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TOWN OF WILTON,
NH

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October 21, 2019

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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.

Follow-up question: Route 101 just outside of Wilton, and many local roads in the area have recently been patched and/or extensively repaved.

Where did the asphalt used for this come from?

Was it in short supply?

Was there some hardship in transporting or keeping it hot from the source(s) used?

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>.)

Follow-up question: Are you aware that in a 1988 proposed rule on Air Contaminants, OSHA proposed a Permissible Exposure Limit of 5 mg/m³ as an 8-hr time-weighted average (TWA) for asphalt fume exposures in general industry? Are you aware this proposal was based on a finding that asphalt fumes should be considered a potential carcinogen?

In their 2001 report, the Health Effects of Occupational Exposure to Asphalt, the Center for Disease Control cites difficulties in accurately separating and measuring aromatic and aliphatic polycyclic hydrocarbons, and state this is why no occupational exposure limits have been established for PACs associated with asphalt fumes. Given this information, how can you suggest that an asphalt plant will produce a “safe level” of PACs?

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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.

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%

Follow-up: Why are you measuring in % instead of concentrations – the appropriate unit of measure when considering PELs?

The EPA states Asphalt processing facilities are major sources of hazardous air pollutants such as formaldehyde, hexane, phenol, polycyclic organic matter, and toluene. Exposure to these toxins may cause cancer, central nervous system problems, liver damage, respiratory problems and skin irritation." NJDHSS: Studies indicate exposure causes coughing, wheezing, shortness of breath, severe irritation of the skin, headaches, dizziness, and nausea. Animal studies show PAHs affect reproduction, cause birth defects and are harmful to the immune system.

Why is all of this information from reputable sources, so vastly different from what you present?

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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 *a//* gasoline and diesel-powered vehicles and other engines, home heating furnaces, electric power plants, and many other sources.

Follow-up: How do the percentages in the table translate as concentrations? How do the concentrations compare to EPA, CDC, WHO standards where established?

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.

Follow-up: Has this been done for the proposed plant? Given that the plant would be built in a valley, would not temperature inversions trapping emissions be an issue?

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.e pa.gov/ ttn/chie f/ ap42/ ch11/ rela ted /e a-report.pd f\).](http://www.epa.gov/ttn/chieff/ ap42/ ch11/ related /e a-report.pdf)

Follow-up: what "air pollution control devices" are incorporated into the plant design?

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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.

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.

Follow-up: The odor from the Amherst plant is detectable at a distance of over .25 miles. How does this plant differ in design so that this is ameliorated?

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.

Follow-up: The noise from the Amherst plant registers as 85dB at a range of 220'. This is loud enough that in order to have a conversation with another person, you have to shout to be heard. How does the proposed plant differ in design so that this is ameliorated?

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.

Follow-up: Are you aware that OSHA mandates a TWA PEL (8hrs) to Coal tar pitch volatiles such as benzene, anthracene, phenanthrene, acridine, chrysene, pyrene of 0.2 mg/m³?

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.

Follow-up: Are you aware of the Worcester Polytechnic Institute study of waters and stormwaters exposed to asphalt? The report indicates test results measuring "concentrations of petroleum hydrocarbons far beyond federal regulations."

Are you aware of any reservoirs under construction that will be lined with asphalt?

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/news_rels/case_by_ht_m). 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.

Follow-up: Will Quinn Bros, LLC , in the event the variance and plant applications are approved, agree to the following provisions regarding that approval to protect the public health?

To assure that the Town of Wilton's citizens and children are not being harmed by the operation of an asphalt plant within the borders of Wilton, any individual, company or corporation constructing and/or operating such a plant will agree to complete and assume financial responsibility for the following:

1. To complete baseline water quality testing in areas to be determined, but within close proximity to the proposed plant's location. Repeat testing in the same locations post plant construction, and during the plant's operational lifetime, a minimum of 2x annually, approximately 6 months apart. Standard water tests with additional hazardous materials tests as recommended by the NH Department of Environmental Services. All testing to be completed under contract with a certified, independent testing laboratory.
2. To complete baseline air quality testing in areas to be determined, but within close proximity to the proposed plant's location. Repeat testing in the same locations post plant construction, and during the plant's operational lifetime, a minimum of 2x annually, approximately 6 months apart. Standard air quality tests with additional volatile hazardous air pollutants (HAPs) as identified to be associated with the production and handling of asphalt by the US Environmental Protection Agency, and any other tests recommended by the NH Department of Environmental Services. All testing to be completed under contract with a certified, independent testing laboratory.
3. To complete a survey of Wilton residents, prior to the construction and operation of the plant, to determine baseline rates of pediatric and adult cancers, of disorders of the central nervous system health, of liver disease, of respiratory issues and disease, of skin irritations and disorders, of chronic headaches, of vertigo and dizziness, and of unassociated nausea as these are all conditions associated by the US Environmental Protection Agency with asphalt production and handling. Survey to be repeated bi-annually during the plant's operational lifetime. Surveys to be completed under contract with a certified, research organization, or NH College or University.
4. All results from the aforementioned tests and surveys to be shared upon completion with the Wilton Select Board, Wilton residents, and are to be included in the annual town report.