Guardian

America's First Choice for Environmental Restoration

A Publication of the Environmental Restoration Program | Travis Air Force Base, California | January 2008

Inside

(Photo by Glenn Anderson)

Beyond the Fence: A backhoe removes contaminated sediment from a drainage ditch adjacent to the base boundary. The ditch received the sediment from a nearby soil site on the other side of the fence. The sediment was placed in the base Corrective Action Management Unit (CAMU).

Travis Soil Report Card

What We Finished And What It Took To Get The Job Done

By Glenn Anderson
Travis Environmental Project Manager

On 18 June 2007, a field team at Travis AFB began the preparations for the cleanup of five contaminated soil sites and two contaminated sediment locations in Union Creek. The goal was to achieve sufficient cleanup levels at each site so that there were no environmental restrictions on the use of these sites by base personnel.

They also planned on placing most of this soil and sediment into the base Corrective Action Management Unit (CAMU). A CAMU is a designated area within a facility that is designed to carry out a corrective action, such as the management of contaminated soil. The Travis AFB CAMU is an on-base soil repository that was built on top of a closed landfill and has received contaminated soil from a number of on-base soil sites.

On 14 December 2007, the team of project managers and heavy equipment operators completed the cleanup of four contaminated soil sites and the construction of a protective soil cap

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Visit our Environmental Restoration Program web site at ***http://public.travis.amc.af.mil/enviro***

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New Year Brings New Challenges

VIEWPOINT

Mark H. Smith
Travis Remedial Program Manager

In the last Viewpoint, I wrote about our desire to improve the technological side of our restoration program in order to provide a more efficient cleanup at our groundwater sites. This quarter, I want to discuss the federal government's strategy for improving the contracting side of our program.

For most of 2007, I have been briefing our environmental regulatory agency representatives on a relatively new concept, known as a Performance-Based Contract (PBC). The concept behind a PBC is simple - rather than providing a detailed description of the tasks that a contractor will perform under a typical do-as-you're-told contract, a PBC only asks the contractor to deliver desired results.

For example, suppose our office needs to upgrade its computer system. An old school Time and Materials contract would have to specify all that the contractor needed to do or acquire to upgrade this new system. The contract might state that the new system must have the new XFP (for Xtra-Fast Processor) and twice the existing memory. The problem with this is that there may actually be a faster processor on the market (the XFP2) by the time the contract is signed, so we could end up with a slower, outdated system. Also, there are few computer experts in my office, so the system setup as specified in the contract may not be the best design. So, we end up with what we asked (and paid) for.

Under a PBC, we would not focus on the stuff inside the computer. Instead, we would specify what we want the computer to be able to do. For example, the resulting system must be able to run our e-mail system, the latest word processor, AND our desktop publishing suite, all at the same time, at a particular speed and without any software conflicts. Oh, we also want it to operate below a certain temperature and use half the electricity that the older system used. Finally, we want it to be compatible with our existing Air Force network and free from any repairs for the next two years.

Notice that we did not specify how the contractor is going to build this system. If they can achieve these results with off-the-shelf computers, that is okay with us. However, since they are one of several firms that want this contract, they may come up with an ideal or innovative design that meets the requirements without increasing the cost of the components, and might offer a lower bid. Maybe they have a technological mastermind on staff who can resolve any problems that the new system will face. Again, we only care about the results and we're leaving the details up to the subject matter experts.

In theory, PBC is a great innovation in government contracting. In practice, it is not easy to implement, nor is it a good fit for all types of work.

PBC is best implemented early on in a project and where there are more knowns than unknowns. A potential contractor may feel the risk is too great to promise a desired result at a set price if there is too much uncertainty in the mix. If we don't know how much data

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on the CAMU. The cap prevents contaminant exposure to base personnel as well as plants and animals that call Travis their home.

"It is important to take a close look at last year's soil actions and identify both successes and areas for improvement," stated Mr. Mark Smith, Travis AFB Remedial Program Manager. "We also want to determine where we go from here."

Success Stories

First and foremost, the field team completed the cleanup of four contaminated soil sites. Even more important, all four cleanup actions achieved cleanup levels that allow the sites to be used without environmental restrictions. Known as residential cleanup levels, they are cleanup standards that allow people, plants and animals to safely occupy a site. Without the presence of environmental land use controls that enforce the restrictions, the base can freely use these sites to support its mission.

Second, almost all of the contaminated soil was placed into the CAMU. A small amount of vegetation-rich soil that did not meet CAMU acceptance standards was taken by licensed hauler to the Chemical Waste Management facility at Kettleman City, CA for disposal. The CAMU approach is both environmentally friendly and cost effective, compared to the option of sending soil to an off-base landfill. By placing the soil into an on-base repository, the base does not take up limited space in our landfills, avoids landfill fees and shipping costs, saves fuel, reduces highway congestion, and reduces the liability associated with the transfer and storage of contaminated soil.

Third, treated water from three groundwater treatment plants supported the soil cleanup actions. This was the first time that treated water was used in this type of on-base activity. Considering the need to conserve limited water resources, the beneficial reuse of treated water has become an important part of project planning.

Fourth, the use of a portable x-ray fluorescence (XRF) tool to identify the presence of lead in soil made it possible to speed up the cleanup action and verify that cleanup levels had been reached without laboratory analysis. This field instrument measured lead concentration in minutes rather than days, saving both time and lab costs. The October 2006 Guardian described the XRF device.

Finally, even after the volume of excavated soil jumped almost 70%, we were still able to fill in the excavations and cap the CAMU without having to buy clean soil from off-base sources. Fortunately, there were several construction projects taking place across the base that were generating clean soil, and it did not take a lot of extra effort to haul it to where it was needed. This was a significant cost avoidance, and it helped to reduce the soil disposal costs associated with these construction projects.

Room for Improvement

"Of course it was disappointing that we did not finish all seven cleanup actions this year," said Mr. Smith. "This was a case of too much soil and too little time." The original soil volume estimate for all seven sites was a little over 13,000 cubic yards; the actual soil volume from just those four sites was about 22,000 cubic yards. Since it took longer to move the additional soil to the CAMU, there was not enough time to carry out the cleanup actions in Union Creek and at a former fire training area before the arrival of the first set of winter storms.

Although treated water usage is definitely a success story, there are opportunities to realize its full potential. At the start of the summer construction season, almost 40% of the water used for dust suppression came out of a treatment plant. However, demand soon exceeded supply, and by December that percentage had dropped to under 5%. "Since our treatment plants were not designed to provide water on demand, and we used gravity feed pipes to temporarily tap into this resource, we could not get the water out to the sites fast enough," noted Mr. Smith. "This was especially true when strong Delta Breezes made dust suppression a high priority, so we are looking at permanent, more efficient solutions to this challenge."

Just the Facts

It is not always easy to envision the level of effort required to carry out such a significant earth-moving project. About 22,000 cubic yards of contaminated clay-rich soil had to be excavated from four separate on-base locations, placed in individual piles, marked with orange snow fencing, covered with a four foot layer of intermediate clean soil, capped with a mix of soil and bentonite, and topped with a thin layer of soil and mulch to promote vegetation growth. Then, all excavations had to be filled with clean soil and properly restored to their original topographic condition.

Just to make it a little challenging, throw in triple-digit tempera-

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Green Icing on the Cake

Hydroseed Promotes Quick Vegetation Growth

By Glenn Anderson
Travis Environmental Project Manager

Most Solano County homeowners know how much fun it is to work with clay-rich soil, either in a garden or yard. When clay gets wet, it sticks to everything and is as easy to manage as peanut butter. When it dries, it can be as hard as a rock and forms desiccation cracks. Thanks to its poor drainage qualities, it allows pools of water to form after a rainstorm and contributes to the formation of unique ecological habitats, known as wetlands.

Clay also erodes easily in the presence of moving surface water, so one can imagine the challenge of restoring a clay-rich site at the end of a soil cleanup action. After a good rainstorm, an excavation site can become a swimming pool or a muddy mess very quickly. It is important to encourage vegetation growth at this type of site to avoid the disadvantages that clay presents to the property owner.

One of the easiest ways to establish a vegetation cover on almost any ground surface is through a process known as hydroseeding. Hydroseeding is the simple procedure of applying grass seed, fertilizer, mulch and water to a soil surface in one liquefied application.

Similar to spraying paint onto the exterior of a house, hydroseed equipment can apply a mixture of seed, soil amendments, and soil stabilizers over a large amount of bare soil in a very short period of time. Most professional hydroseed companies use trucks with powerful spray applicators to cover almost any type of terrain.

Hydroseeding offers a number of advantages over standard methods of soil protection, such as sod. First, it creates exactly the vegetation cover that will flourish best in a particular climate and soil type. The mix of seed for an arid climate, such as the one in northern California, would be very different from a mix for a tropical climate.

A Need for Seed: *Individual seeds can be seen in this closeup of a hydroseed mixture on a soil surface. Pulp-like materials in the mixture serve to stabilize the soil and absorb water, promoting seed germination.*

Second, it is 60%-75% less expensive than the costly application of sod. Although prices will vary greatly across the United States, hydroseeding jobs are commonly priced by the square footage of area to be seeded and can range from 6 cents/sq. ft to 15 cents/sq. ft nationwide.

Finally, hydroseed is easier and quicker to apply, particularly on hills and other non-flat surfaces. The laying of sod is analogous to installing a wooden floor; every piece has to fit properly, or else there will be holes in the coverage. As described above, hydroseeding is analogous to spray painting and can cover 100% of bare soil in a short period of time. A non-toxic green dye is added to the hydroseed mix to allow the seed applicator to see where the mix has been sprayed and ensure that all of the bare soil is covered.

Of course, hydroseeding does have its disadvantages. Sod on bare soil offers a picture perfect lawn in as little as one day. Hydroseeding may take a few weeks to grow a fully develop vegetation cover. Also, anyone can walk on new sod right away, but heavy traffic on a newly seeded area can permanently damage the new vegetation. Walking on a freshly hydroseeded area can leave depressions in the cover and in some cases cause bare spots to form.

With these considerations in mind, Travis AFB selected hydroseeding as an appropriate method of site restoration at four soil cleanup areas as well as its Corrective Action Management Unit (CAMU). A CAMU is a designated area within a facility that is designed to carry out a corrective action, such as the management of contaminated soil.

The Travis AFB CAMU is an on-base soil repository that was built on top of a closed landfill and has received contaminated soil from a number of on-base soil sites. The contaminated soil is covered with a protective landfill cap to prevent

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tures, gusting winds from the Bay Area, and the constant threat of rain to ruin the best laid plans.

So, what did it take to get the job done?

The sidebar below lists the supplies that were used or expended during the fieldwork. It does not describe the earth-moving equipment or trucks that supported the fieldwork, nor does it mention the smaller items (water bottles for personnel hydration, volume of sand for sandbags, etc.) that are also needed to successfully carry out the work. However, this list suggests the level of logistical support that is critical to a successful cleanup project of this size.

"We could not have successfully completed this cleanup project without the outstanding teamwork displayed by both base and contractor managers," stated Mr. Smith. "They responded to changing conditions on a weekly, and sometimes daily, basis and sought out solutions to keep us on track and within budget. It was a pleasure to watch progress in motion."

Cleanup Supplies and Materials

It takes more than a shovel and dump truck to safely dig a lot of dirt. Here is a short list of supplies and materials that were needed to carry out last year's soil cleanup actions.

Diesel Fuel	18,032.6 Gallons
Sandbags	6160 Bags
Bentonite	1337.97 Tons In 872 Supersacks (1.5 tons per sack) On 57 Flatbed Trucks
Nylon Rope	5,400 Feet
Safety Signs	24 Each
Orange Fencing	120 Rolls
Poly Sheeting	282 Rolls
Marking Paint	192 Cans
Orange Cones	300 Each

Other Interesting Facts

Soil Placed in CAMU	22,000 cubic yards
Soil in CAMU Cap	15,280 cubic yards
Waste Sent Off-Base	1,416 cubic yards
Manhours Expended	20,255 hours

Icing

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contaminant exposure to people, plants and animals. The vegetation cover is an important part of the cap construction.

"It took a little over two days to cover all four cleaned soil sites and the CAMU," stated Mr. Mark Smith, Travis AFB Remedial Program Manager. "Fortunately, we experienced our first group of winter storms the week after the last of the hydroseed was applied. The steady rains immediately after hydroseed spraying was perfect timing and helped to speed up the vegetation growth process."

A standard planting mix of rye and fescues was used at the four soil sites, but a special blend of seed for deep-rooted plants was used for the CAMU cap. These plants tend to absorb more water and help to keep water from entering the CAMU.

"The new vegetation covers are developing quite well," said Mr. Smith. "Although they will not look like golf courses, the new vegetation should be ready for any base activity by next spring."

CAMU Epilogue

By Glenn Anderson
Travis Environmental Project Manager

Now that 22,000 cubic yards of contaminated soil have been added to the Corrective Action Management Unit (CAMU) and its new protective cover is in place, what is going to happen to it?

Similar to a closed landfill, the Travis CAMU will undergo closure and post-closure periods. Closure will entail a series of routine inspections and measurements to verify that the cap is performing as designed. For example, moisture readings will show that rainwater is not percolating through the contaminated soil on its way to the groundwater.

Soil gas samples will also be taken around the CAMU to ensure that it is not emitting methane gas. The concern is not that the soil will produce a lot of gas, since it contains very little vegetation. However, the extra weight from the 22,000 cubic yards of new soil may put pressure on the subsurface and cause pockets of methane gas from buried landfill waste to be released. Once there is sufficient data to show that the CAMU is not

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we'll be processing, what operating system we'll be using or what software to install, then it's rather hard to come up with a cost estimate. Awarding a PBC when all we need is to buy the specific software and install it isn't a good fit either. That could be done under one of those do-as-you're-told contracts.

Practice makes perfect (or at least a lot better), and project managers and contracting specialists are gaining more experience with this form of contract. There are government mandates to use PBC in a greater percentage of our contracts, and that may not be the right approach. The PBC approach requires a definable deliverable, and the key word here is 'definable'. Performance has to be measurable, and the metrics assigned to the results are the foundation of a successful PBC. In other words, if we can't measure it, we can't evaluate the success of the PBC.

So, what does this have to do with the New Year?

This year, our basewide groundwater cleanup contract will be a PBC, and we are working with our contractor representative and our federal and state regulatory agency representatives to come up with our groundwater metrics. We want an environmental contractor to select appropriate cleanup remedies for all Travis groundwater sites that are acceptable to the Air Force, regulatory agencies, and the local community. Then, we want these remedies to be placed into action by 2012.

The challenge is to develop the standards that will tell us if the contractor is achieving the desired results. For example, a standard such as "clean up half of the contamination on base" is too vague. How do we measure that? By volume? By concentration? If the contractor cleans up the west side of the base only, was the standard met?

If it was easy, everyone would be using PBC to get all of their government work done for them. But, it is not easy, and that is why this New Year will bring new challenges to my office. We have more knowns than unknowns when it comes to our groundwater, and with help from those with PBC experience, I am confident that we will meet these challenges.

From the Field

(Photos by Glenn Anderson)

(Photo by Glenn Anderson)

Offbase Cleanup

[Upper Left] A backhoe scrapes a contaminated drainage ditch adjacent to the base boundary. [Upper Right] The backhoe deposits a load of contaminated soil into a front end loader. [Lower left and right] The front end loader places the soil into an articulated hauler, which can carry large amounts of soil over rough terrain. The hauler eventually placed the soil into the base Corrective Action Management Unit.

(Photo by Glenn Anderson)

(Photo by Glenn Anderson)

(Photo by Glenn Anderson)

(Photo by Glenn Anderson)

Soil Sifting

The soil cap on the Corrective Action Management Unit is designed to prevent water from percolating through the contaminated soil and into the local groundwater. [Upper Left] An industrial-sized 'soil sifter' separates the desired clay from the large rocks that can prevent the cap from functioning properly. [Upper Right] A front-end loader places a scoop of soil into the sifter. [Lower left] The sifter separates the large rocks from the sand/clay, piles up the large rocks along its side, and sends the sand/clay onto a conveyor belt. [Lower right] The conveyor belt moves the sand/clay to a growing pile. The belt can be pivoted to start a new pile without stopping the sifting process.

(Photo by Glenn Anderson)

(Photo by Glenn Anderson)

(Photo by Glenn Anderson)

(Photo by Glenn Anderson)

Hydroseeding

As described on page 4, hydroseeding promotes vegetation and prevents soil erosion. [Upper Left] A hydroseed applicator truck drives onto an off-base portion of a soil cleanup action. [Upper Right] A high-pressure cannon on the top of the truck shoots a liquid hydroseed mixture onto bare soil. [Lower left] The cannon is swung from side to side to completely cover the excavated area. [Lower right] The drainage ditch and adjacent side slope has a coating of a seed mixture that holds soil particles in place and start the revegetation of the soil surface.

(Photo by Glenn Anderson)

(Photo by Glenn Anderson)

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generating methane gas and the cap is keeping out the rainwater, the closure period will be complete.

Another aspect of CAMU closure is the establishment of physical land use controls. Warning signs are posted, and locked chains or gates across access roads restrict physical access to the CAMU. Since the CAMU was constructed on top of a closed landfill, few additional controls are needed.

Post-closure is a period that lasts forever. It involves routine visual inspections that ensure that the CAMU is still preventing contaminant exposure to base personnel and the local habitat. Minor cracks are repaired, and all signs and fencing are inspected for possible replacement, if needed.

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Travis AFB Restoration Advisory Board Meeting

April 24, 2008 p.m.

Northern Solano County
Association of Realtors
3690 Hilborn Rd
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

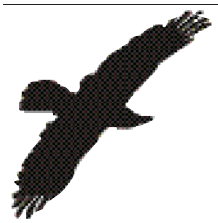
Monday-Thursday: 10 a.m. - 9 p.m.
Friday-Saturday: 10 a.m. - 5 p.m.
Sunday: 1 p.m. - 5 p.m.

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.

If you would like more information or need special accommodations for the RAB meeting, please contact Mark Smith, (707) 424-3062. You can also view our web site at http://public.travis.amc.af.mil/enviro



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