



Robins Air Force Base Environmental Advisory Board (EAB)

Fact Sheet



Volume 9, Issue 2, November 2014

The Robins AFB EAB

Recognizing the importance of public involvement in environmental matters, Robins Air Force Base (Robins AFB) has established the Environmental Advisory Board (EAB). The mission of the EAB is to encourage participation of surrounding communities in the Base's environmental programs and allow community members and other stakeholders to have meaningful dialog with Base officials. Specifically, the EAB serves to promote community awareness and obtain constructive community review, comment, and input on current and proposed actions associated with environmental programs at Robins AFB. The EAB supports the Air Force environmental mission of sustaining readiness, being a good neighbor, protecting human health and the environment for the Base and community, and making smart business decisions.

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November 2014 EAB Meeting

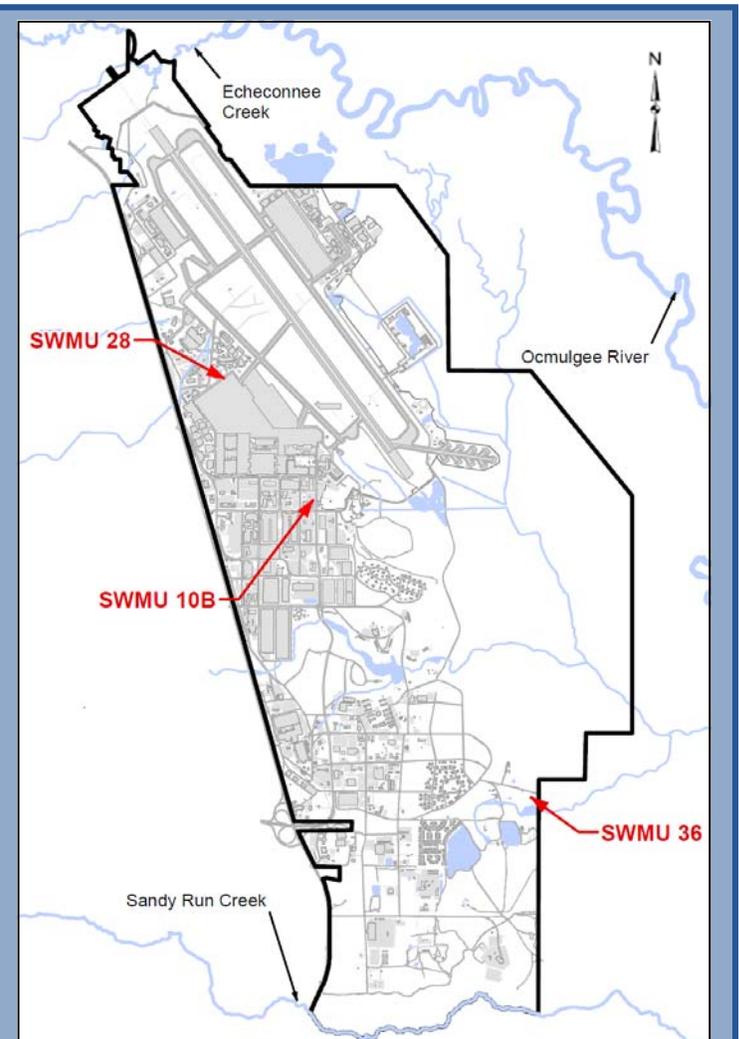
The fall EAB meeting was held on Thursday, November 6, 2014. The topics briefed included: "Update on Progress at Selected Restoration Sites."

This *Fact Sheet* provides a summary of the information and topics discussed during the meeting.

The next meeting will be held on Thursday, February 5, 2015.

CONTINUED UPDATES ON PROGRESS AT SELECT RESTORATION SITES

At the recent EAB meeting, **Ms. Meg Greenwald** of CAPE Environmental Management Inc. (CAPE) and **Mr. Mike Perlmutter** of CH2M HILL briefed on the status of the cleanup efforts at select restoration sites covered under the Performance-Base Remediation (PBR) contract. Specifically, the sites discussed during the meeting included: (i) SWMU 28; (ii) SWMU 10B; and (iii) SWMU 36. The status of each site is presented in this Fact Sheet.



CAPE provided updates on the cleanup efforts at three restoration sites during the recent EAB meeting.

CONTINUED UPDATES ON PROGRESS AT SELECT RESTORATION SITES (CONT'D...)

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SWMU 28

SWMU 28, located on the north end of the Base near the flightline and Building 45, is the site of a fuel release from purge fluid tanks. Contamination generally consists of free product and dissolved petroleum hydrocarbons in groundwater.

The previous remedy for the site consisted of manual removal of free product with natural attenuation of the contamination in the groundwater. To accelerate cleanup of the site, CAPE is implementing an optimized remedy consisting of Enhanced Fluid Recovery (EFR[®]) and Surfactant Enhanced Aquifer Remediation (SURFAC[®]).

EFR[®] involves pulling a vacuum on the subsurface through a series of extraction wells. The vacuum removes contaminated groundwater and free product from the subsurface. With the SURFAC[®] process, the EFR[®] process is conducted and then a surfactant is injected into the wells to increase the mobility of the free product. A second EFR[®] event is then conducted to vacuum out the surfactant and mobilize free product in the groundwater.

To date, three EFR[®] events and three SURFAC[®] events have been conducted. Significant reductions in free product thickness measurements have been observed.



Bailer with free product and surfactant emulsion (left); close-up of wellhead with EFR[®] connection (right)

Restoration of this site also includes demonstrating that contaminant concentrations in soil are below the designated cleanup levels. To evaluate the soil conditions, CAPE collected soil samples in September 2014. The results showed that contaminant

concentrations for the site contaminants of concern (COCs) were below the remedial levels (RLs). Benzo(a)pyrene (not a site COC) was detected in one surficial soil sample. Benzo(a)pyrene is a common contaminant associated with asphalt and other anthropogenic sources. Pieces of asphalt were observed during the sampling efforts. A focused excavation will likely be conducted in this area with additional confirmation sampling following the excavation.

The performance objectives for SWMU 28 include achieving maximum contaminant levels (MCLs) in groundwater by 2015, followed by a three-year compliance monitoring period, before achieving site closeout in 2018. Contingencies (e.g., additional EFR[®] or SURFAC[®] events) can be implemented to address any remaining free product or groundwater contamination. CAPE is also planning to address the one soil exceedance.

SWMU 10B

SWMU 10B is defined as the soil and groundwater contamination in the vicinity of the Base petroleum, oil, and lubricants (POL) area, including the associated fuel storage tank farm and underground pipelines. The spills and leaks are reported to have included both diesel and jet fuel.

The previous remedy for SWMU 10B included Light Non-Aqueous Phase Liquid (LNAPL) recovery (generally passive), Soil Vapor Extraction (SVE) for treatment of soil contamination in the source area, Air Sparge (AS)/SVE for treatment of groundwater contamination, and Monitored Natural Attenuation (MNA) for portions of the plume not influenced by the active remedial systems. A biosparge curtain is located downgradient of the groundwater contaminant plume but was shut down, with regulatory approval, in 2011. The remedy was effective at controlling plume migration and recovering LNAPL and vapor phase hydrocarbons. However, passive LNAPL recovery is a relatively slow process. Additionally, while the AS/SVE system prevented downgradient plume

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CONTINUED UPDATES ON PROGRESS AT SELECT RESTORATION SITES (CONT'D...)

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migration, it did not directly address the contamination in the source area.

To optimize the site remedy, CAPE has implemented surfactant flushing to accelerate LNAPL removal and installed two horizontal directional drilled (HDD) biosparge wells to enhance biodegradation.

A sub-slab vapor depressurization system was installed at Building 197 for vapor intrusion mitigation. Additionally, 19 pressure monitoring points were installed to monitor the vacuum of the SVE system to assess if the sparge vapors are being captured and to make sure the system is not discharging air from the subsurface to the surface and potentially comprising the stability of the nearby tanks.

The initial surfactant flushing event was conducted in February 2014, and the



Inside of mobile remediation system trailer for surfactant flushing



Installation of HDD biosparge well



Grout installation for HDD biosparge well



Vault installation for HDD biosparge well

HDD wells began operation during the summer of 2014. Benzene concentrations in groundwater are currently below the 2020 goal. The path forward for the site is to continue monitoring LNAPL thickness and conducting additional surfactant flushing events, as needed. The vertical AS/SVE and horizontal biosparge systems will continue to operate. The goal at SWMU 10B is to accelerate site closure.

SWMU 36

SWMU 36 (i.e., the Horse Pasture Trench Disposal Site) was used as a disposal area from the 1950s until the 1970s. Soil and groundwater at the site were impacted by volatile organic compounds (VOCs) commonly associated with solvents and lubricants. Initial remediation activities consisted of excavation of the contaminated soil and in-situ chemical oxidation (ISCO) for the contaminated groundwater. Following completion of the excavation activities, No Further Action (NFA) status was granted for site soil.

The ISCO program for groundwater remediation was conducted in 2005 and 2006. While ISCO resulted in notable decreases in groundwater contaminant concentrations, concentrations at many locations remain elevated and additional remediation is required.

To address the residual groundwater contamination, CAPE has implemented three remedies at SWMU 36. These new remedies include: (i) enhanced reductive dechlorination (ERD); (ii) an AS/SVE cut-off barrier; and (iii) aerobic bioremediation using an in-situ submerged oxygen curtain (iSOC[®]). ERD involves injection of a carbon substrate [e.g., emulsified vegetable oil (EVO)] into the groundwater to facilitate oxygen consumption. In the reduced oxygen environment, anaerobic bacteria use the chlorinated ethene contaminants as an energy source, eventually reducing them to non-toxic compounds.

The AS/SVE system is designed to cut-off the SWMU 36 groundwater contaminant plume at the

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CONTINUED UPDATES ON PROGRESS AT SELECT RESTORATION SITES (CONT'D...)

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Injection set-up for ERD Implementation

Robins AFB property boundary using volatilization (for the chlorinated ethenes) and aerobic bioremediation (for the chlorobenzene). Air is injected into the groundwater through the AS wells. The air volatilizes the contaminants in the groundwater, and air bubbles with the contaminants rise toward the ground surface, where they are cap-

tured by the SVE system.

The iSOC[®] is designed to deliver high levels of oxygen into the aquifer to stimulate aerobic bioremediation of the chlorobenzene groundwater plume in the southern and southeastern portion of SWMU 36.

The corrective action objectives for this site are to reduce COC concentrations in groundwater to below RLs and to limit further off-site migration of groundwater COCs. CAPE is implementing a second injection event to neutralize the pH and create reducing conditions in the groundwater. The operation of the AS/SVE cut-off barrier and iSOC[®] system is ongoing. Groundwater data will continue to be collected to evaluate progress and plume containment status.

For more information regarding the EAB, please contact **Ms. Charline Logue, Robins AFB EAB Manager**, at (478) 327-9268 or visit <http://www.robinseab.org>

<u>Acronyms</u>	
AFB	Air Force Base
AS	Air Sparge
COC	Contaminant of Concern
EAB	Environmental Advisory Board
EFR [®]	Enhanced Fluid Recovery
ERD	Enhanced Reductive Dechlorination
EVO	Emulsified Vegetable Oil
HDD	Horizontal Directional Drilling
ISCO	In-Situ Chemical Oxidation
iSOC [®]	In-Situ Submerged Oxygen Curtain
LNAPL	Non-Aqueous Phase Liquid
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
NFA	No Further Action
PBR	Performance-Based Remediation
POL	Petroleum, Oils, and Lubricants
RL	Remedial Level
SURFAC [®]	Surfactant Enhanced Aquifer Remediation
SWMU	Solid Waste Management Unit
SVE	Soil Vapor Extraction
VOC	Volatile Organic Compound

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