the potential economic benefit, so I urge you to stand on the side of the health of your residents.

Thanks,
Lisa

Lisa Sanchez, MPH, REHS
Environmental Sanitarian II

--
Lisa

Please think of the environment; do not print this email unless you really need to. Thanks!

Kelly VanMarter

From: Tom Zalucki <taz22goblue@yahoo.com>
Sent: Sunday, January 30, 2022 7:31 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant

Elected Genoa Twp. Officials,

I am a Howell resident at 1213 Risen Star Way and I am opposed to the proposed Asphalt Plant.

Regards

Thomas Zalucki

Sent from my iPad

Kelly VanMarter

From: Chris Aldighieri <stylee99@gmail.com>
Sent: Monday, January 31, 2022 9:25 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt plant

Hello,

My name is Chris A, residing in Brighton Township, and I oppose this asphalt plant. I have lived in Livingston County most of my life and so seeing the way it is outgrowing itself so quickly is disheartening. This would negatively impact the area's residents.

Thank you,

Chris

Kelly VanMarter

From: beth book <ht1956@aol.com>
Sent: Monday, January 31, 2022 5:27 PM
To: Kelly VanMarter
Subject: Re: From Beth

Kelly, Thank you!!

Can you let me know if it can be noted that I live 1300 feet from this. I so appreciate anything you can do.

I'm shell shocked right now and in disbelief that this is even a conversation.

I'll wait to hear back.

Respectfully, Beth Book

Sent from my iPhone

On Jan 31, 2022, at 4:49 PM, Kelly VanMarter <Kelly@genoa.org> wrote:

Thank you for your email. I am not a voting member of the board but I am compiling all the comments and emails we receive into a complete record of public comment and yours will be added.

Kelly VanMarter, AICP
Assistant Township Manager/Community Development Director

Genoa Charter Township
2911 Dorr Road, Brighton, Michigan 48116
Direct: (810) 588-6900, Phone: (810) 227-5225, Fax: (810) 227-3420
E-mail: kelly@genoa.org, Url: www.genoa.org

From: beth book <ht1956@aol.com>
Sent: Sunday, January 30, 2022 12:28 PM
To: Kelly VanMarter <Kelly@genoa.org>
Subject: From Beth

I'm Beth residing at Lakeshore Village Apartments
Read these horrible facts from 2003!!

Childhood Brain Cancers Near Asphalt Inc

Adapted from a presentation
Dr. Richard W
Blue Ridge Environmental
January 20

Health Problems

- Increased Cancer Rate
 - Over the last five years, very rare childhood cancer rates 11 times that expected in three counties with untreated groundwater contaminated by asphalt in Salisbury.
 - The four cases were identified by a local health department above the actual cancer rate.
 - The ages of the children diagnosed with cancer were similar to the previous seven years, between 1995 and 2000.
 - The rate of morbidity may be increasing. In the previous seven years, between 1995 and 2000,

I STRONGLY oppose this rezoning for any asphalt plant. *This is NOT about money making opportunities!
No room for justification.

Sent from my iPhone

Kelly VanMarter

From: susan funke <suse57@yahoo.com>
Sent: Monday, January 31, 2022 9:01 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant is Not Wanted!

I am a 30+year resident of Genoa Township, the place I brought my family to be free of pollution. Parks, outdoor space, and freedom to enjoy!

The Asphalt Plant will hinder all of that and more, in many ways.

JUST SAY NO!! PLEASE!

Our area can grow in many more environmentally safe ways.

JUST SAY NO!

Thank you,

Susan Funke

275 Chilson Rd

bill@genoa.org

polly@genoa.org

robin@genoa.org

jean@genoa.org

jim@genoa.org

terry@genoa.org

diana@genoa.org

kelly@genoa.org

[Sent from Yahoo Mail on Android](#)

Kelly VanMarter

From: Michelle Herbert <mlherbert63@gmail.com>
Sent: Monday, January 31, 2022 7:19 PM
To: Kelly VanMarter
Subject: ASPHALT PLANT

As a resident of Genoa Township, I am adamantly opposed to moving forward in any way with the approval of the proposed asphalt plant. We count on you to protect the people that live here, our property, and [property values. NO ASPHALT PLANT!

Michelle Herbert

Kelly VanMarter

From: Kim Loomis <kimaloomis@gmail.com>
Sent: Monday, January 31, 2022 6:51 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: NO Asphalt plant

Dear Team,

I am greatly opposed to the possible asphalt plant being considered in Livingston county. There are too many health and environmental concerns for the community to list. Please, do not let this be built in our county, which is so beautiful with fresh air and nature surrounding.

I live at 542 E Davis Rd, and oppose the asphalt plant. I enjoy fresh air for my family, vs the smells and toxins the plant will bring.

Please protect out communities!

Kim Loomis

Sent from my iPhone

Kelly VanMarter

From: Paula Mayrand <pmmayrand@yahoo.com>
Sent: Monday, January 31, 2022 3:51 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Oppose asphalt plant in Genoa

Hello,
I am writing to you to oppose the asphalt plant in Genoa.

Thanks,
Paula Mayrand
5929 Pine trace Ct

Sent from my iPhone

Kelly VanMarter

From: Daena Nicholas <daenakn@gmail.com>
Sent: Monday, January 31, 2022 7:16 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Cc: Daena Nicholas; Anthony Zurke
Subject: Vote no on Asphalt Plant

"I'm resident Daena Nicholas residing at 4569 Oak Pointe Drive, Brighton, MI 48116 and I oppose this asphalt plant."

Although this is proposed in Genoa, its reach is further than that. This will negatively impact residents in Howell, Brighton, and the Townships of Oceola, Marion and Brighton.

The eyesore, environmental damage and the physical health risks from this plant are of concern. I've lived here for 30 years and this is a beautiful area. The thought of an asphalt plant off I 96 and near residential and shopping districts is appalling .

Say no to this plant.
Respectfully

Daena Nicholas
810-599-7163

Kelly VanMarter

From: David Ruttan <dc812@att.net>
Sent: Monday, January 31, 2022 5:07 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant Proposal

My husband and I are asking you to please turn down the Asphalt Plant proposal.

We moved to Howell 15 years ago because of the small hometown “country living” lifestyle that this area presented. Since our move here the area has changed dramatically and not for the better.

It is becoming “city living” lifestyle, too busy, noisy and too much traffic.

We need to protect the clean air and water we currently have. What about the noise, smell and loss of property value?? I live within 3 miles of the proposed location and this is not acceptable!

This area is too close to homes and schools. Is there no rural area that can be found to build this plant?

Please stand with the Livingston County residents and turn down the Asphalt Plant.

Thank you,
Tama and Dave Ruttan

Kelly VanMarter

From: Kevin Wetzel <kevinw@cmcmichigan.com>
Sent: Monday, January 31, 2022 4:16 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Cc: Chris Wetzel; kw348743ellis@gmail.com
Subject: Proposed Asphalt Plant

Dear Members of the Board of Trustees:

I'm writing concerning the proposed approval of the construction of a new asphalt production facility for Capital Asphalt LLC 3888 S. Canal Road, Lansing, MI., to be located at 3080 Toddiem Dr., Howell, MI. My wife and I moved into the Ravines of Rolling Ridge which is located directly across Grand River Ave. from the Home Depot. Our subdivision is approximately one mile from the proposed asphalt production facility site.

I have learned a few things about the proposed construction project that I would like to get confirmation of, corrections to or simply more information about. Please review the following:

1. I was told that the 16 acre property has an application for a PID zoning to accommodate the proposed facility, but that the use on the application was listed for a simple LLC but the actual use was not revealed until after the zoning change was reviewed and accepted by the Board. Is this correct?
2. There will be a silo constructed up to 86' in height. The current maximum height allowed for permanent structures is 30'. Why would the board consider a variance of this degree?
3. The smoke and odors from this type of heavy industrial use has an extremely negative affect on adjacent commercial, schools, a nursing home and many residentially zoned areas. A facility of this type, located this close to these lighter zoned uses will, in fact, negatively affect the property values of the owners of those properties. I am of the opinion that the proposed property is much too close to these lighter uses to be considered by Livingston County and that it should be placed in a heavy industrially zoned location.
4. Jobs are proposed as one of the positive aspects of this facility, however, a minimum of 25 to a maximum of 50 jobs hardly seems a reason to create such a financial burden on the surrounding property owners. Also, It's my understanding that Capital Asphalt will be transferring employees from their Lansing location and so there won't actually be jobs available for residents in Livingston County.
5. It is being reported that the sellers of the property, Bruce Hundley and his wife, Betsy Hundley, have close ties to Bill Rogers and in an article from the Livingston Daily where Todd Smith stated that Mr. Rogers should recuse himself from this approval process, it states that Mr. Hundley contributed funds to Mr. Rogers' campaign. The approval of a facility of this type with such a negative impact on the local community, all If the previous statement is correct, I completely agree, Mr. Rogers should recuse himself as this appears to be a clear conflict of interest.

If the items listed above are true, this manufacturing facility should not be allowed to be located there.

We will continue to fight this project, along with the others in our community who will be negatively affected by it, for as long as it takes to stop this construction project.

Respectively,

Kevin Wetzel
390 Natanna Dr.
Howell, MI 48843

Kelly VanMarter

From: Les M <leslie.whitver@icloud.com>
Sent: Monday, January 31, 2022 4:18 PM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt Plant

Les and Phyllis Whitver are against the building of this plant. We are at 5311 Edgewood Shore. Please vote no! Thanks

Sent from my iPhone Les Whitver.

Kelly VanMarter

From: Charter.net <jtwils@charter.net>
Sent: Monday, January 31, 2022 8:12 PM
To: Kelly VanMarter
Subject: Asphalt plant

Sent from my iPad

We are residents of Genoa Woods Condos and strongly oppose the approval of the asphalt plant being built in this area. Please do not let this happen.

Joyce and Tom Wilson

Kelly VanMarter

From: Allison Dalglish <allison.dalglish@yahoo.com>
Sent: Tuesday, February 1, 2022 11:22 AM
To: Bill Rogers; Polly; Robin Hunt; Jean Ledford; Jim Mortensen; Terry Croft; Diana Lowe; Kelly VanMarter
Subject: Asphalt plant

Hello,

I'm writing to you as a very concerned citizen and parent from Howell, requesting that you DO NOT allow the plans for the asphalt plant to follow through in Genoa Township. You have been trusted to make decisions on behalf of your community and NOW is the time to listen to your fellow community members and step up and protect them- it is your responsibility. This asphalt plan would be DEVESTATING to our community's health, especially our children. Please do not allow this to happen!

Sincerely,
Allison Mageli

Kelly VanMarter

From: Kamil Suzie Kowalski <0622kowalski@gmail.com>
Sent: Tuesday, February 1, 2022 10:00 PM
To: Kelly VanMarter
Subject: Time sensitive questions for the twp.
Attachments: Questions for Genoa Township.docx

Mrs. VanMarter,

With regards to the Asphalt plant proposed in Genoa Township as a resident, mother and taxpayer, I along with hundreds of households in the area are very disturbed on the matter because of the overabundance of details in the submittals that seem to be overlooked. Our Planning Commission and Board of Trustees are residents and want what is best for our community, as we all do. When questions and concerns were raised by the township, it appears the answers were provided by representatives of the Asphalt plant and were taken for face value without further investigation. That is extremely concerning because as a business they want what is best for their business.

I applaud our township representatives because they've helped build and made Genoa Township a wonderful place to live. My husband and I are setting our roots permanently in Howell to raise our son Kaleb. Kaleb goes to school at IXL in Howell on Grand River Ave and lives across the street, just 3 miles away from the proposed location of the plant and a shorter distance as the crow flies. If approved, from 15 months of age until he moves from Genoa Township, he will be exposed endlessly to cancer causing emissions every single day! My family wants what is best for the greater good of our community and for our community to continue to be a desirable and safe place to live. One poor decision could compromise that indefinitely.

I wanted to include an excerpt from a statement made by the Detroit community health director. The following statement was made in reference to the recent asphalt plant proposal in Detroit. This resonated with me, hopefully it will do the same for you. "Kathryn Savoie, Detroit community health director for the Ann Arbor-based Ecology Center, told Crain's last week she was "alarmed" to hear the facility was planned in such close proximity to homes. "I think we all support the need to fix the damn roads, but we can't do that by creating additional environmental harm in the community," Savoie said." This statement rings true for the current topic at hand, and the difficult decision that the Board of Trustees are faced with.

Once the vote is finalized and if the vote grants all variances permitting the plant to continue with their plans, there will be no way for our township to address concerns of residents regarding pollution, smells, traffic. The horse will be out of the barn without any fencing to contain it. There will be zero authority that Genoa Township will have to enforce modifications, as that will be at the EGLE level to address.

If this is approved, it will open the door and be the gateway allowing other heavy industries to move into our community that does not fit in with the character of our township.

Upon researching and reviewing the submittals, I have compiled numerous questions that have been left unanswered. I feel these questions could only be responded to and answered by the Planning Commission, the Board of Trustees, the Ordinance Officer and the Manager of our township.

Attached to this email are pertinent questions I am asking on behalf of myself and many community members that are deeply concerned and opposed to this proposal. We are asking for answers and a response. Please respond at your earliest convenience but before February 7th 2022.

I am also requesting that this email and the attached document with the questions be included in the February 7th meeting packet.

Respectfully submitted,

Suzanne Kowalski
5341 E Grand River Ave
Howell MI 48843

(815)258-9664

1) Can you demonstrate how the proposed asphalt plant will be an asset to the community from the following perspectives. How will this facility contribute to;

- The marketability of the vacant commercial buildings that are along the transportation route of the plant?
- The marketability of vacant retail space along Grand River Avenue that is immediately downwind of the plant?
- The quality of life of residents and businesses in the immediate area? (IE. Outdoor dining at restaurants?)

2) It's noted in the application that specifically Livingston County Road commissioner would benefit from the availability and cost savings.

- Does the road commission issue RFPs for capital improvement projects such as paving roads? If so, is there any guarantee that Capital Asphalt will submit the most competitive bid?
- Could you demonstrate how Capital Asphalt has lowered costs to customers in the past?

3) If this application is still in the process of being decided when the new Master Plan is adopted, will this application be re-evaluated to ensure it fits with the new goals that have been adopted or will it just be accepted as a legal non-conforming use?

4) As the Master Plan says, "Poor planning decisions are difficult to eliminate, most linger forever. The master plan can be viewed as a community blueprint for the future, a mechanism to help ensure each decision fits as part of the whole."

- Do you believe that the Asphalt plant proposal is conducive to the master plan and the greater good of our community?

5) Has the company provided examples, where a plant such as the one being proposed, does have a positive impact on the economical and environmental initiatives of the community?

6) A study performed by Blue Ridge Environmental Defense league found that having an asphalt plant near residential areas adversely impacts property. The asphalt plant does not lend itself to improving the value of residential and commercial properties in the area, how would you envision addressing potential negative impact such a facility could have on the evaluation of properties in proximity to the facility?

7) If approved, this proposal would lead to sand and gravel semi-truck traffic accelerating the deterioration of roads in the immediate area; damage that taxpayers will pay to repair. There has not been a traffic impact analysis that has been submitted.

- Will there be a traffic impact analysis completed to review?

- How will this impact Livingston County Road Commission & UPS traffic?
- Will trucks in turn take Grand River to avoid truck back up?

8) Under qualifying conditions in Article 10.02.01 Single Ownership. "The planned unit development site shall be under the control of one owner or group of owners and shall be capable of being planned and developed as one integral unit." It is shown that one parcel is owned by an LLC while the other is owned by a corporation.

- How is single ownership defined as it pertains to this article?

9) In the application when asked about deed restrictions, it has been stated that the applicant is currently in the process of obtaining and reviewing Title commitments for the subject property. What were those findings?

10) Asphalt plants are considered a heavy industry and shouldn't be established in areas designated for light industries. The minimum lot area to qualify for a PUD is 20 acres; this site is 16.2 however, articles state the Township Board may reduce this standard for sites served by both public water and sanitary sewer. But what about the on-site wetlands and the setbacks in local township ordinances that pertain to the onsite wetlands? Capital Asphalt's plan must accommodate the facility and the regulated distance for onsite stored materials and parking for all staff, do you foresee their plan still be able to meet regulations?

11) Capital Asphalt is requesting the following exceptions to other ordinances:

1. Doubling Dimensional Standards (Stack height)
2. Hazardous Materials and Storage (Above ground 3x the allotted amount)
3. Primary road width (Reductions of around 24%)

- Will all requested variances be permitted to allow this proposal to come to fruition?

12) The proposed use involving an 86' stack, associated parking lot, site lighting, above ground hazardous fuel storage is not harmonious, will be harmful, objectionable to existing and planned future uses in the immediate area, specifically Cleary University, Gildea Woods Daycare, Namou Hotels and the planned technology park.

- Genoa Township & residents are very proud of the fact that it is home to the only institution of Higher education in the county. What has Cleary College's feedback been on this project?

13) Wetlands are indicated on the subject site as indicated on the EGLE Wetland Viewer. The website has a disclaimer that the map is only approximate and a wetland delineation in the field must be performed by a wetland specialist; No wetland delineation has been provided in the submittals. NREPA Part 303 regulates wetlands that are 5 acres or larger or within 500 ft of surface water; as confirmed by the delineation performed by ASTI in September of 2021, the wetlands are larger than 5 acres.

- Why was this information not included in the October packet and available for public overview?
- Why does ASTI conclude in their finding and final report that the subject location is 40 acres when in the Capitals application it states the location site is 16.2 acres?
- Do you believe that wetlands are being overlooked within the township & county with many of these site plans?

14) Under Section 13 of the Genoa Township Ordinances, wetlands are regulated if they are 2 acres or larger. The township's review of the supplied environmental studies did not mention wetlands are a potential issue. Is this matter going to be closer looked at and enforced?

15) Advanced Alloys that is operating and located in the proposed site is currently violating township ordinance and does not comply with all the Salvage Yard requirements.

- How long have they been operating without any interaction/requests for action to follow the ordinance?
- Why has nothing been done to enforce the ordinances and standards that are being violated?
- When was the last inspection by the Zoning Administrator to ensure continuing compliance with the salvage yard standards?
- Should it be expected that township standards/ordinances will not be enforced or checked for compliance for the next facility that operates out of that location?

16) Groundwater quality was not properly addressed without any facts in the submittals based upon a knowledge of the hydrogeology. Stormwater runoff can contain contaminants. The proposed plan is to discharge runoff out of 2 bays into wetlands. There are shallow water supply wells nearby and wellhead protection zones indicating the reliance on groundwater in that area.

- What measures are being taken to protect and prevent wells and the water table from being potentially contaminated and polluted?
- What will be done to mitigate the risk when the asphalt plant contaminates wells, affecting thousands of homes that get their water supply from wells?

17) In Michigan asphalt plants typically operate April 1- December 1 coincidentally when people are the most active outdoors, noxious fumes and odors could be smelled miles beyond the property, interrupting enjoyment of backyards and outdoor areas, but more importantly during that time their emissions exposure is permitted up to 680,000 throughput tons that residents and visitors will be breathing into their lungs causing mass harm to public safety. With the approval of higher stacks this will affect neighboring communities due to travel of emissions/carcinogens OSHA recognizes as cancer causing. The air pollutants contain elements like reactive oxygen species and heavy metals, and these components can affect the central nervous system. It can cause neuroinflammation, short-term memory disturbances, and even Parkinson's disease. It is well known that regulations are so far behind what medical science

informs us. Lobbyists work to keep these regulations as least cumbersome as possible on the industry.

- Are you considering the air quality and health safety impacts this proposal will have, especially the components that are not being closely monitored and regulated, if not why?

Note: Other concerns include the stockpiles of aggregate that are kept on site. Sand and gravel contain silica, a carcinogenic mineral when inhaled. It also causes silicosis. The microscopic particles (PM2.5) are the most hazardous because they can get deep into the lungs and actually pass through the lung wall and enter the bloodstream. The air quality permit granted under Part 55 of NREPA does not require the monitoring for offsite migration of airborne silica. The workers are protected under OSHA, but across the street there is NO protection. There is a criteria for airborne silica, however, asphalt plants, as well as sand and gravel mines are exempt from having to monitor under the General Permit from EGLE Air Quality Division. The silica is in addition to the other airborne contaminants released into the atmosphere.

18) An external Risk Assessment has not been done nor provided. We are concerned for the health of all residents/guests in Genoa Township and surrounding areas, as well as delicate lake ecosystems and wildlife. (Door to door health study did a report and found that nearly 50% of residence that live within a ½ mile had a noticeable decline in their health once the asphalt operations began.

- Have you researched the number of how many people will be detrimentally impacted within the first ½ mile, including the number of Genoa Township's residence that live within the first ½ mile, children and students that attend educational programs within the first ½ mile and surrounding workforce/employees within the first ½ mile that will be severely affected?
- Will a Risk Assessment be done to further evaluate and taken into consideration?

19) Would you want to live in close proximity and downwind from an asphalt plant?

20) Where is the environmental justice for the residences in subsidized housing within 1500ft of the proposed asphalt plant location.

21) What could be done to help you make the right decision that is in the best interest of the entire community?

22) Can the townships vote be delayed until Title commitments, Risk Assessment, Traffic Impact Analysis and all permits required under NREPA, including Part 303, are obtained and fully reviewed?