

Former Hughes Aircraft Company Facility, Malvern Avenue, Fullerton, California

Environmental Investigation and Corrective Measures Study Update

This fact sheet provides updated information about the environmental investigation and cleanup activities for the former Hughes Aircraft (HAC) Facility located at 1901 West Malvern Avenue in Fullerton, California (referred to as the “Site”).

This fact sheet includes the following information:

- Facility background
- Summary of environmental site investigations to date
- Summary of cleanup activities to date
- Next steps

Facility Background

Hughes Aircraft Company (HAC) purchased the 313-acre site in 1957 and operations began in 1959. Prior to 1957, the site was used for orange grove cultivation. The former HAC facility consisted of approximately 100 buildings and temporary structures. Raytheon Company (Raytheon) purchased the former HAC facility in 1997.

Raytheon sold approximately 293 acres of land to LSF II Fullerton in December 1998. LSF II Fullerton and successors redeveloped the acreage acquired from Raytheon.

Current manufacturing facility operations were significantly reduced from prior use.

Summary of Investigation Findings

A **Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI)** began in 1996 and was completed in April 2005, and involved the collection of more than 500 soil / soil vapor samples and the installation of 26 **groundwater** monitoring wells. Samples were collected from the soil surface, down to approximately 500 feet below ground surface.

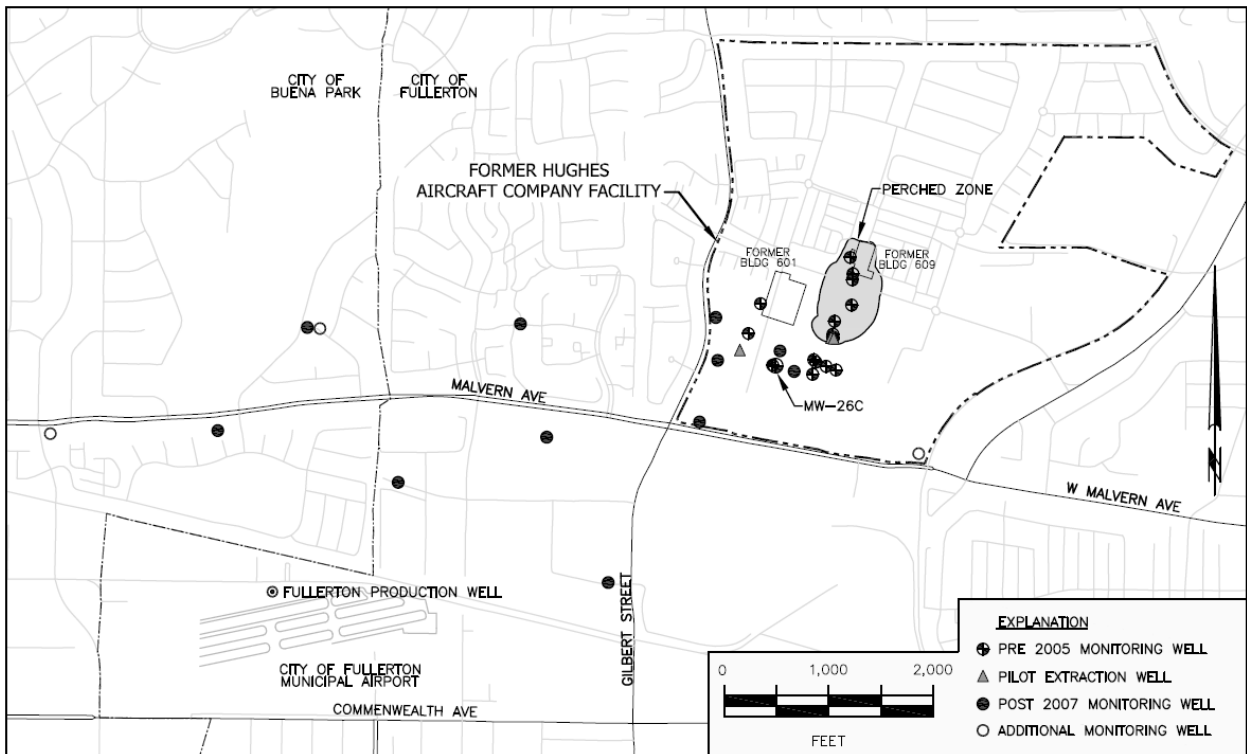
*Words in **bold** are defined in Glossary of Terms.*

The results of this assessment indicated

that the primary compounds were related to solvents used during former Facility operations. These solvents, typically referred to as **Volatile Organic Compounds (VOCs)**, were often historically used as industrial cleaning agents. Former Buildings 601 and 609 were the primary areas where these solvents were detected in deep soil, the perched zone, and groundwater. The figure below shows these former Buildings and the perched zone.

Risk Assessments were prepared using the results of the soil and perched zone water samples collected at the Site, and in September 2002 the **Department of Toxic Substances Control (DTSC)** accepted the risk assessment which allowed for the developers’ land use plan for the Site.

In 2003, a monitoring plan for deeper groundwater was implemented, and in December 2007 there was a detection of VOCs (1,1-dichloroethene and 1,4-dioxane) in Site monitoring well MW-26C. Raytheon and DTSC initiated iterative phases of additional groundwater investigations to determine the extent of VOCs in deeper groundwater. As of October 2012, an additional eleven deep groundwater monitoring wells have been installed



Deeper groundwater monitoring wells installed since 2008 (solid black circles) were generally installed to west/southwest of monitoring well MW-26C. Additional deeper groundwater monitoring wells are planned to be installed and tested in 2013 to the west of and near the southeast corner of the Site (open circles). Pilot testing of groundwater extraction and treatment is underway. These activities provide information to support the CMS.

to investigate the extent both on the Site and to the west/southwest of the Site. These monitoring wells vary in depth and are completed at depths of up to 1,080 feet below ground surface.



Pictured above is a drill rig constructing a deep groundwater monitor well along Brea Creek west of the Site.

Summary of Cleanup Activities

A voluntary self-directed soil and perched zone cleanup effort was completed between 1998 and 2000 to reduce VOCs in the deep soil area and perched zone (an underground pocket of water - not a source of drinking water) at and in the vicinity of a former manufacturing building.

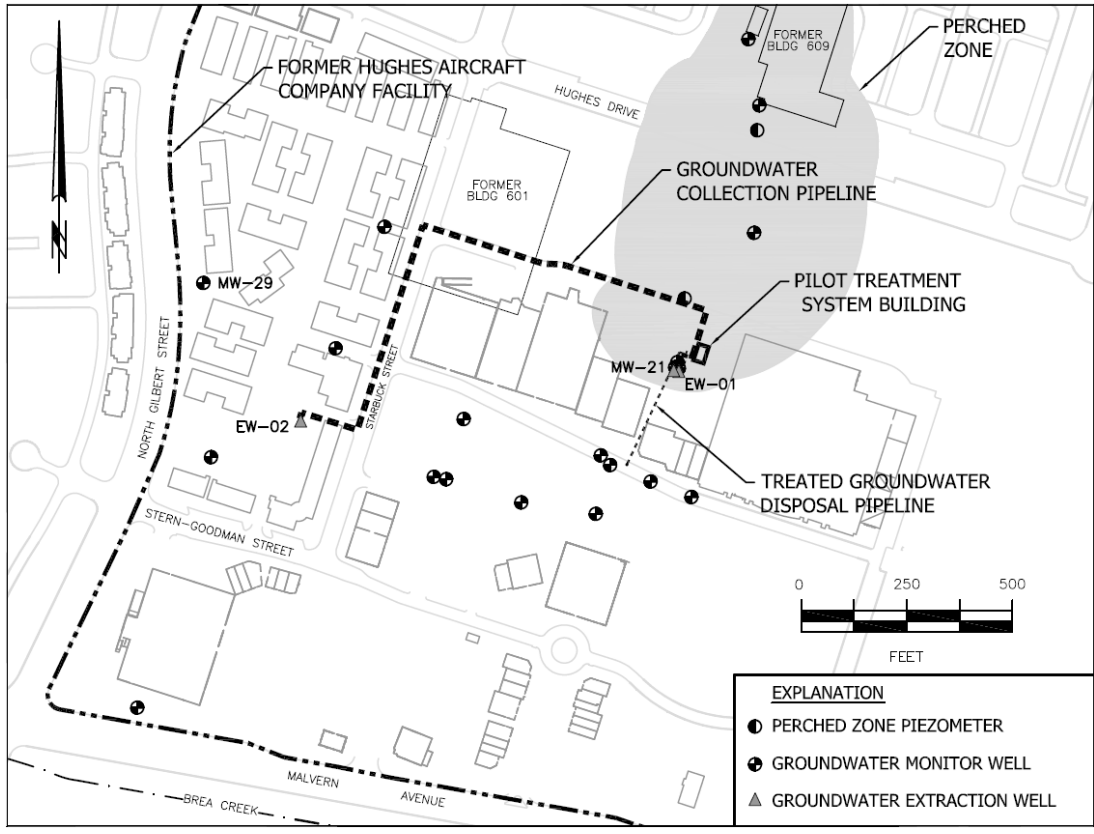
Beginning in 2005, construction of a pilot test groundwater extraction well and bench-testing of groundwater treatment technologies was initiated as part of the **Corrective Measures Study (CMS)** process. A pilot test groundwater treatment system building was constructed at the former facility and began operation in July 2008. The initial pilot test system extracted and treated deeper groundwater from two extraction wells near the southern portion of the perched zone. Groundwater was extracted from the southern wells on a nearly continuous basis and treated through an advanced oxidation process using

ozone and hydrogen peroxide. Based on the results of deeper groundwater investigations conducted in 2008, an additional extraction well was constructed to extract and treat groundwater near the southwest portion of the Site. This extraction well was connected to the pilot test treatment system and began operating in March 2010. In 2012, several tests were conducted completed to evaluate alternative groundwater treatment technologies as part of the CMS. Since start-up of the groundwater extraction and treatment system pilot test in July 2008, approximately 66 million gallons of groundwater have been extracted and treated at the Site. The pilot test system will continue to operate as part of the CMS and additional testing of alternate groundwater treatment technologies is planned.

Next Steps

Additional groundwater investigations and pilot testing of treatment technologies are currently being implemented in support of the CMS. The pilot test treatment equipment will be converted to an advanced oxidation technology using

ultraviolet light and hydrogen peroxide in 2013. The next and potentially final phase of groundwater investigation is anticipated to be completed in the third quarter of 2013; at which time Raytheon and DTSC will meet to determine whether assessment of the deeper groundwater contamination has been sufficiently defined to prepare the final groundwater cleanup plan. Once the deeper groundwater investigation is complete, the CMS Report will be prepared to evaluate alternatives for the final cleanup plan for the groundwater contamination associated with former Facility operations at the Site. If assessment is complete in 2013, the CMS Report would likely be submitted to DTSC in 2014. The CMS Report is subject to public comment before the proposed **final remedy** is approved. In addition, it is currently anticipated that the pilot groundwater extraction and treatment system will continue operations until the final groundwater remedy is selected and implemented.



A pilot groundwater extraction and treatment system was constructed and began operating in July 2008. Between July 2008 and November 2009, extraction wells EW-1 and MW-21 were operated at a combined rate of approximately 20 gallons per minute (gpm). The pilot test system was expanded in late-2009 through early-2010 with installation of extraction well EW-2 and associated groundwater collection pipeline, and retrofitting the treatment equipment to treat groundwater at a rate up to 50 gpm. Extraction well EW-2 has been operational since March 2010, operating at the full pilot-test system capacity of approximately 50 gpm. Approximately 66 million gallons of groundwater have been extracted and treated at the Site since start-up of the groundwater extraction and treatment system pilot test in July 2008.

GLOSSARY OF TERMS

Corrective Measures Study (CMS): A study conducted by the facility owner/operator to identify and evaluate alternative cleanup options to address contamination at a project site.

Department of Toxic Substances Control (DTSC): A department within the California Environmental Protection Agency in charge of the regulation of hazardous waste from generation to final disposal, and for overseeing the investigation and cleanup of hazardous waste sites.

Final Remedy: The final cleanup action proposed for managing contaminants at a project site.

Groundwater: Water beneath the earth's surface that flows through soil and rock openings (aquifers) and often serves as a primary source of drinking water.

Resource Conservation and Recovery Act (RCRA): A federal law that establishes a regulatory system to track and provide safe procedures for management of hazardous wastes from the time of generation to final disposal.

RCRA Facility Investigation (RFI): An investigation that occurs in the corrective action process following a RCRA Facility Assessment. It is an in-depth study designed to gather data needed to determine the nature and extent of contamination at site.

Risk Assessment: Qualitative and quantitative evaluation of the risk posed to human health and/or the environment by the actual or potential presence and/or use of specific pollutants.

Volatile Organic Compounds (VOCs): Chemicals that easily dissipate from liquids to vapors. VOCs include solvents that are used during industrial and manufacturing processes, for degreasing metal parts, and in the dry cleaning process.

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