

**Travis Air Force Base
Environmental Management
Building 570, Travis AFB, California
Environmental Restoration Program
Remedial Program Managers
Meeting Minutes**

24 September 2008, 0930 Hours

Mr. Mark Smith, Travis Air Force Base (AFB), conducted the Remedial Program Manager's (RPM) meeting on 24 September 2008 at 0930 in the Environmental Flight Conference Room, Building 570, Travis AFB, California. Attendees included:

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|--------------------|--|
| • Mark Smith | Travis AFB |
| • Lonnie Duke | Travis AFB |
| • Greg Parrott | Travis AFB |
| • Mary Snow | TechLaw |
| • James Chang | U.S. Environmental Protection Agency (USEPA) |
| • Alan Friedman | California Regional Water Quality Control Board (CRWQCB) |
| • Jose Salcedo | Department of Toxic Substances Control (DTSC) |
| • Rich Freitas | U.S. Environmental Protection Agency (USEPA) |
| • Deszo Linbrunner | U.S. Army Corps of Engineers, Omaha District |
| • Mike Wray | CH2M Hill |
| • Chuck Elliott | CH2M Hill |
| • Rachel Hess | Innovative Technical Solutions, Inc. (ITSI) |
| • Jeff Hess | Innovative Technical Solutions, Inc. (ITSI) |
| • Chuck Clyde | Innovative Technical Solutions, Inc. (ITSI) |
| • Tom Barry | Shaw Engineering and Infrastructure (Shaw E&I) |

Handouts distributed via email prior to the start of the meeting included:

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|----------------|--|
| • Attachment 1 | Meeting Agenda |
| • Attachment 2 | Master Meeting, Teleconference, and Document Schedules |
| • Attachment 3 | SBBGWTP Monthly Data Sheet (August 2008) |
| • Attachment 4 | CGWTP Monthly Data Sheet (August 2008) |
| • Attachment 5 | NGWTP Monthly Data Sheet (August 2008) |
| • Attachment 6 | Upfront Slides |
| • Attachment 7 | Approach Presentation |

1. ADMINISTRATIVE

A. Previous Meeting Minutes

The 13 August 2008 RPM meeting minutes were approved and finalized with one change: Item 1B, Action Item #2, change 'acceptance letter has been received by TAFB' to 'acceptance letter is forthcoming'.

B. Action Item Review

None.

C. Meeting Dates and Master Document Schedule Review

The Travis AFB Master Meeting, Teleconference, and Document Schedules were discussed during this meeting (see Attachment 2). Mr. Smith asked all participants to verify that they were available for the rest of the meeting dates.

Travis AFB Annual Meeting and Teleconference Schedule

- The next RPM meeting will be 22 October at Travis; the teleconference will be 6 October.

Travis AFB Master Document Schedule

- Basewide, GW ROD: The dates need to be modified.
- Five Year Review: The final date for the report should be 24 September 2008.
- Soil Remedial Action Report: The final date for the report is 30 September 2008. Mr. Chang complemented the TAFB staff on getting both of these documents completed in FY08.
- POCO MNA Evaluation Report: Complete and moved to history.
- Guardian quarterly newsletter: Out for review; no problem getting published and mailed in time for next RAB in October.
- CAMU Monitoring and Maintenance Report: Final copies ready to distribute to the agencies.

2. CURRENT PROJECTS

A. Treatment Plant Operation and Maintenance Update

Mr. Duke reported on the water treatment plant sites. He has been reading the EPA primer on sustainable remediation and will start emphasizing power usage in the summaries.

South Base Boundary Groundwater Treatment Plant

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 95.8% uptime, and 3.5 million gallons of groundwater were extracted and treated during the month of August 2008. All of the treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 82.8 gallons per minute (gpm) and electrical power usage was 16,224 kWh; 22,227 pounds of CO₂ was emitted (based on DOE calculation). Approximately 2.1 pounds of volatile organic compounds (VOCs) was removed during August 2008. The total mass of VOCs removed since the startup of the system is 343.8 pounds (see Attachment 3).

One shutdown occurred on 3 August 2008 for a high pressure alarm at the air stripper. The stripper was acid washed and the system was restarted 4 August 2008.

No optimization activities were planned or performed during August.

Central Groundwater Treatment Plant

The Central Groundwater Treatment Plant (CGWTP) performed at 83.5% uptime with approximately 2.4 million gallons of groundwater extracted and treated during the month of August 2008. All treated water was diverted to the storm drain. The average flow rate for the CGWTP was 63.8 gpm and electrical power usage was 31,477 kWh for all plants; 43,123 pounds of CO₂ was emitted. Approximately 10.6 pounds of VOCs were removed from groundwater, and 24.1 pounds from vapor, during August 2008. The total mass of VOCs removed since the startup of the system is 10,915 pounds. (see Attachment 4).

Four shutdowns in August 2008 occurred in the central plant. One was due to a hydrogen peroxide low flow alarm. Three were due to a tank level sensor fault, most likely caused by high ambient temperatures.

No optimization activities were conducted in August 2008. Mr. Salcedo asked about breakthrough occurring and what's being done. Mr. Duke answered that funding possibilities are being explored, The numbers are being watched closely.

North Groundwater Treatment Plant

The North Groundwater Treatment Plant (NGWTP) performed at 100% uptime with approximately 550,000 gallons of groundwater extracted and treated during the month of August 2008. All treated water was discharged to the duck pond. The average flow for the NGWTP was 12.3 gpm and electrical power usage was 7,278 kWh. 9,461 pounds of CO₂ was emitted. Approximately 1.6 ounces of VOCs were removed during August 2008. The total mass of VOCs removed since the startup of the system is 5,413.9 pounds (see Attachment 5).

No shutdowns occurred in the month of August 2008.

No optimization activities were planned or performed during August. Mr. Duke noted that the Influent concentration level of trichloroethene has increased from 8.5 to 12 ug/L.

B. Petroleum Only Contamination (POCO) Status

Mr. Duke gave an update on the Petroleum Only Contamination (POCO) status. The report went final last month. Travis AFB has achieved Remedy in Place (RIP) at site ST028. Mr. Duke asked if the base needs a letter from the Water Board. Mr. Friedman replied he would look into it – it may need just a simple statement.

C. CAMU Monitoring and Maintenance Report (Final)

Final copies were distributed to the agencies.

D. Five Year Review Response to Comments

Report is final; if FedEx arrives before the end of the meeting the hardcopy can be distributed to the agencies. Otherwise it will be mailed. All comments from the agencies were incorporated.

E. Vapor Intrusion Field Work

Mr. Wray gave an update on the Vapor Intrusion field work. Phase one of the field work has been completed, which includes the soil gas sampling and sub-slab indoor air sample collection. The results and data evaluation will be presented in a report in November for agency review. Mr. Smith stated this document will be added to the Master Document Schedule. Phase two, which is the building survey, is underway. The report will propose additional steps to evaluate VI risk, if needed.

Mr. Chang asked if the EPA results he had sent to Mr. Anderson had been forwarded to CH2M Hill. Mr. Wray answered that it had and the data is being evaluated also.

F. Soil Remedial Action Report

Mr. Duke gave an update on the RAR status. The report will be final on 30 September 2008. The agencies will be getting the hardcopy and CD sometime in October.

G. NGWTP Optimization Memorandum

Mr. Duke handed out hardcopies of the final technical memorandum. Discussion followed concerning the electronic copies of these reports – do they satisfy state requirements? Mr. Salcedo stated they do, but he wanted to add that in order to upload into the state's electronic document repository, the size of the file needs to be 10 MB or less.

3. NEW ACTION ITEM REVIEW

None.

4. PROGRAM/ISSUES/UPDATE

A. Future Planning

1. Soil and Sediment RA's

There are three unfinished soil sites: two sediment (SD001, SD033) and FT005. The sediment sites will start work between August and October, 2009. Will have to shut down the treatment plant at that time and divert water around the excavation. For FT005, the Remedial Investigation (RI) plans will start in March 2009. Field work will be done in dry season and get levels down to industrial levels or better if able. This site may take until 2012 to complete, depending on funding and workload. Mr. Chang asked what is left to plan for FT005. The scope has increased therefore the site needs further characterization. Ms. Hess explained that during Shaw's investigation, materials were encountered that were beyond the initial Remedial Action (RA). Need to establish the extent of the materials (asphalt, concrete, other construction debris) . Mr. Smith added that fuel was also found, which Mr. Duke confirmed and added that it too needs to be fully characterized before mobilization. Funds were not available in FY08 to address additional work, but are for FY09 and work can begin. In 2009 the additional site characterization will occur, then the RD will be supplemented and 2012 is the projected construction year for the Remedial Action (RA) (See attachment 6).

Work that will be accomplished before the end of the calendar year 2008 is the removal of the grubbing pile at LF007 (125 y³) and the continuance of CAMU monitoring and maintenance by ITSI.

The slide presentation included a list of key staff from ITSI. The main objectives of this work effort were also listed (both new contracts), including promoting a team effort (taking a triad approach) of all involved parties. This would include the agencies, the base, USACE, ITSI and CH2M Hill.

Also presented were the objectives of the remaining groundwater sites and a general timeline for the goals for these sites. Key staff from TAFB, USACE, the agencies and CH2M Hill was listed.

Looking forward, various tools will be utilized to enhance communication, encourage teamwork, provide efficiency and foster trust. The monthly RPM teleconferences will be status updates, and the face-to-face meetings will transition to triad working meetings. An ftp site for large file sharing will be used to speed up the review process, if necessary. Mr. Smith also mentioned the continual optimization of systems, not to cut corners, but to put efforts and resources where it makes the most

sense. Enhanced attenuation will be utilized, as there are better ideas and technologies available since the IROD was developed. A timeline was presented to the group.

2. Groundwater

Mr. Smith introduced the presentation of the overall strategy of environmental work. There won't be so much talk about PBC anymore, just refer to contracts and focus on objectives (see Attachment 7).

Much has been accomplished thus far, including two groundwater IRODs, two Five-Year Reviews, groundwater extraction and treatment (GET) and soil vapor extraction (SVE) installed and working well. There are also ongoing monitored natural attenuation (MNA) assessments with migration control and declining volatile organic compound (VOC) concentrations at all but one site (DP039). All IROD objectives are being met except for three sites: LF007C, SS030 and DP039. Site DP039 was referred to as the 'frankenstein' site. Going forward, a Feasibility Study (FS) with a review of new technologies will be written. EPA suggested this and AFCEE agreed. Following that, a GWROD is planned for 2010, with final remedies installed and operating by 2012 (RIP goal by the Air Force).

At this time, it will be presented to the agencies the ideas of how to proceed. Approval of all steps is not being asked at this time, but TAFB and CH2M Hill wanted to make agencies aware of plans so they can bring up concerns and give feedback. The idea is to continue existing remedies and enhance/optimize them.

Mr. Elliott took over the presentation at this point. He is excited to be involved in this work and taking the sites from ROD to RIP. Much progress has been made. The plan is to improve existing remedies, prepare an action plan for all sites, and to present work plans (before submission) at RPM meetings. The following information is a bird's-eye view of what is being proposed.

North Area

The extent of the off-base plume at LF007C needs to be investigated. Use of groundwater modeling may require additional extraction and monitoring wells; solar groundwater pumps will be used. The rebound study for FT004 and SD031 are almost complete; results will be evaluated and recommendations made from this evaluation. MNA is fully implemented at LF006; a natural attenuation assessment report (NAAR) will be written and used to supplement the FS.

South Area

Site SS030 has a large low concentration plume of TCE that needs further investigation. Additional investigation is needed on east side where there has been raised TCE numbers, above the MCL. Suspect the existing FT005 GET on the east may be pulling the SS030 plume eastward. The rebound study for FT005 is almost complete; results will be evaluated and modifications to GET may be needed. There is evidence that plume from SS016 is migrating south towards SS029. Wells cannot

be installed under runway to control migration. Mr. Salcedo asked if levels are being monitored and that SS029 is not overwhelmed by migration or go off-site. Mr. Elliott stated that levels are looked at yearly; there is evidence that migration is occurring but also data demonstrates capture is happening and no evidence that plume is going off-base.

Central Area

At the Central Plant it is recommended to take the high energy treatment options (ThOx and UVOx) offline and use carbon instead. This would be a significant monetary savings and also reduction in carbon emissions. At site SS016, an old oil spill has been resistant to treatment; GET has been effective at controlling the plume but not at reducing the TCE concentration. Therefore, looking at implementing Enhanced Reductive Dechlorination (ERD), this involves injecting emulsified oil in the source area.

Mr. Freitas asked what is the driver for the methods being chosen, cost or time? Mr. Smith answered that to stay with the same treatment method keeps both the cost and the time required to cleanup high. Time is very important and time spent now investigating new technologies that that will work in the long term and I reduce life-cycle costs is time well spent. We want to reduce both the cost and the time to clean up. We have some work to do to demonstrate these new technologies and to demonstrate to the regulatory agencies that all are fully characterized.

Mr. Freitas suggested thinking outside of the box – enhanced MNA, for example. Mr. Smith reiterated that is exactly what is being done. Mr. Elliott added that the goal of the IROD was control only, not necessarily cleanup. The technology wasn't available in the mid-90's. The team is looking at different methods for the ROD to get to clean up; the goal of looking at alternatives is to simplify the ROD process.

Mr. Salcedo asked if the choice of ERD was made because of the success at SS015 and if other surfactants were considered. Mr. Elliott answered yes, although this is different oil (soy oil). It was pointed out that the geology needs to be studied as this type of remedy may not work in tight clay formations. Mr. Smith said that the intent of this meeting was not to overwhelm the group with details but to present the ideas. A pilot study at SS016 will be conducted and details presented then on the success of ERD.

Site ST032 will be moved to the POCO program. There is no more TCE at this site, only fuels. A technical memo will be written for this transfer.

Site ST027 is under POCO currently; however TCE contamination has been found in southwest area of plume. The level of TCE found was around 400 ppb. It is assumed it may be higher at the actual source. Full characterization needs to be performed.

Site SS015 had been selected for ERD and vegetable oil was injected. Reduction in contaminant levels was seen. There remains one well with contamination in the source area.

WIOU Area

This is the industrial area on the west side of base. There are two wells (SD036 and SD037) still above 1 ppm; plan to implement ERD to tackle the hotspots. Otherwise, not many exceed 100 ppb. SVE will continue at several sites, as well as GET. Site SD034 at the northern end of the plume has Stoddard solvent floating product and the plan is to continue the removal – Mr. Smith mentioned that they will resume skimming if they see 1/4" or more. Down gradient, MNA has been the selected remedy and the assessment will be presented in the NAAR.

Site LF008

This is a pesticide site. There are very low hits. It will be suggested to shut down GET for a one year rebound study to see if there are any changes.

POCO Sites

Site ST028 is pretty much done. At site ST018, the presence of MTBE needs to be addressed. MNA is not effective for this compound. It is suggested to install GET and treat with coconut shell carbon. Most likely four wells will need to be installed.

Site DP039

This site has been selected for a treatability study. Mr. Smith mentioned that Mr. Anderson wrote a persuasive letter to AFCEE on why this site should be selected for this study. The TCE plume is migrating southeast, right at the phytoremediation area. It is suggested to install a biobarrier down gradient from the phytoremediation area that won't interfere with the tree roots.

Bioreactor Overview

TAFB has been selected by AFCEE for the Bioreactor Project. This is a two year contract including 18 months of monitoring. They would like to be in the field by November. The reactor works like a percolator. Depending on results, may see more of this technology in the future. The base plans on continuing the monitoring past the initial 18 months.

Mr. Wray added that the plan is for this to be the final remedy. If it doesn't work as planned, it will have to go back to extraction well. Mr. Salcedo suggested having a plan B. Mr. Duke reviewed the objectives, monitoring plan and schedule to finish the presentation.

Mr. Smith stated that a revised Document Schedule may be needed to help everyone keep track of the schedules. He asked for suggestions for structure – a time line, calendar, or as it is presently, by document. The existing schedule will continue to be used if nothing better is developed. Slides from today will be sent to everyone.

It was reiterated that the shutdown of extraction wells at DP039 will need to happen in October so there is time to equilibrate for baseline sampling.

The list of new 2008 documents upcoming for review was presented. Some are primary, some secondary; some are updates only. It was suggested that the ESD be removed.

Mr. Chang added that this is a good overall approach. He asked what is happening with the Potrero Hills Annex. Mr. Smith answered that the intent is to write the Potrero Hills ROD in-house. There is perchlorate in the groundwater that is not from AF activities. Currently Potrero Hills is under a Water Board order, waiting on the private company (responsible party) to address the contamination issues and characterize the groundwater.

Mr. Chang commented on institutional controls for the off-base portions of contamination. The IC's will have to be taken into consideration, with agreements with landowners or deed restrictions.

TRAVIS AIR FORCE BASE
ENVIRONMENTAL RESTORATION PROGRAM
REMEDIAL PROGRAM MANAGER'S MEETING
Bldg 570, Large Conference Room
24 Sept 2008, 9:30 A.M.
AGENDA

1. ADMINISTRATIVE

- A. PREVIOUS MEETING MINUTES
- B. ACTION ITEM REVIEW
- C. MEETING DATES AND MASTER DOCUMENT SCHEDULE REVIEW

2. CURRENT PROJECTS

- A. TREATMENT PLANT OPERATION AND MAINTENANCE UPDATE
- B. PETROLEUM ONLY CONTAMINATION (POCO) STATUS
- C. CAMU MONITORING AND MAINTENANCE REPORT (FINAL)
- D. 5 YEAR REVIEW STATUS
- E. VAPOR INTRUSION ASSESSMENT STATUS
- F. SOIL REMEDIAL ACTION REPORT STATUS
- G. NGWTP OPTIMIZATION MEMORANDUM (FINAL)

3. NEW ACTION ITEM REVIEW

4. PROGRAM/ISSUES/UPDATE

- A. FUTURE PLANNING
 - (1). SOIL/SEDIMENT RA'S
 - (2). GROUNDWATER

Travis AFB Master Meeting and Document Schedule

Annual Meeting and Teleconference Schedule

Suppliers Teleconference (8:30 a.m. - 10:00 a.m.)	Monthly RPM Meeting (Begins at 9:30 a.m.)	RPM Teleconference (Begins at 9:30 a.m.)	Restoration Advisory Board Meeting (Begins at 7:00 p.m.) (Poster Session at 6:30 p.m.)
1-22-08	1-23-08	1-7-08*	—
2-26-08	2-27-08	2-4-08	—
3-18-08	3-19-08 #	—	—
4-22-08	4-23-08	4-7-08	4-24-08
5-20-08	5-21-08 ##	5-5-08	—
6-17-08	6-18-08	—	—
7-29-08	7-30-08	—	—
8-26-08	8-27-08	8-13-08	—
9-23-08	9-24-08	—	—
10-21-08	10-22-08	10-6-08	10-23-08
—	—	11-10-08	—
12-09-08	12-10-08	—	—

*During the 7 Jan teleconference an additional meeting with EPA was scheduled for 9-10 Jan to discuss past GSAP issues in preparation for moving ahead with the current GSAP and the upcoming Groundwater Performance Based Contract (PBC).

**Holiday Weekend

Teleconference for the 3/19/08 meeting at **0800**

The 21 May Remedial Program Manager's Meeting was cancelled.

Travis AFB Master Document Schedule
(continued)

	PRIMARY DOCUMENTS			
	Basewide Travis, Glenn Anderson	Potrero Hills Annex Travis, Glenn Anderson	Five Year Review Travis, Glenn Anderson	Soil Remedial Action Report Travis, Glenn Anderson
Life Cycle	Groundwater ROD	Potrero Hills ROD		FT003, FT004, LF007E, SD045
Scoping Meeting	1-24-07	180 days after Water Board Order Rescinded	01-23-08	NA
Predraft to AF/Service Center	2-01-09	+ 360 days	03-11-08	01-29-08
AF/Service Center Comments Due	4-01-09	+ 420 days	03-26-08	02-13-08
Draft to Agencies	6-15-09	+ 480 days	04-10-08	05-09-08
Draft to RAB	6-15-09	+ 480 days	04-10-08	05-09-08
Agency Comments Due	8-15-09	+ 540 days	06-11-08	07-11-08
Response to Comments Meeting	9-01-09	+ 555 days	07-30-08 08-04-08	09-17-08
Agency Concurrence with Remedy	9-15-09	+ 570 days	NA	NA
Draft Proposed Plan to Agencies	12-01-09	+ 600 days	NA	NA
Issue Proposed Plan	1-15-10	+ 615 days	NA	NA
Public Comment Period	1-15-10 to 2-15-10	+ 615 to 645 days	NA	NA
Public Meeting	1-28-10	+ 625 days	NA	NA
Response to Comments Due	3-01-10	+ 640 days	09-16-08	09-17-08
Draft Final Due	3-01-10	+ 640 days	09-16-08	09-17-08
Final Due	5-01-10	+ 700 days	09-30-08	09-30-08

Travis AFB Master Document Schedule
(Continued)

SECONDARY DOCUMENTS	
Life Cycle	POCO Evaluation of Monitored Natural Attenuation Travis, Lonnie Duke; CH2M Hill, Mike Wray
Scoping Meeting	NA
Predraft to AF/Service Center	05-23-08
AF/Service Center Comments Due	06-06-08
Draft to Agencies	06-20-08
Draft to RAB	06-20-08
Agency Comments Due	07-18-08
Response to Comments Meeting	08-01-08 NA
Response to Comments Due	08-22-08 NA
Draft Final Due	NA
Final Due	08-22-08 (8-14-08 Actual)
Public Comment Period	NA
Public Meeting	NA

Travis AFB Master Document Schedule
(Continued)

INFORMATIONAL DOCUMENTS		
Life Cycle	Quarterly Newsletters (Oct 2008) Travis, Mark Smith	CAMU Monitoring & Maintenance Report Travis, Lonnie Duke
Scoping Meeting	NA	NA
Predraft to AF/Service Center	NA	08-15-08
AF/Service Center Comments Due	NA	08-30-08
Draft to Agencies	09-15-2008	NA
Draft to RAB	NA	NA
Agency Comments Due	10-06-2008	NA
Response to Comments Meeting	TBD	NA
Response to Comments Due	10-08-2008	NA
Draft Final Due	TBD	NA
Final Due	10-14-2008	09-12-08
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Document Schedule
(Continued)

HISTORICAL DOCUMENTS	
Life Cycle	GW ROD Support Vapor Intrusion Screening Level Assessment Travis, Glenn Anderson; CH2M Hill, Mike Wray
Scoping Meeting	NA
Predraft to AF/Service Center	01-18-08
AF/Service Center Comments Due	02-08-07
Draft to Agencies	02-15-08
Draft to RAB	02-15-08
Agency Comments Due	03-14-08 *
Response to Comments Meeting	04-23-08
Response to Comments Due	06-12-08
Draft Final Due	NA
Final Due	06-12-08
Public Comment Period	NA
Public Meeting	NA

* received comments on 4/14/08

South Base Boundary Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 97

Reporting Period: 1 – 31 August 2008

Date Submitted: 16 September 2008

This data sheet includes the following: results for the operation of the South Base Boundary Groundwater Treatment Plant (SBBGWTP); a summary of flow rates for the individual extraction wells; a brief description of any shutdowns or significant events related to the system; and a summary of analytical results for selected samples collected.

Operations Summary – August 2008

Operating Time: **712.5 hours**

Percent Uptime: 95.8%

Electrical Power Usage: 16,224 kWh

Gallons Treated: **3.5 million gallons**

Gallons Treated Since July 1998: **619 million gallons**

Volume Discharged to Union Creek: **3.5 million gallons**

Volume Used for Dust Suppression: **0 gallons**

VOC Mass Removed: **2.1 pounds^a**

VOC Mass Removed Since July 1998: **343.8 pounds**

Rolling 12-Month Cost per Pound of Mass Removed: \$3,629^b

Monthly Cost per Pound of Mass Removed: \$3,192^b

^a Calculated using August 2008 EPA Method SW8260B analytical results.

^b Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system. High costs are due to low influent concentrations.

Flow Rates

Average Groundwater Total Flow Rate: 82.8^a

Average Flow Rate (gpm) ^b							
FT005				SS029		SS030	
EW01x05	1.7	EW736x05	2.9	EW01x29	6.1	EW01x30	4.5
EW02x05	2.8	EW737x05	Off line ^c	EW02x29	9.8	EW02x30	1.4
EW03x05	4.0	EW742x05	Off line ^c	EW03x29	Off line ^d	EW03x30	Off line ^d
EW731x05	Off line ^c	EW743x05	Off line ^c	EW04x29	10.3	EW04x30	19.1
EW732x05	Off line ^c	EW744x05	Off line ^c	EW05x29	3.4	EW05x30	5.5
EW733x05	Off line ^c	EW745x05	Off line ^c	EW06x29	7.6	EW06x30	0.0 ^e
EW734x05	0.0 ^e	EW746x05	Off line ^c	EW07x29	6.5	EW711x30	3.6
EW735x05	3.3						
FT005 Total:			14.7	SS029 Total:		43.7	SS030 Total: 34.1

^a The average groundwater flow rate was calculated using the Union Creek Discharge Totalizer and dividing it by the operating time of the plant.

^b Average extraction well flow rates measured by each extraction well totalizer divided by the well’s operating time.

^c Extraction well was shutdown for a one-year rebound study in December 2007 based on the *Work Plan for RPO Actions at Sites SD031, FT004, and FT005* (CH2M HILL, 2007).

^d Extraction well was off line due to low VOC concentrations.

^e Extraction well was not operational during August 2008.

gpm—gallons per minute

Shutdown/Restart Summary

Location	Shutdown		Restart		Cause
	Date	Time	Date	Time	
SBBGWTP (water)	3 August 2008	09:00	4 August 2008	14:30	High pressure alarm at the air stripper
SBBGWTP = South Base Boundary Groundwater Treatment Plant					

Summary of O&M Activities

Monthly groundwater sampling at the SBBGWTP was performed on 1 August 2008. Sample results are presented in Table 1. The total VOC concentration (69.8 µg/L) in the influent sample has decreased slightly since the July 2008 sample (77.4 µg/L). The total influent VOC concentrations have generally remained steady during recent quarters. 1,2-DCA, the indicator chemical for Site FT005, was detected at a concentration of 0.36 µg/L in the influent sample.

On 3 August 2008, the treatment system was shut down due to a high pressure alarm at the air stripper. The blower back pressure reading prior to shut down on 31 July was 17 inches of H₂O. On 4 August, the air stripper was acid washed. After restarting the system, the blow back pressure was 16 inches of H₂O.

Optimization Activities

On 4 December 2007, nine extraction wells (EW731x05, EW732x05, EW733x05, EW737x05, and EW742x05 through EW746x05) were shut down for rebound testing in accordance with the *Work Plan for Remedial Process Optimization (RPO) Actions at Sites SD031, FT004, and FT005* (CH2M HILL, 2007). These extraction wells will remain off-line for one year. These extraction wells will remain off-line for one year. These wells were sampled in May 2008 as part of the annual GSAP event. At the end of the rebound period (Fourth Quarter 2008), the groundwater extraction wells will be sampled to assess rebound and plume stability. No other optimization activities were conducted in August 2008.

Table 1

Summary of Groundwater Analytical Data for August 2008 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum ^a (µg/L)	Detection Limit (µg/L)	N/C	1 August 2008 (µg/L)	
				Influent	Effluent
Halogenated Volatile Organics					
Bromodichloromethane	5.0	0.17	0	ND	ND
Carbon Tetrachloride	0.5	0.19	0	ND	ND
Chloroform	5.0	0.16	0	ND	ND
Dibromochloromethane	5.0	0.17	0	ND	ND
1,1-Dichloroethane	5.0	0.16	0	ND	ND
1,2-Dichloroethane	0.5	0.13	0	0.36 J	ND
1,1-Dichloroethene	5.0	0.14	0	0.40 J	0.21 J
cis-1,2-Dichloroethene	5.0	0.15	0	3.8	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND
Methylene Chloride	5.0	0.32	0	ND	0.56 J
Tetrachloroethene	5.0	0.20	0	ND	ND
1,1,1-Trichloroethane	5.0	0.16	0	ND	ND
1,1,2-Trichloroethane	5.0	0.32	0	ND	ND
Trichloroethene	5.0	0.16 – 0.32	0	64	ND
Vinyl Chloride	0.5	0.40	0	ND	ND
Non-Halogenated Volatile Organics					
Benzene	1.0	0.16	0	ND	ND
Ethylbenzene	5.0	0.16	0	ND	ND
Toluene	5.0	0.17	0	ND	ND
Xylenes	5.0	0.19 – 0.34	0	ND	ND
Other					
Total Petroleum Hydrocarbons – Gasoline	50	4.9	0	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	33	0	NM	ND
Total Suspended Solids (mg/L)	NE	1.1	0	1.2 J	NM

^a In accordance with Appendix B of the *Travis AFB South Base Boundary Groundwater Treatment Plant Operations and Maintenance Manual* (CH2M HILL, 2004).
J = analyte concentration is considered an estimated value
mg/L = milligrams per liter
N/C = number of samples out of compliance with discharge limits
ND = not detected
NE = not established
NM = not measured
µg/L = micrograms per liter

Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 109

Reporting Period: 1 – 31 August 2008

Date Submitted: 16 September 2008

This data sheet includes the following: results for the operation of the Central Groundwater Treatment Plant (CGWTP), West Treatment and Transfer Plant (WTTP), and thermal oxidation (ThOx) system (previously referred to as the two-phase extraction [TPE] system); a summary of flow rates for the CGWTP, WTTP, ThOx, and extraction wells EW01x16, EW02x16, EW03x16, EW605x16, and EW610x16; a brief description of any shutdowns or significant events related to the systems; and a summary of analytical results for selected samples collected.

Operations Summary – August 2008

Operating Time:

CGWTP: 621 hours

WTTP: Water: 621 hours

Vapor: 621 hours

ThOx: 616 hours

Percent Uptime:

CGWTP: 83.5%

WTTP: Water: 83.5%

Vapor: 83.5%

ThOx: 82.8%

Electrical Power Usage:

CGWTP: 6,220 kWh

WTTP: 13,797 kWh

ThOx: 11,460 kWh

ThOx: Natural Gas Usage: 2,702 therms

Gallons Treated: **2.4 million gallons**

Gallons Treated Since January 1996: **389.6 million gallons**

VOC Mass Removed:

10.6 lbs (groundwater only)^a

24.1 lbs (vapor only)^b

VOC Mass Removed Since January 1996:

2,366 lbs from groundwater

8,549 lbs from vapor

UV/Ox DRE: 99.0 %

ThOx DRE: 99.8 %

Rolling 12-Month Cost per Pound of Mass Removed: \$542^c

Monthly Cost per Pound of Mass Removed: \$490^c

^a Calculated using August 2008 EPA Method SW8260B analytical results.

^b Total VOC vapor mass removed was calculated using June 2008 EPA Method TO-14 analytical results for the WTTP system, WTTP extraction wells, and the ThOx system.

^c Costs include operations and maintenance, reporting, analytical laboratory, project management, and electric and natural gas costs related to operation of the system. Natural gas costs are included for the first time.

DRE = destruction removal efficiency

UV/Ox = ultraviolet oxidation

Flow Rates

Average Groundwater Flow Rate: **63.8 gpm^a**

Location	Average Flow Rate	
	Groundwater (gpm) ^b	Soil Vapor (scfm)
EW01x16	21.1	NA
EW02x16	4.1 ^c	NA
EW03x16	0.22	NA ^d
EW605x16	12.2	NA ^d
EW610x16	3.1	NA ^d
WTTP	24.9 ^e	132
ThOx	< 0.1 ^e	56.4

^a as measured by the effluent discharge to the storm drain divided by the operating time.

^b as measured by extraction well totalizer divided by the operating time.

^c EW02x16 was restarted on 22 July 2008 after the pump motor was replaced.

^d soil vapor was extracted from the well; however, the flow rates are not measured.

^e as measured by the effluent groundwater pumped to the CGWTP divided by the operating time.

gpm = gallons per minute

NA = not applicable/not available

scfm = standard cubic feet per minute

Flow Rates

Flow Rate from the WIOU, DP039, and LF008 Extraction Wells on August 29, 2008 (gpm)							
SD037/ SD043				SD033/SD034/ DP039		LF008/SD036	
EW599x37	5.1	EW705x37	2.2	EW501x33	9.1	EW719x08	3.3
EW700x37	4.5	EW706x37	0.7	EW503x33	0.0 ^a	EW720x08	3.0
EW701x37	1.4	EW707x37	0.8	EW01x34	0.4	EW721x08	1.2
EW702x37	2.7	EW510x37	4.4	EW02x34	0.0 ^a	EW593x36	2.9
EW703x37	1.9	EW511x37	1.6	EW563x39	1.0	EW594x36	1.6
EW704x37	0.9	EW555x43	2.2	EW782x39	1.7	EW595x36	6.6
gpm—gallons per minute							
^a Flow meter malfunctions and may need to be repaired/replaced.							

Shutdown/Restart Summary

Location	Shutdown		Restart		Cause
	Date	Time	Date	Time	
CGWTP (Groundwater):					
CGWTP	4 August 2008	17:15	5 August 2008	14:30	Hydrogen peroxide low flow alarm
CGWTP	13 August 2008	16:30	14 August 2008	13:00	Tank level sensor fault
CGWTP	17 August 2008	13:00	18 August 2008	10:00	Tank level sensor fault
CGWTP	22 August 2008	16:00	25 August 2008	09:00	Tank level sensor fault
WTTP (Groundwater and Vapor):					
WTTP	4 August 2008	17:15	5 August 2008	14:30	CGWTP was off line
WTTP	13 August 2008	16:30	14 August 2008	13:00	CGWTP was off line
WTTP	17 August 2008	13:00	18 August 2008	10:00	CGWTP was off line
WTTP	22 August 2008	16:00	25 August 2008	09:00	CGWTP was off line
ThOx (vapor):					
ThOx	4 August 2008	05:00	4 August 2008	10:00	Low natural gas pressure.
ThOx	4 August 2008	17:15	5 August 2008	14:30	CGWTP was off line
ThOx	13 August 2008	16:30	14 August 2008	13:00	CGWTP was off line
ThOx	17 August 2008	13:00	18 August 2008	10:00	CGWTP was off line
ThOx	22 August 2008	16:00	25 August 2008	09:00	CGWTP was off line
CGWTP = Central Groundwater Treatment Plant ThOx = Thermal Oxidation System WTTP = West Treatment and Transfer Plant					

Summary of O&M Activities

Monthly groundwater samples were collected at the CGWTP on 1 August 2008. Groundwater sample results are summarized in Table 1. The total VOC concentration (533.4 µg/L) in the August 2008 CGWTP influent groundwater sample has decreased since the July 2008 sampling (1,440 µg/L). However, VOC concentrations in June and July 2008 had been unusually high relative to historical results.

On 4 August 2008, vapor extraction from EW03x16, EW605x16, and EW610x16 was turned off for one month as part of an annual rebound test. Groundwater extraction at these wells continued.

The CGWTP was shut down several times in August 2008 due to elevated tank level sensor readings. The false readings were caused by high ambient temperatures (>100°F).

Optimization Activities

No optimization activities were conducted for August 2008.

Table 1

Summary of Groundwater Analytical Data for August 2008 – Central Groundwater Treatment Plant

				1 August 2008 (µg/L)					
				Influent	After UV/OX	After Carbon 1 Effluent	After Carbon 2 Effluent	After Carbon 3 Effluent	System Effluent
Constituent	Instantaneous Maximum ^a (µg/L)	Detection Limit (µg/L)	N/C						
Halogenated Volatile Organics									
Bromodichloromethane	5.0	0.17	0	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5	0.19	0	ND	ND	ND	ND	ND	ND
Chloroform	5.0	0.16	0	0.22 J	0.21 J	0.20 J	0.23 J	0.27 J	0.22 J
Dibromochloromethane	5.0	0.17	0	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5.0	0.13	0	0.36 J	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.16	0	0.32 J	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.16	0	0.22 J	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	0.16	0	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.13	0	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.14	0	1.1	ND	0.18 J	0.17 J	ND	ND
cis-1,2-Dichloroethene	5.0	0.15 – 1.5	0	97	0.58	0.56	0.48 J	0.76	0.61
trans-1,2-Dichloroethene	5.0	0.15	0	2.6	ND	ND	ND	ND	ND
Methylene Chloride	5.0	0.32	0	ND	ND	ND	ND	ND	0.57 J
Tetrachloroethene	5.0	0.20	0	0.77	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.16	0	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.32	0	ND	ND	ND	ND	ND	ND
Trichloroethene	5.0	0.16 – 1.6	0	430	4.5	4.4	3.3	1.1	0.80
Vinyl Chloride	0.5	0.40	0	0.85	ND	ND	ND	ND	ND
Non-Halogenated Volatile Organics									
Benzene	1.0	0.16	0	ND	ND	ND	ND	ND	ND
Ethylbenzene	5.0	0.16	0	ND	ND	ND	ND	ND	ND
Toluene	5.0	0.17	0	ND	ND	ND	ND	ND	ND
Total Xylenes	5.0	0.19 – 0.34	0	ND	ND	ND	ND	ND	ND

^a In accordance with Appendix G of the *Travis AFB Central Groundwater Treatment Plant Operations and Maintenance Manual* (URS Group, Inc., 2002).

J = analyte concentration is considered an estimated value

N/C = number of samples out of compliance with discharge limits

ND = not detected

µg/L = micrograms per liter

North Groundwater Treatment Plant Monthly Data Sheet

Report Number: 99

Reporting Period: 1 – 31 August 2008

Date Submitted: 16 September 2008

This data sheet includes the following: results for the operation of the groundwater extraction systems; a summary of flow rates for the individual extraction wells; a brief description of any shutdowns or significant events related to the systems; and a summary of analytical results for selected samples collected.

Operations Summary – August 2008

Operating Time: **Water:** 744 hours

Percent Uptime: **Water:** 100%

Electrical Power Usage: **7,278 kWh**

Gallons Treated: **0.55 million gallons**

Gallons Treated Since March 2000: **80.9 million gallons**

Volume Discharged to Duck Pond: **0.55 million gallons**

Volume Discharged to Storm Drain: **0 gallons**

Percentage of Treated Water to Beneficial Use: 100%

VOC Mass Removed:

VOC Mass Removed Since March 2000:

0.1 lbs (groundwater only)^a

173.9 lbs from groundwater

0 lbs (vapor only)^b

5,240 lbs from vapor^c

Rolling 12-Month Cost per Pound of Mass Removed: \$106,169^{de}

Monthly Cost per Pound of Mass Removed: \$12,780^d

^a Calculated using August 2008 EPA Method SW8260B analytical results.

^b The SVE system was shut down in December 2007 in accordance with the *Work Plan for Remedial Process Optimization (RPO) Actions at Sites SD031, FT004, and FT005* (CH2M HILL, 2007).

^c Cumulative total VOC vapor mass removed includes 4,860 pounds of petroleum hydrocarbon VOC mass removed and treated by a portable catalytic oxidizer system between 15 July and 17 September 2003.

^d Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system. High costs are due to low influent groundwater concentrations and low flow rates.

^e The rolling 12-month cost per pound of mass removed is calculated by the sum of the monthly cost over the past 12 months divided by the sum of pounds removed during the same period.

Flow Rates

Average Groundwater Total Flow Rate: **12.3 gpm^a**

Location	Groundwater Flow Rate on 29 August 2008 (gpm)
EW565x31	Off line ^b
EW566x31	Off line ^b
EW567x31	Off line ^b
EW576x04	1.9
EW577x04	2.1
EW578x04	Off line ^b
EW579x04	Off line ^b
EW580x04	Off line ^b
EW621x04	3.1
EW622x04	1.4 ^c
EW623x04	1.6 ^c
EW614x07	1.0 ^d
EW615x07	1.1 ^d

^a The flow rate was calculated using the effluent discharge totalizer divided by the operating time of the plant.

^b Extraction well was shutdown for a one-year rebound study in December 2007 based on the *Work Plan for RPO Actions at Sites SD031, FT004, and FT005* (CH2M HILL, 2007).

^c Extraction well was restarted on 5 August 2008 after a restriction in the eductor supply line was cleared.

^d LF007 extraction wells were turned on for the dry season on 30 April 2008.

gpm = gallons per minute

Shutdown/Restart Summary

Location	Shutdown		Restart		Cause
	Date	Time	Date	Time	
NGWTP (water)	NA	NA	NA	NA	No shutdowns during the month of August 2008
NA = not applicable NGWTP = North Groundwater Treatment Plant					

Summary of O&M Activities

Monthly groundwater sampling at the NGWTP was performed on 1 August 2008. Sample results are presented in Table 1. The total VOC concentration (18.4 µg/L) in the influent sample has increased since the July 2008 sample (8.5 µg/L). Several VOC constituents were detected in the influent sample. Although SD031 extraction wells were shut down, the indicator chemical for the site, 1,1-dichloroethene, was detected at a concentration of 0.21 J µg/L in the influent sample. VOCs were not detected in the effluent sample.

In July 2008, extraction wells EW622x04 and EW623x04 were off line due to low pressure and flow on the supply side of each well. In August 2008, EQM applied compressed air into the eductor supply line. The pressure inside the pipe reached 90 psi and then it dropped significantly to less than 20 psi. The supply lines were further flushed by the plant's supply pump. Sand and scale deposits were determined to be the cause of the clogging.

Optimization Activities

On 4 December 2007, the six extraction wells (EW565x31, EW566x31, EW567x31, EW578x04, EW579x04, and EW580x04) were shut down for rebound testing. These extraction wells will remain off-line for one year. These wells were sampled in May 2008 as part of the annual GSAP event. At the end of the rebound period (Fourth Quarter 2008), the groundwater extraction wells will be sampled to assess rebound and plume stability. No other optimization activities were conducted in August 2008.

Table 1

Summary of Groundwater Analytical Data for August 2008 – North Groundwater Treatment Plant

Constituent	Instantaneous Maximum ^a (µg/L)	Detection Limit (µg/L)	N/C	1 August 2008 (µg/L)	
				Influent	Effluent
Halogenated Volatile Organics					
Bromodichloromethane	5.0	0.17	0	1.2	ND
Bromoform	5.0	0.19	0	0.41 J	ND
Carbon Tetrachloride	0.5	0.19	0	ND	ND
Chloroform	5.0	0.16	0	3.3	ND
Dibromochloromethane	5.0	0.17	0	0.64	ND
1,1-Dichloroethane	5.0	0.16	0	ND	ND
1,2-Dichloroethane	0.5	0.13	0	ND	ND
1,1-Dichloroethene	5.0	0.14	0	0.21 J	ND
cis-1,2-Dichloroethene	5.0	0.15	0	0.25 J	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND
Methylene Chloride	5.0	0.32	0	0.34 J	ND
Tetrachloroethene	5.0	0.20	0	ND	ND
1,1,1-Trichloroethane	5.0	0.16	0	ND	ND
1,1,2-Trichloroethane	5.0	0.32	0	ND	ND
Trichloroethene	5.0	0.16	0	12	ND
Vinyl Chloride	0.5	0.40	0	ND	ND
Non-Halogenated Volatile Organics					
Benzene	1.0	0.16	0	ND	ND
Ethylbenzene	5.0	0.16	0	ND	ND
Toluene	5.0	0.17	0	ND	ND
Xylenes	5.0	0.19 – 0.34	0	ND	ND
Other					
Total Petroleum Hydrocarbons – Gasoline	50	4.9	0	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	32	0	NM	ND

^a In accordance with Appendix G of the *Travis AFB North Groundwater Treatment Plant Operations and Maintenance Manual*, Sites FT004, SD031, and LF007 Area C (URS Group, Inc., 2005).

N/C = number of samples out of compliance with discharge limits

ND = not detected

NM = not measured

µg/L = micrograms per liter

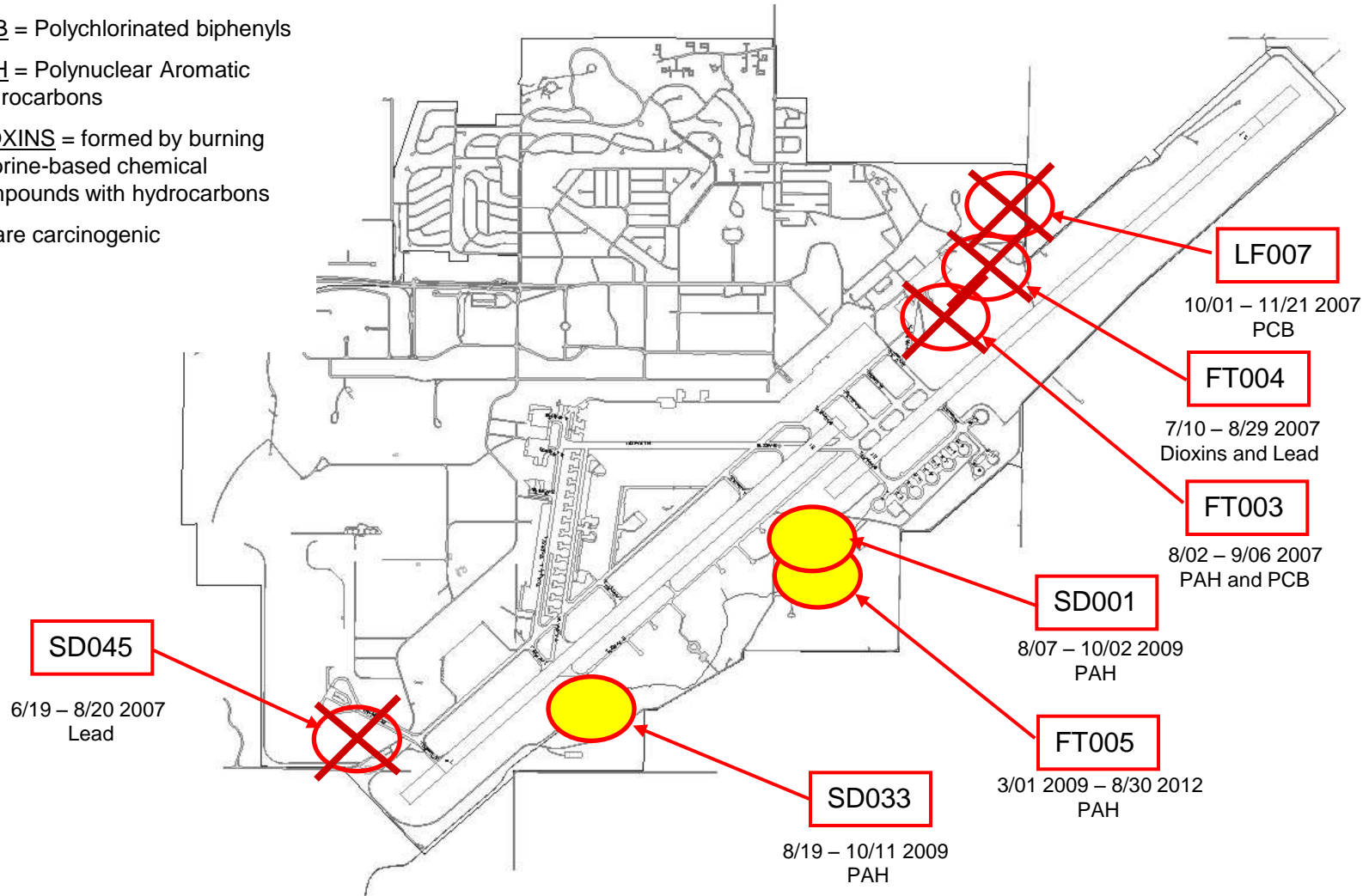
Remaining Soil Sites

PCB = Polychlorinated biphenyls

PAH = Polynuclear Aromatic Hydrocarbons

DIOXINS = formed by burning chlorine-based chemical compounds with hydrocarbons

All are carcinogenic



ITSI

- Rachel Hess – Project Manager
- Jeff Hess – Technical Support
- Chuck Clyde – Site Superintendent
- Steve Crane – Program Manager
- John England – Risk Manager
- Rich Purdue – Lead Engineer

Objectives

Promote Team Effort (Agencies, Travis, USACE, ITSI & CH2M HILL) to complete Soil and Sediment Actions at the three remaining NEWIOU Sites.

Install Final Remedies for Sediment Sites SD001, SD033 and Soil Site FT005

Continue CAMU Monitoring and Maintenance

Transport and Disposal of LF007 Grubbing Pile

Reduce Life-Cycle Costs

Remaining Groundwater Sites

Objectives

Promote Team Effort (Agencies, Travis, USACE, ITSI & CH2M HILL) to Accomplish Groundwater Goals while Reducing the Risk to HH and Environment

Continual Optimization of Treatment Systems & Monitoring Network

Install Final Remedies for 23 Groundwater Sites

Reduce the Carbon Footprint of the Cleanup Program

Reduce Life-Cycle Costs

Goals

Update CSMs and Additional Site Characterization

Focused Feasibility Study by September 2009

Basewide Groundwater ROD by September 2010

Install final remedies for 23 sites by September 2012

Travis Team

- Travis AFB
 - Mark Smith – RPM
 - Glenn Anderson – PM
 - Lonnie Duke – PM
- USACE – Omaha District
 - Dezso Linbrunner – PM
 - Jennifer Musilek – Quality Assurance, Geology
 - Kimberly Witt – Quality Assurance, Chemistry
- Regulatory Agencies
 - USEPA – James Chang
 - RWQCB – Alan Friedman
 - DTSC – Jose Salcedo
- CH2M HILL

CH2M HILL

- Mike Wray – PM (10 years at Travis AFB)
- Chuck Elliott, P.G. – Technical Dir. (15 yrs at Travis AFB)
- Doug Downey & Gerald Vogt – Sr Advisors
- Loren Krook, P.E. – Focused FSs (15 yrs at Travis AFB)
- Leslie Royer, P.G., CH – GSAP Mgr (11 yrs at Travis AFB)
- Doug Berwick, P.E./Chris Goodrich – RA-O
- Tony Jaegel, P.E. – Regulatory Specialist
- Brad Shearer, P.E. – Technology Mgr
- Gavan Heinrich, P.G. – Site Characterization Mgr
- Mark Fesler – Chemistry Mgr.

Workload and Way Forward

Various **tools** can be utilized to enhance communication, encourage teamwork, provide for efficient and effective document reviews and foster trust:

1. **Triad** – Systematic planning, dynamic work strategies, and real-time measurement technologies – which requires on site communications and decisions, work plan presentations, data posting and working RPM meetings.
2. **Live meetings** (computer/phone)
3. **Website** (data and document posting/sharing)
4. **FTP Site** (file sharing)
5. **RPO** – Process for ongoing evaluation of remediation systems and monitoring systems to optimize remedy efficiency. (Continued treatment with consideration for energy usage and reducing redundant or unnecessary actions while still achieving the design objectives.)
6. **Enhanced Attenuation** – Attack source areas of groundwater plumes using in-situ technologies.
7. **Monthly RPM Meetings** – Transition from status updates to supporting triad through increased discussion/presentations of work plans, data results, etc.



TRAVIS RESTORATION ERP SITE TIMELINE

Remedial Investigations

ST009 (Closed)
RW012 (Closed)
OT019 (Closed)
ST021 (Closed)
ST022 (Closed)

FT003 C
SD045 C
LF007 R-Soil

SD001 C
FT005 R - Soil
SD033 R - Soil

Potrero Hills LUC ROD

DS020
WP023
WP024

SS016 R
SD036 R
SD037 R
DP039 R

RIP after RD/RA-C
IAW GW ROD/RODs

FT004 R
FT005 R
LF006 C
LF007 R
LF008 R
SS015 R
SS029 R
SS030 R
SD031 R
ST032 R
SD033 R
SD034 R
SS035 R
SS041 C
SD043 R

FT002 C
OT010 C
OT011 (inc in LF007)
WP017 C

RW013 (Closed)

WABOU RA's

SD042 (Closed)

LF044 (RIP LUC)
SS046 (RIP LUC)

SD041 (NFRAP)

WABOU ROD
Signed 12/2002

NEWIOU ROD
Signed 5/2006

GW
ROD

RIP and/or Site Closure
by Groundwater ROD/RODs

C=Close
R=RIP

SEPT 2008

Groundwater Interim RIP provided by:
NEWIOU GW IROD in 1997
WABOU GW IROD in 1999

PBC Award
takes
Remaining
Sites to RIP


POCO Sites SS014, ST018, ST027 and ST028
Excluded from CERCLA and GW ROD/s
PBC in place FY06 - FY10 to RIP

LUC Sites: SS015, SS016, ST032, SD033, SD037,
DP039, SD043, LF044 and SS046

Overall Strategy

Travis AFB
Environmental Restoration Program
Implementation Strategy


Strategy Discussion

- ▶ What we've accomplished so far
 - ▶ IROD objectives
 - ▶ Where are we heading?
 - ▶ How do we get there?
 - ▶ Regional approaches
- 


We've Accomplished A Lot

- ▶ Groundwater IROD for the NEWIOU (1998)
- ▶ Groundwater IROD for the WABOU (1999)
- ▶ Two Five-Year Reviews (2003 and 2008)
- ▶ GET installed at 13 sites (capture from 18 sites)
 - CGWTP: 2,366 lbs VOCs removed to date
 - NGWTP: 173.9 lbs
 - SBBGWTP: 343.8 lbs


We've Accomplished A Lot

- ▶ SVE installed at 7 sites
 - CGWTP: 8,549 lbs (includes WTTP)
 - NGWTP: 5,240 lbs
 - ▶ I.e., a total of over 16,670 lbs of VOC mass removed
 - ▶ Ongoing MNA assessments at 9 sites
 - Migration control via MNA achieved at all but one site (DP039 central plume area)
 - Declining VOC concentrations at all but one site (DP039)
- 


IROD Objectives

- ▶ Source Control at 10 sites
 - ▶ Migration Control at 15 sites
 - ▶ Off-base Remediation at 3 sites
 - ▶ Second Five-Year Review concludes that these objectives are being met at all but 3 sites
 - Site LF007C: off-base contamination may not be captured
 - Site SS030: off-base contamination may not be captured
 - Site DP039: contaminant migration likely in the central portion of the plume
- 


Where Do We Go From Here?

- ▶ Feasibility Study (2009)
 - ▶ Basewide Groundwater ROD (2010)
 - ▶ Final remedies installed and operating basewide (2012)
 - ▶ After that?
 - O&M
 - Groundwater monitoring
- 

How Do We Get There?

- ▶ Action Plan
 - ▶ Quality Assurance Project Plan (QAPP) update
 - ▶ Basewide Health and Safety Plan update
 - ▶ Enhancements of existing remedies (more on this in a minute)
 - ▶ Ongoing O&M of existing remedies (continue to use RPO process)
 - ▶ Ongoing GSAP
- 

How Do We Get There?


- ▶ Natural Attenuation Assessment Report (NAAR)—how has MNA worked so far?
 - ▶ *Focused* FS (evaluate a limited range of alternatives)
- 

Remedy Enhancements


- ▶ Recommend immediate implementation
 - Simplify the FS and ROD process
 - Bias toward action
 - More time to perfect them
- ▶ Don't change existing remedies, supplement and improve them

Regional Approach


North Area

- ▶ Investigate off-base contamination at LF007C
 - ▶ Expand LF007C GET as needed (use solar energy)
 - ▶ Complete rebound study at FT004 and SD031, make any needed modifications to GET
 - ▶ Assess historical performance of MNA at FT004, SD031, LF006, LF007B, and LF007D during the interim period
 - ▶ Select MNA and GET in the FS/PP/ROD
- 


South Area

- ▶ Investigate off-base contamination at SS030
 - ▶ Expand SS030 GET as needed
 - ▶ Complete rebound study at FT005, make any needed modifications to GET
 - ▶ Select GET in the FS/PP/ROD at Sites FT005, SS029, and SS030
- 


Central Area

- ▶ Optimize the CGWTP
 - Replace Thermal Ox unit with VGAC (save energy and reduce carbon footprint)
 - Shut down the Ultraviolet Oxidation unit and use LGAC (save energy, etc.)
 - ▶ Implement ERD (inject emulsified oil) in the OSA source area at Site 16
 - ▶ Continue GET in the remainder of Site 16
 - ▶ Continue to capture and treat downgradient groundwater contamination at Site SS029
- 

Central Area, cont'd

- ▶ Move ST032 to the POCO program (no longer contains chlorinated VOCs) and document in the ROD
 - ▶ Perform an MNA assessment and complete a POCO Tier 1 Evaluation
 - ▶ Select MNA to address residual fuels contamination and perform groundwater monitoring under POCO
- 


Central Area, cont'd

- ▶ Implement MNA in ST027—Area A (fuels-contaminated area) under the POCO program
 - ▶ Investigate the extent of the newly-discovered TCE contamination at ST027—Area B
 - ▶ Select source area ERD remedy (edible oil injection) in the FS/PP/ROD for ST027 Area B
- 


Central Area, cont'd

- ▶ Assess performance of MNA at SS015 during the interim period
- ▶ Select MNA at SS015 in the FS/PP/ROD


WIOU Area

- ▶ Implement ERD in SD036 and SD037 hot spots via edible oil injection
 - ▶ Continue GET/SVE at SD033, SD034, SD036, and SD037
 - ▶ Continue Stoddard Solvent floating product removal at SD034
- 


WIOU Area, cont'd

- ▶ Assess MNA performance during the interim period at downgradient SD033 and SD037 (report in the NAAR)
 - ▶ Select MNA in the FS/PP/ROD
- 


Site LF008

- ▶ Perform rebound study
 - ▶ Continue/modify/shut down GET as indicated
 - ▶ Assess MNA as final remedy
- 

POCO Sites

- ▶ Investigate/confirm extent of fuels contamination at SS014 and complete Tier 1 POCO Evaluation
 - ▶ Assess suitability of MNA at SS014, and implement MNA at SS014, ST027 Area A, and ST028
 - ▶ Install GET system at ST018 to address MTBE
- 

Site DP039

- ▶ Install bioreactor in DP039 source area as an AFCEE tech demo project (more to follow)
 - ▶ Continue GET/SVE in the remainder of the source area
 - ▶ Install a biobarrier via emulsified oil injection downgradient from the phytoremediation area
 - ▶ Assess historical MNA performance in the downgradient part of the plume
- 

New 2008 Documents for Review

- ▶ QAPP Update – 27 Nov (P)
- ▶ Action Plan – 08 Dec (S)
- ▶ HSP Update – 27 Nov (P)
- ▶ ESD – 03 Nov (P)
- ▶ Site ST027 Plume Delineation WP – 01 Dec (S)
- ▶ Site ST032 POCO Tech Memo – 01 Dec (S)
- ▶ NAAR (North & West areas) – 08 Dec (S)
- ▶ Site LF007C Plume Delineation WP – 15 Dec (P)
- ▶ Site LF008 Rebound Study WP – 03 Nov (S)
- ▶ Site ST018 POCO RA WP – 08 Dec (S)

P = Primary Document

S = Secondary Document



Site DP039 Bioreactor Demonstration Project

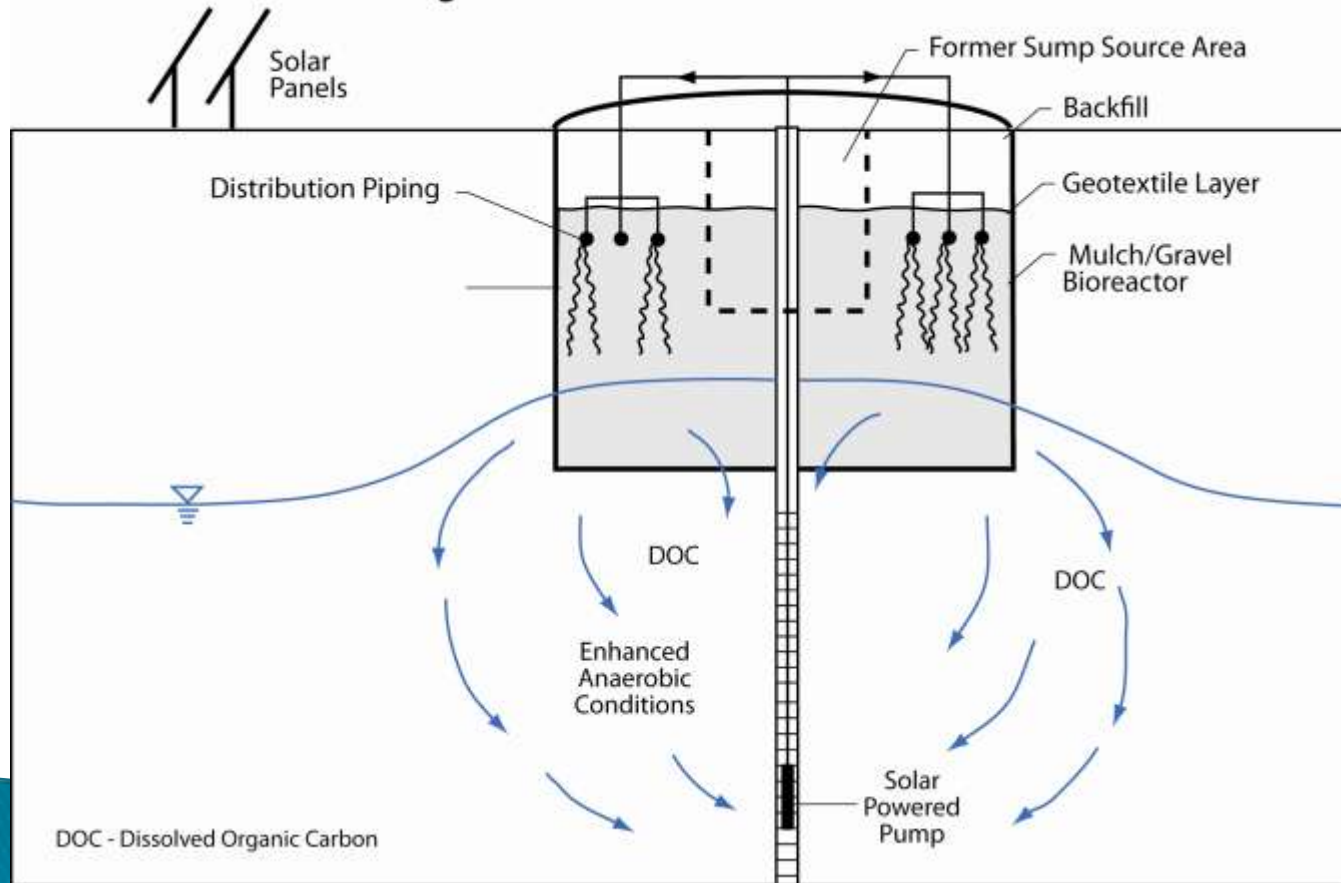
Travis AFB
Environmental Restoration Program
Implementation Strategy




Bioreactor Overview

- ▶ Travis AFB was selected for an AFCEE/TD technology demonstration contract for sustainable in situ bioreactors
- ▶ Two-year contract for installation and initial 18-months of monitoring (additional LTM under Travis program)
- ▶ Travis AFB is the first choice for this application
- ▶ Rapid approval is required to allow bioreactor construction in Nov 08
- ▶ Propose a simple remedial action work plan be prepared for approval

Figure 1 - In Situ Bioreactor Cross Section



DP39 Bioreactor Objectives

- ▶ Enhance reductive dechlorination (ERD) of TCE and all CVOCs in the DP039 source area
 - ▶ Reduce the timeframe that groundwater extraction is required in the source area
 - ▶ Demonstrate reliability of solar-powered pumps for recirculating source area groundwater through the bioreactor
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Monitoring Plan

- ▶ Establish 6 to 8 additional discrete interval monitoring wells in DP039 source area to document organic carbon distribution and VOC reductions at various depths
- ▶ Turn off source area wells Oct–Nov 08 to collect more accurate baseline data with VOCs closer to equilibrium
- ▶ Evaluate key ERD parameters such as DOC, ORP, TCE and daughter product degradation, dehalococcoides populations
- ▶ Semi-annual monitoring through Sept 2010

Schedule

- ▶ Contract Award – 30 Sept 08
 - ▶ Demonstration Work Plan Complete – 17 Oct 08
 - ▶ Work Plan Approval – 4 Nov 08
 - ▶ Baseline Monitoring of GW – Nov 08
 - ▶ Construction of Bioreactor – Nov – Dec 08
 - ▶ First Performance Monitoring – Mar 09
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