Pease, Amanda

From: vanderZander, Iris <iris.vanderzander@doh.hawaii.gov>
Sent: Monday, June 24, 2019 1:44 PM
To: Pease, Amanda
Subject: RE: Factory Street AM excerpts for review

Thanks, Amanda!

I have the conclusions of the assessment in my head, but not on paper. My conclusion is that the lead is likely from lead smelting operations and/or car battery operations. Based on the assessment on the neighboring properties, it did not migrate from the properties, but it was dumped on the shoulders and maybe road prior to its first paving.
The ratios of lead to other metals are very high, therefore there was a very pure source of lead as typical for car batteries. Fill material should have a variety of metals, typical also high Ba from paint. I did not see any wood or other fill material, not large metal pieces. I looked at some samples of layer A under the microscope, but could not see any metallic pieces. Lead from gasoline usually does not have that high lead concentrations as we find (perhaps in the deeper layers some lead can be attributed to gasoline from the gas station on the corner).

When you look at the layer at 0 to 1 ft bgs, it is brown and powdery looking. This fits the description of lead dioxide which you can take a look at here :
https://en.wikipedia.org/wiki/Lead_dioxide
This would fit to the description of the eye witness, who said he did rummaged through the "ash piles" for pieces of lead that were dumped on the road. The timeline fits also with paving. He said it happened between approximately 1955 and 1966. Most houses on the road were built around the 1965 to 1968, which was about the time when Hawaii received a federal grant to improve secondary roads. There is also oil in layers A and B, but I think this is from oiling the roads and we could not correlate it to the lead. I also would expect to see much higher concentrations of other metals from used oil (e.g. chromium). Having lead dioxide/oxide instead of pure lead would also make sense from an operational perspective (see this video on how somebody smelted lead from a car battery-
https://www.youtube.com/watch?v=sB13bbF6A04; you can forward to 8 min 20 secs to see how the lead oxides is taken off and the dumped on the side). When you smelt car batteries (or tire weights), you get lead and lead oxides. The lead has a lower smelting point and is liquid. The oxides will float to the surface and have to be scraped up and will be discarded, before you can decant the lead into the mold. Why would you toss the lead onto the street that you may want to sell as fishing weights?
You would toss the waste material (oxides and maybe unmelted fragments) -not the precious lead. To get the final confirmation on that, it would be interesting to do a lead speciation on it, but I got sucked into this project already too deeply.

In summary, the observation, ratios of lead to other metals, and distribution of lead in the shallow lateral decision units point to the source of the lead being at the corner of Factory Street and King Street (DU-6), where the fishing supply shop was located. Based on eye witness observations and absence of high lead concentrations on the neighboring properties, lead was directly dumped onto the street or shoulder area when the road was unpaved. Grading before paving may have pushed the lead more into the street or towards DU-5 and down to DU-4. The corner gas station with battery rebuilder opposite to the fishing supply store was an ideal source for smelting of lead weights (car batteries, tire weights).

From: Pease, Amanda <Pease.Amanda@epa.gov>
Sent: Monday, June 24, 2019 9:06 AM