Citizens' Guide on Development of Final Plans for the Sediment Remedy Program

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Lockheed Martin Middle River Complex
2323 Eastern Boulevard
Middle River, Maryland

As part of remedy design studies in Dark Head Cove, Lockheed Martin found higher concentrations of contaminants in sediment in areas targeted for removal

Lockheed Martin has been performing characterization and remedy design studies in Cow Pen Creek and Dark Head Cove to prepare for cleanup of sediment near the Middle River Complex. As part of these studies, samples were recently collected in Dark Head Cove adjacent to the outfalls from Tax Block E, the location of former Building D. These samples were collected from submerged sediments eight to ten feet beneath the water surface, near the outlets of what is referred to as Outfall 005. These samples included higher concentrations of polychlorinated biphenyls (PCBs) than previously detected, along with very low levels of uranium and thorium. See graphic on page 2.

The PCBs were measured in concentrations up to 3,600 parts per million immediately adjacent to the outfall. These concentrations would be of concern if people were to contact the submerged material on a regular basis. These concentrations are higher than previously detected, but are in an area that is already planned for sediment removal.

Uranium was detected within this same area at concentrations slightly above typical naturally occurring (background) levels, indicating that some uranium may have come from the Middle River Complex. These detections need to be confirmed with further testing, but current data indicate conditions and concentrations far below levels that pose a human health or ecological hazard.

Tom Blackman, Lockheed Martin's project manager for the Middle River Complex remediation project, noted: "The depth of these materials indicates that they were released into the environment decades in the past. We're fairly certain these contaminants came from Building D. We can't be certain when they made their way to Dark Head Cove, whether when Building D was in active use (1940's through 1960's), or when Building D was being demolished back in 1971."

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Project History

In the late 1990s Lockheed Martin began environmental testing at both the Middle River Complex and Martin State Airport, to assess impacts from former industrial operations and disposal practices that were commonplace in industry more than a half-century ago. Since that time, Lockheed Martin has been actively investigating groundwater, soil and sediments at both locations. The company is in different stages of planning and cleanup on each part of the Middle River remediation effort.

The Lockheed Martin team conducted extensive environmental investigations, developed cleanup objectives and goals, and screened alternatives for cleaning up sediments in the waterways of Cow Pen Creek, Dark Head Cove and Dark Head Creek. Preliminary sampling of the sediments revealed the presence of concentrations of polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and metals such as cadmium and chromium. The alternatives for cleaning up the sediments were reduced to a short list of options, which were addressed by the Feasibility Study.

In 2012 Lockheed Martin presented its alternatives for cleaning up the sediments. Public Information Sessions were held in early 2012, and a Citizens Working Group met from February through April of that year to examine the alternative approaches.

For many years, Lockheed Martin has worked closely with the Maryland Department of the Environment, the U.S. Environmental Protection Agency, and local civic association leaders, providing briefings and informational materials that have been distributed throughout the community to ensure the neighboring residents have optimal opportunities for understanding the proposed remediation plans. This timely, open and transparent communication will continue throughout the remediation process. Lockheed Martin will continue to seek feedback from the community leaders and neighbors.

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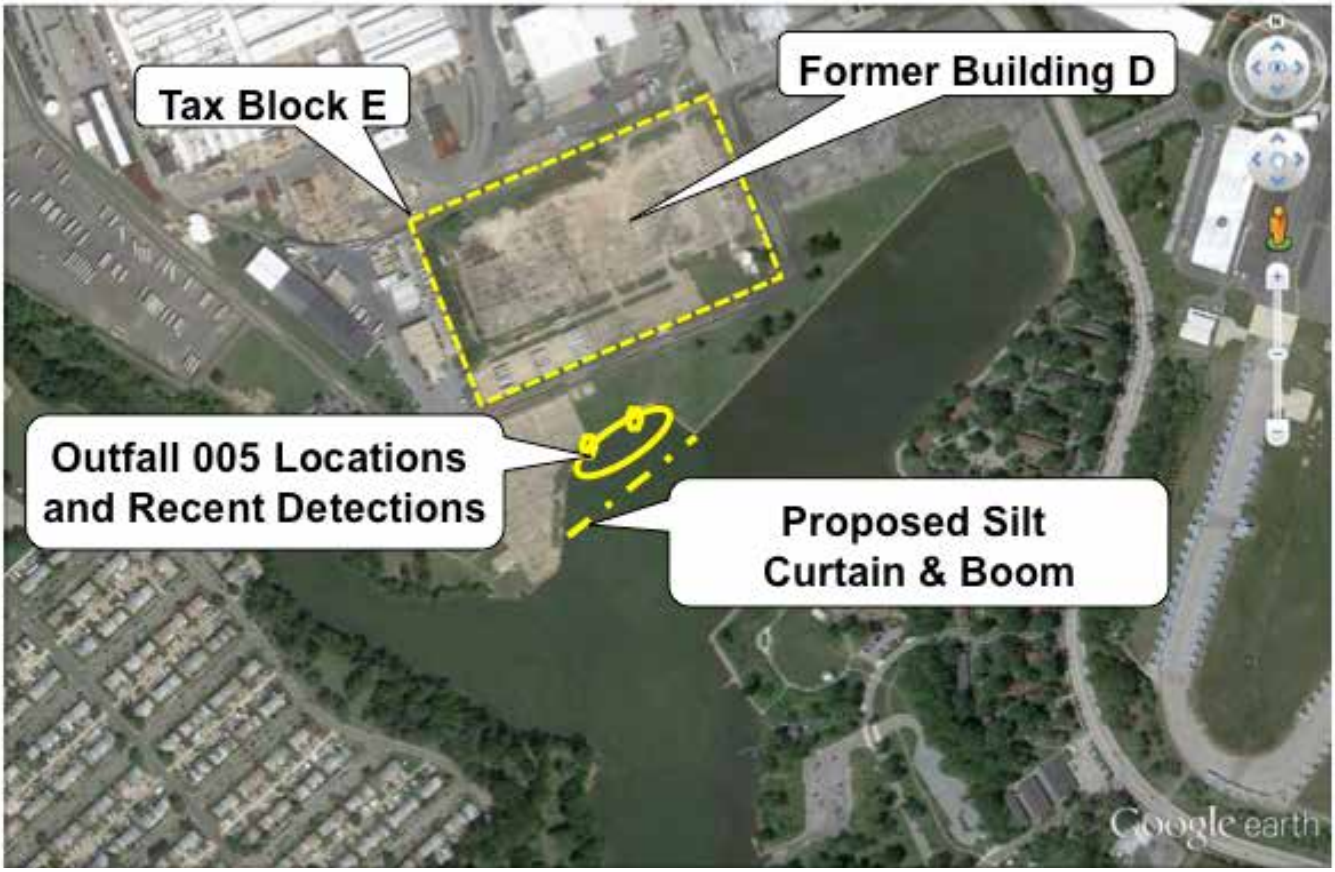
From 1956 through 1970, the Martin Company and later Martin Marietta (Lockheed Martin predecessor companies), researched, developed and fabricated fuel assemblies in Building D for small-scale nuclear reactors using varying enrichments of uranium. The company also received a license to possess a magnesium-thorium alloy for the fabrication of missile components. Building D was decontaminated under the review of the Atomic Energy Commission (the predecessor of the Nuclear Regulatory Commission and the Department of Energy) in 1970, and was determined to be suitable for unrestricted use. Building D was demolished in 1971. Based upon a 1994 review of the 1970 Building D decontamination report, the Nuclear Regulatory Commission noted some residual material was still present below the remaining concrete slab of Building D, but reaffirmed its original conclusion that the site in its current state (as of 1994) was approved for unrestricted use. The site has been inspected on numerous occasions since that time, most recently in 2012. Results from all the surveys and associated sampling indicate that there are no radiological hazards based on the current use of the site. To be certain, appropriate precautions will be implemented during remediation of Tax Block E.

Tom Blackman outlined a number of steps Lockheed Martin is now proposing as interim cleanup measures for Dark Head Cove. These are steps that can be taken before the full remedy is implemented. "While the sediment isn't mobile, (it is below deep water and in a quiet and stable area of the cove), we are proposing to put a silt curtain in place to assure that the contaminants don't move. We are also proposing to put a boom in place in the water to limit access to the area by

Project History continued

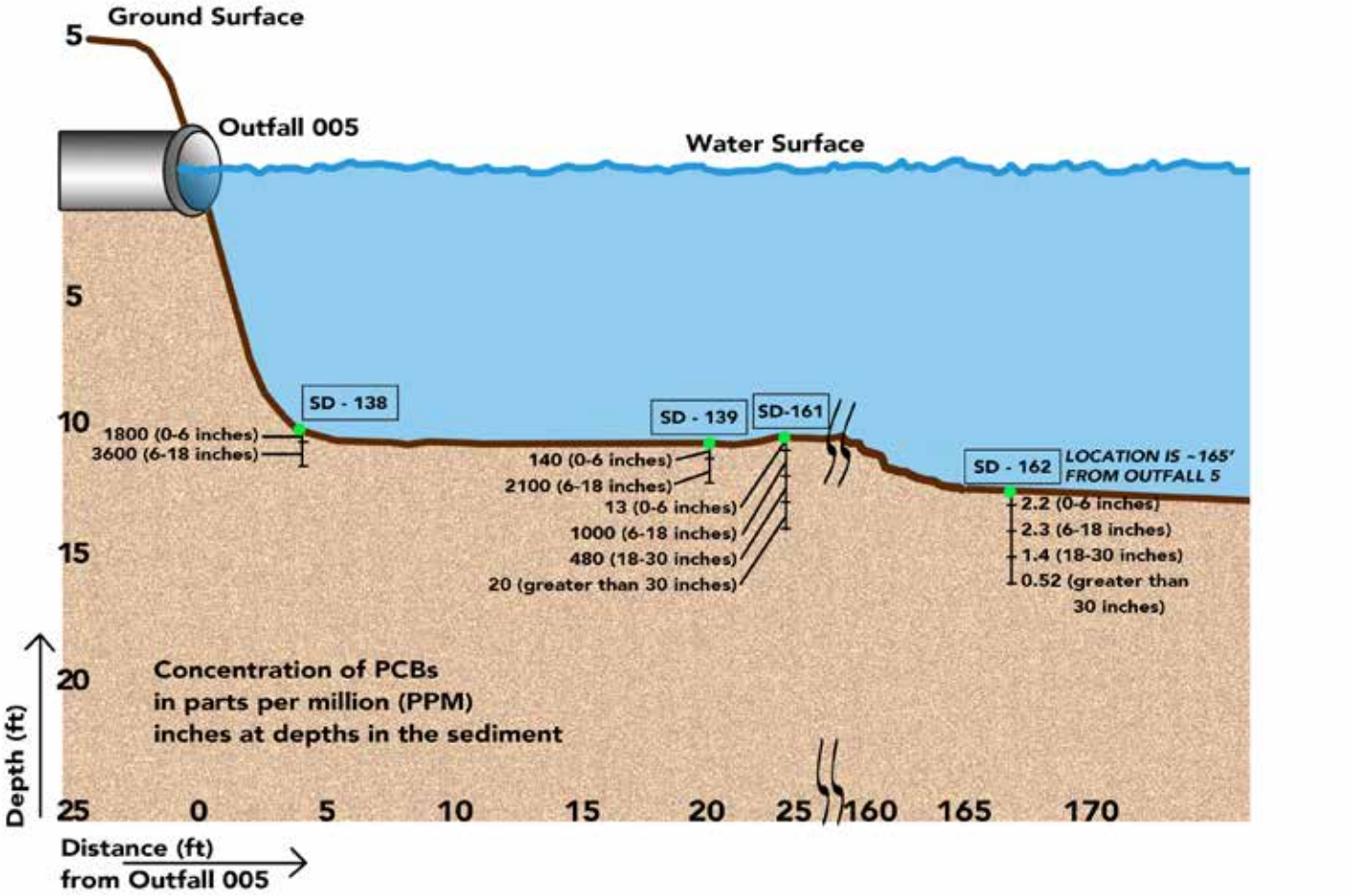
The recommended final approach was approved by the Maryland Department of the Environment and the U.S. Environmental Protection Agency in 2013. This approach calls for removal of about 48,800 cubic yards (about 3,300 truckloads) of contaminated sediments from more than 12.5 acres in Cow Pen Creek and the area in front of the bulkhead in Dark Head Cove; treatment in place (in situ) of contaminated sediments over the remaining 8.5 acres of potential concern; and monitored natural recovery of about 4 acres of sediments in the area being treated in place. Shoreline will be stabilized, habitat enhanced, and the riparian area where the land and surface water meet will be planted after the remedial work is completed, where necessary. Lockheed Martin will monitor the operation and maintenance of the in-place treatment to verify the effectiveness of the approved remedy.

In order to develop the final plans for implementing the approved approach, Lockheed Martin began more intensive sampling in 2013. Follow-up samples were taken in September 2013 in Cow Pen Creek and Dark Head Cove. Extensive samples were taken in sediments eight to ten feet below the surface of the water. This Guide speaks to the initial results of that more intensive survey.



Area of recent sediment findings at Middle River Complex.

Higher PCB Concentrations in Dark Head Cove Sediments



Higher concentrations of polychlorinated biphenyls (PCBs) have been identified in recent sampling, and interim cleanup actions are being proposed. Very low levels of uranium were also found in the same area, to be removed during the interim actions.

boaters, and to immediately erect sediment contact advisory signs warning people that no anchoring should take place within 100 feet of the signs. We already proposed dredging the area as part of the final remedy, and are now proposing to MDE and EPA an interim remedial measure at this location to remove the sediment with higher concentrations of PCBs more quickly."

The area containing sediments with elevated PCB concentrations is estimated to be less than one acre. The interim remedial measure would involve dredging, dewatering, and disposing of between 500 and 2,500 cubic yards of sediment (approximately 50 to 150 truckloads) off site over a several-month period. A portion of the storm drain system from Block E to Dark Head Cove was cleaned in 2011, and the final segments of Outfall 005 leading to the bulkhead were proposed to be cleaned out as part of the final sediment remediation. Lockheed Martin is now proposing to clean out these remaining sections of approximately 35 feet (Outfall 005 West) and 80 feet (Outfall 005 East) as part of its interim remediation measure.

The interim dredging and outfall cleaning will require the agreement of regulators. Once Lockheed Martin submits an application, the Maryland Department of the Environment will issue a public notice of the request and host a public informational/educational meeting and public hearing, if requested. Lockheed Martin will also coordinate permitting activities with Baltimore County. Because work would take place in the waterway, approval will also need to come from the U.S. Army Corps of Engineers. Timing of the dredging will be determined by the Maryland Department of the Environment and will likely take into account factors like the summer recreational season and the fish spawning season. This interim dredging could begin in late 2014.

As part of the ongoing process, technicians were taking the samples to provide the data necessary to refine the final design for the remediation of the sediments in Cow Pen Creek, Dark Head Cove and Dark Head Creek. As part of that process, Blackman directed his team to sample close to the bulkhead, and to check for uranium material in the sediments. He explained: "It's important to create a clear picture of what's in the sediments; and it's important to do a thorough search. The better we search, the better we will be able to develop a design for final remediation that handles things properly. The citizens of Maryland, our neighbors, and users of Dark Head Cove deserve nothing less."

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Because the contaminated sediment is under eight to ten feet of water, there is no realistic opportunity for exposure to humans and therefore no significant risk to human health based on contact with the sediment. Community residents are advised to continue to adhere to the State of Maryland's current fish consumption advisories due to the presence of PCBs. For more information, see mde.maryland.gov/fishadvisory

Questions and Answers

1. Is it still safe to eat fish or crabs from Dark Head Cove?

Area residents are advised to follow the current Maryland State Fish Advisories for Dark Head Cove. The Advisories recommend limiting the number of fish and crab consumed from each waterway in the area. The advisory is available at: *http://www.mde.state.md.us/programs/Marylander/CitizensInfoCenterHome/Pages/citizensinfocenter/fishandshellfish/index.aspx*

2. When will warning signs be erected?

MDE-approved Sediment Contact Advisory signs will be installed in March 2014, certainly in ample time before the start of the boating season.

3. Where did the Polychlorinated Biphenyls (PCBs) come from?

The PCB contamination is likely the result of industrial operations that took place in Building D from the 1940's through the 1960's; from use of the Building D basement for storage of PCB-containing materials; or from a possible release during demolition of Building D in 1971. Three areas in Block E are contaminated with PCBs:

- PCBs were found in the first four feet of soil in the southeastern area of Block E, near a 500,000-gallon water tank used by the Middle River Complex as backup for fighting fires.
- PCBs were detected in the south-central part of where Building D was located in Block E, in an area that once housed cleaning, plating, and finishing rooms, an electrical transformer room and an electrical substation outside the building. In this area PCBs were detected in the first four feet of soil in one spot, and four- to ten-feet deep in another.
- PCBs were detected in the western and southwestern portion of Block E where the nuclear laboratory, an electrical transformer room and a waste collection area were located. PCBs were detected nine feet below the surface of the ground in one spot and eight- to twelve-feet below the surface in another. In the southwestern portion of the block, PCBs were found sixteen feet below the surface.

4. Where did the uranium come from?

Possibly from activities that took place in Building D from 1956 to 1970. The Martin Company and later Matin Marietta, Lockheed Martin's predecessors, researched,

Signs are being installed to discourage anchoring near the outfalls; anchoring could result in bringing up contaminated sediment.

developed and fabricated fuel assemblies in Building D for nuclear reactors using varying enrichments of uranium. This included fabrication of aircraft components and thermo-electric generators known as Systems for Nuclear Auxiliary Power (SNAP). Nuclear Regulatory Commission (NRC) records indicate that decontamination activities removed radioactive residue from Building D between June and September 1970. Building D was demolished in 1971, and at that time the Nuclear Regulatory Commission concluded that the site met its criteria to be released for unrestricted use.

5. How do you know that additional contaminants are not lodged in the uncleaned portions of the two branches to Outfall 005?

We don't. When we address Outfall 005, whether as part of the proposed Interim Measures or the Final Sediment Remediation, we will be prepared to capture and contain any contaminants that might be released. Eventually, as part of the complete remediation of Tax Block E, the storm drain system within the block will be removed entirely, reconfigured, and new storm drain piping installed.

6. What about contaminants that could be uncovered as you clean up Block E, especially if it rains during the work and in case of severe weather conditions such as rainstorms, hurricanes and windstorms?

Appropriate precautions will be implemented during the remediation of Block E, including steps to preclude any transport of contamination to Dark Head Cove. All our plans, including sediment and erosion controls, will also be reviewed and approved by regulatory agencies including MDE and Baltimore County.

7. If the sampling took place in September 2013, why did it take so long to announce the results?

Analysis of results is a long and complicated process. The sampling in Dark Head Cove and Dark Head Creek that produced these latest findings took place in mid-September, 2013. The samples were sent to the laboratory for analysis at that time. Preliminary laboratory results were returned in late October; validated data were made available November 18. These are typical lengths of time to obtain certified environmental data. After having considered the significance of the results and developed ideas for the proposed interim solutions, Lockheed Martin verbally notified the Maryland Department of the Environment (MDE) of the PCB results on December 16 and the U.S. Environmental Protection Agency (EPA) on December 17. Results were sent to the MDE by letter on January 2, 2014. Due to the November 18 sampling results, Lockheed Martin also decided to conduct an additional PCB survey and is now designing that survey.

The project team began further examining the uranium and thorium results in mid-December including experts brought in specifically to review this information. The detected results are so low that it is uncertain whether the uranium and thorium are all naturally occurring or contain some contribution from the Middle River site. Lockheed Martin has begun planning additional sampling. The new sampling plans will be submitted to the Maryland Department of the Environment for review prior to implementation.

8. If there is an interim action to dredge the area of contamination in Dark Head Cove, will you dredge a second time during final clean up?

We would plan to dredge the area near the outfalls only once, but will make a final determination of what is necessary in consultation with MDE and EPA.

9. Will dredging disturb the contaminants and expose them as a potential risk to humans or the environment?

At the same time the sediments are disturbed they are removed out of the water, thereby minimizing the potential for contaminants to be released to the environment. Additionally, all reasonable precautions will be implemented, including installation of a silt curtain to contain any contaminants that are disturbed.

Glossary

Cleanup — Actions to deal with a release of a hazardous substance that could affect humans or the environment. The term "cleanup" is sometimes used interchangeably with the terms remedial action, removal action, response action, or corrective action.

EPA — U.S. Environmental Protection Agency

MDE — Maryland Department of the Environment

Middle River Complex — The site of Lockheed Martin's Mission Systems and Training (MST) and Applied Nanostructured Solutions (ANS) facilities and General Electric's MRA Systems, Inc., subsidiary, known as Middle River Aircraft Systems, or MRAS. The Middle River Complex is also known locally as Plant 1.

Polychlorinated Biphenyls (PCBs) — Man-made organic chemicals manufactured and used in construction materials and electrical products among other applications. A number of PCB types exist and their reported toxicity ranges from carcinogenic to non-carcinogenic. The manufacture of PCBs was banned in 1979.

Remediation — The process of correcting or cleaning up environmental contamination. Various federal and state laws, regulations, and other requirements govern this process.

Sediment — Refers to sand, silts and clays washed from the land into water, usually after rain or snowmelt. Sediment is found under water in storm drains, ponds, lakes, creeks, streams, rivers and oceans.

Silt Curtain — A temporary barrier of geotextile material used to contain sediments within a defined area of a water body.

Surface Water — All water bodies naturally open to the atmosphere (rivers, creeks, storm drains, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc.).

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Lockheed Martin Would Like to Invite the Community to a Public Information Session On Proposed Interim Sediment Cleanup Plans at the Middle River Complex

Date: Monday, April 14, 2014

Location: Marshy Point Nature Center • 7130 Marshy Point Road

Times: 5 to 7 p.m. - Informal poster session with personalized attention and questions/answers; 7 p.m. - Formal presentation of proposed plans, followed by a question and answer and comment period

Light refreshments will be served.