

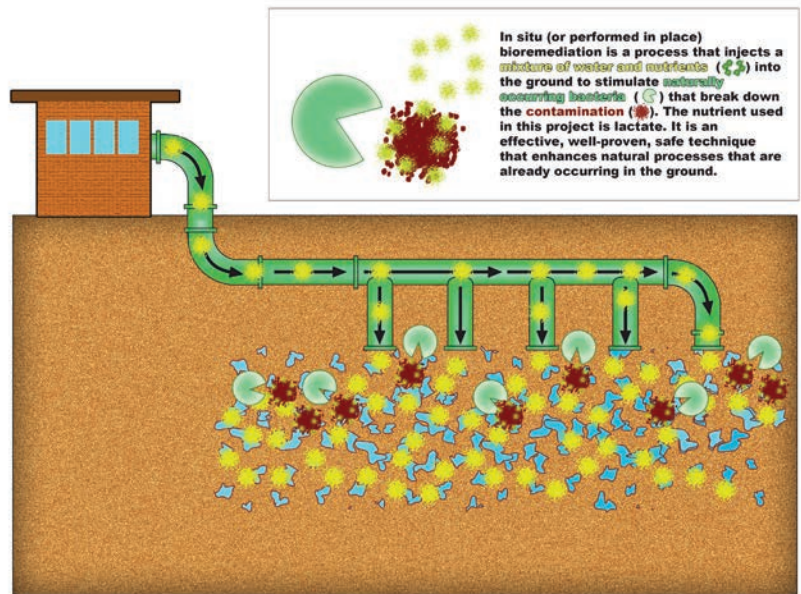
Middle River Complex Project Bulletin

March 2016

Bioremediation beginning in Block E

Three groundwater plumes require cleanup at the Middle River Complex. Lockheed Martin has been removing contaminants from Blocks G and I since 2014 using bioremediation. Now we're planning similar work in Block E.

In January 2016 Lockheed Martin resumed work to clean up contaminated groundwater in Block E using bioremediation. When we were preparing the site in 2013 we discovered two undocumented underground storage tanks. The area around the tanks included quantities of the solvent trichloroethene (also known as TCE and trichloroethylene). The quantities of solvent were too large to be removed by bioremediation, so we installed a pumping and vacuum system that removed the bulk of the trichloroethene from the groundwater and soil in the area via four extraction wells. Crews removed 550 pounds of trichloroethene and disposed of them at a licensed waste facility. We completed this work in 2015 and sent reports to the Maryland Department of the Environment in 2016.



We're now installing a bioremediation system to address the remainder of the trichloroethene from Block E groundwater. The system consists primarily of piping that runs to the injection wells, through which a lactate mixture is injected into the ground. Lactate is a non-toxic food mixture produced from the sugar of corn and beets. The food mixture energizes bacteria already present in the soil to consume and break down the trichloroethene

into non-toxic substances. Connections to the wells were completed in February. A neutral bromide solution is injected into the wells to determine the ideal amount of the food mixture to use.

The system across all three blocks includes about 75 wells for injecting the food mixture. The Lockheed Martin team will take samples from monitoring wells located in the treatment areas to determine if additional lactate is needed to further feed the bacteria. The team will take samples monthly at first, then quarterly after that.



Three groundwater treatment areas are shown in blue. An array of monitoring wells are located surrounding each groundwater plume.

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“So far we’ve been very encouraged by the results of the bioremediation in Blocks G and I,” Tom Blackman, Lockheed Martin’s remediation manager for the Middle River Complex, said. “We anticipate similar results in Block E. We expect bioremediation to complete the groundwater cleanup in three to five years. We’ll continue to monitor our results after that to make sure our work is complete.”

The community will learn the results of the bioremediation efforts once cleanup has been evaluated.

Besides the three plumes of contaminated groundwater in Blocks G, I and E, Lockheed Martin found several small, shallow and isolated areas of contaminated groundwater near former fuel underground storage tanks beneath the industrial buildings. Site workers and visitors do not come into direct contact with this contamination because these pockets of groundwater are not used for any purpose. The Maryland Department of the Environment will continue to restrict any use of shallow groundwater. Potential vapor intrusion into buildings from these plumes is monitored regularly, and several vapor extraction systems are in place to capture vapors before they can enter the buildings.

Shallow groundwater at the Middle River complex discharges slowly to Dark Head Cove and Cow Pen Creek, and low levels of contaminants have been found

there. Crews monitor these levels annually and they are routinely well below the Maryland criteria for volatile organic compounds for open bodies of water, as well as for drinking water and are not a concern for fish. Improvements in

groundwater quality resulting from the bioremediation treatment, as well as sediment remediation, should further improve associated water quality in the cove and creek. Periodic groundwater investigations in the Hawthorne and Wilson Point neighborhoods show that contaminants have not moved across the creek and cove.

Feel free to contact Bill Phelps, Director of Communications for Lockheed Martin at 800-449-4486 or by email at william.phelps@lmco.com if you have questions or concerns.



Equipment inside the trailer distributes lactate (sugars) and water through a system of underground injection wells to activate bioremediation.

For more information on this or other projects, go to www.lockheedmartin.com/middleriver

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