West Lake Update

August 25, 2014

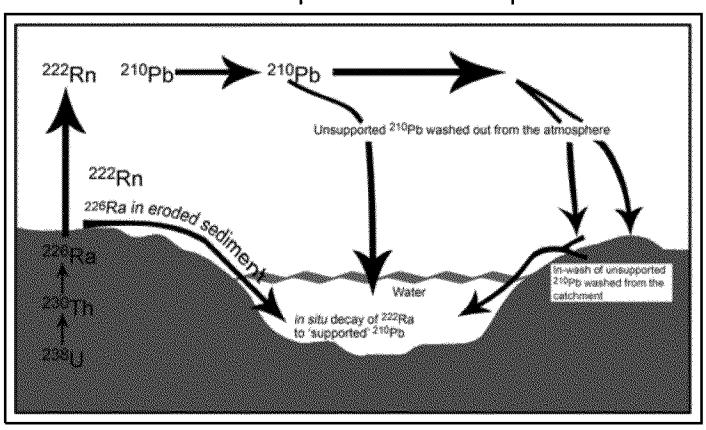
This issue of West Lake Update is focused on Lead-210.

General Information

Lead-210 is a decay product of Radon-222 and Uranium-238 and has a half-life of 22 years. (Half-life is the time required for one half of the chemically unstable material to degrade into a more stable material.) Elevated Lead-210 in soils is not uncommon due to natural processes, including radon daughter washout from rain events and accumulation over time. As a result, slightly elevated levels of Lead-210 are commonly found in low-lying areas where rain collects and concentrates, such as the drainage ditch at the Bridgeton Municipal Athletic Complex (BMAC). Lead-210 levels up to 20 picocuries per gram (pCi/g) or higher can be found when analyzing soil and sediment samples collected from such areas. Appendix B of EPA's Multi-Agency Radiation Survey and Assessment of Material and Equipment (MARSAME) manual provides more information online at: www.epa.gov/radiation/marssim/docs/marsame/appendixB.pdf

Radon Daughter Washout Process

The radon daughter washout process, through which rain naturally collects radon decay products, is a known and well-studied natural process. In fact, Lead-210 accumulation and radiometric dating is an established technique used in geology to determine the age of deposited material. The illustration below depicts the washout process:



The 22-year half-life of Lead-210 provides opportunities for its buildup in sediments and low-lying areas. As mentioned, rain naturally collects radon decay products from the air. Areas where rain collects and concentrates can reflect slightly elevated levels of Lead-210 over time, due to its natural accumulation and 22-year half-life.

Residential PRG and Exposure Risk

As discussed above, levels of Lead-210 around 10 pCi/g do not represent contamination or levels above background. The levels of Lead-210 detections reported by both the community group (10.89 pCi/g) and by the recent EPA investigation at BMAC (9.45 pCi/g) are also below EPA's established Preliminary Remediation Goal (PRG) of 33.5 pCi/g, which is based on a residential occupancy scenario.

Residential occupancy scenario PRGs are established based on the assumption of continual residential occupancy above large areas of contaminated material, and require the consumption of on-site vegetation over a 30-year period. Because the drainage ditch at BMAC is not a large area used as a primary residence and no crops are being cultivated within the ditch, residential PRGs wouldn't apply to this area—even if their pCi/g levels were high enough.

A hypothetical recreational PRG for the drainage ditch, or similar outdoor areas with slightly elevated Lead-201 levels, could be set at 887 pCi/g. The primary difference between the recreational and residential exposure scenarios is that the residential scenario includes indoor exposure, continual soil ingestion, and vegetation consumption exposure pathways, while the recreational scenario does not. Under this recreational scenario (887 pCi/g), a person would have to occupy the drainage ditch for more than 600 hours a year for 30 years to increase their risk of developing cancer by a one-in-a-million chance. This risk level is well within EPA's acceptable risk range and does not require remedial action or site controls. Put another way: if 1 million people were exposed under this scenario, one person among them might develop cancer, beyond the general cancer rates within the population.

FACTS: Lead-210 at Dayton, Ohio, FUSRAP Sites

It was recently stated by an individual in the community, and subsequently reported by at least one local media outlet, that in 2004 the U.S. Army Corps of Engineers (USACE) cleaned up low levels of Lead-210 at Formerly Utilized Sites Remedial Program (FUSRAP) sites in Dayton, Ohio. This is incorrect information.

In fact, according to published documents, USACE investigated four Dayton sites as part of the Superfund process in 2004 and concluded that each site did not pose a threat to human health or the environment, and that no further action was warranted. At this time no remediation has been performed at the Dayton sites by USACE.

Investigation reports for the Dayton sites are available online: www.lrb.usace.army.mil/Missions/HTRW/FUSRAP/DaytonSites.aspx

Community Inquiries
Ben Washburn
913-551-7364
Washburn.Ben@epa.gov

Find Us On
www.facebook.com/eparegion7
www.twitter.com/eparegion7
www.scribd.com/eparegion7
www.epa.gov/region7/cleanup/west_lake_landfill/index.htm