LOCKHEED MARTIN

Tallevast

Fact Sheet | January 2025

INTRODUCTION

This fact sheet summarizes Lockheed Martin Corporation's environmental investigation and cleanup history at the former American Beryllium Company site in Tallevast, Florida. It details the site ownership history, site assessment activities, interim remedial actions, remedial design, remediation system construction, and ongoing remediation system operations.

BACKGROUND

The former American Beryllium Company facility is located in Tallevast, Florida, a small unincorporated community in southwestern Manatee County, between Sarasota and Bradenton. The area's land use is predominantly single-family homes, interspersed with churches, light commercial, industrial development, and heavy manufacturing.

Lockheed Martin acquired ownership of the former American Beryllium Company facility through its 1996 acquisition of Loral Corporation. In late 1996, Lockheed Martin ceased operations at this facility and sold it to BECSD, LLC, in 2000. BECSD leased the facility to Wire Pro Inc. (WPI) until January 2007. WPI was sold to Cooper Industries, Inc. that month, which leased the facility until its operations ceased in June 2007. Lockheed Martin leased the property from BECSD from July 2007 until June 30, 2009, when it was repurchased.

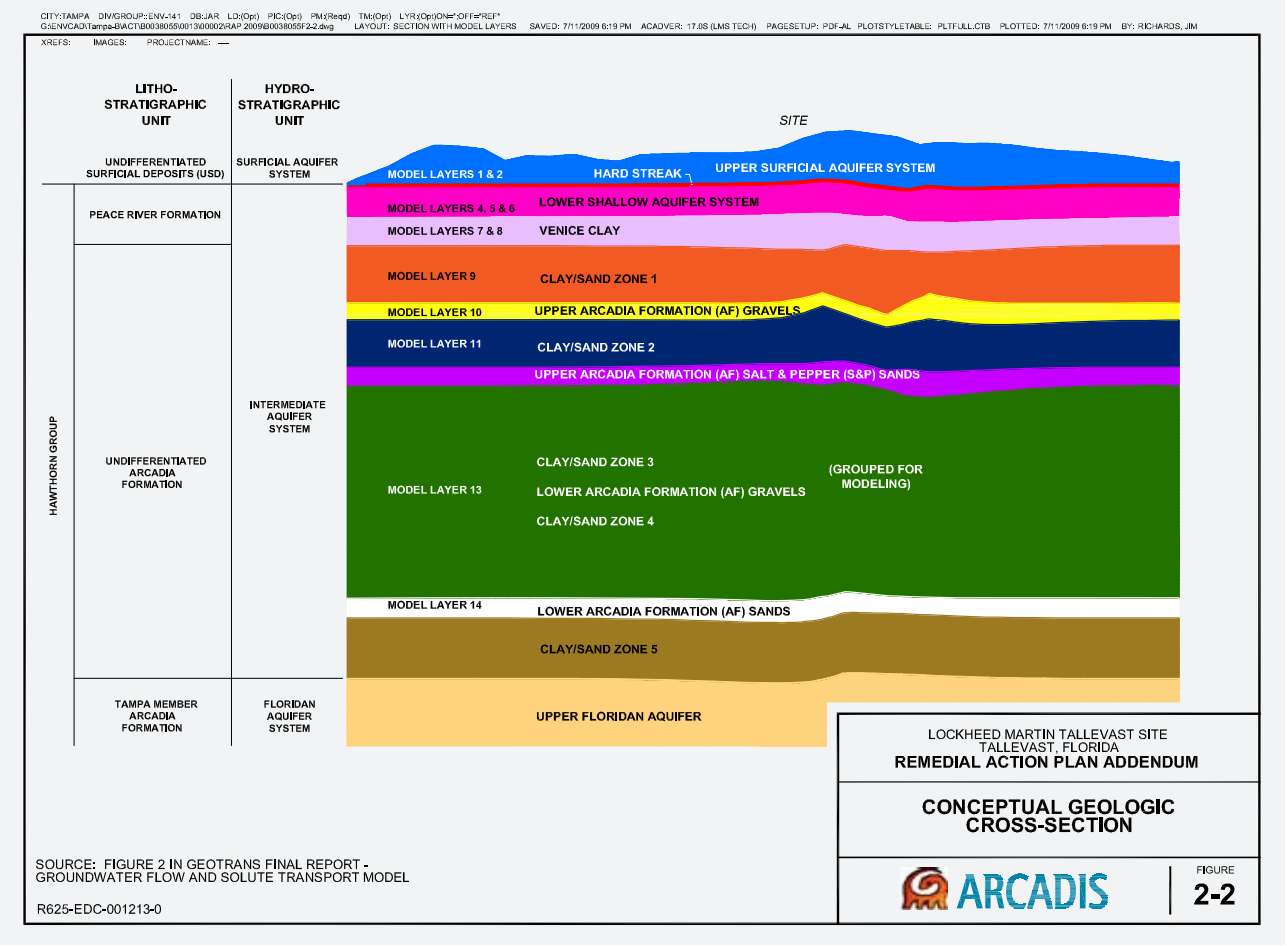
SITE ASSESSMENT

From 2000 to 2006, Lockheed Martin conducted extensive soil and groundwater assessments. All site assessment activities were conducted under the oversight of the Florida Department of Environmental Protection (FDEP) and in accordance with Chapter 62-780, Florida Administrative Code (FAC). Over 400 soil samples were collected from over 1,400 boring locations, and thousands of groundwater samples were taken from more than 275 monitoring wells. The site assessment results indicated that polycyclic aromatic hydrocarbons (PAHs) and metals (arsenic, copper, chromium, and beryllium) were detected in soils at the facility. Standard leachability tests indicated that these substances were not in a form or sufficient quantity to represent a threat of off-site transport by surface water or groundwater percolation. Furthermore, as long as an adequate exclusion barrier is maintained to sequester the contaminated soil from human exposure, there is no undue incremental risk to health or the environment.

Several contaminants found in common industrial solvents historically used at the site were detected in groundwater. The contaminants detected included 1,4-dioxane, tetrachloroethene (PCE), and trichloroethene (TCE). The assessment indicated that these contaminants were present at concentrations that exceeded the Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs).

Extensive subsurface characterization determined that three aquifer systems are underlying the site. The "Surficial Aquifer System," the "Intermediate Aquifer System," and the "Floridan Aquifer." The shallowest ("Surficial Aquifer System") is a single hydrogeologic unit that is a primary water-bearing zone. The middle ("Intermediate Aquifer System") is a multilayered system comprised of 12 separate and discernible hydrogeologic units or layers containing four (4) primary water-bearing zones. The lowest ("Floridan Aquifer System") is a single hydrogeologic unit and is a primary water-bearing zone. Extensive testing of the subsurface conditions has shown that only the upper-most four (4) water-bearing zones (one shallowest "Surficial Aquifer System" zone and upper-most three "Intermediate Aquifer System" zones) are impacted by site-related contamination. The deepest water-bearing zone of the "Intermediate Aquifer System" and the deeper "Floridan Aquifer" appear to be unaffected by the contamination.

The site assessment results were submitted to the FDEP in a Site Assessment Report and several Addenda. On September 25, 2006, the FDEP issued a site assessment approval order.



Conceptual geologic cross-section showing stratified layers beneath the Tallevast site.

INTERIM REMEDIAL ACTIONS

In September 2001, a source removal action was conducted to remove soil with elevated TPH concentrations from a former sump area. The remedial excavation encompassed an area of approximately 2,400 square feet and extended five feet below ground level. A total of 538 tons of impacted soil were excavated and properly disposed of off-site.

In 2006, Lockheed Martin implemented an interim groundwater treatment system to begin contaminant mass removal from the source area to reduce the potential for further spread of contamination while the full-scale remedy was being developed. The interim treatment system included 10 extraction wells installed on the Lockheed Martin property in the area of the highest contaminant concentrations. The extracted groundwater was treated using the Phot-Cat advanced oxidation process, which destroyed the contaminants by oxidation using a TiO2 catalyst and UV light. The water was then passed through granular activated carbon as a final polishing step. The interim system was operated from August 2006 until July 2012, when it was shut down and decommissioned to make room for the installation of the full-scale treatment system. The total volume extracted and treated from initial startup in August 2006 to shut down in July 2012 was approximately 40.3 million gallons.

Extraction well manifold for interim groundwater treatment system.

REMEDIAL ACTION PLAN

FDEP issued its Site Assessment Approval Order in September 2006. Lockheed Martin then developed a Remedial Action Plan (RAP) Addendum for the site. The comprehensive remedial actions detailed in the RAP Addendum were developed through a systematic process grounded in appropriately balancing state, community, and corporate interests. This process included the following:

- Establishment of objectives.
- Determination of remedial system requirements from analytical and test data.
- Evaluation of remedial alternatives.
- Selection and justification of remedial approach and plan implementation.

These steps were informed by open communication with the surrounding community and its experts, environmental remediation experts retained by Lockheed Martin, and interaction with the FDEP. The RAP Addendum was based on assessments of the facility, assessments of the site geology and hydrogeology, characterization of the nature and extent of soil and groundwater impacts, an evaluation of remedial technologies, and forecasts of the time required to complete the remedy.

The RAP Addendum's proposed and selected Remedial Action Objectives are described below.

Remedial Action Objectives:

Soil

The RAP Addendum proposed a single objective for soil:

Reduce the potential for exposure to contaminants of concern (COCs) present in soil at the facility.

Groundwater

The RAP Addendum proposed the following objectives for groundwater at the site

- Reduce the potential for human exposure to COCs in groundwater.
- Hydraulically control groundwater containing COCs in concentrations greater than the groundwater cleanup target levels (GCTLs) as listed in Chapter 62-777 of the FAC.
- Actively extract and treat the groundwater plume until concentrations are below GCTLs.
- Minimize community and natural resource disturbance.

A wide range of remedial alternatives were evaluated, and the final design combined measures that met the defined objectives. The selection process emphasized overall protection of human health and the environment and compliance with FDEP regulations.

Selected Remedial Approach:

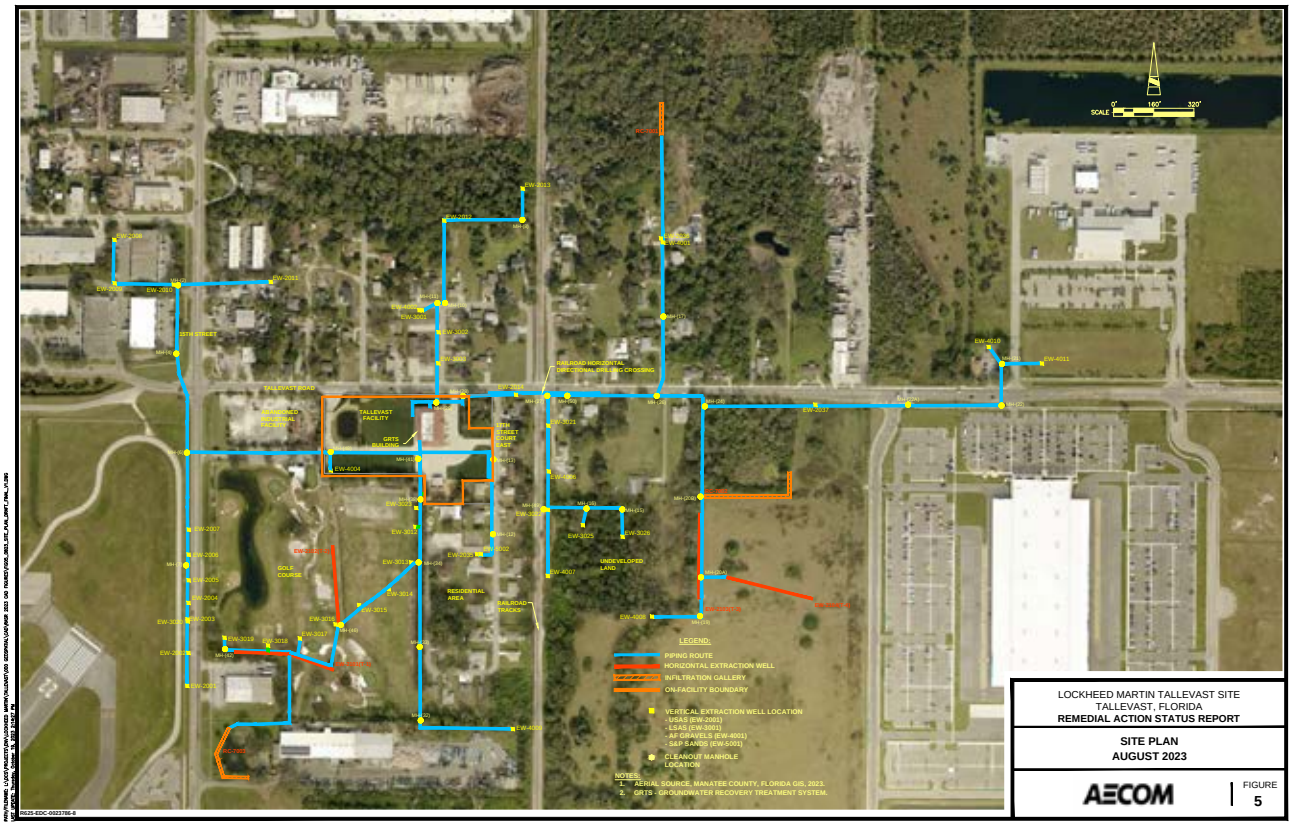
Soil

The site's soils have been left in place and are being managed through institutional and engineering controls commonly used throughout Florida for sites undergoing remediation. Access to the facility is restricted by fencing and on-site security. Barriers covering the impacted soils protect employees and visitors from exposure. Deed restrictions, which include mandates for appropriate soil management practices to protect against human exposure, will prevent inappropriate modifications to the facility.

Groundwater

The selected remedial approach for groundwater uses the same fundamental treatment technologies employed in the interim extraction and treatment system.

The existing groundwater recovery system was expanded to capture and extract the contaminated groundwater within the impacted aquifer zones. A total of 77 extraction wells and four (4) trenches were installed. An array of closely spaced extraction and injection wells was installed in the on-facility areas containing the greatest contaminant mass.



Extraction well and conveyance piping layout.

Groundwater Treatment System

A new groundwater treatment system was constructed to replace the former interim system. Contaminated groundwater is pumped from the extraction well network and conveyed to the treatment facility on the Lockheed Martin property. The water is treated using an advanced oxidation process (AOP) followed by activated carbon. Most treated water is discharged to the Manatee County wastewater treatment system under an Industrial Wastewater Discharge Permit. Some treated water is reinjected through infiltration galleries adjacent to local ponds and wetlands to mitigate the potential lowering of water levels in these areas from the remedial extraction pumping activity or reinjected on-site in the area of the highest COC concentration to enhance flushing. This water is further treated using reverse osmosis before reinjection.

The design incorporated redundant treatment unit operations and warning systems that are inspected and tested regularly to ensure the proper and safe operation of the groundwater extraction and treatment systems.

Images of the process equipment in the groundwater treatment plant.

Expanded Monitoring Program:

An expanded monitoring program was implemented to evaluate the capture and removal of the groundwater plume in all affected aquifer zones. The groundwater plume will be actively extracted and treated until concentrations are below the FDEP GCTLs.

The design provided for significant contaminant mass removal in the first five (5) years of system operation. Sampling and analysis activities confirm system performance over time. Periodic sampling and analysis monitor effectiveness.

The FDEP issued the final RAP Approval Order on January 4, 2012. Construction and testing of the treatment system were completed in 2013, and it began operating in November 2013.

GROUNDWATER MODELING

In parallel with the development of the RAP Addendum, Lockheed Martin conducted extensive groundwater modeling to support the design activities. A three-dimensional computer model of groundwater flow, complemented by solute transport modeling was used to simulate the recommended groundwater remedial alternative, support the design of the alternative, and estimate remediation time frames.

Groundwater flow and solute transport modeling were used to evaluate potential groundwater extraction scenarios in the site's Surficial and Intermediate Aquifer Systems. The model enabled the project team to simulate various potential extraction and focused injection and extraction scenarios, thereby refining the selection of the recommended remediation alternative. This included assessing the extent of hydraulic capture and rate of COC removal under each scenario so as

to determine an effective strategy for preventing further migration of COCs, the effective location and number of extraction and focused injection/extraction points on-facility, and the rapid removal of significant portions of groundwater-borne contaminant mass. The model also facilitated the evaluation of scenarios to mitigate potential groundwater drawdown impacts on surface water and wetlands in the area.

The groundwater flow model was then used to simulate the hydraulic responses of the groundwater flow system to the entire treatment system, including focused flushing with injection-extraction in on-facility "hot spot" areas, and the control of wetland-pond water levels through groundwater recharge of treated effluent. Progressive shut-down of extraction wells and trenches was simulated in 5-year increments to help reduce the time to reach GCTLs by avoiding creating stagnation points. The solute transport model used the flow fields simulated in the flow model to predict the rate of plume capture and mass extraction. The groundwater modeling results indicated that the estimated time to achieve GCTLs is approximately 48 years. However, a significant amount of the contaminant mass would be removed in the first five years of operation.

The groundwater flow and solute transport model is also used to predict and subsequently optimize the sequential shutdown of extraction wells and trenches over time in response to reductions in contaminant concentrations. The groundwater model simulation predicts that COCs in different areas of the plume will be reduced to below GCTLs at various times in the future. It is beneficial to shut down extraction wells and/or trenches in areas of the plume where COCs no longer exceed GCTLs.

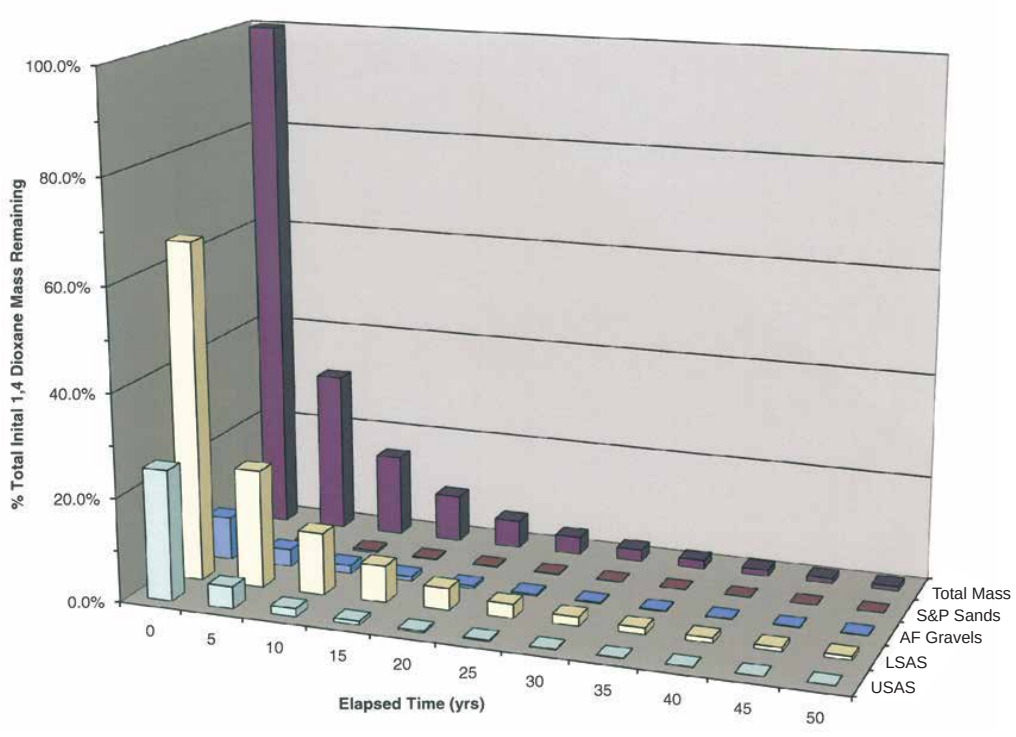


Figure 53. Predicted percentage of total initial mass of 1,4-dioxane remaining in the USAS, LSAS, AF Gravels, and S&P Sands over the 50-year simulation period under recommended remedial alternative.

GeoTrans, Inc.
A TETRA TECH COMPANY

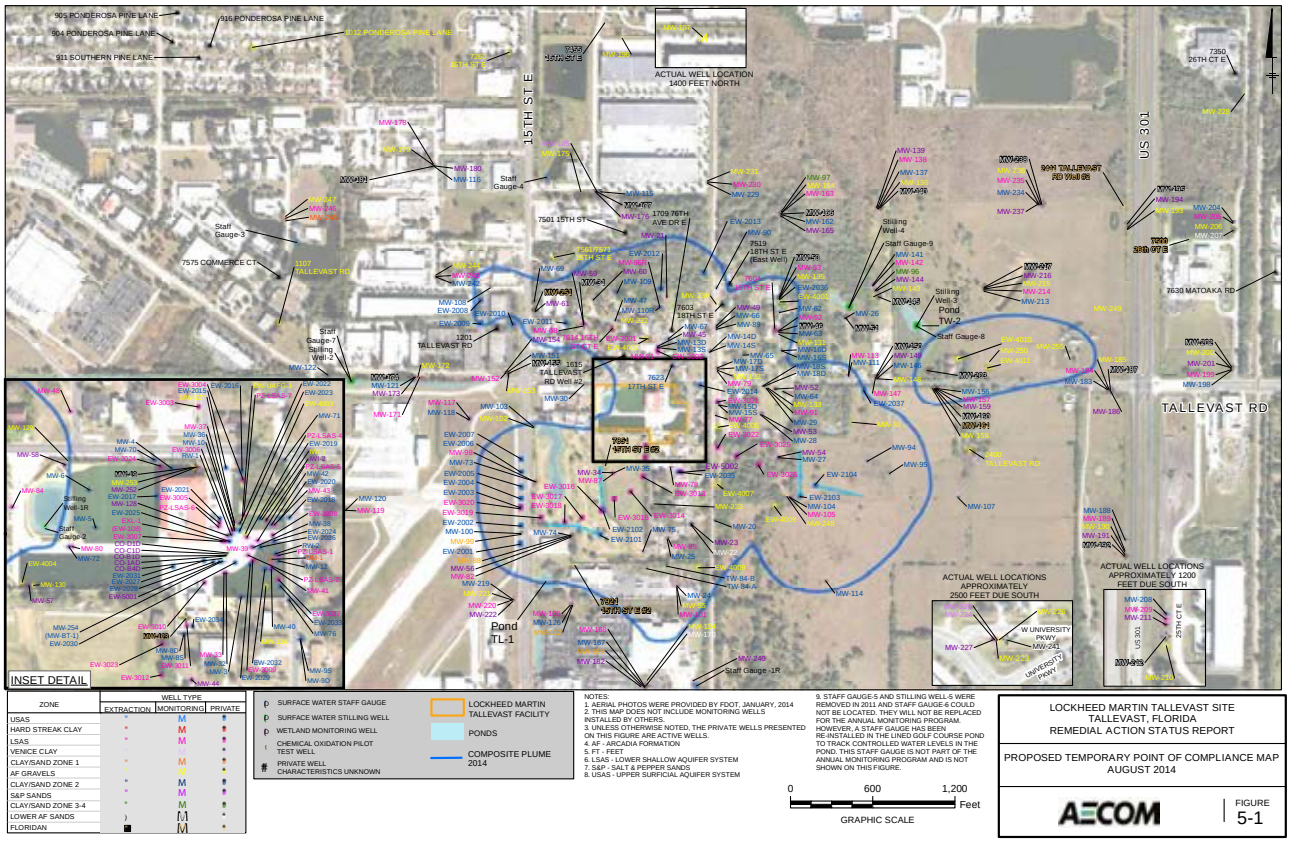
REMEDIATION SYSTEM OPERATIONS

Lockheed Martin completed construction of the groundwater remediation system in 2013 and has been operating, maintaining, and monitoring the treatment system since that time. Notification of full-time operation to the FDEP occurred on November 18, 2013. The plant and extraction well field are performing as designed, operating at excellent system uptime, capturing the groundwater plume, removing contaminant mass, destroying and/or capturing recovered contaminants, and meeting all permit criteria. The total volume of groundwater treated from system start-up through December 2024 was approximately 849,023,700 gallons.

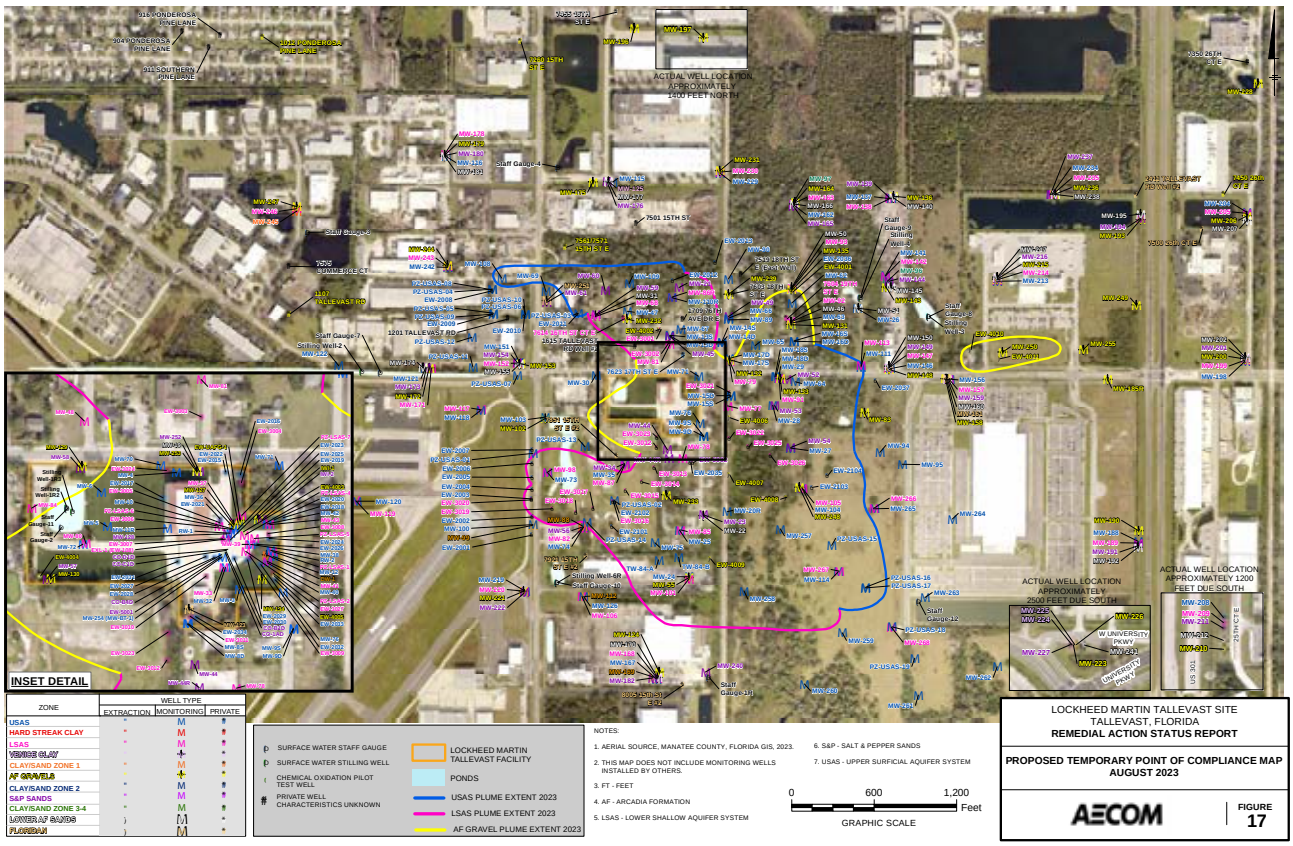
As mentioned, the groundwater model was used to predict a reduction in COC concentrations over time to support the progressive shutdown of extraction wells and trenches. The RAP Addendum specifies that if COC concentrations in the monitoring wells within the area of the plume affected by an extraction well/trench do not exceed GCTLs in samples from two consecutive sampling events, Lockheed Martin will recommend the extraction well/trench be shut down. If the FDEP concurs, the extraction well/trench will be shut down, and a post-active remediation monitoring (PARM) plan will be implemented. Since the system's start in 2013, sixteen extraction wells and two extraction trenches have been shut down, and these extraction points have either completed PARM and have been deactivated or are currently in PARM.

CLEANUP PROGRESS

Since the treatment system began operating in 2013, over 700 pounds of contaminants have been removed from groundwater, exceeding the mass removal predictions in the RAP Addendum. **Based on the 2023 comprehensive groundwater sampling event, the area of the groundwater contaminant plume is approximately 112 acres. This is a reduction of 43 acres—or 28%—since the system started in 2013.**



Approximate extent of plume in August 2014.



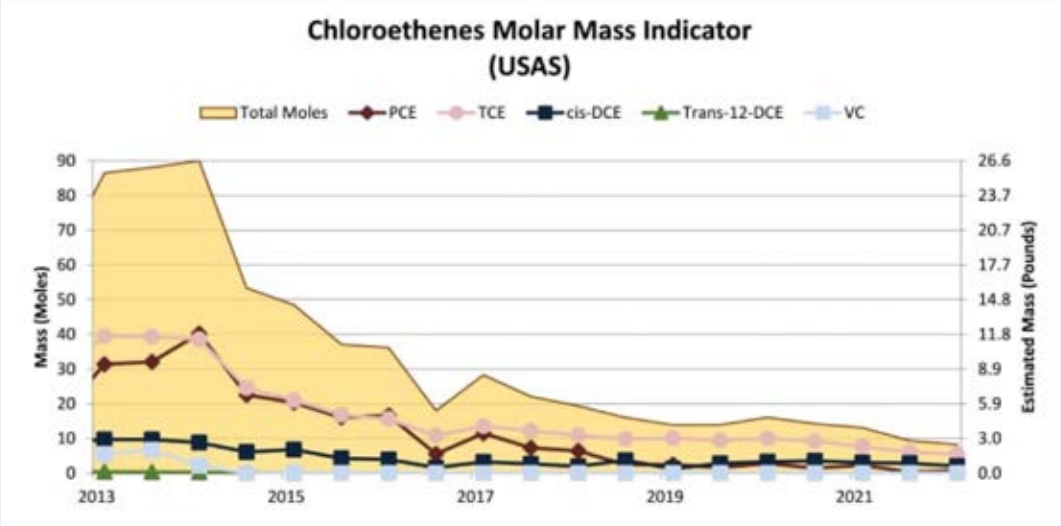
Approximate extent of the plume in August 2023, which has been reduced by 28% since 2013.

In June 2022, Lockheed Martin submitted a Plume Stability Analysis to the FDEP. This Analysis was performed voluntarily by Lockheed Martin as part of an internal remedial optimization initiative. This study included statistical analyses of contaminant concentrations in individual monitoring and extraction wells and a plume-wide analytics study to comprehensively assess the progress and effectiveness of ongoing remedial activities after 8 years of the projected 48-year cleanup time frame.

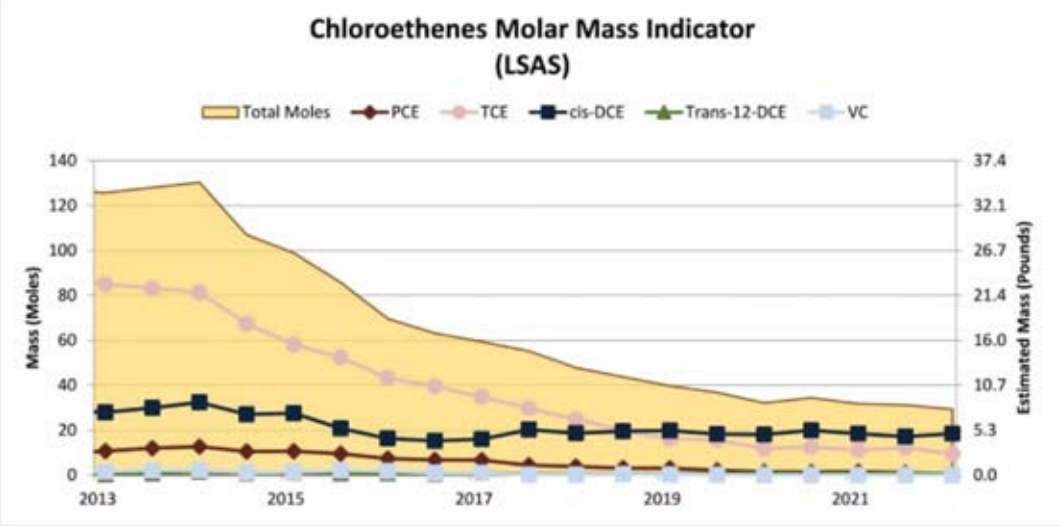
Using the Mann-Kendall analysis, a COC concentration trend evaluation was conducted for individual sampling locations. This method is widely accepted in environmental science and approved by the FDEP for evaluating monotonic trends in data sets that consistently increase or decrease over time and evaluating plume characterization. Plume stability was further evaluated using the Ricker Method®. The Ricker Method® analysis compares relative changes in contaminant plume characteristics over time, including area, average concentration, and mass indicator. This Groundwater Plume Analytics® study used analytical data from February 2013 to February 2022.

The Mann-Kendall analysis for wells in all four impacted aquifer units indicates that contaminant concentrations in individual well trends have predominantly decreased during active groundwater contamination remediation. There are no increasing trends in wells above GCTLs outside of treatment system capture. The trend analysis indicates that the plumes at the site are stable to decreasing.

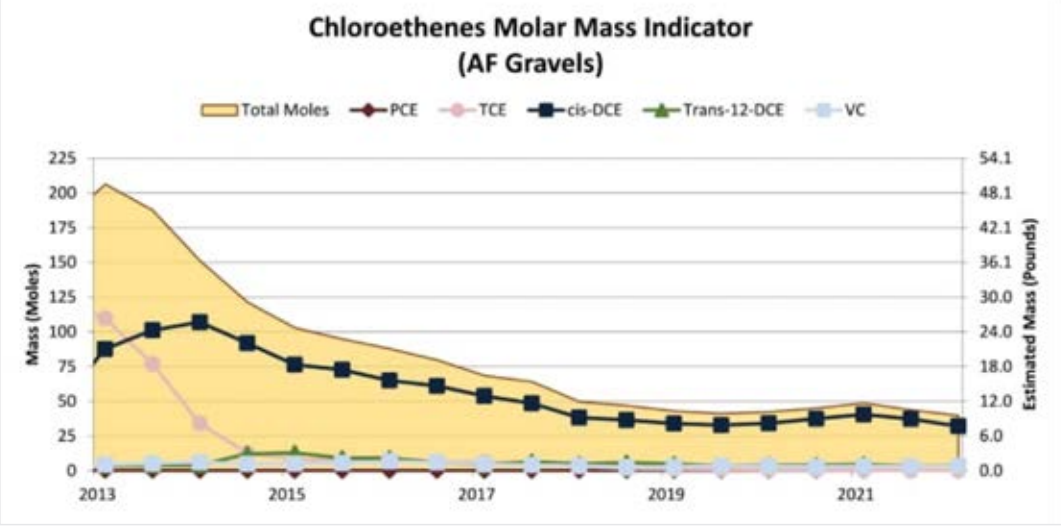
The Groundwater Plume Analytics® study data clearly showed that there have been significant and quantifiable reductions in plume areas, average concentration, and mass indicator in all four impacted aquifer units. In addition, molar fraction charts exhibit in-situ reductive dechlorination is occurring in some aquifer units, which is contributing to the overall COC concentration and mass reduction. This information shows that the groundwater treatment system operates as designed and captures all site plumes.



(Figure 9) Plume Stability Analysis Trend Chart – USAS



(Figure 10) Plume Stability Analysis Trend Chart – LSAS



(Figure 11) Plume Stability Analysis Trend Chart – AF Gravels

For more information about Lockheed Martin's ongoing Environmental Remediation efforts, visit our dedicated webpage.

Contact Information
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