From: "Hamlin, Eric P" <Eric.P.Hamlin@maine.gov>
Date: July 23, 2021 at 3:15:21 PM EDT
To: jjallard13@gmail.com
Subject: Bustins Island soil analytical results

Hi, Craig,

This email is a response to your request for comment on soil analytical results for three samples taken on Bustins Island. It is my understanding from our previous conversation that these samples were taken as a result of concerns expressed regarding the use of old asphalt pavement (sometimes referred to a recycled asphalt pavement or "RAP" or "regrind") as a surface on some otherwise unpaved roads.

First, I need to offer some disclaimers. I am not a chemist and I am not a toxicologist, and I cannot do a medical risk assessment.

What I can do is look at laboratory report you provided and the contaminants that were found in the samples, and compare them to our screening levels for the beneficial use of solid waste, which appear as Appendix A in 06-096 C.M.R. ch. 418 *Beneficial Use of Solid Wastes.* This is the set of rules under which the Department evaluates proposed beneficial uses for solid waste materials. I do this a lot. Under our rules, a beneficial use is defined as follows:

06-096 C.M.R. ch. 400 §1(T):

> **Beneficial use.** "Beneficial use" means to use or reuse a solid waste or waste derived product:
>
> (1) As a raw material substitute in manufacturing,
>
> (2) As construction material or construction fill,
>
> (3) As fuel, or
>
> (4) In agronomic utilization.

Our Appendix A screening levels are based on extensive research by EPA and others. We use those to evaluate the potential risk to public health and the environment posed by solid wastes proposed for beneficial use. Common examples are the use of dredge material or contaminated soils (for example, much of the City of Portland peninsula contains urban fill with contaminants from past building or industrial activities, fires, etc.). The numbers in Appendix A are intentionally very conservative, and are set low enough so that if someone proposes a beneficial use and the contaminants do not exceed those screening levels, we will not deny the application based on risk from

chemical contaminants. We do sometimes approve the use of wastes with contaminant levels higher than the Appendix A values, but we then require applicants to explain what factors will be used to ensure that risk is limited to an acceptable level. For example, material with contaminants below Appendix A could be approved for residential property fill, where material with higher levels might only be approved for fill on commercial properties, under pavement, or on sites that also already have some contamination.

Much of what we do is based on risk, and the Department uses a tiered approach to regulation. Things that are determined not to present significant risk are often exempted from regulation or licensing requirements, things that are somewhat more risky may be subject to abbreviated licensing under a permit by rule, things that are potentially more risky than that require more comprehensive licensing, and things that are unacceptably risky are prohibited.

The beneficial use of aged, fully hardened asphalt pavement in paving material production and road and parking lot maintenance has been exempted from beneficial use permitting for many years. In 2015, in response to inquiries by excavation contractors, MDOT, MTA, and other parties, we added aged, fully hardened asphalt pavement to our list of inert fill materials. This addition allows the unlicensed use of old pavement as construction fill (although we encourage higher and better uses such as feedstock material for new pavement manufacture, or in road and parking lot projects). The reason we added it to our inert fill definition is that we felt that there was more than ample evidence to show that it did not present an unacceptable level of risk and therefore did not require any real oversight.

When we talk about the use of old pavement in road and parking lot construction and maintenance, that includes things like the use of old pavement as a base layer for new pavement or as a less dusty surface for otherwise unpaved roads and driveways; in our opinion these are acceptable and safe practices, and therefore exempt.

I looked at the lab data and ran it by our chemist too. It does look like the hold time was exceeded for Total Petroleum Hydrocarbons and Volatile Organics, so they may be biased somewhat low but probably not a lot. Metals results look fine.

I asked our chemist what carbon chain length compounds would be picked up by TPH, and she said that TPH typically captures either C9-C36 or C10-C28, so not gasoline but things that are heavier than that. A quick Web search indicates that things like kerosene, diesel fuel, and lubricating oils would likely fall in that range.

I don’t know what the source of the TPH would be, but would not expect that from the RAP. Freshly manufactured and laid down asphalt pavement will sometimes create a sheen – possibly from lighter weight petroleum compounds in the fresh emulsion, the use of things like diesel fuel to keep the hot mix asphalt from sticking in the dump truck bodies, equipment spills, or something like that. RAP or “regrind” is usually made from old pavement and even if there was anything on it like fluids from vehicle leaks, the grinding, storage, and transport would likely cause most of that to volatilize and

offgas. The asphalt itself contains much longer carbon chain molecules that I assume would not show up with TPH testing. They are also not very water soluble, which is why asphalt functions well in roofing shingles, driveway sealer, pavement, and basement waterproofing. As noted above, in our experience we don't see petroleum contamination from old asphalt, which was part of the reason that we exempt the use of it in the manner you've used it on Bustins or, since 2015, allowed its unregulated use as construction fill. We do not exempt the use of fresh asphalt, and the liquid asphalt emulsion itself would present more of a risk. If I recall correctly, asphalt pavement is somewhere in the ballpark of 5 or 6% asphalt emulsion and the rest is aggregate.

I have attached a spreadsheet with your analytical results compared to our Appendix A screening levels. I put a note in the far right column about arsenic. Our strictly risk-based number for arsenic is pretty low at 7.9 mg/kg dry weight, but due to the geology of Maine we often see naturally occurring arsenic at significantly higher levels. We've determined that about 16 mg/kg dry weight of arsenic is sort of an average background concentration for Maine, but it varies a lot and I have seen numbers from as low as 2-4 and much higher…in the 20s and 30s for material that is not suspected to have anthropogenic contamination.

I'm at a loss about the TPH numbers…I would not expect that to be present in old asphalt that wasn't otherwise impacted in some way so I suspect it MAY be from vehicles using the road or some other activity nearby. We don't screen based on TPH generally; we have specific numbers for different carbon chain lengths. I have included those in the lower portion of the spreadsheet for comparison.

To summarize, I'm somewhat puzzled by the TPH numbers, but without seeing the fractions broken out by carbon chain length can't really compare them to our beneficial use screening levels. The results for volatiles and metals are either below our screening levels (generally far below) except for arsenic, but that is well within the range that is considered generally typical of native soils.

I hope this is helpful. Again, I'm just looking at this from the same perspective I would if you were proposing to beneficially use soil for some purpose and comparing to our risk based numbers. The actual use of old asphalt pavement as a road surface is exempt from licensing requirements for the reasons explained earlier.

Please let me know if you have questions.

Sincerely,

Eric P. Hamlin
Environmental Specialist
Division of Solid Materials Management
Maine Department of Environmental Protection
207-822-6344
www.maine.gov/dep

Analytical parameter	sample	Stump dump sample	sample	Chapter 418 Appendix A screening level	Maine background level
Arsenic	8.35 mg/kg	5.48 mg/kg	8.47 mg/kg	7.9 mg/kg	16 mg/kg
Cadmium	ND	ND	ND	22 mg/kg	
Lead	7.18 mg/kg	7.60 mg/kg	8.44 mg/kg	200 mg/kg	
Acetone	0.0332 mg/kg	ND	ND	47 mg/kg	
Methyl acetate	0.0500 mg/kg	ND	ND	No screening level	
Total Petroleum Hydrocarbons	783 mg/kg	1240 mg/kg	2100 mg/kg	See below	
Petroleum hydrocarbons					
C9-C10 aromatics				37.5 mg/kg	
C11-C22 aromatics				230mg/kg	
C9-C18 Aliphatics				1350 mg/kg	
C19-36 Aliphatics				10000 mg/kg	