



Oak Ridge Site Specific Advisory Board Recommendation 229: Recommendation on the Preferred Alternative for the Proposed Plan for Water Treatment at Outfall 200 at Y-12 National Security Complex

Background

Mercury contamination at the Y-12 National Security Complex (Y-12) is widespread and has been identified in soil, sediment, surface water, groundwater, in and underneath buildings, drains, and sumps. Mercury continues to be released into Upper East Fork Poplar Creek (UEFPC) from several sources.

Mercury contamination at Y-12 is the result of operations that took place primarily in three buildings at the west end, namely, Alpha 4, Alpha 5, and Beta 4, and to a lesser extent in Alpha 2. These buildings are located in an area known as the West End Mercury Area (WEMA).

From the 1950s to 1963 large amounts of mercury were used in the three buildings where lithium isotopes were separated for weapons production. About 24 million pounds of mercury were used, of which about 2 million pounds were unaccounted for and of this, about 700,000 pounds are estimated to have escaped in the air, surface water, soils, and sediments.

The most urgent issue to address at Y-12 is the presence of mercury in surface water. Mercury moves through the storm sewer system in the WEMA to Outfall 200, where the headwaters of UEFPC emerge. Mercury in the creek flows through Y-12 to Station 17, where the creek exits the plant, becoming East Fork Poplar Creek, which eventually empties into the Clinch River to the west.

The objectives for mercury cleanup at Y-12 are to reduce mercury in surface water and stabilize and eliminate mercury in the soils. The Department of Energy Oak Ridge Office of Environmental Management (DOE EM) has been working with the Environmental Protection Agency and the Tennessee Department of Environment and Conservation to arrive at a solution for mercury remediation. A draft mercury strategy plan was submitted to the regulators in March 2013 followed by a workshop where discussions were held about mercury challenges and what can be done. The consensus of the participants was that the problem was complex and will require a number of solutions that are complementary with an adaptive management plan.

One of those solutions is to reduce mercury leaving the Y-12 Plant via surface water. Remedial alternatives have been developed for construction of a new water treatment facility to treat discharges from the WEMA storm sewer system at Outfall 200. Water emerging at Outfall 200 would be treated at that point with a mercury treatment plant.

In July 2015 DOE EM issued a Proposed Plan for Water Treatment at Outfall 200 Under the Record of Decision for Phase I Interim Source Control Actions in the Upper East Fork Poplar Creek Characterization Area (DOE/OR/01-2661&D2). The proposed plan describes several alternatives for constructing a water treatment plant and proposed a preferred alternative.

Discussion

The proposed plan offers two basic alternatives and several modifications under Alternative 2. Alternative 1 is a No Action Alternative that is required under the Comprehensive Environmental Response, Compensation, and Liability Act to provide a comparative baseline against which other alternatives can be evaluated.

Alternative 2 is to build a water treatment plant at Outfall 200. Alternative 2 includes several proposed modifications:

- Alternative 2a: Water Treatment at Outfall 200 with 1500 gallons per minute (gpm) Treatment Capacity and No Stormwater Storage;
- Alternative 2b: Water Treatment at Outfall 200 with 3000 gpm Treatment Capacity and No Stormwater Storage;
- Alternative 2c: Water Treatment at Outfall 200 with 3000 gpm Treatment Capacity and 2 Million Gallons of Stormwater Storage;
- Alternative 2d: Water Treatment at Outfall 200 with 3000 gpm and 10 Million Gallons of Stormwater Storage.

Details of all of these alternatives are found in the proposed plan (DOE/OR/01-2661&D2).

DOE's preferred alternative is Alternative 2c. Members of the Oak Ridge Site Specific Advisory Board Environmental Management & Stewardship Committee reviewed the proposed plan and discussed the preferred alternative at its September 16, 2015, meeting and endorsed DOE's preferred Alternative 2c.

Recommendation

The Oak Ridge Site Specific Advisory Board recommends Alternative 2c in the Proposed Plan for Water Treatment at Outfall 200: the construction of a new water treatment facility near Outfall 200 to manage UEFPC stream flow of 40,000 gpm. The system would provide treatment capacity for 3000 gpm of influent surface water plus 1000 gpm of recycle flows (e.g., backwash water and filter press filtrate) and stored stormwater. The stormwater storage capacity will be 2 million gallons.

The Adaptive Management strategy is reasonable and with modularization being part of the design, construction and operational process, revisions and/or additions to the treatment system may be necessary.