



Guardian

America's First Choice for Environmental Restoration

A Publication of the Environmental Restoration Program

Travis Air Force Base, California

April 2020

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Editor's Corner

Warning, Acronyms Ahead!

In the interest of maintaining the sanity of our readers when reading the main article, we have deciphered the following list of acronyms:

AFB: Air Force Base

DTSC: Department of Toxic Substances Control

EPA: Environmental Protection Agency

ERP: Environmental Restoration Program

IMO: In my opinion

LOL: Laughing out loud

OMG: Oh my gosh

PANS: Pretty Awesome New Stuff

RPM: Restoration Program Manager

RWQCB: Regional Water Quality Control Board

TTYL: Talk/type to you later



(Photograph by Angel Santiago [AGEISS])

Alien Presence: Gene Clare from the Air Force Civil Engineer Center inspects a new organic carbon distribution system that could improve the performance of groundwater cleanup at solvent sites.

Live Long and Pump Slow

New Vegetable Oil System May Improve Groundwater Cleanups

By Glenn Anderson

Travis Environmental Project Manager

Acronyms have become a huge part of our daily communication, and few Guardian readers could make it through the day without using an acronym at least once. Acronyms are easy to remember and speed up the flow of ideas in conversations. Examples of commonly used acronyms are ASAP (as soon as possible), AWOL (absent without leave), and DMV (Department of Motor Vehicles). Some organizations are known only as acronyms (NASA – National Aeronautics and Space Administration and CIA – Central Intelligence Agency; and it is easy to forget

what some acronyms stand for (SCUBA – Self Contained Underwater Breathing Apparatus and RADAR – Radio Detection and Ranging).

It is essential for environmental professionals to use acronyms in routine discussions. Which is easier to say: “CERCLA” (pronounced “sir-klah”) or (take a breath) “Comprehensive Environmental Response, Compensation, and Liability Act of 1980”? Our two operable units (portions of the base that contain restoration sites) are referred to only as acronyms (NEWIOU – North, East, West Industrial Operable Unit and WABOU – West/Annexes/Basewide Operable Unit). What would we do without these shortcuts?

This article is about to introduce a brand new environmental acronym that will be

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Visit our Environmental Program web site at <https://www.travis.af.mil/Information/Environment/>



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ORChestrating the Future

For most people, April is the month that brings showers for May flowers and the end of another tax season. For the Travis restoration team, it brings the third quarter of fiscal year 2020 and the type of administrative work that is essential and not as pretty as May flowers. Let me summarize what the immediate future holds for us.

1. ORC Preparations – We have to have the new Optimized Remediation Contract (ORC) in place before 30 September 2021, which marks the end of our current environmental contract. We have already made a lot of progress in identifying technical requirements that will give potential ORC contractors the goals that have to be met and producing independent government estimates that help a contractor selection board to determine which contract proposal gives Uncle Sam the most bang for his tax buck. Later on this year, we will invite our regulatory agency representatives to a planning meeting to get their input into the contract selection process.

2. Hangar Construction Monitoring – Earlier this year, we finished a soil cleanup action that cleared the way for the construction of a new three-bay aircraft maintenance hangar. However, there are still a few environmental tasks associated with this Military Construction Project, so our work at this site is far from over. One requirement that came from the hangar design is the repositioning of a horizontal groundwater extraction well; this involves the decommissioning of an existing well and the construction of a new well in a location that will not interfere with aircraft operations. We also have to make sure that the groundwater cleanup infrastructure (a bioreactor and a number of monitoring and injection wells) are not damaged during hangar construction. Finally, a lot of piping and electrical conduit have to be moved out of the hangar's footprint. So, this construction project will keep my field crew hopping for the next couple of years.

3. Vapor Intrusion Monitoring – Vapor intrusion (VI) is an environmental



VIEWPOINT

Lonnie A. Duke
Travis AFB Restoration
Program Manager

issue that is receiving greater regulatory scrutiny. VI consists of the movement of volatile chemicals from contaminated groundwater into an overlying building, primarily indoor air spaces such as office buildings. In the past we conducted VI assessments in the offices of existing buildings and learned that the tight clay soil beneath Travis AFB and intact concrete slabs beneath buildings make it very difficult for contaminated vapors to enter office spaces. However, an assessment has not been made at new buildings, even though offices in these buildings were designed with passive ventilation systems and vapor barriers to reduce the potential for VI in these new buildings. As soon as a passive ventilation systems sampling work plan receives regulatory approval, we will conduct chemical analyses of air samples from the ventilation systems, the office spaces above them, and the outdoor air near these facilities and will then compare the results to determine the potential for VI risk within these new offices.

4. Petroleum investigations and cleanups – On the east side of Travis AFB near the Civil Engineer Maintenance, Inspection and Repair Team building, we discovered an area with petroleum contamination in the soil and groundwater and are working to complete an investigation of this new contaminant source this year. In addition, we have scheduled the cleanup of petroleum-contaminated soil in the area south of the small arms range for this summer.

Obviously, we have a lot of work to keep us busy this year and will not be bored anytime soon. We will give you a status report of these administrative and field activities in the October 2020 *Guardian*.



SPOC

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easy to remember and will put a smile on the face of every science fiction fan who hears it.

Currently, we treat high solvent concentrations in groundwater by injecting emulsified vegetable oil (EVO) into the subsurface. The EVO helps to create the conditions needed for naturally-occurring bacteria to break down the solvents into harmless compounds.

Unfortunately, it is not easy to inject EVO into the tight clay soil beneath Travis AFB. It is a slow process that uses up a lot of manhours, since a field team has to be present during the injection process. Also,

because EVO has a higher viscosity than water, it will occasionally find its way back to the surface when the low permeable soils cannot take it in at a consistent rate. This “day-lighting” wastes EVO and creates a mess that has to be cleaned up.

Recently, we began a test of a new cleanup system that has the potential to significantly improve the performance of groundwater cleanup actions that rely on EVO injections. It uses a series of

drums that are loaded with vegetable oil, mulch (including organic waste from a local adult beverage company), and iron. Contaminated groundwater is drawn into these drums by a peristaltic pump and picks up dissolved organic carbon before being pumped back into the subsurface. The treated water maintains a low viscosity, so it moves easier in clay soil and avoids EVO daylighting.

This new system is simple in design

and does not need a lot of energy, so a solar panel provides enough electricity to operate the low-flow pump. This independent power source allows the system to be portable, so it can be operated in an open field where there are no utilities available. Finally, once it is set up, it runs on its own without the need for a field technician to monitor it.

So, what do we call this Solar-Powered Organic Carbon injection system? Keeping in mind the era in which most of us old timers grew up, it is only fitting that we refer to this new and improved technology as the SPOC system!

The engineering team that designed and built the first SPOC prototype de-

(trichloroethene) have dropped, and concentrations of its breakdown products (cis-1,2-dichloroethene and vinyl chloride) have increased in the injection areas, which is good news. However, shallow bedrock and clay-rich soil make it very difficult to inject EVO where it is needed, resulting in an incomplete groundwater cleanup.

Two wells that are close to one another in the center of the Solvent Spill Area were selected to carry out the test, one to extract contaminated groundwater and one to inject the carbon-rich treatment water. After a two-month startup period (during which the system may temporarily run on base power), the

SPOC system will continue the injection process for about 80 days until a 3,000 gallon volume target is reached. That equates to an injection rate of about 100 milliliters (20 teaspoons) per minute. A rate of a teaspoon every three seconds is fairly slow.

“We believe that the slow injection rate of the SPOC system will actually speed up the cleanup of contaminated groundwater at this location,” said Mr. Lonnie Duke, Travis AFB

Restoration Program Manager. “If it proves to be successful, we will evaluate an expansion of the SPOC system to additional injection wells at this and other solvent sites.”

IMO, If SPOC can reach CERCLA goals ASAP, the RPM of the Travis AFB ERP along with representatives of the EPA, DTSC and RWQCB will say OMG and call it PANS. LOL. TTYL.



From Design to Production: The schematic diagram on the left shows the components of the SPOC system. Extracted groundwater picks up dissolved organic carbon when it moves through the blue drums and is slowly reinjected back into the ground. The photograph on the right shows the relatively simple equipment layout of the SPOC system. (Diagram by Jeff Gamlin [Jacobs Engineering]) (Photograph by Angel Santiago [AGEISS])

scribes this system as “the **logical** way to conduct vegetable oil injections and promote an aquifer’s microbial system that can **live long and prosper**.”

Travis AFB is testing this new system at the Solvent Spill Area, a restoration site that illustrates the effectiveness of using EVO to break down solvents and the challenges of getting the EVO into the right places. Concentrations of the primary groundwater contaminant



Editor's Update

April Public Meeting Rescheduled!

As much as we appreciate and enjoy the face-to-face time with the members of the Travis Restoration Advisory Board and the local community during our public meetings, we recognize and appreciate that everyone is currently living each day in a period of great uncertainty and disruption. In the interest of public safety and in compliance with federal and State of California initiatives, we have rescheduled the April 2020 Restoration Advisory Board meeting to 22 October 2020. By then we will have a lot to discuss: the results of the 2020 summer construction season, the progress in selecting the next environmental contractor to continue our cleanup efforts, and of course, the impact of the current virus pandemic on our restoration program. Until we meet again, please be safe, practice good hygiene, stay informed of the latest information from federal and state health officials, and put us on the calendar for next autumn!

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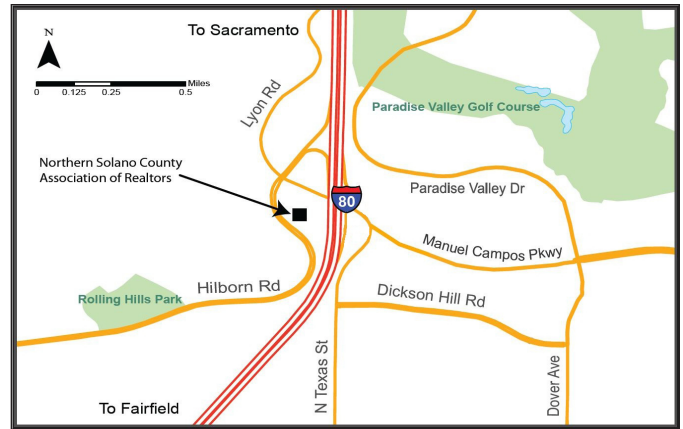


If you would like more information or need special accommodations for the RAB meeting, please contact Lonnie Duke, (707) 424-7520.

Travis AFB Restoration Advisory Board Meeting

October 22, 2020
7 p.m.

Northern Solano County
Association of Realtors
3690 Hilborn Road
Fairfield, CA



LOCATION OF INFORMATION REPOSITORIES

Vacaville Public Library

1020 Ulatis Drive
Vacaville, CA 95688

(707) 449-6290

Monday-Thursday: 10 a.m. - 9 p.m.

Friday-Saturday: 10 a.m. - 5 p.m.

Sunday: 1 p.m. - 5 p.m.

Fairfield-Suisun Com. Library

1150 Kentucky Street
Fairfield, CA 94533

(707) 421-6500

Monday-Thursday: 10 a.m. - 9 p.m.

Friday-Saturday: 10 a.m. - 5 p.m.

Sunday: 1 p.m. - 5 p.m.

Mitchell Memorial Library

510 Travis Boulevard
Travis AFB, CA 94535

(707) 424-3279

Monday-Thursday: 10 a.m. - 9 p.m.

Friday: Closed

Saturday: 12 p.m. - 6 p.m.

Sunday: 12 p.m. - 6 p.m.

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