

ARD-45

2024

Hot Mix Asphalt Plants: Health Effects and Standards

This fact sheet provides information about hot mix asphalt plants, their potential health risks and how they are regulated. **People living near a hot mix asphalt plant might smell odors from the plant. However, the risk for adverse, or bad, health effects is very low.**

Hot mix asphalt is used as paving material for roads. The paving material is a mix of approximately 95% gravel, sand and stone that is bound together by asphalt cement. Asphalt cement is a product of crude oil. It is heated and mixed with the aggregate (the mix of gravel, sand and stone) at a hot mix asphalt facility. After mixing, the hot mix asphalt is loaded into trucks and taken to a construction site. Some plants also process reclaimed asphalt pavement.

When hot mix asphalt plants heat asphalt cement, the cement releases various chemicals and odors. Fugitive dust emissions are also released when the aggregate is used on the site and when it is moved from storage piles to loaders and dump trucks.

Air emissions from hot mix asphalt plants

The chemical composition of hot mix asphalt depends on the source of the crude oil, the type of asphalt being made and the processes used to make it. In general, air emissions from hot mix asphalt plants may include the following:

- Volatile organic compounds (VOCs).
- Polycyclic aromatic hydrocarbons (PAHs).
- Asphalt (Bitumen) fume (CAS #8052-42-4).
- Particulate matter (PM).
- Sulfur dioxide.
- Hydrogen sulfide.
- Nitrogen oxides.
- Carbon monoxide.

Motor vehicles, fireplaces, woodstoves and various industries also produce some of these chemicals. In outdoor air, these chemicals are commonly found at low levels. Levels might be higher near a hot mix asphalt plant or paving project.

People living near a hot mix asphalt plant might smell odors from the plant. Odor detection depends on the emissions, or releases, from the facility and wind direction. Odors from asphalt production can cause irritation. However, the risk for adverse, or bad, health effects is very low. Children might be more sensitive than adults to certain chemicals.

Potential health effects

Exposure

You might be exposed to emissions from the production of hot mix asphalt by breathing them in the air. Emissions can also condense onto exposed areas of skin. Workers in hot mix asphalt plants typically have the greatest exposure to asphalt plant emissions. Potential health effects from exposure to hot mix asphalt plant emissions depend on the content of the emissions, how long exposure lasted, the amount or concentration of exposure and individual sensitivity.

Exposure investigations in several communities where hot mix asphalt plants have been operating have measured various pollutants in outdoor air. The studies did not find any chemicals or compounds at levels that would pose a public health hazard.

Short-term (acute) effects

Workers in the asphalt industry have reported health symptoms such as:

- Irritation of the eyes, nose, and throat.
- Headache.
- Fatigue.
- Shortness of breath.
- Wheezing.
- Dizziness.
- Nausea.

These symptoms result from short-term exposure to high levels of hot mix asphalt emissions. The symptoms usually go away after exposure has stopped.

Many of the highly odorous chemicals in asphalt plant emissions can be smelled at levels below those expected to cause harmful effects. However, continued exposure to odors can cause health symptoms such as fast heart rates, dizziness, nausea, sweating and anxiety in sensitive persons. These symptoms are usually short-term and go away after the odors disappear. People should consult their health care providers if these symptoms continue.

Long-term (chronic) effects

Some asphalt workers with high exposure to asphalt plant emissions over longer periods of time have experienced symptoms such as coughing, wheezing and shortness of breath. Bronchitis has also been reported among asphalt workers. However, not enough information is available to say the bronchitis was caused by exposure to asphalt plant emissions while working.

Cancer-causing (carcinogenic) effects

Some research shows evidence that lung cancer can be related to occupational asphalt plant emissions exposures. Other studies have found no association with lung cancer. At times, low concentrations of carcinogenic PAHs have been identified in asphalt plant emissions at various worksites.

No studies have linked exposure to hot mix asphalt plant emissions in residential areas with an increased risk for cancer.

Health standards and criteria

Air pollutants released by asphalt plants include particulate matter, carbon monoxide, sulfur dioxide, nitrogen dioxide, volatile organic compounds, asphalt (Bitumen) fume and hazardous air pollutants. Particulate matter are inhalable particles found in the air. They are categorized into two sizes. Inhalable particles of 10 micrometers or less in diameter (PM₁₀) and fine inhalable particles of 2.5 micrometers or less in diameter (PM_{2.5}). A single hair from your head has an average diameter of about 70 micrometers –

making the hair 30 times larger than the largest fine particle.

A hot mix asphalt plant must meet emissions criteria specified in New Hampshire Code of Administrative Rules, [Env-A 100 et seq.](#), *New Hampshire Rules Governing the Control of Air Pollution* and federal Code of Federal Regulations [40 CFR 60 Subpart I Standards of Performance for Hot Mix Asphalt Facilities](#) to receive an air permit from the New Hampshire Department of Environmental Services (NHDES). If emissions criteria are met, emissions from hot mix asphalt plants would not be expected to pose a public health hazard.

For more information

For more information or a list of references, please contact the NHDES Environmental Health Program at [\(603\) 271-6802](#). If you are looking for information about a specific hot mix asphalt facility, please visit the [NHDES OneStop online database](#).

Note: This fact sheet information is accurate as of January 2024. The availability of additional information after this date may render this information inaccurate or incomplete.