

Citizens' Guide to the Proposed Plan for Treating Groundwater Contamination at Greater Strawberry Point, Martin State Airport



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This Citizens Guide is a summary of Lockheed Martin's proposed plan for addressing groundwater contamination. The full plan can be found at www.lockheedmartin.com/martinstateairport.

Lockheed Martin, from the 1940s through the 1960s. These investigations revealed limited instances of chemicals of concern in groundwater exceeding regulatorily allowed levels. Although groundwater plumes containing low levels of chemicals are moving towards Stansbury and Frog Mortar Creeks, the plumes remain close to their sources and the chemicals are not expected to reach the creeks or impact the surface water of the creeks.

Lockheed Martin's proposed remedial action plan for Greater Strawberry Point is based on a feasibility study conducted in 2018 and a design characterization report prepared in 2017 that includes summaries of previous historical investigations. The feasibility study includes an evaluation of the nature and extent of environmental contamination at Greater Strawberry Point, the human health risk assessment, and an ecological risk assessment. (All these reports are available at www.lockheedmartin.com/martinstateairport.)



More than 100 groundwater samples and 200 soil samples were collected as a part of Lockheed Martin's investigations. Surface water and sediment samples also were collected from Stansbury Creek.

Martin State Airport is located at 701 Wilson Point Road in Middle River, Maryland, and is bounded by Frog Mortar Creek to the east and Stansbury Creek to the west. Both creeks join the Chesapeake Bay at the southern tip of the airport. Greater Strawberry Point is on the southwest portion of the airport.

Since 2007, Lockheed Martin has been investigating surface soil, subsurface soil, and groundwater at Greater Strawberry Point on Glenn L. Martin State Airport in Middle River, Maryland. This work identified the extent of environmental contamination potentially resulting from industrial operations conducted there by the Glenn L. Martin Company and Martin Marietta, predecessors of

The Human Health Risk Assessment for Greater Strawberry Point was prepared in 2017 using US Environmental Protection Agency (USEPA) and Maryland Department of the Environment (MDE) guidelines. Risk to humans from exposure to soil and groundwater was evaluated based on current and likely future land uses, and using the HHRA guidelines. Because site use at Greater Strawberry Point is currently commercial and industrial and is expected to remain so in the future, evaluations of the risks of exposure to contaminants were confined to commercial, industrial, and construction workers. No contaminants of concern to those workers were identified in the soil at Greater Strawberry Point, and so no remedial action for soil is warranted. Commercial and industrial workers are also not expected to be exposed to chemicals in groundwater

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because groundwater is not used for drinking or industrial processes, and because commercial and industrial workers are not expected to come into contact with groundwater directly in their day-to-day work. Only construction workers could come into contact with contaminants in groundwater, but those contaminants are at very low levels, and would be managed during construction.

The Ecological Risk Assessment conducted in 2010 evaluates risk due to exposure to surface soil, sediment, and surface water in the wooded area in the northern portion of Greater Strawberry Point. While some risks were identified for some contaminants in surface soil and sediment, because the habitat in this area is so limited and the concentrations of contaminants are isolated, no remedial actions are warranted. No risks were identified for surface water. Stansbury Creek sediment was tested at 12 locations and no contaminants were detected.

Remedial Action Objectives

During the feasibility study, Lockheed Martin developed Remedial Action Objectives based on the results of its investigations and risk assessments. These objectives are the goals Lockheed Martin adopted for protecting human health and the environment at Greater Strawberry Point:

1. Prevent exposure of construction workers to trichloroethene (TCE) in groundwater during construction. (The TCE was found in groundwater under an area near Taxiway J once used for testing and storage.)
2. Prevent human exposure to groundwater containing concentrations of contaminants of concern greater than groundwater criteria.
3. Prevent off-site migration of site contaminants to Stansbury Creek, and prevent exceedances of ambient water quality criteria or human exposure criteria in Stansbury Creek and Frog Mortar Creek by migration of contaminated groundwater.
4. Prevent exposure to site soil by anyone other than industrial or construction workers performing typical commercial and industrial activities.
5. Prevent exposure of industrial workers to volatile organic compounds (VOCs) resulting from vapor intrusion into buildings that could cause unacceptable risk.

During the course of its study, Lockheed Martin took into account the different ways that industrial and construction workers might be exposed to groundwater given current uses of land at Greater Strawberry Point. Lockheed Martin also took into account how to provide the highest level of protection for human health and the environment.

Summary of Clean Up Alternatives

Lockheed Martin identified four alternatives for cleaning up groundwater at Greater Strawberry Point that meet the remedial action objectives. These alternatives include combinations of methods and plans to restrict access to contaminated groundwater, and contain, remove, or treat contamination. These alternatives are:

- Alternative G-1 – No action (consideration required by regulation);
- Alternative G-2 – Monitored natural attenuation (MNA), land-use controls (LUCs), and five-year reviews;
- Alternative G-3 – *In situ* chemical oxidation, MNA, LUCs, and five-year reviews; and
- Alternative G-4 – *In situ* enhanced bioremediation, MNA, LUCs, and five-year reviews.

Glossary

Bioremediation—the treatment of pollutants or waste (such as contaminated groundwater) by the use of microorganisms (such as bacteria) that break down undesirable substances.

In situ—for this project, *in situ* means on-site and below ground.

Land-Use Controls—restrictions to prevent residential and industrial groundwater use until residential groundwater standards are met.

Monitored Natural Attenuation—describes a range of physical and biological processes. At Greater Strawberry Point, volatile organic compounds would be reduced mainly through natural biological activity, but would also be reduced by dispersion, dilution, movement through the aquifer, and adsorption onto soil particles.

Surficial aquifer—shallow zone of water-bearing soil or rock, closest to the ground surface.

What Criteria Were Used To Evaluate The Alternatives?

Threshold criteria (The selected remedy must satisfy these criteria)—Provide overall protection of human health and the environment, and comply with applicable statutes and regulations.

Balancing criteria (These criteria are used to weigh the relative merits of the alternatives)—Long-term effectiveness and permanence; reduction of toxicity, mobility, or volume of contamination through treatment; short-term effectiveness; implementability; sustainability; and cost.

Modifying criteria (These criteria are considered during evaluation, but are evaluated after remedy selection)—Government acceptance; community acceptance.

Preferred Alternative

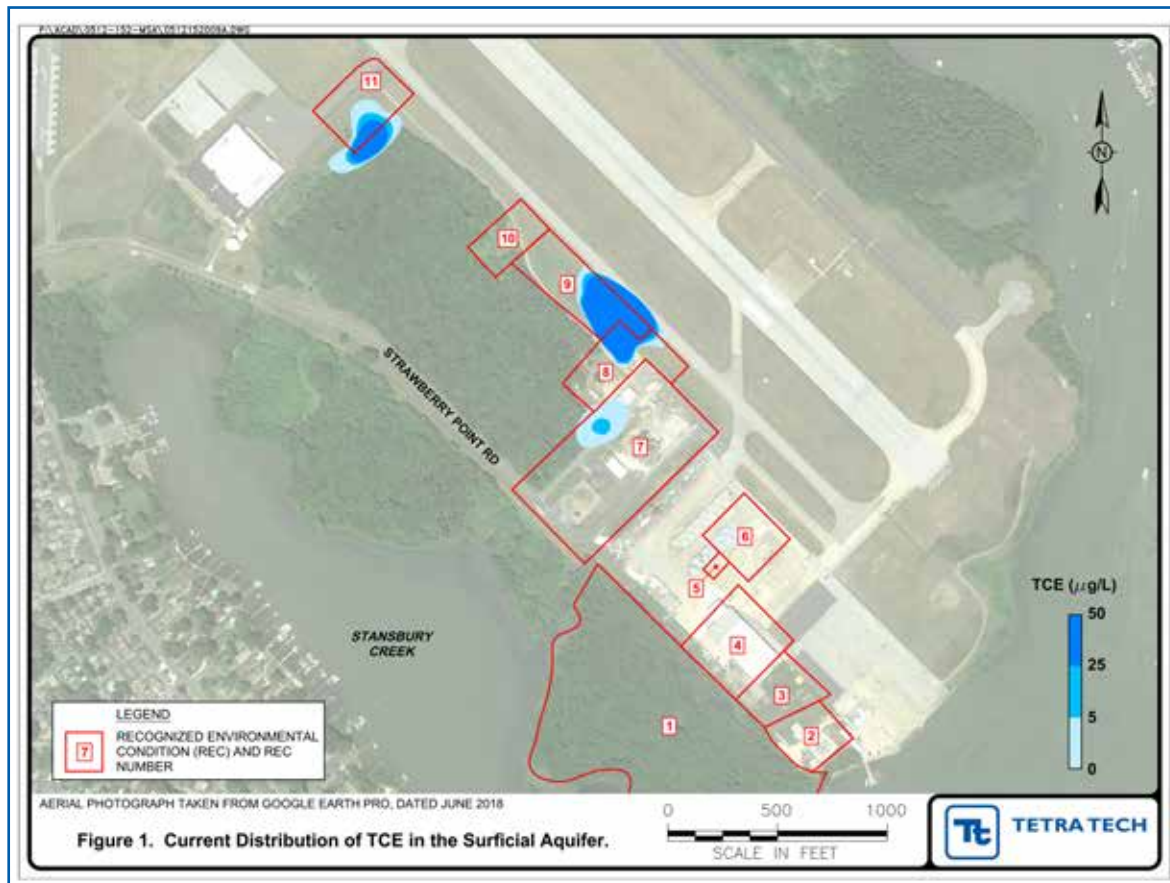
Lockheed Martin selected Alternative G-2 as the preferred approach to groundwater remediation at Greater Strawberry Point. Chemical concentrations in groundwater are sufficiently low that the addition of oxidation or bioremediation does not significantly affect the time taken to achieve the same remediation goals. Monitored natural attenuation (Alternative G-2) is estimated to take 40 years, versus 32 years for Alternatives G-3 and G-4. Alternatives G-3 and G-4 are also significantly more expensive (45-55% higher). Alternative G-2 is also ranked more favorably for sustainability because it has a smaller carbon footprint. For example, no intrusive activities and their associated

energy consumption are involved with monitored natural attenuation.

Monitored natural attenuation (MNA) (Alternative G-2) is estimated to take 40 years, versus 32 years for Alternatives G-3 and G-4. Lockheed Martin has successfully used MNA in other locations.

The land-use controls proposed under Alternative G-2 include limiting land use to industrial purposes and prohibiting use of groundwater from the surficial aquifer for drinking water and industrial purposes. Land-use controls would also prevent residential use of the site. Environmental covenants would be recorded in the County land records to help ensure the effectiveness of these controls. Land-use controls would continue until groundwater contaminant concentrations are below residential remediation goals.

A site review would be required at least once every five years to evaluate the protectiveness of the remedy, review environmental laws and regulations in effect at the time of the review, review the effectiveness of the monitored natural attenuation, verify that the land-use controls are effective, and provide direction for further action. Groundwater monitoring will be ongoing during the periods between site reviews.



Community Participation Information

The public is encouraged to participate in the decision-making process for the Greater Strawberry Point Site at Martin State Airport by reviewing and commenting on the proposed plan during the public comment period. All public comments, questions, and concerns are appreciated. You do not have to be a technical expert to comment.

Public comment period for the proposed plan: through April 19, 2019

Location of project documents:
www.lockheedmartin.com/martinstateairport

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