



Maryland Department of the
Environment

FACTS ABOUT:

FROG MORTAR CREEK WATER CONTACT ADVISORY

The Maryland Department of the Environment's (MDE) Land Restoration Program, through its Controlled Hazardous Substance Enforcement Division, is overseeing Lockheed Martin Corporation's (Lockheed Martin) environmental assessment and cleanup activities related to the release of chlorinated solvents and metals from areas around Martin State Airport in Middle River, Baltimore County, Maryland. In connection with this assessment, MDE is issuing a water contact advisory for the waters adjacent to the shoreline of the airport.

What is the problem with Frog Mortar Creek near Martin State Airport?

Under MDE's oversight, Lockheed Martin has conducted environmental assessment activities at and around Martin State Airport. As part of those activities, Lockheed Martin collected surface water samples in March 2011 from the shoreline along Frog Mortar Creek. The chlorinated solvents Trichloroethene (TCE), cis -1,2 Dichloroethene (CIS-1,2) and Vinyl Chloride (VC) were identified in some surface water samples at levels that exceed MDE recommended lifetime risk screening levels. These risk estimates, which are based on lifetime exposures, are inherently conservative and do not represent any short-term health hazards.

MDE requested that Lockheed Martin sample the surface water more frequently to determine the extent of the problem and whether seasonal trends exist. The data collected over the past year indicates that contaminant levels are highest during cooler weather, from fall through late spring and lower during the summer months, but the discharge of the three chlorinated solvents from the subsurface into the surface water is constantly changing. As the discharge is affected by wind, rainfall and temperature, it is impossible to predict for any given day whether levels of contamination will exceed lifetime risk levels.

Why is MDE issuing a water contact advisory? What does this mean?

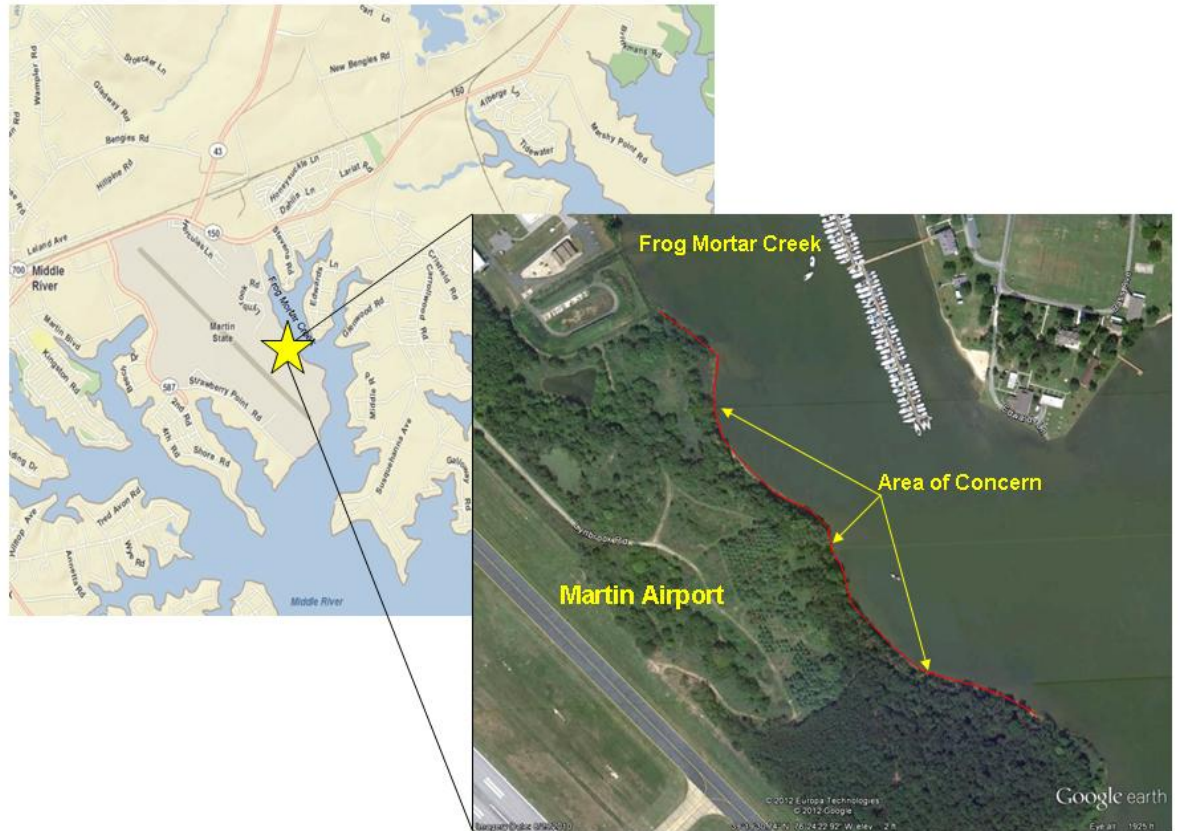
Out of an abundance of caution, MDE is issuing a water contact advisory. MDE recommends that people be aware of the potential risks and limit their exposure through swimming or wading in the waters adjacent to Martin Airport on the south shore of Frog Mortar Creek. The area of concern begins at the beach immediately adjacent to the



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southern end of the Air National Guard structures and continues in a southeasterly direction for 2,000 feet. The map below shows the area for which MDE is issuing its advisory.



Signs will be placed on the shoreline in the affected area to advise boaters and swimmers. The advisory will be on MDE’s website, and the Department will issue public notice as appropriate. We anticipate posting the advisory in February 2012.

Lockheed Martin is proposing a treatment system to capture and treat groundwater prior to it entering the creek. Until the system can be approved and constructed, and reductions in surface water concentrations are confirmed, the water contact advisory will remain in place and monitoring will continue to be used to evaluate whether additional steps are needed to protect the health of people using the creek.



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Is this a ban on swimming in this area?

No. The contaminants in the sampling results are not at a level that merits a prohibition against swimming in this area. The contaminants at the levels measured do not present an acute health risk. They represent lifetime risk estimates and are developed to be conservative and protective of all potential users.

How often would I be able to swim there and still be safe?

The calculations assume that someone beginning as a small child who spends four hours a day in the water, 70 days a year over 30 years could have a slightly greater cancer risk, based on a statistical analysis. Swimming less frequently than this estimate will lower the potential health risks. MDE generally requires remedial measures be put in place for cancer risks in excess of 1 in 100,000 over the course of a lifetime. Based on the current contaminant concentrations in the area of concern, reducing swimming activities to less than four hours a day and approximately 20 days a year during the summer months would result in risk levels within the MDE acceptable lifetime cancer risk range. Any person should choose the risk level with which they feel comfortable. This is personal decision.

What are the levels of these compounds that have been detected, and what levels are allowed as safe?

The swimming screening levels that are currently being used for this site for cis-1,2-Dichloroethene, TCE and vinyl chloride are 300 ppb, 10 ppb and 0.7 ppb, respectively. The levels of each of the three compounds have varied seasonally and between sampling locations. The average cis-1,2-Dichloroethene and TCE concentrations were below their swimming screening values in all three 2011 swimming season rounds. The highest level of vinyl chloride has been 140 parts-per-billion (ppb), found adjacent to the Dump Road Area shoreline in March 2011, when swimming was unlikely due to the time of year. The highest observed summertime level of vinyl chloride has been 32 ppb, identified in July 2010. The average vinyl chloride concentration in June met the screening level of 0.7 ppb, the combined average of June and August results was 0.9 ppb and the combined average of June, August and September results was 1.8 ppb. The overall summertime average increased primarily due to an elevated concentration of vinyl chloride of 21 ppb at location SW-38 in September 2011.

What are the potential health impacts of TCE, cis-1,2 dichloroethene, and vinyl chloride?

Trichloroethene, known as TCE, breaks down and forms “daughter” byproducts. TCE and two such byproducts, cis-1,2-dichloroethene and vinyl chloride, are found in groundwater at Martin State Airport and in Frog Mortar Creek. Vinyl chloride is the most toxic of the “daughter” compounds, so the vinyl chloride levels that regulators consider to



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be safe – or “allowable” – are extremely low.

Studies have shown that some people exposed to high concentrations of these chemicals may have an increased risk of cancer. People can potentially be exposed to these chemicals while swimming by accidentally ingesting water and by direct skin contact.

For additional information on the potential health impacts of TCE, cis-1,2-dichloroethene and vinyl chloride, the federal Agency for Toxic Substances and Disease Registry (ATSDR) provides summaries about TCE, cis-1,2-dichloroethene and vinyl chloride and their health effects. These fact sheets can also be obtained directly from ATSDR at:

- Trichloroethene (TCE) - <http://www.atsdr.cdc.gov/tfacts19.pdf>;
- cis -1,2 Dichloroethene (CIS-1,2) - <http://www.atsdr.cdc.gov/tfacts87.pdf>; and
- Vinyl Chloride (VC) - <http://www.atsdr.cdc.gov/tfacts20.pdf>.

Any personal health-related questions should be consulted with a personal physician.

What happens to the chemicals when they reach Frog Mortar Creek?

The nature of these chemicals is to evaporate, or volatilize, which is why they are known as volatile organic compounds, or VOCs. Sampling indicates these chemicals appear to be entering Frog Mortar Creek in the sediments closest to the shoreline near the Dump Road Area. Through dilution, dispersion, and volatilization, the concentrations generally decrease further away from the airport shoreline. Higher water and air temperatures and tidal movements cause volatilization and mixing, continuing the process of lessening the effects of these VOCs.

My family and I have been swimming at Frog Mortar Creek for years. Should we be concerned?

Historical information suggests that contamination sources present along the perimeter of Frog Mortar Creek have existed for some time but have only recently been discovered due to advances in screening technologies and extensive efforts to identify and clean up historical sources of contamination.

Based on the current contaminant concentrations in the area of concern, reducing swimming activities to less than four hours a day and approximately 20 days a year during the summer months would result in risk levels within the MDE acceptable lifetime cancer risk range.



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What happens next? Will there be more sampling? What if conditions worsen?

Sampling will continue, particularly during the boating and swimming season. Should conditions worsen, MDE, Lockheed Martin and the property owner, the Maryland Aviation Administration, will work to establish additional measures to protect public safety. This could include playing buoys or fencing off areas of the creek to prevent public access. Any such actions would be communicated to the public.



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