

**Travis Air Force Base
Environmental Restoration Program
Restoration Advisory Board (RAB) Meeting**

Meeting Minutes

21 April 2016

I. Welcome and Introduction

Col Dietrick III introduced himself and thanked everyone for attending. **Mr. Duke**, acting Restoration Program Manager, called to order the regular meeting of the **Travis AFB RAB** at 7 pm on **21 April 2016** in the **classroom at the Northern Solano County Association of Realtors office**. General introductions were made. Mr. Duke thanked Col Dietrick III; Ms. Carol Gaudette, the Travis Installation Support Team Section Chief; the USACE, Omaha District; the regulatory agency representatives; RAB members, including newly added RAB members; and everyone else for attending.

Roll Call

The following RAB members were present:

Name	Affiliation	Present
Col George T.M. Dietrick III	USAF, Travis AFB (Air Force Co-Chair)	✓
David Marianno	Suisun City Resident (Community Co-Chair)	✓
Nadia Hollan Burke	U.S. Environmental Protection Agency (EPA)	
Adriana Constantinescu	SF Bay Regional Water Quality Control Board	✓
John Foster	Nat'l Association of Uniformed Services	✓
Mike Reagan	Travis Regional Armed Forces Committee	✓
Ben Fries	Dept. of Toxic Substances Control (DTSC)	✓
Jim Dunbar	City of Fairfield Representative	
*David M. Feinstein	Principal Planner City of Fairfield	✓
*Gale Spears	Communications Director City of Fairfield	
*Thomas Randall	AMC Civic Leader	✓
*Mark Pennington	Principal Scandia Elementary School	✓
*George Hicks	Dept. of Public Works City Hall	✓
*W.T. Jeanpierre	American Legion	✓
*Mayrene Bates	Solano County School Board Trustee, Dist. 4	✓
*Debi Tavey	President FF-SS Chamber of Commerce	
*Amit Pal	PG&E Representative	

* Denotes new RAB members.

Public Members present:

- Bill Cumberland Citizen
- Mark Smith Citizen
- Brad Smith Citizen

Agencies and Contractors present:

- Glenn Anderson Travis AFB AFCEC/CZOW
- Lonnie Duke Travis AFB AFCEC/CZOW
- Angel Santiago Travis AFB AFCEC/CZOW
- Carol Gaudette Travis AFB AFCEC/CZOW
- Bill Hall Travis AFB AFCEC/CZRW
- Merrie Schilter-Lowe Travis AFB AMW/PA
- Dezso Linbrunner USACE, Omaha District
- Meg Greenwald CAPE
- Landon McKenney CAPE
- Mike Wray CH2M
- Tricia Carter CH2M
- Jeannette Cumberland CH2M

II. Approval of minutes from last meeting

The previous meeting minutes were approved as written.

III. Additional Agenda Items and Questions

Mr. Duke asked if there were any questions about the agenda or if anyone had any additional items not already on the agenda. He stated that there will also be an opportunity at the end of the meeting to add agenda items or ask questions. Mr. Duke announced Mr. Smith's retirement and welcomed Mr. Angel Santiago, the Global Engineering, Integration, and Technical Assistance (GEITA) contractor from AEGIS.

Mr. Santiago gave a brief introduction to his background in Environment Restoration. Mr. Santiago said when he was active duty at Travis AFB he volunteered to work at the Environmental Management office. His first assignment was working with the environmental restoration office as field team worker and coordinator supporting storm water pollution prevention and water quality, as well as underground storage tank certification. He also had an opportunity to work at the environmental management office for about 6 years as a hazardous waste program manager, and asbestos and lead-based paint program manager. He continued to work with storm water pollution

prevention and water quality. After retirement, he worked at Recology, a local company, as an Environmental, Compliance, and Safety Manager. He later accepted an offer from Mark Smith to join the Environmental Restoration team at Travis AFB. Mr. Santiago joined the Travis team in December 2015.

Mr. Duke told the audience that Mr. Anderson would discuss Innovative 'New' Technologies, Ms. Schilter-Lowe would discuss Community Involvement, Mr. Duke would discuss Travis AFB Earth Day Activities, and Mr. Wray would discuss the 2013 Travis AFB Performance Based Contract project.

IV. Discussion Topics

a) Mr. Anderson presented information on Innovative Technologies.

Mr. Anderson said innovation is the act of starting or introducing something new or unusual; being creative. He added that innovative processes tend to be promising, yet unproven. The definition of optimization is "the act of improving or developing as far as possible; making the most effective use of." Mr. Anderson provided a couple of examples of innovation and optimization; one being the "horseless carriage". The first automobile was innovative. However, the 500 horsepower souped-up muscle car? That would be an optimization. Innovative: The first Wright Brothers Aircraft. Optimization: C-17 Globemaster III is improved, faster, better. Innovation also applies to cleaning up the groundwater; for example, pump and treat verses emulsified vegetable oil (EVO) injections. Two slides were presented of one of the groundwater plumes at Travis AFB. The first one reflects the plume in 2010 and the second one shows the plume in 2014. The 2010 slide was taken after ten years of pump and treat, which is a success story because a lot of contamination was removed. However, the pump and treat infrastructure is old and takes a lot of energy to run and emits CO₂ to the atmosphere. The 2014 slide was taken after four years of EVO injections. This slide highlights a smaller plume with lower TCE concentrations. Even though the TCE concentrations are lower as a result of the EVO injections, we believe that the process could be "faster - better".

Innovation, the Next Generation at Travis AFB:

The Environmental Restoration team believes that the process can be sped up so that the petroleum products can be removed from the subsurface faster and more thoroughly. A bioreactor is a vessel in which a chemical process is carried out and which involves organisms or biochemically active substances derived from such organisms. This process can either be aerobic or anaerobic. Aerobic means oxygen is present, and anaerobic means there is a lack of 'free' oxygen present.

Aerobic "Washboard" bioreactor:

- In this case we had a leaking oil/water separator that released Stoddard solvent containing trichloroethene (TCE) into the groundwater. This solvent floats on top of the water table. The current remedy is passive skimming and enhanced attenuation. This remedy is a relatively slow process.
- The washboard bioreactor uses aerobic bacteria to break down Stoddard Solvent. The problem is that once all the oxygen is used up, the solvent breakdown stops.
- The innovative answer: inject oxygen microbubbles into the groundwater and spread them around using a “washboard effect”.
- Fluctuating the water table by cycling extraction wells creates a washboard effect. An in situ submerged oxygen curtain device (ISOC) is used to increase dissolved oxygen in groundwater. ISOC is an applicator tool that is placed in a well and it forces oxygen into the groundwater.
- The Aerobic Bioreactor is filled with gravel and TersOX/ORC is added. TersOx/ORC is a proprietary formulation of food-grade, calcium peroxide that produces a controlled release of molecular oxygen.

Anaerobic Drywall Bioreactor:

- In this case fuel leaks have contaminated the local groundwater. This fuel floats on top of the water table.
- Previous remedies included active fuel skimming and vacuuming. The final solution for fuel sites is usually monitored natural attenuation, which takes a long time.
- To expedite cleanup, the fuel soaked soil is excavated and a bioreactor filled with gravel and crushed drywall, as a source of sulfate to support sulfate enhanced biodegradation of dissolved fuel, is built.
- A solar powered pump recirculates the surrounding groundwater through the anaerobic bioreactor, increasing the treatment zone. With the solar-powered pump, this system is 100% “off the grid”.

Both Technologies are promising but untested. Consequently, both technologies require demonstration projects to verify that they work at Travis AFB. The Demonstration periods for the two different types of bioreactor are: Two to three years for the Washboard Bioreactor, and four years for the Dry Wall Bioreactor.

Mr. Reagan asked if these technologies have been tested at other locations and is Travis AFB just testing for the soils at these sites, or are these brand new technologies? Mr. Anderson said it is brand new for this type of clay soil environment. It has worked in a laboratory, and the chemistry makes sense.

Mr. Marianno asked what the active ingredient in the drywall is that helps with the cleanup? Mr. Anderson said that the drywall contains sulfur-based materials. Mr. Reagan inquired as to the size of the bioreactors? Mr. Anderson said they are normally

about 25 to 30 feet deep, but these will be much shallower; just below the water table. Mr. Anderson said that baseline samples will be collected before system startup, and samples will also be collected following system startup to monitor the effectiveness of the bioreactors; quarterly the first year, and semiannual for two (2) to three (3) years.

b) Ms. Schilter-Lowe presented information on Community Involvement.

Ms. Schilter-Lowe presented an overview of the community involvement plan. Initially, this plan is one that the Air Force and The Regulatory Agencies created to encourage community involvement in the environmental cleanup process at Travis AFB.

The CIP includes the history of the Air Force installation and of the environmental restoration process. The document includes the history of Travis AFB, including its missions and assets. It also includes a description of the environmental sites, the site investigations and a summary of site risks (i.e. contamination in soil, surface water, groundwater, and sediment in Union Creek, from organic compounds that were left there from past disposal practices).

The CIP includes information on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), known as The Superfund Law. The Superfund law mandates the investigation and cleanup of active, inactive or abandoned military bases and civilian sites with hazardous materials that could endanger humans or the environment. The law requires that the community be involved at designated milestones throughout the cleanup. In this plan Travis AFB listed the activities in which to involve the community: contact local officials and community leaders, facilitate RAB meetings, establish and maintain contact with stake holders, establish and maintain a public website, and publish newsletters and fact sheets.

The plan contains lists of agencies with oversight responsibilities, from the Secretary of the Air Force for Legislative Affairs, to the regulatory agencies, to the Restoration Program Manager.

The plan includes a list of objectives and responsibilities to enlist the support and participation of elected officials and RAB members, provide information on technical activities, inform the community about procedure, policies, and requirements of the Superfund Program. Activities to engage the public include holding public meetings, conducting site tours, advertising the program both on and off base, and developing a contact list for the stakeholders. The communities Travis needs to reach include Fairfield, Suisun City, and Vacaville.

Ms. Schilter-Lowe reminded the RAB members to fill out the questionnaire that was emailed to them so that Travis AFB can get an idea of their knowledge of the Travis AFB cleanup program, as well as areas of interest.

Ms. Schilter-Lowe presented an overview of the Environmental Restoration Program process:

- Preliminary assessment and site inspection (PA/SI): Former or current Travis AFB employees are interviewed to provide information on any past waste disposal activities they may have witnessed or taken part in.
- Remedial investigation and feasibility study (RI/FS): Collect samples, analyze, and assess risk. Explore cleanup alternatives and evaluate feasibility.
- Proposed Plan (PP): The Air Force formally requests input from the community, attendance at the public meeting for the Proposed Plan, provide oral comments during the public meeting or provide written comments during the public comment period.
- Decision document, or Record of Decision (ROD): After the decision document is signed, the public should review the document and responsiveness summary. A public notice will appear in local newspapers and social media to inform of the documents' availability.
- A ROD is a legally binding document that captures all decisions made. All comments on the ROD and Air Force responses are published in a responsiveness summary. Should a change to the ROD be required, either a ROD amendment or an explanation of significant differences (ESD) will be developed for public review and comment.
- Remedial design remedial action (RD/RA): This phase of the process is where the cleanup decisions made in the ROD are designed and implemented in the field. This is not the end of opportunity for the public to participate in the ERP. Updates are available via the quarterly newsletter and a Travis AFB Environmental Public Affairs representative may be contacted with any questions. Public Affairs can be reached by phone at 707-424-2011 or via email at EnviroPA@travis.af.mil.
- Long term monitoring (LTM): Continued monitoring through sampling and analysis until cleanup levels are achieved or continued protectiveness is provided through land use controls (LUCs).

Ms. Schilter-Lowe spoke about emerging contaminants. PFOS/PFOA is a fire fighting foam used to put out aircraft fires. More research needs to be conducted to see if it affects the soil/groundwater and drinking water. There are no established cleanup levels because it has not been studied enough yet. However, in 2020 all industries will stop using PFOS/PFOA foam.

Mr. Foster said that back in the early days of the RAB, meetings seemed more geared to asking the public to help in the decision making. The process has evolved to a much more robust and professional process that involves the public. Adding he applauds the current process shift and it is much better for the RAB and all the participants that are involved in the process. Mr. Duke added that the process has matured quite a bit and

the performance-based contracts help with the process. Travis AFB will continue with the outreach programs to inform the public as to the clean-up process.

Mr. Marianno asked why there hasn't been any discussion about the money spent on the technology demonstrations. In the past Travis AFB shared the cleanup program costs. Mr. Duke said that this is part of the performance-based contract concept. The contractor is given an end goal, and what the base wants to achieve. And then the contractors come back with their ideas on how to achieve the cleanup. Then they compete to win the contracts. The cost of the cleanup has gone down as a result of the PBCs and the increased competition between contractors. The contractor is conducting the technology demonstration and if successful the cleanup costs less money and takes less time. Mr. Smith added that this was about a 4-million dollar a year program, and with the PBC award, if you project that out over the number of years, it's about the same. However, Travis AFB is reducing the life cycle of the site cleanups, and you will find we reach the end goal of cleanup while saving money. The contractor comes up with the idea that they believe will expedite the cleanup process. Then if USACE-Omaha supports it, and the regulatory agencies support it, then it gets implemented.

Mr. Reagan said that Travis AFB is using innovative technologies that are cleaning up the soil and groundwater which has been documented. How do you get this knowledge out to other communities that have the same types of contaminated plumes? Mr. Duke said one way is the annual Battelle Conference scheduled for next month, where ideas are shared among contractors and other bases.

Mr. Duke announced that Earth Day will be celebrated at Travis AFB on 22 April 2016, and that activities will be available for children. Also a presentation was given at the Teen Center regarding water pollution.

V. Cleanup Program Status

Mr. Wray talked about the 2013 Performance Based Contract.

Mr. Wray provided an overview of a Performance Based Contract (PBC). The key contract components include project goals and objectives, actions taken to achieve objectives, current program status, and the work CH2M will be doing over the summer and the next five years.

Travis Contract, Key Components:

- The contract is funded by the Air Force Civil Engineer Center (AFCEC).
- US Army Corps of Engineers, Omaha District, provides contracting services and oversight of the work being conducted.
- The PBC: The Air Force is buying objectives (results), not prescribed actions.
- This PBC runs for 8 years, 2013 through 2021.

- The contract players are: Bill Hall of AFCEC Headquarters San Antonio, Dezso Linbrunner of USACE Omaha, Lonnie Duke, Glenn Anderson, and Angel Santiago of AFCEC at Travis AFB, Nadia Burke of US Environmental Protection Agency, Adriana Constantinescu of California Regional Water Quality Control Board, Ben Fries of California Department of Toxic Substances Control, Mike Wray of CH2M, and CH2Ms small business partner Meg Greenwald of CAPE Inc.

Project goals and Objectives:

- The options for performance objectives for each site include Site Closeout (SC), Response Complete (RC), or Optimized Exit Strategy (OES).
- The highest level is site closeout (SC). After installing and operating a remedy for some period of time, the site achieves the established cleanup levels for soil or groundwater. Once cleanup levels are achieved the groundwater is monitored for two years to confirm the cleanup levels are sustained. After the data supports SC, all of the infrastructure (i.e., wells and pipes) are removed. The Air Force no longer has to spend funds on the SC sites, allowing the Air Force unlimited use and unrestricted exposure of a particular site. SC is the most desirable objective.
- The second level of performance objective is Response Complete (RC). This objective is applied to sites that achieve the cleanup levels, but there isn't enough time in the contract to conduct the two-year monitoring to confirm the cleanup levels have been sustained and to decommission all cleanup infrastructure, such as monitoring wells and bioreactors.
- Optimized Exit Strategy (OES). This is for sites where SC or RC may not be achieved before the end of the contract. We still want to make a lot of progress on these sites, by taking actions now to minimize the cleanup time. In this case, the contractor takes steps to reduce overall cleanup costs, and develop a strategy to achieve cleanup levels after the contract ends.
- Our contract includes 40 sites. The contracted performance objectives are: 26 SC sites, 2 RC sites, and 12 OES sites.
- A key component of this contract is to maximize green and sustainable remediation (GSR) opportunities. GSR is being achieved by using renewable energy such as solar power to run the treatment systems, applying In situ treatment, installing bioreactors, using emulsified vegetable oil, and selecting monitored natural attenuation when appropriate.

Actions taken to Achieve Project Objectives:

- Developed a project management plan to guide cleanup activities.
- Developed an OES plan for the 12 sites that will not reach cleanup levels by 2021.
- Developed multiple biological assessments to protect sensitive species and their habitat from remediation activities.

- Developed a land use controls implementation plan to ensure LUCs are properly set up and enforced.
- Continued monitoring of a big soil landfill called the corrective action management unit (CAMU).
- Continued with the groundwater monitoring program, and the treatment system operation and maintenance.
- Drilled soil borings for installation of monitoring wells, extraction wells, injection wells, and gravel chimneys.
- Constructed in situ bioreactors, solar powered systems, and soil excavations.
- Implemented EVO injections, biobarriers (elongated bioreactors), and “hot spot” cleanups.
- Removed and closed inactive oil water separators.
- Authored remedial action construction completion reports to document the field construction work.

Current Project Status:

- One site has achieved SC. One site has achieved RC. Completed remediation implementations include 23 site investigations, EVO injections at 8 sites, installed two (2) In situ bioreactors, installed three (3) in situ biobarriers, installed five (5) groundwater recirculation systems, continued monitoring of 10 MNA network sites, installed three (3) solar power installations, and installed two (2) groundwater extraction systems.

Program Looking Forward:

- Continue with the annual base-wide sampling and monitoring, continuous operation and maintenance of extraction and treatment equipment, remove and decommission 12 oil water separators, install two (2) bioreactors, complete one (1) EVO injection; complete one (1) soil remedial investigation; multiple soil excavations, second round of EVO injections as needed to achieve objectives; other remedy enhancements as needed to achieve objectives, and conduct a five-year review in 2018 under a separate contract and by a different contractor.
- SC Sites: Conduct a risk assessment and possible ROD amendments for soil sites that have been under LUCs for a number of years, soil excavations, achieve cleanup levels at all SC sites and then monitor groundwater sites to confirm achievement of cleanup levels for two (2) years, treatment systems removal/demolition, well decommissioning, and site closeout reports.
- RC Sites: monitor progress towards cleanup level achievement; carry out remedy enhancements as needed.
- OES Sites: Continue with implementation of planned remedy enhancements, followed by preparation of OES implementation completion reports and OES effectiveness reports.

Mr. Foster asked if the OWSs are going to be removed or are some of the remains going to be left behind? If OWS remains are left behind then the term OWS “removal” is misleading. Mr. Wray said it is a combination of the two. The contract states to close the OWS, and that it is acceptable to close some by abandoning in place. All equipment above grade will be removed, however there will be some material (mostly broken up concrete) left in place that is below grade. The soil surrounding the OWS will be tested, and if the soil results come back with contamination, the OWS will be removed along with the contaminated soils.

VI. Regulatory Agency Reports

Ms. Constantinescu introduced herself saying she is an engineering geologist with San Francisco Bay Water board and oversees cleanup in groundwater plumes. She has more than thirty years of professional experience as an engineering geologist. She spent ten years working for the Institute of Geology and Geophysics in Romania. In California she worked as a consultant for ten years in areas from Crescent City to San Diego. The past ten years she worked as an engineering geologist for the San Francisco Bay Regional Water Quality Control Board. She worked for the DOD program overseeing projects on military bases, active and non-active, and of course at Travis AFB, Moffett Federal Airfield, NASA Redevelopment Project, Mare Island, the former Concord Naval Weapons Station, and other numerous military bases around San Francisco Bay.

She presented an overview of the Water Board, an update on drought information and actions, and celebration of Earth Day 22 April 2016.

Ms. Constantinescu presented a flow chart of California’s Environmental Agencies: from California EPA, Air Resources Board, Department of Resources Recycling and Recovery, Department of Toxic Substances Control, etc. and illustrated how the Water Board fits within the California/EPA family. The State Water Resources Board was created by the Legislature in 1967 and its mission is to ensure the highest reasonable quality of waters for the State, while allocating those waters to achieve the optimum balance of beneficial uses. The State Board provides policy guidance and budgetary authority to the nine regional boards: North Coast Water Board; S.F. Bay Water Board; Central Coast Water Board; L.A. Water Board; Central Valley Water Board; Lahontan Water Board; Colorado River Water Board; Santa Ana Water Board; and San Diego Water Board.

The Regional Boards develop and enforce water quality objectives and implementation plans, also known as the Basin Plan. It establishes the water quality objectives in clean water. Ms. Constantinescu presented a map that outlines the geographical limits of the San Francisco Bay Region, “our region”. San Francisco Bay is a very complex eco system that conveys waters from the Sacramento and San Joaquin Rivers into the Pacific Ocean. The region’s waterways, wetlands, and bays form the centerpiece of the San Francisco metropolitan region, including all or portions of nine counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

In 1967 the legislature adopted the water code, known as Porter-Cologne Water Quality Control Act. The Legislature granted powers to the State Board and Regional Water Boards including setting standards and issuing orders and enforcement actions. Subsequently, in 1972, the U.S. Congress adopted a Federal Clean Water Act which was largely based on California Porter-Cologne. The Clean Water Act delegates authority to some states, one being California, to issue National Pollution Discharge and Elimination System (NPDES) permits.

One of the main regulatory tools we use is GeoTracker, (the state environmental management database) to which the public has access. GeoTracker is a data management system used for managing sites that impact groundwater, especially those that require groundwater cleanup, as well as permitted activities, such as operating underground storage tanks and land disposal sites. By accessing this database you can check to see if there is an immediate and potential threat to the public from leaking underground fuel tanks, and the progress made in the cleanup actions. The website is: <https://geotracker.waterboards.ca.gov>.

One year ago during our 23 April 2015 RAB meeting Adriana presented information on the big 2015 California drought, and the photo I shared was a lake with extreme receding water. I show this picture again because we are “not out of the woods”. We still need to conserve water. The next slide showed the average percentage of rainfall from Portland, Oregon down to San Diego, California. While Northern California showed above average rainfall so far this year, Southern California had less than 75 percent of normal average rainfall. We still need to continue to conserve water. Why? Because we need above average snowfall to get our reservoirs, lakes, and aquifers replenished. Conservation is always an important consideration, and it helps to get the best use out of our water.

Earth Day is celebrating its 45th anniversary of the launching of its worldwide environmental movement. To celebrate, the Fairfield-Suisun Sewer District will hold three fun events:

Creek Cleanup at two locations, Open house at the Wastewater Treatment Plant, and an outreach booth at the Fairfield Civic Center.

Mr. Fries of the California Department of Toxic Substances Control did not have any comments.

VII. Focus Group Reports

Mr. Duke thanked the focus group for their continued support in reviewing the current list of documents, including the ST028 POCO Completion Report, CAMU 2015 Annual Report, ST032 POCO Completion Report; Oil Water Separator Corrective Action Plan, CG508 Well Decommissioning Tech Memo, SD031 Remedial Investigation Work Plan, and the FT004 Technology Demonstration Construction Completion Report.

VIII. RAB/Public Questions

None.

IX. Set Date and Place for Next RAB Meeting

The next RAB Meeting is scheduled for **20 April 2017** at the office of the Northern Solano County Association of Realtors in Fairfield.

X. Adjournment

Mr. Duke adjourned the meeting at **8:45 pm.**

Minutes submitted by: Jeannette Cumberland, CH2M

Minutes approved by: The Travis RAB on 20 April 2017