

# Middle River Complex and Martin State Airport Site Overview

April 2024

This fact sheet summarizes Lockheed Martin Corporation's history of environmental investigation and cleanup at the Middle River Complex and Martin State Airport in Middle River, Maryland. It describes the history, current status, and planned future activities at each site.

## History

**1929:** Glenn L. Martin Company, a predecessor to Lockheed Martin Corporation, buys land in Middle River, Maryland, to build and test aircraft. The Middle River Complex and Martin State Airport of today are located on the land purchased at that time.

**1970s:** Lockheed Martin sells part of the original land. Ashley Furniture, Johnson & Towers, Tilley Chemical, Total Industrial Group, the U.S. Postal Service, and a gas station-convenience store are now on the land that was sold.

**1990s–2000s:** Preliminary economic revitalization plans prompt questions about Middle River Complex environmental conditions.

Maryland Aviation Administration finds china, papers and other items associated with the former Glenn L. Martin Company when digging to install underground utilities.

In response, Lockheed Martin begins investigating environmental conditions at Martin State Airport and Middle River Complex.

**2006:** Lockheed Martin enters Maryland Department of the Environment's (MDE's) Voluntary Cleanup Program for Middle River Complex.

**1955:** Maryland Air National Guard (MDANG) begins leasing space at the Martin State Airport.

**1975:** State of Maryland buys Martin State Airport, operated by the Maryland Aviation Administration (MAA), part of the Maryland Department of Transportation.

**1990s–Present:** Lockheed Martin creates and executes plans to clean up contamination at the sites, as summarized in this fact sheet.

**2014:** Oversight of the Middle River Complex environmental investigation moves under MDE's land restoration program because investigations begin to include adjacent surface water bodies.



Learn more about the sites' environmental efforts at

[www.lockheedmartin.com/middleriver](http://www.lockheedmartin.com/middleriver) and [www.lockheedmartin.com/martinstateairport](http://www.lockheedmartin.com/martinstateairport)



## Middle River Complex

LMC Properties, Inc. owns the Middle River Complex. A tenant that builds and tests aircraft parts is based in A-, B- and C-Buildings. Environmental cleanup and monitoring activities are ongoing at several areas of the site. Cleanup activities address historical contamination in site soils, sediments, and groundwater. Teams are currently monitoring some areas to confirm the success of the cleanup efforts.

### RISK ASSESSMENTS

Lockheed Martin has conducted extensive studies and cleanup at the Middle River Complex under the oversight of the MDE and the U.S. Environmental Protection Agency (EPA). Our efforts focus on distinct parts of the environment:

- Soil
- Groundwater
- Surface water
- Sediment (soil material in the riverbed)
- Building sub-slab vapor (vapor from soil or groundwater contamination under a building that could come indoors)



The Middle River Complex includes Blocks A, B, D (including D Panhandle), E, F, G, H and I. Lockheed Martin cleanup activities also took place in Cow Pen Creek to the west and in Dark Head Cove to the south.

Lockheed Martin is cleaning up the site to risk-based health standards, based on extensive risk assessments performed for the site. The risk assessments informed us which chemicals to target for cleanup. The assessments proposed target cleanup amounts based on the current or future site use, such as industrial or recreational. Risk-based cleanups do not mean that the chemicals and metals no longer exist in site soils. Instead, the remaining chemicals are at levels that MDE and EPA deem as “low risk” to affecting human health for the kind of activities that will be allowed to occur on the site now and in the future.



## SOIL INVESTIGATIONS AND CLEANUP

Soil sampling found subsurface concentrations of polycyclic aromatic hydrocarbons (PAHs) and the metals mercury, arsenic and hexavalent chromium above risk-based health standards.

Lockheed Martin cleaned up soil in Tax Blocks B, D, D-Panhandle, F, G and H. MDE reviewed the cleanup results and made statements that “No Further Action” was needed (or similar certifications). For example, Block A received a “No Further Requirements Determination” because no cleanup was necessary.

Lockheed Martin cleaned up sites to risk-based industrial standards except the Block D Panhandle. Teams cleaned up the Block D Panhandle to a recreational standard so the land could be repurposed for public use in the future.

Soil investigations in Block E found elevated concentrations of polychlorinated biphenyls (PCBs) and chlorinated benzenes above risk-based health standards, in addition to PAHs. We completed the Block E risk-based soil cleanup in 2022. We are monitoring Block E to confirm the cleanup is meeting the intended objectives.

Many of the original underground storm drains and inlet structures for the historical building remained in Block E after the building was razed in the early 1970s. Lockheed Martin started cleaning and rehabilitating these storm drains in 2011 to protect surface water in Dark Head Cove. Block E cleanup activities included removing and replacing most of the existing storm drain pipelines.

Historical Middle River Complex documents describe the use of radioactive materials in the former D-Building, historically located in Block E. The Nuclear Regulatory Commission conducted a closeout verification survey of that parcel in 1994. The survey found no detectable radiation above background levels. It stated Block E was suitable for unrestricted use in its current condition, with the basement floor slab in place and the floor drains plugged with concrete.



*The original building slab stayed in Block E after the building was torn down in the early 1970s.*

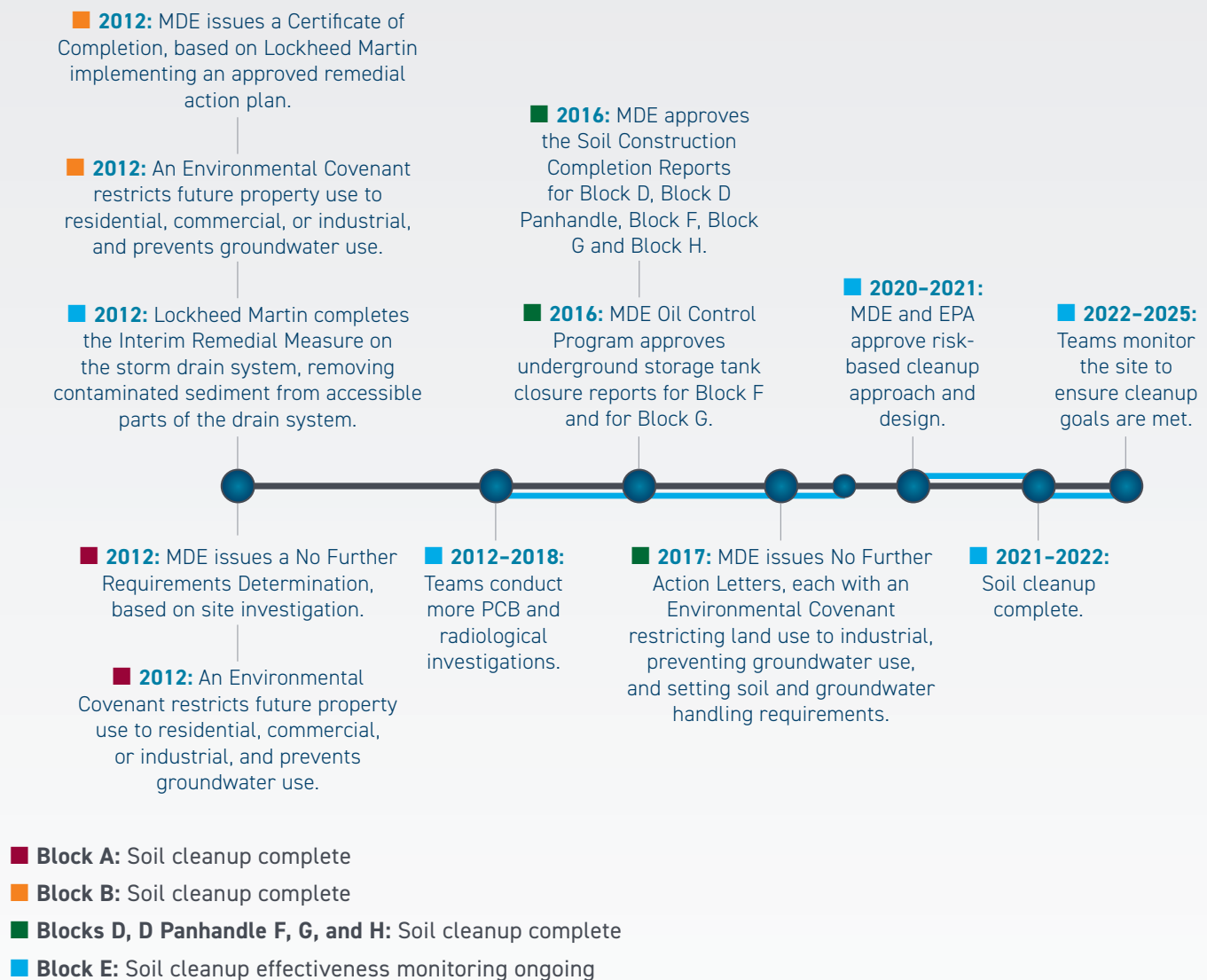


*During cleanup, crews removed and took the concrete slab off-site. The site restoration includes a large meadow of local grasses and flowering plants.*

Lockheed Martin surveyed the area in 2004 and 2012, and did not find radiation significantly above background levels at the ground's surface. Radiological sampling continued during soil investigations at Block E. The sampling found small amounts of radioactive materials in some floor drains under the foundation slab, all of which the Block E clean-up removed. Lockheed Martin developed and followed precautions for handling and disposing the material under the oversight of MDE.

Ongoing industrial operations currently prevent us from investigating the soil under existing buildings in Block I. However, if any new construction activities reveal the potential for contaminated soil, we will investigate to determine if cleanup is needed.

## CLEANUP PROGRESS



## GROUNDWATER INVESTIGATIONS AND CLEANUP

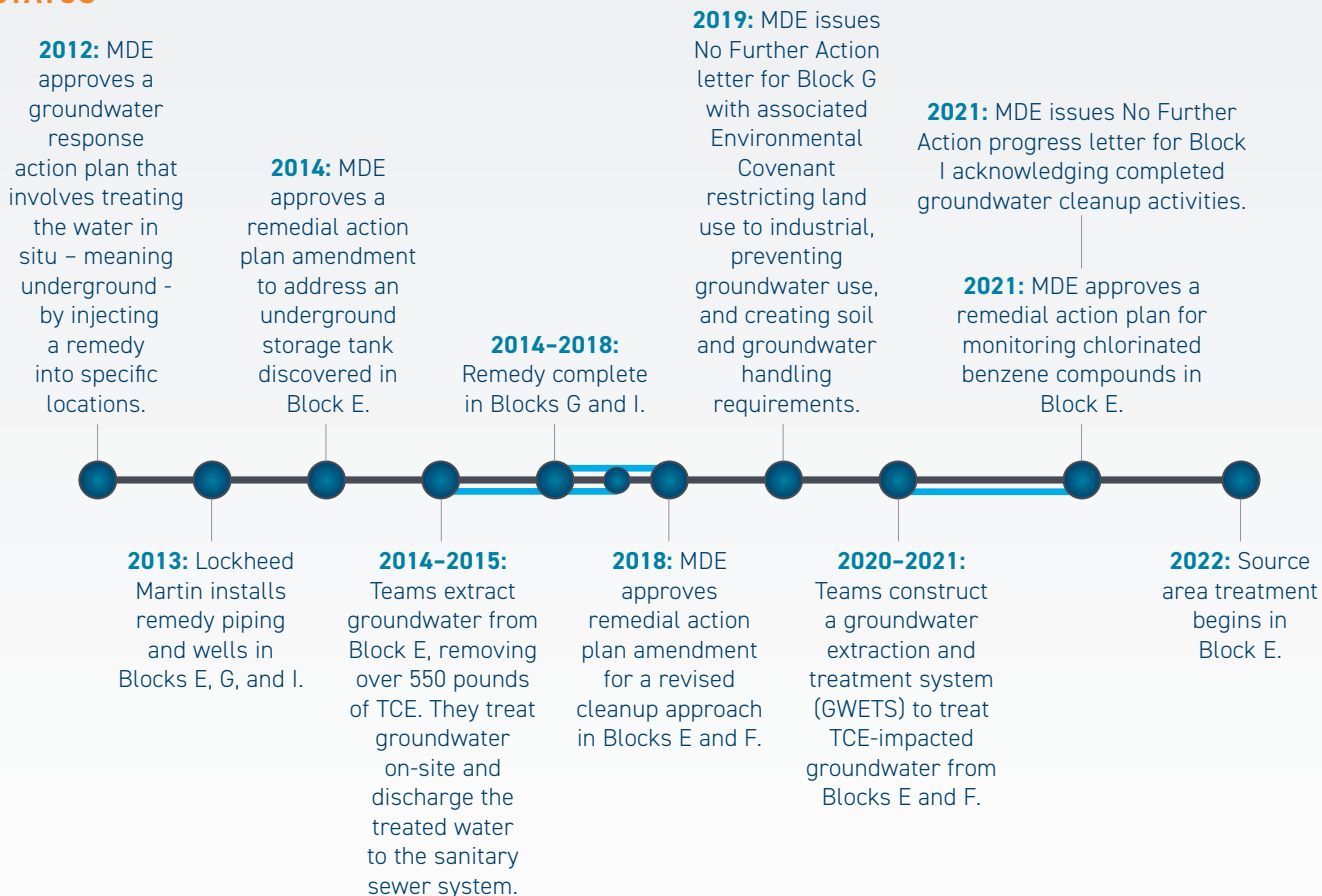
The site has groundwater contaminated with volatile organic compounds (VOCs), including trichloroethene (TCE) and chlorinated benzenes. Site investigations found three areas with elevated TCE levels that needed to be cleaned up. Two of these areas, located in Blocks G and I, are cleaned up. MDE granted these groundwater cleanup areas “No Further Action” designations, meaning that the groundwater cleanup activities met all of the objectives. Note that for Block I, this designation applies only to the area where we completed groundwater cleanup.

Lockheed Martin is currently cleaning up the third TCE-impacted groundwater area in Block E and Block F. We built a groundwater treatment system in 2020 and 2021. It takes groundwater from the ground, treats it, then discharges the treated water to the sanitary sewer under a discharge permit with Baltimore County. Additional remedial activities to target the highest contaminated areas began in 2022 and are anticipated to continue through 2025. We are monitoring another part of Block E that has low levels of chlorinated benzenes to ensure the compounds are breaking down naturally.

Teams currently monitor other groundwater VOC plumes in Block I, west of A-Building and south of C-Building, to ensure they do not move offsite at concentrations that impact people or the environment. We also check if these groundwater plumes migrate to areas we have already cleaned up. **These plumes are relatively stable and have not moved much.** Lockheed Martin samples groundwater across the site periodically. We use the data to learn the location of VOCs and other contaminants, including 1,4-dioxane and hexavalent chromium.

*As a precaution, site groundwater should not be used for any purpose.*

## STATUS





## SEDIMENTS AND SURFACE WATER

Sediment sampling found elevated concentrations of PAHs, polychlorinated biphenyls (PCBs), and metals such as cadmium. These levels meant Lockheed Martin needed to take action to lower the potential risks associated with long-term direct contact, fish taking in the contaminants and potential impact to organisms living in the sediment.

The Lockheed Martin team addressed contaminated sediments in the Cow Pen Creek and Dark Head Cove riverbeds in three phases between 2015 and 2018 using dredging, excavation and in-place (*in situ*) treatment. We checked the effectiveness of the activated carbon *in situ* treatment in Dark Head Cove during the first three years. Results told us that we met the cleanup objectives earlier than expected, removing the contaminants from exposure to the food chain. We monitored the restored areas within Cow Pen Creek and along its banks and upland areas between 2018 and 2022. Also, we have monitored restored submerged aquatic vegetation since 2018. We expect to complete our final monitoring in 2024 or 2025. In 2023, EPA issued the final approval for the *in situ* cleanup and MDE issued a "No Further Action Letter" confirming that the sediment cleanup is complete.

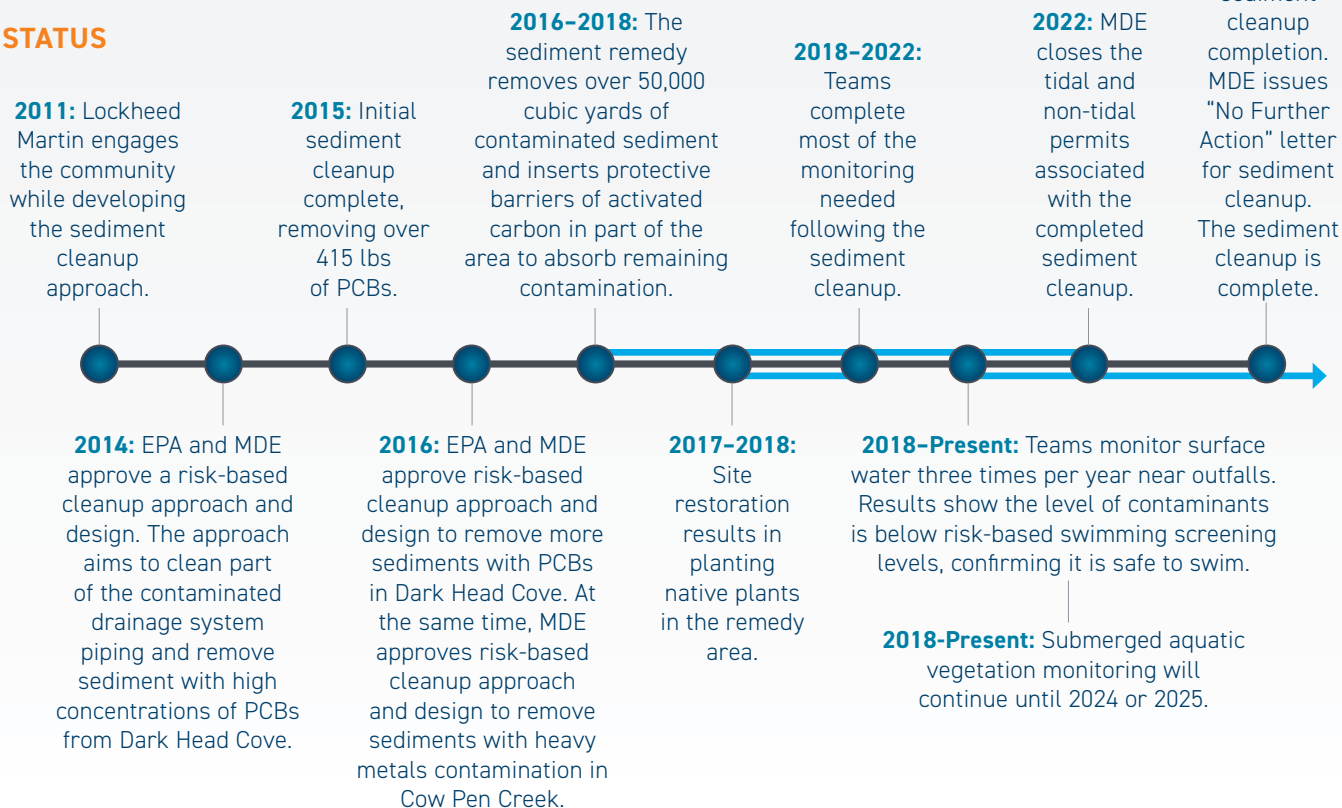
Our ongoing surface water monitoring program aims to ensure recreational users of the water bodies remain safe. Maryland Department of Natural Resources fishing advisories for the Chesapeake Bay and the Baltimore region apply to these waterways, as well as other local waterways.

Surface water sampling tells us about cleanup activity status at the site. The most recent water monitoring results demonstrate that:

- a) The groundwater treatment system is effective.
- b) 1,4-dioxane is not a current risk in the area.
- c) PCBs are above regulatory ambient water quality criteria, but below risk-based swimming screening levels.

**2023:** EPA issues the final approval for the *in situ* (i.e., in place) sediment cleanup completion. MDE issues "No Further Action" letter for sediment cleanup. The sediment cleanup is complete.

## STATUS





## VAPOR INTRUSION MITIGATION

Lockheed Martin has sampled indoor air and sub-slab vapor for VOCs in Block I, at A-, B- and C-Buildings since 2006. Lockheed Martin's investigation of soil vapor and indoor air in and around buildings at the Middle River Complex indicates that indoor air quality is safe from historically used chemicals. *That means employees who work in Complex buildings do not need to be concerned about the quality of their indoor air.*

Three sub-slab depressurization systems (SSDS) currently operate at the site: one beneath the former plating shop in the south end of A-Building, one beneath the south end of the C-Building basement, and one in Drop Hammer Building. These systems stop contaminants found in soil vapor beneath the building from entering the building and impacting indoor air quality via a process called vapor intrusion.

MDE has approved a higher basement-specific TCE screening level where workers are typically exposed to air in the A-Building basement for a short time (i.e., low occupancy). TCE concentrations in indoor air in the A-Building basement have never gone above this basement-specific screening level.

## Martin State Airport

Lockheed Martin has completed thorough environmental studies at Martin State Airport. The studies have primarily focused on an area called the Dump Road Area, which is between Taxiway T or "Tango" and Frog Mortar Creek. Lockheed Martin's work is subject to review and approval by MDE's Land Restoration Program. The team has also conducted environmental investigations around the Main Terminal, Strawberry Point, Greater Strawberry Point, and in Frog Mortar Creek and Stansbury Creek. Lockheed Martin coordinates investigations, cleanup, and permitting activities at Martin State Airport with the State of Maryland, through Maryland Aviation Administration (the property owner) and with the Maryland Air National Guard (a major airport tenant).



Martin State Airport includes three areas (shown with blue labels) with ongoing groundwater cleanup or monitoring and two areas where surface water has been sampled.



## DUMP ROAD AREA

Investigations in the Dump Road Area found chlorinated volatile organic compounds (CVOCs), including TCE, cis-1,2 dichloroethene, and vinyl chloride. The CVOCs were at levels above federal and Maryland standards in groundwater moving from the Dump Road Area towards Frog Mortar Creek. To protect the creek, Lockheed Martin installed extraction wells and built a groundwater treatment plant. Treated, clean groundwater discharges to Frog Mortar Creek. We test it often to ensure it meets permit requirements. The groundwater treatment plant has been extremely successful at reducing contamination in Frog Mortar Creek by capturing and treating contaminated water before it reaches the creek.

We are also targeting the sources of contamination (source areas) by injecting bacteria and nutrients into the ground between the taxiway and runway and expanding the extraction well network in the Dump Road Area to better target the upgradient source areas. One injection has already been completed, and more are planned to help reduce contamination in the source area across the taxiway. The additional extraction wells are planned to be installed and operational in 2024.

Lockheed Martin also coordinates with the Maryland Aviation Administration and the Maryland Air National Guard to control the risk of exposure to airport maintenance or construction workers in the area. Lockheed Martin, MDE and Maryland Aviation Administration are working together to determine what environmental conditions may need to be addressed to support airport operations and how to effectively close the landfill.

**2017:** Lockheed Martin constructs a groundwater treatment plant and installs 16 extraction wells to prevent contaminated groundwater from the Dump Road Area from going into Frog Mortar Creek .

**2022–Present:** Monitoring continues to evaluate the remedy effectiveness and plan more injections if needed.

**2024:** Crews start constructing six new extraction wells to expand the groundwater collection and treatment area. Wells will be online by late 2024 and will operate for at least five years.

**2022:** Source area injections begin.

**December 2022:** Based on successful groundwater treatment plant operations, MDE lifts the swimming advisory for Frog Mortar Creek.



## FROG MORTAR CREEK

Based on earlier water test results, MDE set a swimming advisory for part of Frog Mortar Creek in 2012, before Lockheed Martin started groundwater treatment. MDE posted six signs in the waters near the shoreline of the airport. The signs told the public to limit swimming in the area. The advisory was a very conservative approach to reduce the potential for health risks. **MDE has now lifted the water contact advisory in response to the decreased levels and recent absence of CVOCs in Frog Mortar Creek. Lockheed Martin's successful operation of the groundwater treatment system led to MDE lifting the advisory.**

**2012:** Lockheed Martin starts sampling surface water in Frog Mortar Creek by Martin State Airport six times a year, including during peak water recreation summer months. MDE releases water contact advisory and swimming screening levels.

**2018:** Levels of CVOCs, including trichloroethene, cis-1, 2-dichloroethene and vinyl chloride, are significantly lower than before groundwater treatment.

**2020 Summer Season:** Sampling finds CVOCs in only five out of 84 total creek samples, all below swimming screening levels.

**2022 Summer Season:** Teams reduce sampling from six to four times per year at fewer locations. Sampling do not find CVOCs in any creek samples.

**2017:** Crews install groundwater treatment system at Martin State Airport to capture and treat impacted groundwater before it reaches Frog Mortar Creek.

**2019 Summer Season:** Sampling finds CVOCs in only two out of 84 total creek samples, all below swimming screening levels.

**2021 Summer Season:** Sampling **does not find CVOCs** in any creek samples.

**December 2022:** MDE lifts water contact advisory.

## GREATER STRAWBERRY POINT

Lockheed Martin currently monitors the natural breakdown of chemicals that are in the groundwater beneath Greater Strawberry point. Chemical concentrations in groundwater are low enough that active cleanup would not significantly improve upon natural processes to reduce the time needed to meet remediation goals.

Groundwater plumes in Greater Strawberry Point contain low levels of chemicals in groundwater near Stansbury and Frog Mortar Creeks. But, the plumes mostly stay close to their sources, and surface water sampling in the creeks isn't showing any contamination. TCE is in groundwater between Strawberry Point Road and Stansbury Creek at levels above the state and federal groundwater standards. Lockheed Martin will keep monitoring groundwater in the area.

**2007-2019:** Lockheed Martin finds limited amounts of TCE and vinyl chloride above MDE conservative levels for drinking water use.

**2020:** Lockheed Martin begins monitoring the natural break down of chemicals in groundwater (also called natural attenuation) in Greater Strawberry Point. The process includes land-use controls and five-year reviews of cleanup progress.

**2019:** MDE approves feasibility study for cleanup. The study finds that active cleanup was not needed and groundwater monitoring would be the best approach.

## STANSBURY CREEK

The most recent surface water sampling at Stansbury Creek did not show elevated results. Lockheed Martin has completed sampling and has no plans for remediation.

**2009:** Sediment sampling finds levels of PAHs next to one outfall that drains paved surfaces associated with airport operation. The samples are consistent with others in the area and have very low risks to human health and the environment.

**2016:** Sediment and surface water sampling finds PAHs levels and some elevated metals levels in the sediment by these outfalls in Stansbury Creek. The samples are similar to 2009 results and do not find elevated VOC levels in the creek surface water and sediment.

**2010:** MDE tells Lockheed Martin no remediation is required for Stansbury Creek.

**2022–2023:** Four rounds of VOC testing of surface water samples do not find TCE or other CVOCs, despite concentrations detected inland in the Greater Strawberry Point area. MDE agrees that additional surface water sampling is not needed and groundwater sampling at Greater Strawberry Point can continue as planned.

## MAIN TERMINAL

Investigations for the airport Main Terminal area surrounding Hangars 1 through 6 showed low levels of fuel-related compounds. We expect them to degrade naturally without impacting nearby waterways.

**2011:** Lockheed Martin begins geophysical and soil vapor surveys, as well as soil and groundwater testing.

**2013–2019:** Two groundwater wells sampled yearly to look for low levels of fuel-related compounds.

**2012:** Lockheed Martin completes Main Terminal work report and conducts more groundwater testing.

**2019–Present:** Groundwater monitoring decreased to two wells sampled every other year.

## Public Outreach and Citizen Participation

Lockheed Martin wants the community to understand the cleanup progress at both the Middle River Complex and Martin State Airport sites. Following our tradition of including community members, we value all parties' input on looking for and cleaning up contamination.

During many permitting and planning efforts, local, state and federal governments ask for public comment. We will continue to share opportunities for comment through our community outreach efforts.

## Glossary and Acronym List

**Arsenic** — an odorless and tasteless semi-metal that enters bodies of water naturally from the earth and from industrial processes.

**Attenuation** — the decrease of the amount of a chemical in soil or groundwater over time due to natural processes. Those processes can include the microbial breakdown of the compound (biodegradation), soil or sediment particles adsorbing the chemical, dilution as chemicals move through an aquifer and mix with clean groundwater, the evaporation of volatile organic compounds, and chemical reactions due to natural soil and groundwater conditions.

**Background radiation** — radiation that comes from natural sources and is always in the environment. This includes solar and cosmic radiation, as well as radioactive elements in the ground, building materials and the human body.

**Cadmium** — an element found naturally in soil and rocks. Cadmium is also found in some foods and in man-made consumer products such as batteries, plastics, pigments, paints and metal coatings. Cadmium does not break down in the environment and generally does not dissolve in water. In the ground, cadmium typically attaches to soil and sediment.

**Chlorinated volatile organic compounds (CVOCs)** — chemicals typically used as cleaning and degreasing agents. They include methylene chloride, perchloroethylene, trichloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, and carbon tetrachloride.

**Chlorinated benzenes** — chemicals historically used at the site in dielectric fluid, along with polychlorinated biphenyls in electric transformers.

**Chromium** — an element found naturally in the earth's soil and water and all plants. Ore refining, chemical and refractory processing, cement plants, automobile and aircraft parts production, tanning, and chrome pigments may also add chromium to the environment.

**EPA** — U.S. Environmental Protection Agency

**Hexavalent chromium** — a type of chromium that is not typically found naturally in the earth's soil, and is typically produced by industrial processes. It may be used for plating metal parts or as pigments.

**in situ** — in place. In remediation, it typically means injecting treatment materials into the ground instead of removing groundwater or soil out of the ground to be treated.

**MDE** — Maryland Department of the Environment

**Mercury** — a metal used in man-made products such as batteries and thermometers, which also occurs naturally.

**Polycyclic aromatic hydrocarbons (PAHs)** — a group of chemicals formed during the incomplete burning of coal, oil, gas, wood, garbage, or other organic substances, such as tobacco and charbroiled meat. There are more than 100 different polycyclic aromatic hydrocarbons. They are also often found in asphalt paving, roofing materials and urban environments.

**Polychlorinated biphenyls (PCBs)** — a group of man-made organic chemicals with no known natural sources. Polychlorinated biphenyls can be oily liquids or solids and are colorless to light yellow. They were once used commonly as a component of dielectric fluids in electrical transformers.

**Sediment** — sand, silt and clay 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.

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

**Trichloroethene (TCE)** — a VOC used to clean metals and in specialty adhesives. It was used commonly as a degreaser in industrial operations. Trichloroethylene is another, older, name for the same chemical.

**Volatile organic compounds (VOCs)** — a class of chemical that transforms from a liquid to a gas at room temperature.



### For More Information

#### Visit the Lockheed Martin website:

[www.lockheedmartin.com/middleriver](http://www.lockheedmartin.com/middleriver) and  
[www.lockheedmartin.com/martinstateairport](http://www.lockheedmartin.com/martinstateairport).

### Contact Information

Lockheed Martin welcomes your questions or requests for more information!

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