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William Keefe

October 21, 2019

Neil Faiman, Chair
Wilton Zoning Board of Adjustment
P.O. Box 83
Wilton, NH 03086

Re: Quinn Properties, LLC
Case No. 7/9/2019-1

Dear Mr. Faiman:

Quinn Properties, LLC has submitted a variance application on Lot B-10 to allow for the construction of a batch plant and silo which would exceed the 45' height limit in the Industrial District. This narrow issue should be the focus of the ZBA's attention.

We are aware of some of the materials which have been submitted by a number of parties and to provide balance should the ZBA elect to broaden the scope of the hearing Dr. Laura Green will be present Wednesday evening if the Board has any questions concerning environmental and toxicology issues.

I have submitted seven copies of Dr. Green's Questions and Answers Regarding Hot Mix Asphalt Plants and Environmental and Public Health Considerations. Also attached is a one page summary of Dr. Green's qualifications. (Her full *curriculum vitae* runs 23 pages and can be found at <https://greentoxicology.com/resume/LauraGreenCV.pdf>.)

Very truly yours,



William Keefe

WK/ac
Enclosure
cc: Quinn Properties, LLC

**QUESTIONS AND ANSWERS REGARDING HOT MIX ASPHALT PLANTS
AND ENVIRONMENTAL AND PUBLIC HEALTH CONSIDERATIONS**

Laura C. Green, Ph.D., D.A.B.T.
October 2019

Q. Are hot mix asphalt plants common in the United States?


A. Yes. There are some 3,600 hot mix asphalt plants in the U.S. (U.S. EPA, 2000, available at <http://www.epa.gov/ttn/chief/ap42/ch11/related/ea-report.pdf>). Hot-mix asphalt is usually produced at temperatures of between 300 and 325 degrees Fahrenheit, and needs to be applied at no less than about 250 degrees. It therefore needs to be produced relatively close to where it is needed. This is why hot-mix asphalt is produced at thousands of small facilities near residential centers and roadways, rather than at a few large facilities at distant locations.

Q. Have hot mix asphalt plants been tested with regard to airborne emissions?

A. Yes. The U.S. Environmental Protection Agency (EPA) has extensively tested, or overseen the testing of, hot mix asphalt production. (See <http://www.epa.gov/ttn/chief/ap42/ch11/related/c11s01.html> and associated links, especially the Emission Assessment Report at <http://www.epa.gov/ttn/chief/ap42/ch11/related/ea-report.pdf>).

Q. On the basis of testing, are hot mix asphalt plants major sources of air pollution?

A. No, they are minor sources. Although hot mix asphalt plants had been initially listed by U.S. EPA, in 1992, among the 174 types of manufacturing facilities or other sources that *might* be major sources of air pollution (*per* the federal Clean Air Act), test data collected thereafter indicated that hot mix asphalt plant emissions were *smaller than expected*. Accordingly, hot mix asphalt facilities were “de-listed” by U.S. EPA and are considered instead to be only minor sources (see *Federal Register*: February 12, 2002, Volume 67, Number 29, Pages 6521-6536, “National Emission Standards for Hazardous Air Pollutants: Revision of Source Category List Under Section 112 of the Clean Air Act,” available at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2002_register&docid=02-3348-filed.pdf) In other words, U.S. EPA determined that additional controls or emissions reductions, beyond those already in place, are not required for hot mix asphalt plants, even for the largest plants in operation.

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Q. What compounds are emitted to the air from hot mix asphalt plant exhaust stacks?


A. The gases expected to exit the exhaust stack of the proposed facility are listed below in the table. As shown, more than 99% of the exhaust gases are made up of four chemicals — nitrogen, water vapor, oxygen, and carbon dioxide. Emissions of these four chemicals, at these rates, are not expected to affect public health.

Typical concentrations of compounds in gases emitted by hot-mix asphalt facilities.

Compound	Concentration in stack gas
Nitrogen	67.7 %
Water	20.0 %
Oxygen	9.5 %
Carbon dioxide	2.8 %
Carbon monoxide	0.02 %
Sulfur dioxide	0.004 %
Nitrogen oxides	0.005 %
Volatile organic compounds (VOCs)	0.004 %
Total	100 %

Q. Can the other emitted materials listed in Table 1 harm health?

A. Yes, but only *at sufficiently large concentrations*, and not at small concentrations. Large concentrations of substances such as carbon monoxide, sulfur dioxide, nitrogen oxides, and other pollutants can cause health problems. These pollutants, which are products of incomplete combustion, are emitted by *all* gasoline and diesel-powered vehicles and other engines, home heating furnaces, electric power plants, and many other sources.

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Q. How is it determined whether the airborne impacts from the proposed plant would or would not be acceptably small?

A. Air dispersion modeling has been performed for many hot mix asphalt plants in many settings: the results indicate that air quality in immediately surrounding neighborhoods is not significantly affected. If the modeling shows unacceptably large impacts, state regulatory agencies will not grant an air permit for the proposed plant.

Q. Will “fugitive emissions” – emissions not captured by air pollution control devices – significantly adversely affect air quality and public health?


A. They are not expected to do so. Fugitive emission sources from hot mix asphalt production include:

- aggregate material handling and traffic;
- vapors released from equipment vents and from hot-mix asphalt placed into trucks; and
- truck exhaust.

Public concerns in the late 1990's prompted U.S. EPA to conduct a comprehensive study in which two hot mix asphalt plants (one in California and one in Massachusetts) were tested extensively for fugitive emissions and stack emissions. The EPA found that fugitive emissions of volatile substances were small, relative to exhaust stack emissions. (See EPA's 2000 Hot Mix Asphalt Plants Emission Assessment Report at <http://www.epa.gov/ttn/chief/ap42/ch11/related/ea-report.pdf>).

Q. Can hot mix asphalt plants create nuisance odors?

A. Yes, sometimes: reduced sulfur compounds and other constituents of asphalt cement can produce the distinctive odor of hot mix asphalt. However, use of best practices for capturing airborne emissions, and odor neutralizing agents, can substantially minimize these odors. Moreover, these odors are produced only when hot mix asphalt is being freshly applied at road-sites, or when it is being loaded into truck-beds at the production plant or at facility silos. In the latter cases, these odors would not be expected to be detectable beyond the property boundaries of the production site.

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Q. Will asphalt odors be detectable at Goss Park?

A. No: the Park is too far from the proposed location of the hot mix asphalt plant for asphalt-odors to reach the Park.

Q. Will noise from the facility be detectable at Goss Park?

A. No: the Park is too far from the proposed location of the asphalt plant for noise due to hot mix asphalt production, or to loading of the product into trucks, to reach the Park.


Q. Are emissions from hot mix asphalt plants harmful to worker health?

A. With regard to worker health and safety, although *roofers* who work with roofing asphalts (which are quite different, chemically and physically, from paving asphalts) and who remove coal-tar based products *may* be at some excess risk of some respiratory disease, people working with *paving* asphalt do not seem to be at excess risk. Watkins and colleagues (*J. Occup. Environ. Med.* 2002;44:551-558) found no excess risk of lung cancer or of non-malignant lung disease due to asphalt exposure in workers exposed occupationally to asphalt fumes.

Of course, direct dermal contact with hot mix asphalt itself can cause serious skin burns and must be avoided. Insufficiently diluted fumes of asphalt, especially in combination with physical exertion, can cause transient irritation of the upper airways or eyes, and are also to be avoided.

Q. Do asphalt plants or asphalt concrete otherwise threaten water quality?

A. Rarely. Many hot mix asphalt plants operate near drinking water aquifers and other potentially sensitive areas without incident. Asphalt concrete (the finished product) is solid and inert at all ambient temperatures. Asphalt concrete does not dissolve in water. Asphalt has been used for more than 50 years to line drinking water reservoirs and fish rearing ponds. Water in these settings must meet rigorous, health-based, drinking water standards. For example, for more than 40 years, the Metropolitan Water District of Southern California has used hot mix asphalt to line its drinking water reservoirs. Many fish hatchery ponds in Oregon and Washington are lined with hot mix asphalt. However, asphalt testing laboratories use organic solvents in some specification tests (such as ASTM D2042-01, "Solubility of Asphalt Materials in Trichloroethylene"), so care must be utilized to prevent these solvents from spilling and contaminating surrounding grounds and groundwater.

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Q. Overall, then, are emissions from modern hot mix asphalt plants hazardous to public health?

- A. Although some of the chemical compounds emitted by asphalt plants can be hazardous if people are exposed to high enough levels, the amounts of these compounds emitted from these plants (and from associated operations, such as loading the product onto trucks) are too small to affect public health. The North Carolina Department of Environment and Natural Resources (NCDENR), for example, studied ambient air impacts from asphalt plants in the state, including in the very hilly terrain of western North Carolina. The NCDENR found that “asphalt plant emissions generally should not pose health hazards for people living nearby.” (See: <http://www.enr.state.nc.us/newsrels/caseby.htm>). As indicated above, unlike some 200 different industrial categories, hot mix asphalt production facilities have been found to be too small to constitute major sources of air pollution *per* U.S. EPA. Air quality modeling of emissions from modern hot mix asphalt facilities typically shows that impacts are acceptably small, even for the nearest neighbors to a site, let alone for those farther afield.

Odors can and should be controlled to acceptable levels, as should dust and traffic from such operations.

Experience with thousands of currently operating hot mix asphalt plants in the nation indicates that they can be designed and operated in manners consistent with maintenance of environmental quality and public health. Accordingly, such plants do not threaten the health, safety, or general welfare of the public.

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Dr. Green has performed original research, published, and consulted in the areas of chemical carcinogenesis, toxicology and pharmacology, food chemistry, analytical chemistry, risk assessment, and regulatory policy. Prior to founding Green Toxicology, Dr. Green was Vice President at CDM Smith, President at Cambridge Environmental Inc., and the founder and director of Meta System's Environmental Health and Toxicology group. She also served as Research Director of the Scientific Conflict Mapping Project at the Harvard University School of Public Health, during which time she co-authored the text, *In Search of Safety: Chemicals and Cancer Risk*. Dr. Green currently specializes in: (1) performing qualitative and quantitative assessments of health and environmental risks; (2) providing toxicologic and other technical expertise designed to aid in regulatory compliance and in decision-making; (3) providing and directing scientific support for litigation and other matters; and (4) teaching toxicology.

Dr. Green holds a B.A. with honors from the Department of Chemistry at Wellesley College (1975) and a Ph.D. from the former Department of Nutrition and Food Science (currently the Department of Biological Engineering) at the Massachusetts Institute of Technology (1981). She is a diplomate of the American Board of Toxicology (D.A.B.T.).

Download: Curriculum Vitae (.pdf)

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