Message

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Sent: 11/17/2017 9:29:52 PM
To: Robinson, Derek J CIV NAVFAC HQ, BRAC PMO [derek.j.robinson1@navy.mil]
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Subject: Typed out excerpts - 2008 Navy Memo re Conceptual Site Model
Attachments: Conceptual Site Model for the Removal of the Sanitary and storm sewers.pdf; Conceptual Site Model for the Removal of the Sanitary and storm sewers_Parcel B.pdf

Dear Derek,

The final Radiological Removal Action Completion Reports (RACRs) for Parcels B and G, Section 2.2, Conceptual Site Model, both cite the attached *Navy Memorandum for the Record: Conceptual Site Model for the Removal of the Sanitary and Storm Sewers at Hunters Point Shipyard*, December 11, 2008.

I apologize to those who could not read the excerpts I sent previously because I cut and pasted snapshots from the pdf that did not transmit through email to some recipients. For your convenience, I have typed out some excerpts that you might find interesting:

Section 2, Background, p.1-2: "Contamination . . could have come from rework and repair of radioluminescent devices (Ra-226 and Sr-90), NRDL [Naval Radiation Defense Laboratory] experimentation and development of radiation survey instrumentation (Ra-226, Cs-137, and Sr-90), or decontamination of ships that participated in atomic weapons testing. . . . radiological operations at HPS started in 1941 and concluded in 1974 with the closure of the shipyard. During this time, controls of radioactive materials, particularly involving radioluminescent devices, were much more relaxed than today's standards and any radiological operation could have potentially impacted the sewer system. . . . Slip fittings were used at pipe joints of the sewer system, therefore the lines were not sealed and some leakage from the pipe was expected when the system was built. Additionally, excavated manholes have been found to be porous. The potential for materials to migrate from piping and manholes into the surrounding soils is significant."

Section 3b., Conceptual Site Model, p. 2: "Historically, the systems were cleaned, repaired, and replaced as necessary. In addition to potential normal seepage, all three of these operations could have released contaminations [sic] into soils surrounding the systems. In fact, cleaning was often accomplished by power washing that could have forced the contamination from the system and in some cases leave the piping free of contamination but the surrounding soils contaminated. . . . Power washing of old sewer systems easily cracks the pipes and allows for releases of pipe sediment into surrounding soils."

Section 3c. Conceptual Site Model, p. 3: "To date, the removal action has demonstrated the accuracy of the conceptual site model."

Section 3d. Conceptual Site Model, p. 4, shows that as of December 9, 2008, the Navy found 6.9% of contaminated soil in Parcel B (including Parcel D-2) trenches and 12.2% of Parcel G. This represented 93.8% of the Parcel B trench units and 58.5% of the Parcel G trench units.

Section 3e(2)(a), p. 4: "There is always the possibility of naturally occurring radioactive material (NORM), however the types of contamination found in the sewer excavations do not fit the profile of NORM. This has been carefully monitored by the Navy to ensure there is no need to change the CSM. One method in use is

comparison of the Ra-226 activity with the U-238 activity. This is based on the assumption that when Ra-226 is naturally occurring it exists in equilibrium with U-238. Theoretically, if two isotopes are in secular equilibrium the activities should be the same and thus the ratio of the activities should be 1 to 1. If Ra-226 was introduced into an environment by a man-made device or a contamination event then the ratio of Ra-226 relative to U-238 should be biased high by the amount of Ra-226 deposited."

Section 3e(2)(b), p. 4: "For Parcel B, . . . the U-238 activity was consistently lowewr than the Ra-226 activity by a significant margin. The U-238 activity ranged from 10 to 60 percent of the Ra-226 results. . . from the Parcel G . . . The U-238 activity were 30 and 50% of the Ra-226 results. These results would indicate that although there is some small amount of Ra-226 naturally occurring in the HPS [Hunters Point Shipyard] soil the bulk of the Ra-226 activity was introduced by man-made sources. Based on the U-238 to Ra-226 ratios at Parcels B and G, the current CSM for HPS is correct and the majority of radioactive materials at the base is from man-made sources, and is not NORM."

Section 4a Ongoing Removal Operations, p. 5: "93.8 percent of the sewer survey units in Parcel B have . . . demonstrates the validity of the CSM [Conceptual Site Model]. Most contamination has been found in the soils surrounding the pipes, primarily below five feet. This is consistent with the pipe locations and the fact that repairs to the system or power washing would have resulted in the spread of contamination well beneath and beyond the piping system."

Section 5a(4) Summary: "The analysis of the Ra-226 and U-238 ratios for in [sic] Parcel B pipe sediment indicate the presence of radium contamination not the possibility of higher levels of naturally occurring radioactive material"