

Y-12's and ongoing environmental biomonitoring

Mick Wiest, of the Y-12 Environment, Safety and Health organization's Water Compliance Department, continues to discuss the environmental biomonitoring program at Y-12 with thoughts on the importance of the program. Mick begins this installment of his commentary with, "The Y-12 National Security Complex has been working for years to minimize the impact of legacy pollutants to its receiving streams of Bear Creek and East Fork Poplar Creek. One of those legacy pollutants has been mercury, inadvertently released or spilled during the 1950s and 1960s."

By far the largest amount of mercury entered the East Fork Poplar Creek when the COLEX (column exchange) process was active during the period from 1955 to 1963. This process separated the Lithium 6 needed for the Cold War development of thermonuclear weapons.

However, it is not as simple as just stopping the process that created the mercury releases. Mercury released from a few large buildings where the process existed has continued to pose a legacy concern and has continued to migrate during stormwater runoff and because of wet weather springs.

Mick says, "Y-12's Biological Monitoring and Abatement Program has maintained a special focus on mercury over the 25-year history of the program. The biologists that carry out the program have become experts in the unique way mercury behaves in the environment."

"Program activities include sampling and analysis of both the aquatic life and the water environment. In the case of mercury, concentrations of this pollutant in creek water have steadily come down over the last two decades as measured in East Fork Poplar Creek.

"However, there has not been a corresponding reduction of mercury in fish tissue, and this presents a dynamic that the monitoring program continues to study. There is clearly more work needed to understand the true impact legacy contaminants have on the receiving stream and how best to move forward to improve both water quality and the aquatic life.

"Soon after the Biological Monitoring and Abatement Program was initiated at Y-12 in 1985, it was viewed as a very thorough and comprehensive program to assess and manage an impacted stream. Similar biomonitoring programs were soon developed for Department of Energy sites in other parts of the country. They were patterned after the 1985 program developed by the Oak Ridge National Laboratory for Y-12.

"This joint effort biomonitoring program was recognized this year when the international journal *Environmental Management* devoted a special issue to the 25-year study of Oak Ridge's East Fork Poplar Creek. The special issue is titled, *Long Term Biological Monitoring of an Impaired Stream: Implications for Environmental Management*, Volume 47, Number 6, June, 2011.

"The journal is available online at: www.springerlink.com. The format is technical and the information is presented primarily for the scientific community.

"The Y-12 Biological Monitoring and Abatement Program data and other environmental data are also presented in the oak Ridge Reservation Annual Site Environmental Report Summary."

That concludes Mick's remarks. The last document he referenced can be found at the Department of Energy's Oak Ridge Office Information Center located at 475 Oak Ridge Turnpike and online at: <http://www.oakridge.doe.gov/external/Home/PublicActivities/InfoCenter/ContactUs/tabid/229/Default.aspx>

While Y-12 has provided support to maintain the nation's nuclear weapons and provided uranium fuel for the U S Navy as well as helped reduce the threat of nuclear war through nonproliferation actions and at the same time provided support to other government departments such as the National Aeronautics and Space Administration and the U S Navy, we have also taken strong positive actions regarding legacy

pollution resulting from the necessary handling of special hazardous materials. This has not always been as rigorous as it has been for the past three decades.

Environmental monitoring enables us to continue to be even more vigilant in our efforts to both contain pollutants on the site and to reduce the creation of waste while continuing to do the necessary handling of hazardous materials required for the work done at Y-12. A lot of effort, energy and creative thought are given to improving the manner in which our work with hazardous materials is accomplished safely and in an environmentally friendly way.

The goal of zero discharge of pollutants is a serious goal and one that is being pursued in all aspects of Y-12 operations through several pollution prevention programs. We will have more to say about the history of those programs soon.

Finally, I saw an article in The Oak Ridger on Thursday, October 13, 2011, that began, "Current exposure to mercury released from the Y-12 plant at the Oak Ridge Reservation is not a public health hazard, concludes the Agency for Toxic substances and Disease Registry in the public health assessment recently released for public comment."

The article went on to state, "ATSDR assessed the health effects for community residents possibly exposed to three forms of mercury in the air, soil surface water, sediment, plants and fish." The article noted that current exposure to mercury released from the Y-12 plant is "not a public health hazard."

In researching the past releases and potential exposure prior to the 1997 removal of the contaminated soil, the article noted that drinking water from East Fork Poplar Creek, during specific weeks from 1956 to 1958, that was contaminated by inorganic mercury or swallowing soil contaminated with inorganic mercury from its banks prior to the soil's removal could possibly have increased the risk of adverse health effects.

They were not able to determine whether any potential harmful health effects could have come from breathing the air from 1950 to 1953, swallowing the water from 1953 to 1955 or eating the fish during the 1950s and 1960s.

There was a link given to the study, <http://www.atsdr.cdc.gov/HAC/PHA/HCPHA.asp?State=TN>. A copy of the assessment is also available in local libraries. Public input will be accepted until November 11, 2011.

Y-12 continues to address legacy contamination issues through various programs and initiatives. The recently awarded American Recovery and Reinvestment Act funding helped clean up several areas inside two major buildings and demolish four old buildings. The face of Y-12 is changing, and cleanup is evident almost everywhere one looks today.

We are preparing for future missions and cleaning up residual legacy issues. Thanks goes to the many other folks like Mick Wiest whose jobs are designed to help keep Y-12 in compliance with environmental regulations.