Final

Travis Air Force Base
Environmental Management
Building 570, Travis AFB, California
Environmental Restoration Program
Remedial Program Manager's
Meeting Minutes

22 April 2009, 0930 Hours

Mr. Mark Smith, Travis Air Force Base (AFB), conducted the Remedial Program Manager's (RPM) meeting on 22 April 2009 at 0930 in the Base Civil Engineer's Conference Room, Building 570, Travis AFB, California. Attendees included:

• Glenn Anderson	Travis AFB
• Lonnie Duke	Travis AFB
• Mark Smith	Travis AFB
• James Chang	U.S. Environmental Protection Agency (USEPA)
• Alan Friedman	California Regional Water Quality Control Board (CRWQCB) (via teleconference)
• Jose Salcedo	Department of Toxic Substances Control (DTSC)
• Dezso Linbrunner	USACE, Omaha District
• Mike Wray	CH2M HILL
• Leslie Royer	CH2M HILL
• Rachel Hess	ITSI

Handouts distributed at the meeting and presentations included:

• Attachment 1	Meeting Agenda
• Attachment 2	Master Meeting, Teleconference, and Document Schedules
• Attachment 3	SBBGWTP Monthly Data Sheet (March 2009)
• Attachment 4	CGWTP Monthly Data Sheet (March 2009)
• Attachment 5	Presentation: Passive Diffusion Bag Sampling Methodology
• Attachment 6	Presentation: Program Update

1. ADMINISTRATIVE

A. Start Teleconference Line for CRWQCB, Alan Friedman

B. Previous Meeting Minutes

The 25 March 2009 RPM meeting minutes were approved and finalized with a few changes:

Page 1, add text ‘presentation’ to Attachments 6, 7, and 8

Page 3, add ‘ed’ to Focus (fourth bullet) and change ‘to’ to ‘in’ in the following paragraph.

Page 4, remove ‘addendum’ from first bullet; and some text changes to second paragraph.

Page 5, remove statement ‘no lamps were out’ in Central GWTP paragraph.

Page 6, Section B, correct title and text to ’ST027B.’

C. Action Item Review

Action Items from March were reviewed.

Action items one and two are still open.

Action item three is to be determined pending the field work schedule. Possible date is August 2009.

Action items four and five are closed.

Other potential site visit would be for the work at the phytoremediation site in July or September. If possible, it would be good to coordinate a visit to overlap with the visit of the sediment sites, especially for the RAB members. However, excavation is the most important, and visits are secondary.

D. Master Meeting and Document Schedule Review

The Travis AFB Master Meeting, Teleconference, and Document Schedules were discussed during this meeting (see Attachment 2).

Travis AFB Annual Meeting and Teleconference Schedule

— The next RPM meeting will be 20 May 2009. Mr. Linbrunner cannot attend however someone from his office (Ms Muselik or Ms Witt) will be in attendance. Mr. Linbrunner added that USACE oversight of the GSAP sampling would be occurring at the same time as the next RPM meeting.

The Corps has been tasked with oversight by the Air Force to ensure all parties are protected.

Travis AFB Master Document Schedule

— Basewide GW ROD: Dates have been updated based on Focused Feasibility Study dates.

— Potrero Hills Annex ROD: No change.

Mr. Chang commented on an email he sent to TAFB, suggestions to keep everyone informed on Potrero Hills. Mr. Anderson agreed and will notify the Potrero Hills contractor to ensure all agencies have been placed back on their distribution list.

— RD/RA QAPP Update: Responses to EPAs comments are being drafted. The comment on the Model QAPP will be addressed also.

— Comprehensive Site Evaluation Phase II Work Plan: Now ready for agency review and will be sent in the next few days. This work is part of the Air Force's Military Munitions Response (MMR) program, which is considered a sister program to ERP. This plan is similar to a site inspection plan but with more detail. Mr. Anderson asked the agencies to allow as much time as possible for review of the document. Two potential areas of concern are the Skeet Range and the Bunkers.

— Focused Feasibility Study (FFS): Dates have been pushed out by four months.

Mr. Chang commented that the schedule now seems more realistic. Mr. Anderson agreed it made sense to push the FFS schedule back; more resources will be available to review documents, and the additional time will be used to gather data from the supporting projects.

— Action Plan: Comments have been received and responses accepted. Move to historical.

— Site ST027B Plume Delineation Work Plan: Work is proceeding.

— Phases 1 & 2 Vapor Intrusion Report: Final dates are to be determined pending final results from Phase 3 data and evaluation. Decision was made at meeting with EPA on 30 March 2009.

— Phytostabilization Tech Memo: Ready for agency and RAB review. This is a small document.

— SS016 IRA Work Plan: Dates have been pushed back due to access restrictions to the site.

— Site ST032 Tech Memo: Memo is final and can be moved to historical.

— Site SS030 Work Plan: No change.

— 2008 Annual GWTP RPO Report: Draft is out for review.

- Field Sampling Plan: Addendum removed from title; it is more like a Basewide plan.
- SS014 Tier 1 POCO Evaluation Work Plan: Draft is out for review.
- Natural Attenuation Assessment Report (NAAR): Dates have been updated as a response to EPA's recommendation.
- Passive Diffusion Bag (PDB) Tech Memo: Dates have been updated. Draft out to the agencies for review. TAFB would like to push for approval of this sampling technique so it can be used for the upcoming GSAP sampling. There will be a presentation today on results of the study.
- DP039 RPO Work Plan: Dates have been updated as a response to EPA's recommendation.
- SD036/SD037 RPO Work Plan: Dates have been updated to accommodate other activities.
- ST018 Remedial Action (RA) Work Plan: Dates have been updated. This is for the South gas station which is a POCO site.
- Site ST032 POCO Evaluation Work Plan: Added to schedule.
- ST027B Site Characterization Report: Added to schedule.
- Quarterly Newsletter (Guardian): April issue has been distributed.

Mr. Chang expressed concern in supporting the schedule as it stands currently. Is it possible to push the NAAR and DP039 documents to July? Mr. Wray said that should be fine as they feed into the FFS.

2. CURRENT PROJECTS

A. Treatment Plant Operation and Maintenance Update

Mr. Duke reported on the water treatment plant status.

South Base Boundary Groundwater Treatment Plant

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 90.5% uptime, and 1.9 million gallons of groundwater were extracted and treated during the month of March 2009. All of the treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 47.0 gallons per minute (gpm) and electrical power usage was 13,944 kWh; 19,103 pounds of CO2 was created (based on DOE calculation). Approximately 1.9 pounds of volatile organic compounds (VOCs) were removed in March. The total mass of VOCs removed since the startup of the system is 361 pounds (see Attachment 3).

One shutdown occurred in March for a scheduled base power outage. An increase of VOC concentrations was observed in the influent. The effluent was non-detect

except for one TPH-G estimated result. Another sample was taken and analyzed with a quick turnaround time (TAT) and found to be non-detect for TPH-G. Upon further review it was determined that the original reported result was in error. Mr. Salcedo asked which lab performed the analysis. Empirical has been used, but will most likely discontinue using them as this has not been the first reporting issue. PEL is the standard lab used.

No optimization activities were conducted during March.

Central Groundwater Treatment Plant

The Central Groundwater Treatment Plant (CGWTP) performed at 83.5% uptime with approximately 2.6 million gallons of groundwater extracted and treated during the month of March 2009. All treated water was diverted to the storm drain. The average flow rate for the CGWTP was 70.7 gpm and electrical power usage was 31,424 kWh for all plants connected to the Central GWTP; 43,078 pounds of CO2 was created. Natural gas usage for the ThOx was 2,648 therms. Approximately 5.0 pounds of VOCs were removed from groundwater, and 7.6 pounds from vapor, in March. The total mass of VOCs removed since the startup of the system is 11,040 pounds (see Attachment 4).

One shutdown occurred in March for a scheduled base power outage. Two other shutdowns occurred for a faulty UV lamp that was replaced and for an UV/Ox hydrogen peroxide low flow alarm. One more shutdown occurred in order to collect an activated carbon sample from T-501 GAC vessel.

No optimization activities were conducted during March.

North Groundwater Treatment Plant

The North Groundwater Treatment Plant (NGWTP) was shut off on 17 February 2009 due to standing water forming in the vernal pools and is still offline.

Mr. Salcedo had a question on some results reported on page 8 of the CGWTP report. In some cases the effluent result is higher than the influent result. With the low levels of influent being seen, it has been recommended in the draft RPO report to take the carbon off-line. The levels will be compared to the action levels but it is expected that the results reported for the influent are well below the action levels.

B. ST027B Field Effort

Mr. Duke gave an update on the field work at ST027B. Round two of sampling occurred on 4-5 April 2009. The taxiway had to be shut down. The next round is scheduled for Memorial Day weekend. It is proving to be a challenge to take soil gas samples through the clay soil at this site.

C. LF044 Potential Construction Project

Mr. Anderson gave an update on LF044. Comments on the proposal have been received from EPA. WB and DTSC have no comments. TAFB is working with the contractor to ensure they comply with land use controls as described in the WABOU Soil ROD.

D. Vapor Intrusion Assessment Status

Mr. Anderson gave an update on the VI Assessment status. TAFB, CH2M HILL and EPA met on 30 March 2009 to discuss technical aspects of the phase 3 sampling effort. The decision was made to hold off on the Phase 1 and 2 report until Phase 3 is completed. EPA has offered to perform limited sampling and analysis. Mr. Anderson will provide information to EPA about where sampling should occur.

E. Phyto Area Study Schedule

Mr. Anderson reported on the phyto area study schedule. The focus will be on transpiration of contaminants. The question to be answered is how are the trees drawing up the contaminants and if so, what is happening with them. Surface flux sampling will occur also, as the roots may break up the ground and create a preferential pathway for VOCs to be released. If selected as part of the DP039 treatment system, it may need to be evaluated from a health risk perspective.

F. SD001 and SD033 Field Work

Ms. Hess reported on the status of sediment sites field work. Revisions have been started to the Final Work Plan. Field work is scheduled to begin in August 2009. ITSI is reviewing the current biological survey. The existing SWPPP is usable. Revisions to the Model QAPP will include PAHs; ITSI will work with the EPA chemist on those revisions.

3. PRESENTATIONS

A. DTSC: Terradex LUC Monitoring System

Mr. Salcedo gave a presentation on the state's Terradex LUC monitoring system. This is a password protected website that allows Underground Services Alert to notify Terradex, who then notifies the State of California of work to be performed at or near LUC sites. Mr. Salcedo walked the group through the process of how he receives alerts and what he does with them. The alerts give details for contact information, when work is to start, and a map with LUCs in red. The information allows agencies to contact the base to make sure no LUCs are violated. Mr. Salcedo then provides a response and closes the alert.

Mr. Anderson asked how Terradex gets the LUC information, as he noticed the base map on the website didn't have LF044. Mr. Salcedo said the information comes from

the ROD and may not be current. Mr. Smith added that any agency with access should have read-only access, with updates going through Terradex. Mr. Salcedo added that the site also has excavation, construction and permit information in the 'history' section. Ms. Hess asked if it was a state-only website. Mr. Salcedo said, no, it is run by an independent contractor who approached the state and demonstrated what could be done with their information.

B. Passive Diffusion Bag Sampling Methodology

Ms. Royer presented the results of the pilot test study for passive diffusion bag (PDB) methodology (see Attachment 6). A PDB was passed around for RPM members to see. Ms. Royer explained the background and technique of the sampling method.

The PDBs can be filled with lab grade water onsite, or purchased prefilled. Stainless steel weights are used to sink the PDB to the correct depth, if needed. This sampling technique is used for VOC sampling. A comparison study was performed at TAFB where micro-purge samples were taken from various base wells with a wide range of VOC concentrations and compared with PDB samplings of the same wells. A summary of findings was presented and found that less than 50% relative percent difference was calculated between the PDB results and the micro-purge results. The conclusion is that this sampling method is excellent for VOC sites; it also presents a cost savings to the project.

Mr. Duke commented on the evolution of the field sampling process. Mr. Smith also noted that this method eliminated the need to purge the well, which decreases the amount of waste created and level of decontamination needed. The PDB reaches equilibrium with the water in the well. Mr. Salcedo also commented that this is not a new technology and stated that he has no problem with the PDB method being used in lieu of micro-purging. Mr. Chang added that he also sees the advantages and only commented that Travis AFB should follow EPA methodology and record well maintenance impacts. Ms. Royer responded that sedimentation is monitored as part of the groundwater program. The field form has a space to write observations of sediment present or tears to the bag, etc. High volume purging is used when sedimentation is verified. Mr. Wray added that the process in the SOP includes techniques to verify the PDB is submerged. The PDBs need to be installed early as they sit for two weeks in the wells before being retrieved and Travis asked the agencies for their approval to use PDBs at 10 groundwater sites with VOCs as the main chemical of concern. Mr. Chang wants to check with EPA's QA person first. An email from EPA will be sent by next week. Mr. Smith stated he would contact Mr. Friedman separately (who left the teleconference early).

C. Program Update, Management Overview Briefing

Mr. Wray gave an update on activities completed, in progress and upcoming (see Attachment 7). In keeping with the Triad approach to the project, this presentation is given to keep everyone informed on what's been done and what's upcoming. The

dates shown on the page titled "Upcoming" in the presentation are for the draft versions.

The dates for the NAAR and DP039 RPO Work Plan will be delayed by two months as previously discussed. Mr. Duke added that two dig permits have been received and waiting on one more. Also, the airfield waiver for ST027 is valid; waiting on one more airfield waiver from the base.

Field work at LF007C and SS030 may be impacted by late rains. The ground has to be dry before work can begin.

4. NEW ACTION ITEM REVIEW

None.

5. PROGRAM/ISSUES/UPDATE

None.

6. POTENTIAL RESPONSE TO COMMENTS (RTC) MEETINGS

A. QAPP Update

Mr. Anderson presented an update on the Analytical QAPP RTC. Draft responses have been received from CH2M HILL. TAFB still needs to address the comment concerning the Model QAPP.

Ms. Hess requested a copy of the comments and also an electronic version of the 2000 Model QAPP. Mr. Chang requested that ITSI send a proposal of modifications for the PAHs to Mr. Eidelberg (EPA chemist).

General Discussion

Mr. Chang asked to see, and was provided with, the RAB agenda items, as he will not be able to attend. Mr. Cooper, however, plans on attending. Mr. Salcedo also will not be in attendance.

5. Action Items

ITEM	RESPONSIBLE	ACTION ITEM	DUE DATE	STATUS
1.	Air Force	Update document schedule to include dates for Work Plan for Sediment Sites	Apr 2009	**Open**
2.	Air Force	Update document schedule to include dates for interim plans for FT005	Apr 2009	**Open**
3.	Air Force	Coordinate site visit of sediment excavations with RAB members	TBD	**Open**

TRAVIS AIR FORCE BASE
ENVIRONMENTAL RESTORATION PROGRAM
REMEDIAL PROGRAM MANAGER'S MEETING
22 April 2009, 9:30 A.M.

AGENDA

1. ADMINISTRATIVE

A. DIAL UP TELECONFERENCE PHONE FOR WATER BOARD PM, 707-424-8811
B. PREVIOUS MEETING MINUTES
C. ACTION ITEM REVIEW
D. MASTER MEETING AND DOCUMENT SCHEDULE REVIEW

2. CURRENT PROJECTS

A. TREATMENT PLANT OPERATION AND MAINTENANCE UPDATE (LONNIE)
B. ST027B FIELD EFFORT (LONNIE)
C. LF044 POTENTIAL CONSTRUCTION PROJECT (GLENN)
D. VAPOR INTRUSION ASSESSMENT STATUS (GLENN)
E. PHYTO AREA STUDY SCHEDULE (GLENN)
F. SD001 AND SD033 FIELD WORK (ITSI)

3. PRESENTATIONS

A. DTSC: TERRADEX LUC MONITORING SYSTEM
B. PASSIVE DIFFUSION BAG SAMPLING METHODOLOGY
C. PROGRAM UPDATE: ACTIVITIES COMPLETED, IN PROGRESS AND UPCOMING

4. NEW ACTION ITEM REVIEW

5. PROGRAM/ISSUES/UPDATE

6. POTENTIAL RESPONSE TO COMMENTS MEETINGS

A. QAPP UPDATE

Travis AFB Master 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.)
01-27-09	01-28-09		—
02-24-09	02-25-09		—
03-24-09	03-25-09		—
04-21-09	04-22-09		04-23-09
05-19-09	05-20-09		—
06-23-09	06-24-09		—
07-21-09	07-22-09		—
08-25-09	08-26-09		—
09-22-09	09-23-09		—
10-20-09	10-21-09		10-22-09
—	—	11-16-09	—
12-08-09	12-09-09		—

Travis AFB Master Document Schedule

PRIMARY DOCUMENTS				
	Basewide Groundwater Travis, Glenn Anderson		Potrero Hills Annex Travis, Glenn Anderson	RD/RA QAPP Update Travis, Glenn Anderson CH2M Hill, Mark Fesler
Life Cycle	**Proposed Plan**	**ROD**	**ROD**	**Plan**
Scoping Meeting	NA	**01-24-07**	**180 days after Water Board Order Rescinded**	**NA**
Predraft to AF/Service Center	04-14-10	07-21-10	+ 360 days	12-18-08
AF/Service Center Comments Due	04-28-10	08-04-10	+ 420 days	01-09-09
Draft to Agencies	05-12-10	08-18-10	+ 480 days	02-06-09
Draft to RAB	05-12-10	08-18-10	+ 480 days	02-06-09
Agency Comments Due	07-07-10	10-13-10	+ 540 days	04-10-09
Response to Comments Meeting	**TBD**	TBD	**+ 555 days**	**04-22-09**
Agency Concurrence with Remedy	TBD	NA	+ 570 days	NA
Public Comment Period	TBD	NA	+ 615 to 645 days	NA
Public Meeting	**TBD**	**NA**	**+ 625 days**	**NA**
Response to Comments Due	TBD	TBD	+ 640 days	05-20-09
Draft Final Due	08-04-10	11-10-10	+ 640 days	NA
Final Due	09-01-10	12-08-10	+ 700 days	05-20-09

PRIMARY DOCUMENTS		
	Comprehensive Site Evaluation Phase II **Travis, Glenn Anderson** **Sky Research, Ian Roberts**	**Focused Feasibility Study** **Travis, Glenn Anderson** **CH2M Hill, Loren Krook**
Life Cycle	**Work Plan**	**FFS**
Scoping Meeting	**NA**	**NA**
Predraft to AF/Service Center	01-15-09	09-17-09
AF/Service Center Comments Due	02-12-09	10-01-09
Draft to Agencies	04-29-09	10-15-09
Draft to RAB	04-29-09	10-15-09
Agency Comments Due	05-29-09	12-17-09
Response to Comments Meeting	**06-10-09**	**01-20-10**
Agency Concurrence with Remedy	NA	NA
Public Comment Period	NA	NA
Public Meeting	**NA**	**NA**
Response to Comments Due	06-22-09	02-17-10
Draft Final Due	06-22-09	02-17-10
Final Due	07-22-09	03-17-10

SECONDARY DOCUMENTS						
Life Cycle	**Action Plan** **Travis, Glenn Anderson** **CH2M HILL, Chuck Elliott**	**Site ST027B Plume Delineation Work Plan** **Travis, Lonnie Duke** **CH2M HILL, Gavin Heinrich**	**Phases 1 and 2 Vapor Intrusion Report** **Travis, Glenn Anderson** **CH2M HILL, Leslie Royer**	**Phytostabilization Tech Memo** **Travis, Glenn Anderson** **Parsons, Bill Plaehn**	**SS016 RPO Work Plan** **Travis AFB, Lonnie Duke** **CH2M HILL, Doug Berwick**	**ST032 Tech Memo** **Travis AFB, Lonnie Duke** **CH2M HILL, Gavan Heinrich**
Scoping Meeting	**NA**	**NA**	**NA**	**10-09-08**	**NA**	**NA**
Predraft to AF/Service Center	11-21-08	11-21-08	12-08-08	02-09-09	05-06-09	01-23-09
AF/Service Center Comments Due	01-09-09	11-28-08	12-15-08	02-16-09	05-20-09	02-06-09
Draft to Agencies	01-28-09	12-09-08	01-12-09	04-29-09	05-27-09	02-19-09
Draft to RAB	01-28-09	12-09-08	01-12-09	04-29-09	05-27-09	02-19-09
Agency Comments Due	03-26-09	02-11-09	02-17-09	05-29-09	06-26-09	03-23-09
Response to Comments Meeting	**04-09-09**	**01-25-09**	**02-25-09**	**06-10-09**	07-08-09	**03-25-09**
Response to Comments Due	04-30-09	04-08-09	TBD*	06-22-09	07-22-09	04-02-09
Draft Final Due	NA	NA	NA	NA	NA	NA
Final Due	04-30-09	04-08-09	TBD*	06-22-09	07-22-09	04-02-09
Public Comment Period	NA	NA	NA	NA	NA	NA
Public Meeting	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

*The Vapor Intrusion report will be rescheduled to incorporate the Phase 3 data and evaluation per discussion with EPA on 30 March.

SECONDARY DOCUMENTS					
Life Cycle	**SS030 RPO Work Plan** **Travis, Lonnie Duke** **CH2M HILL, Loren Krook**	**2008 Annual GWTP RPO Report** **Travis AFB, Lonnie Duke** **CH2M HILL, Daniel Chern**	**Field Sampling Plan Addendum** **Travis AFB, Glenn Anderson** **CH2M HILL, Loren Krook**	**SS014 Tier 1 POCO Evaluation Work Plan** **Travis AFB, Lonnie Duke** **CH2M HILL, Gavan Heinrich**	**Natural Attenuation Assessment Report** **Travis AFB, Glenn Anderson** **CH2M HILL, Leslie Royer**
Scoping Meeting	**NA**	**NA**	**NA**	**NA**	**NA**
Predraft to AF/Service Center	01-08-09	03-25-09	04-24-09	03-18-09	04-29-09
AF/Service Center Comments Due	01-15-09	04-01-09	05-08-09	03-25-09	05-13-09
Draft to Agencies	02-09-09	04-1309	05-15-09	04-01-09	05-27-09
Draft to RAB	02-09-09	04-13-09	05-15-09	04-01-09	05-27-09
Agency Comments Due	03-11-09	05-13-09	06-15-09	04-29-09	06-26-09
Response to Comments Meeting	**03-25-09**	**05-20-09**	**06-24-09**	**05-04-09**	**07-08-09**
Response to Comments Due	04-08-09	05-27-09	07-08-09	05-11-09	07-22-09
Draft Final Due	NA	NA	NA	NA	NA
Final Due	04-08-09	05-27-09	07-08-09	05-11-09	07-22-09
Public Comment Period	NA	NA	NA	NA	NA
Public Meeting	**NA**	**NA**	**NA**	**NA**	**NA**

SECONDARY DOCUMENTS						
Life Cycle	**Passive Diffusion Bag (PDB) Tech Memo** **Travis AFB, Lonnie Duke** **CH2M HILL, Leslie Royer**	**DP039 RPO Work Plan** **Travis AFB, Glenn Anderson** **CH2M HILL, Doug Berwick**	**SD036/SD037 RPO Work Plan** **Travis AFB, Lonnie Duke** **CH2M HILL, Doug Berwick**	**ST018 Remedial Action Work Plan** **Travis AFB, Lonnie Duke** **CH2M HILL, Gavan Heinrich**	**SITE ST032 POCO Evaluation Work Plan** **Travis AFB, Lonnie Duke** **CH2M HILL, Gavan Heinrich**	**ST027B Site Characterization Report** **Travis AFB, Lonnie Duke** **CH2M HILL, Gavan Heinrich**
Scoping Meeting	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Predraft to AF/Service Center	04-01-09	05-08-09	05-22-09	06-12-09	05-01-09	08-14-09
AF/Service Center Comments Due	04-03-09	05-22-09	06-05-09	06-26-09	05-15-09	08-28-09
Draft to Agencies	04-07-09	05-29-09	06-19-09	07-10-09	05-29-09	09-14-09
Draft to RAB	04-07-09	05-29-09	06-19-09	07-10-09	05-29-09	09-14-09
Agency Comments Due	05-05-09	06-29-09	07-20-09	08-07-09	06-26-09	10-16-09
Response to Comments Meeting	**05-20-09**	**07-14-09**	**07-22-09**	**08-26-09**	**07-22-09**	**10-21-09**
Response to Comments Due	06-19-09	08-14-09	08-21-09	09-11-09	08-5-09	11-04-09
Draft Final Due	NA	NA	NA	NA	NA	NA
Final Due	06-19-09	08-14-09	08-21-09	09-11-09	08-05-09	11-04-09
Public Comment Period	NA	NA	NA	NA	NA	NA
Public Meeting	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

INFORMATIONAL DOCUMENTS	
Life Cycle	**Quarterly Newsletters (Apr 2009)** **Travis, Glenn Anderson**
Scoping Meeting	**NA**
Predraft to AF/Service Center	NA
AF/Service Center Comments Due	NA
Draft to Agencies	03-19-2009
Draft to RAB	NA
Agency Comments Due	04-02-2009
Response to Comments Meeting	**TBD**
Response to Comments Due	04-06-2009
Draft Final Due	NA
Final Due	04-13-2009
Public Comment Period	NA
Public Meeting	**NA**

South Base Boundary Groundwater Treatment Plant
Monthly Data Sheet

Report Number: 104 **Reporting Period: 1 – 31 March 2009** **Date Submitted: 15 April 2009**

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 – March 2009

Operating Time: **673 hours** Percent Uptime: 90.5**%**

Electrical Power Usage: 13,944 kWh

Gallons Treated: **1.9 million gallons** Gallons Treated Since July 1998: **644 million gallons**

Volume Discharged to Union Creek: **1.9 million gallons**

VOC Mass Removed: **1.9 pounds**[a] VOC Mass Removed Since July 1998: **361 pounds**

Rolling 12-Month Cost per Pound of Mass Removed: $3,469[b]

Monthly Cost per Pound of Mass Removed: $7,467[bc]

[a] Calculated using March 2009 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.
[c] Cost increase due to production of 2009 Annual RPO reports and decreased process flow rate.

Flow Rates

Average Groundwater Total Flow Rate: 47.0 gpm[a]

Average Flow Rate (gpm)[b]							
FT005				**SS029**		**SS030**	
EW01x05	1.4	EW736x05	Off line[e]	EW01x29	1.0	EW01x30	11.7
EW02x05	2.1	EW737x05	Off line[c]	EW02x29	9.0	EW02x30	4.5
EW03x05	3.2	EW742x05	Off line[c]	EW03x29	Off line[d]	EW03x30	Off line[d]
EW731x05	Off line[c]	EW743x05	Off line[d]	EW04x29	9.8	EW04x30	Off line[e]
EW732x05	Off line[c]	EW744x05	Off line[c]	EW05x29	0.9	EW05x30	11.2
EW733x05	Off line[c]	EW745x05	Off line[c]	EW06x29	14.6	EW06x30	NA[f]
EW734x05	Off line[e]	EW746x05	Off line[c]	EW07x29	Off line[e]	EW711x30	Off line[e]
EW735x05	Off line[e]						
FT005 Total:	**6.7**			**SS029 Total:**	**35.3**	**SS030 Total:**	**27.4**

[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] Extraction well flow rates are based on the average of the weekly readings.
[c] Extraction well was shut down for a 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 is off line due to low VOC concentrations.
[e] Extraction well was not operational during March 2009 due to malfunctioning equipment.
[f] Extraction well was not operational at time of measurement due to recharging well.

gpm—gallons per minute
NA – not available

Shutdown/Restart Summary

Location	Shutdown		Restart		Cause
	Date	Time	Date	Time	
SBBGWTP (water)	13 March 2009	15:00	16 March 2009	11:30	Scheduled Base power outage
SBBGWTP = South Base Boundary Groundwater Treatment Plant					

Summary of O&M Activities

Monthly groundwater samples at the SBBGWTP were collected on 2 March 2009. Sample results are presented in Table 1. The total VOC concentration (118.2 µg/L) in the influent sample has increased since the February 2009 sample (66.9 µg/L). Trichloroethene, cis-1,2-dichloroethene, and 1,2-dichloroethane were the only VOCs detected in the influent sample. 1,2-Dichloroethane is the indicator chemical for Site FT005. VOCs were not detected in the effluent sample, indicating good treatment efficiency. However, TPH-G was detected in the effluent sample at a concentration of 52 J µg/L, which slightly exceeded the instantaneous maximum concentration of 50 µg/L.

Investigation into the SBBGWTP air stripper performance was initiated based on the unexpected detection of TPH-G in the SBBGWTP effluent stream. The pressure of air flowing across an air stripper can help determine if maintenance is required. A high pressure drop across an air stripper would indicate significant scaling, and contact between the air and the process water would decrease, thus decreasing efficiency. The back pressure within the air stripper has remained constant since approximately October 2008 at around 17 pounds per square inch (psi). The air stripper continues to function effectively.

Field samples collected in March 2009 were sent to Empirical Laboratories for analysis. The analytical result of 52J µg/L for TPH-G in the SBBGWTP effluent stream indicated that the value was estimated since it was below the minimum reporting limit for that analyte. Because the result was so close to the method detection limit (MDL) of 50 µg/L, CH2M HILL have requested the chromatogram from Empirical for that particular sample for further analysis.

Preliminary analytical data from the April 2009 sampling event have indicated no presence of TPH-G in the effluent stream at the SBBGWTP. Further details from the April 2009 sampling event will be presented in the South Base Boundary Groundwater Treatment Plant April 2009 Monthly Data Sheet. CH2M HILL will continue to monitor system effluent concentrations to maintain compliance with all regulations.

In March 2009, the SBBGWTP PLC for Site FT005 was indicating a fault, and the FT005 extraction wells were not functioning, except for EW01x05, EW02x05, and EW03x05. The pressure transmitter (water level sensor) in well EW734x05 was repaired in February 2009 and its pump was returned to service. Data communication issues with the SBBGWTP SCADA system have subsequently resulted in decreased productivity from EW734x05. Efforts to repair the FT005 PLC were initiated on 18 March, 2009, but the source of the problem was determined to be both software and hardware related. The SBBGWTP SCADA system is expected to be back online by the end of April 2009.

The variable frequency drive (VFDs) for EW02x29 was replaced and reprogrammed on 19 March, 2009. This pump was still operating, but the parameter signal relay to the SBBGWTP SCADA system was not functioning correctly due to a damaged VFD. The power source for the pump in EW02x29 was discovered to be faulty and may have led to the damage of the original VFD that was replaced. The faulty power was most likely caused by a ground voltage leak between the circuit breaker panel (located near EW06x29) and the EW02x29 wellhead. A power splice from well EW01x29 in the electrical pullbox located near the EW02x29 was completed to provide reliable power to the pump in EW02x29. As a result,

EW01x29 and EW02x29 are now powered by the same electrical circuit. EW02x29 pump is currently operational.

The VFD for EW07x29 was also replaced and reprogrammed on 19 March, 2009. The pump in this well was not operating. During troubleshooting activities, the pump in EW07x29 was found to have a ground short in its motor windings. The ground short had rendered the pump unusable. This condition most likely led to damage of the original VFD that was being replaced. A replacement pump (identical in specifications to the damaged pump) was installed on 27 March, 2009. This pump is currently operational.

Optimization Activities

The nine extraction wells involved in the rebound study at FT005 have remained offline while awaiting the decision to return the wells to service or keep them offline. Samples from these offline extraction wells continue to be collected during regular sampling events. A discussion of the analytical results collected during the rebound study is presented in the *Draft South Base Boundary Groundwater Treatment Plant 2008 Annual Remedial Process Optimization Report (CH2M HILL, 2009)*.

No other optimization activities were conducted in March 2009.

Table 1
Summary of Groundwater Analytical Data for March 2009 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum[a] (µg/L)	Detection Limit (µg/L)	N/C	2 March 2009 (µg/L)	
				Influent	Effluent
Halogenated Volatile Organics					
Bromodichloromethane	5.0	0.18	0	ND	ND
Carbon Tetrachloride	0.5	0.22	0	ND	ND
Chloroform	5.0	0.17	0	ND	ND
Dibromochloromethane	5.0	0.10	0	ND	ND
1,1-Dichloroethane	5.0	0.19	0	ND	ND
1,2-Dichloroethane	0.5	0.22	0	0.55 J	ND
1,1-Dichloroethene	5.0	0.24	0	ND	ND
cis-1,2-Dichloroethene	5.0	0.16	0	7.6	ND
trans-1,2-Dichloroethene	5.0	0.21	0	ND	ND
Methylene Chloride	5.0	0.27	0	ND	ND
Tetrachloroethene	5.0	0.16	0	ND	ND
1,1,1-Trichloroethane	5.0	0.20	0	ND	ND
1,1,2-Trichloroethane	5.0	0.14	0	ND	ND
Trichloroethene	5.0	0.50	0	110	ND
Vinyl Chloride	0.5	0.19	0	ND	ND
Non-Halogenated Volatile Organics					
Benzene	1.0	0.12	0	ND	ND
Ethylbenzene	5.0	0.10	0	ND	ND
Toluene	5.0	0.14	0	ND	ND
Xylenes	5.0	0.10 - 021	0	ND	ND
Other					
Total Petroleum Hydrocarbons – Gasoline	50	50	1	NM	52 J
Total Petroleum Hydrocarbons – Diesel	50	100	0	NM	ND
Total Suspended Solids (mg/L)	NE	4.0	0	6.8	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: 116 **Reporting Period: 1 – 31 March 2009** **Date Submitted: 15 April 2009**

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 are also included on this data sheet.

Operations Summary – March 2009

Operating Time:		Percent Uptime:		Electrical Power Usage:	
CGWTP:	621 hours	**CGWTP:**	83.5%	**CGWTP:**	6,720 kWh
WTTP:	Water: 621 hours	**WTTP:**	Water: 83.5%	**WTTP:**	16,050 kWh
	Vapor: 621 hours		Vapor: 83.5%		
ThOx:	665 hours	**ThOx:**	89.4%	**ThOx:**	8,674 kWh

ThOx: Natural Gas Usage: 2,648 therms

Gallons Treated: **2.6 million gallons**

Gallons Treated Since January 1996: **408 million gallons**

VOC Mass Removed:

5.0 lbs (groundwater only)[a]

7.6 lbs (vapor only)[b]

VOC Mass Removed Since January 1996:

2,423 lbs from groundwater

8,617 lbs from vapor

UV/Ox DRE: 95.1%[c]

ThOx DRE: 99.7%

Rolling 12-Month Cost per Pound of Mass Removed: $686[d]

Monthly Cost per Pound of Mass Removed: $1,948[de]

[a] Calculated using March 2009 EPA Method SW8260B analytical results.
[b] Total VOC vapor mass removed was calculated using March 2009 EPA Method TO-14 analytical results for the ThOx system and the WTTP SVE system.
[c] Acetone, a common laboratory contaminant, was the primary VOC detected in the sample collected after the UV/Ox.
[d] Costs include operations and maintenance, reporting, analytical laboratory, project management, and electric and natural gas costs related to operation of the system.
[e] Cost increase due to production of 2009 Annual RPO reports

DRE = destruction removal efficiency UV/Ox = ultraviolet oxidation

Flow Rates

Average Groundwater Flow Rate: **70.7 gpm**[a]

Location	Average Flow Rate	
	Groundwater (gpm)[b]	Soil Vapor (scfm)
EW01x16	23.7	NA
EW02x16	6.7	NA
EW03x16	1.0	NA[c]
EW605x16	13.5	NA[c]
EW610x16	1.5	NA[c]
TPE-W	NA	NA
WTTP	23.3[d]	138
ThOx	0.14[d]	54.1

[a] as measured by the effluent discharge to the storm drain divided by the operating time during the month.
[b] as measured by extraction well totalizer divided by the operating time.
[c] soil vapor was extracted from this well; however, the flow rates are not measured at individual wells at SS016.
[d] 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

Average Flow Rate from the WIOU, DP039, and LF008 Extraction Wells (gpm)[a]							
SD037/ SD043				SD033/SD034/ DP039		LF008/SD036	
EW599x37	4.0	EW705x37	1.0	EW501x33	1.0	EW719x08	Off line[c]
EW700x37	4.5	EW706x37	0.6	EW503x33	1.5	EW720x08	Off line[c]
EW701x37	1.4	EW707x37	0.9	EW01x34	0.3	EW721x08	Off line[c]
EW702x37	0.6	EW510x37	4.0	EW03x34	0.9	EW593x36	2.4
EW703x37	0.9	EW511x37	1.6	EW563x39	Off line[b]	EW594x36	0.8
EW704x37	1.9	EW555x43	0.7	EW782x39	Off line[b]	EW595x36	0.4

gpm—gallons per minute

[a] Extraction well flow rates are based on the average of the weekly readings.
[b] Extraction wells were shut off to facilitate the Bioreactor Sustainability Study at Site DP039.
[c] Extraction wells were shut off to support a rebound study at Site LF008.

Shutdown/Restart Summary

Location	Shutdown		Restart		Cause
	Date	Time	Date	Time	
CGWTP (Groundwater):					
CGWTP	13 March 2009	16:00	16 March 2009	09:00	Scheduled Base power outage
CGWTP	16 March 2009	16:30	17 March 2009	14:00	Faulty UV Lamp; Replace UV lamp #1
CGWTP	21 March 2009	06:30	21 March 2009	19:30	Power failure
CGWTP	23 March 2009	14:00	23 March 2009	15:30	Collect activated carbon sample from T-501 GAC vessel
CGWTP	29 March 2009	16:30	30 March 2009	14:30	UV/Ox hydrogen peroxide low flow alarm
WTTP (Groundwater):					
WTTP	13 March 2009	16:00	16 March 2009	09:00	Scheduled Base power outage
WTTP	16 March 2009	16:30	17 March 2009	14:00	CGWTP was shutdown (see above)
WTTP	21 March 2009	06:30	21 March 2009	19:30	Power failure
WTTP	23 March 2009	14:00	23 March 2009	15:30	CGWTP was shutdown (see above)
WTTP	29 March 2009	16:30	30 March 2009	14:30	CGWTP was shutdown (see above)
WTTP (Vapor):					
WTTP	13 March 2009	16:00	16 March 2009	09:45	Scheduled Base power outage
WTTP	16 March 2009	16:30	17 March 2009	14:00	CGWTP was shutdown (see above)
WTTP	21 March 2009	06:30	21 March 2009	19:30	Power failure
WTTP	23 March 2009	14:00	23 March 2009	15:30	CGWTP was shutdown (see above)
WTTP	29 March 2009	16:30	30 March 2009	14:30	CGWTP was shutdown (see above)

Location	Shutdown		Restart		Cause
	Date	Time	Date	Time	
ThOx (Vapor):					
ThOx	13 March 2009	16:00	16 March 2009	09:30	Scheduled Base power outage

CGWTP = Central Groundwater Treatment Plant
GAC = Granular Activated Carbon
WTTP = West Treatment and Transfer Plant
ThOx = Thermal Oxidation System

Summary of O&M Activities

Monthly groundwater sampling at the CGWTP and quarterly groundwater sampling at the ThOx and WTTP were performed on 2 March 2009. Groundwater sample results are summarized in Table 1. Vapor samples were collected from EW03x16, EW605x16, EW610x16, and 2-Phase® well (TPE-W) on 4 March 2009. In addition, quarterly vapor samples were collected at the ThOx unit, the WTTP SVE system, and the manifold at the WTTP SVE system on 4 March 2008. Vapor results are presented in Tables 2 through 5, respectively.

The total VOC concentration (230 µg/L) in the March 2009 CGWTP influent groundwater sample has decreased since the February 2009 sampling (287 µg/L). Trichloroethene (TCE), cis-1,2-dichloroethene (DCE), and trans-1,2-DCE were detected in the system influent. There were no detections of these contaminants after treatment by UV-Ox. However, a trace amount of chloroform was detected after the UV-Ox treatment. Cis-1,2-DCE, chloroform, and TCE were present after treatment by the granular activated carbon (GAC) sample points, as well as in the system effluent. However, these concentrations are less than their respective effluent limits. The detections in these samples may be attributed to desorption from the GAC. The groundwater total effluent VOC concentrations from the WTTP and ThOx were 172 µg/L and 650 µg/L. Both concentrations have increased from previous quarterly results. TCE and cis-1,2-DCE were the primary VOCs detected in groundwater.

On 4 March 2009, vapor samples were collected from EW03x16, EW605x16, EW610x16, and the TPE-W. Total VOC concentrations from these wells were 302 ppbv, 151 ppbv, 103 ppbv, and 1,940 ppbv. The EW03x16 total VOC concentration has decreased significantly since September 2008 sampling (22,264 ppbv). The ThOx continues to treat the soil vapor from these four extraction wells. Cis-1,2-DCE and TCE were detected in the ThOx influent vapor sample at concentrations of 1,820 ppbv and 8,700 ppbv, respectively, which are greater than concentrations observed in the extraction wells. The total VOC concentration in the influent sample (10,520 ppbv) has increased since the December 2008 sampling (7,101 ppbv). Vapor samples collected from the ThOx influent in December 2008 and March 2009 both contained total VOCs at concentrations lower than previous samples (21,164 ppbv in September 2008 and 45,700 ppbv in June 2008). The sample collection location was repositioned in December 2008 to include total influent vapors from all extraction wells online instead of just TPE-W.

The WTTP SVE system continued to treat soil vapor from the WIOU; however, vapor extraction has ceased from Site DP039 in order to facilitate the Bioreactor Sustainability Study.The March 2009 influent VOC vapor concentration was approximately 139 ppbv with majority of the contamination as TCE. From the manifolds at the WTTP SVE system, the total VOC concentrations from V-203 (WIOU East) and V-204 (WIOU West) were 58 ppbv and 400 ppbv, respectively.

In February 2009, the EW610x16 groundwater extraction pump was repaired and placed back into the well. The pressure transmitter was repaired in March 2009, and EW610x16 is fully operational. Free product was removed from two Site SD034 wells. Approximately 0.25 inches of product was removed from MWSSAx34, a 1-inch Schedule 40 PVC well. Approximately 6 inches of product was removed from EW01x34, a 2-inch Schedule 40 PVC well.

The hour meter associated with the WTTP SVE blower is suspected to be faulty. The total running hours recorded during March 2009 were inconsistent with its observed operation. To better approximate the

WTTP SVE run time, its running hours for March 2009 were assumed to be the same as the WTTP groundwater extraction system for March 2009. The hour meter will be replaced in April 2009 and discussed in the April 2009 Central Groundwater Treatment Plant Monthly Data Sheet.

Optimization Activities

No optimization activities were conducted in March 2009.

Table 1
Summary of Groundwater Analytical Data for March 2009 – Central Groundwater Treatment Plant

Constituent	Instantaneous Maximum[a] (µg/L)	Detection Limit (µg/L)	N/C	2 March 2009 (µg/L) WTTP Effluent	TPE Effluent	Influent	After UV/OX	After Carbon 1 Effluent	After Carbon 2 Effluent	After Carbon 3 Effluent	System Effluent
Halogenated Volatile Organics											
Bromodichloromethane	5.0	0.18 – 0.90	0	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	5.0	0.17 – 0.85	0	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5	0.22 – 1.1	0	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5.0	0.10 – 0.50	0	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	5.0	0.17 – 0.85	0	0.37 J	ND	ND	0.18 J	0.22 J	0.23 J	0.26 J	0.19 J
1,2-Dichlorobenzene	5.0	0.16 – 0.80	0	ND	ND	ND	ND	ND	ND	ND	ND
1.3-Dichlorobenzene	5.0	0.50 – 2.5	0	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.10 – 0.50	0	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	0.19 – 0.95	0	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.22 – 1.1	0	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.19 – 0.95	0	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.16 – 0.32	0	9	220	38	ND	0.20 J	0.30 J	0.22 J	0.30 J
trans-1,2-Dichloroethene	5.0	0.21 – 1.0	0	1.6	ND	2.2	ND	ND	ND	ND	ND
Methylene Chloride	5.0	0.27 – 1.4	0	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5.0	0.16 – 0.80	0	0.59	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.20 – 1.0	0	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.14 – 0.70	0	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5.0	0.50 – 2.5	0	160	430	190	ND	1.9	1.5	1.5	1.2
Vinyl Chloride	0.5	0.19 – 0.95	0	ND	ND	ND	ND	ND	ND	ND	ND
Non-Halogenated Volatile Organics											
Benzene	1.0	0.12 – 0.60	0	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5.0	0.1 – 0.50	0	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5.0	0.14 – 0.70	0	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	5.0	0.10 – 1.0	0	ND	ND	ND	ND	ND	ND	ND	ND
Other											
Total Dissolved Solids (mg/L)	NE	20	0	NM	NM	NM	NM	NM	NM	764	NM

[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
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
NS = not sampled
µg/l = micrograms per liter

Table 2
Soil Vapor Analytical Data for March 2009 – Site SS016

Constituent	4 March 2009 (ppbv)			
	EW03x16	EW605x16	EW610x16	TPE-W
Volatile Organics				
Benzene	ND (0.248)	0.81	ND (0.124)	ND (4.39)
Carbon Tetrachloride	ND (0.442)	ND (0.221)	ND (0.221)	ND (7.82)
Chloroethane	ND (0.316)	ND (0.158)	ND (0.158)	ND (5.59)
Chloroform	ND (0.442)	ND (0.221)	ND (0.221)	ND (7.82)
Chloromethane	ND (0.248)	0.32 J	0.37 J	ND (4.39)
cis-1,2-Dichloroethene	32.8	7.63	4.80	130
trans-1,2-Dichloroethene	ND (0.14)	0.30 J	ND (0.0699)	ND (2.47)
1,1-Dichloroethene	ND (0.248)	0.93	0.67	ND (4.39)
Ethylbenzene	ND (0.282)	ND (0.141)	ND (0.141)	ND (4.99)
Freon 11	ND (0.394)	ND (0.197)	ND (0.197)	ND (6.97)
Freon 12	ND (0.216)	0.50	0.50	ND (3.82)
Freon 113	ND (0.348)	ND (0.174)	ND (0.174)	ND (6.16)
Methylene Chloride	ND (0.22)	ND (0.11)	ND (0.11)	ND (3.89)
Methyl Ethyl Ketone (2-Butanone)	ND (0.21)	0.93	0.65	ND (3.72)
Tetrachloroethene	0.60 J	0.41 J	0.41 J	ND (5.06)
Toluene	ND (0.244)	ND (0.122)	ND (0.122)	ND (4.32)
1,1,1-Trichloroethane	ND (0.26)	ND (0.13)	ND (0.13)	ND (4.6)
1,1,2-Trichloroethane	ND (0.32)	ND (0.16)	ND (0.16)	ND (5.66)
Trichloroethene	267	137	92.8	1,810
Vinyl Chloride	ND (0.276)	ND (0.138)	ND (0.138)	ND (4.89)
Xylenes, m,p-	ND (0.492)	ND (0.246)	ND (0.246)	ND (8.71)
Xylene, o-	ND (0.232)	ND (0.116)	ND (0.116)	ND (4.11)

J = analyte concentration is considered an estimated value
ND = not detected
ppbv = parts per billion by volume
( ) = detection limit

TABLE 3
Soil Vapor Analytical Data for March 2009 – Central Groundwater Treatment Plant

Constituent	4 March 2009 (ppbv)	
	ThOx Influent	**ThOx Effluent**
Volatile Organics		
Benzene	ND (23.9)	ND (0.124)
Bromomethane	ND (28.8)	ND (0.149)
Carbon Tetrachloride	ND (42.7)	ND (0.221)
Chloroethane	ND (30.5)	ND (0.158)
Chloroform	ND (42.7)	ND (0.221)
Chloromethane	ND (23.9)	ND (0.124)
cis-1,2-Dichloroethene	1,820	0.41 J
1,2-Dichlorobenzene	ND (25.5)	1.09
1,3-Dichlorobenzene	ND (29)	ND (0.15)
1,4-Dichlorobenzene	ND (27.6)	0.41 J
1,2-Dichloroethane	ND (48.1)	10
1,1-Dichloroethene	ND (23.9)	ND (0.124)
Ethylbenzene	ND (27.2)	0.62
Freon 11	ND (38)	ND (0.197)
Freon 12	ND (20.8)	ND (0.108)
Freon 113	ND (33.6)	ND (0.174)
Methylene Chloride	ND (21.2)	0.32 J
Methyl Ethyl Ketone (2-Butanone)	ND (20.3)	0.71
Tetrachloroethene	ND (27.6)	0.47 J
Toluene	ND (23.5)	8.35
trans-1,2-Dichloroethene	ND (13.5)	ND (0.0699)
1,2,4-Trichlorobenzene	ND (43)	0.27 J
1,2,4-Trimethylbenzene	ND (27.8)	0.49 J
1,3,5-Trimethylbenzene	ND (34)	ND (0.176)
Trichloroethene	8,700	0.47 J
Vinyl Chloride	ND (26.6)	ND (0.138)
Xylenes, m,p-	ND (47.5)	6.76
Xylene, o-	ND (22.4)	2.14

J = analyte concentration is considered an estimated value
ND = not detected
ppbv = parts per billion by volume
ThOx = thermal oxidation system
( ) = detection limit

Table 4
Soil Vapor Analytical Data for March 2009 – West Transfer and Treatment Plant

Constituent	4 March 2009 (ppbv)		
	SVE Influent	SVE Mid-Treatment	SVE Effluent
Volatile Organics			
Benzene	ND (0.124)	ND (0.124)	ND (0.124)
Carbon Tetrachloride	ND (0.221)	ND (0.221)	ND (0.221)
Chloroethane	ND (0.158)	ND (0.158)	ND (0.158)
Chloroform	1.77	ND (0.221)	0.55
Chloromethane	ND (0.124)	0.63	0.50
cis-1,2-Dichloroethene	10.3	1.18	6.12
trans-1,2-Dichloroethene	1.42	ND (0.0699)	ND (0.0699)
1,3-Dichlorobenzene	ND (0.15)	ND (0.15)	ND (0.15)
1,1-Dichloroethane	ND (0.166)	ND (0.166)	ND (0.166)
1,2-Dichloroethane	ND (0.249)	ND (0.249)	ND (0.249)
1,1-Dichloroethene	ND (0.166)	ND (0.124)	0.34 J
1,2-Dichloropropane	ND (0.143)	0.35 J	ND (0.143)
Ethylbenzene	ND (0.141)	ND (0.141)	ND (0.141)
Freon 11	ND (0.197)	ND (0.197)	0.33 J
Freon 12	0.50	0.48 J	0.48 J
Freon 113	ND (0.174)	ND (0.174)	ND (0.174)
Methylene Chloride	ND (0.11)	ND (0.11)	ND (0.11)
Methyl Ethyl Ketone (2-Butanone)	ND (0.105)	ND (0.105)	ND (0.105)
Tetrachloroethene	3.32	ND (0.143)	ND (0.143)
Toluene	ND (0.122)	ND (0.122)	0.75
1,1,1-Trichloroethane	ND (0.13)	ND (0.13)	ND (0.13)
1,1,2-Trichloroethane	ND (0.16)	ND (0.16)	ND (0.16)
Trichloroethene	121	55.9	ND (0.153)
Vinyl Chloride	ND (0.138)	ND (0.138)	ND (0.138)
Xylenes, m,p-	ND (0.246)	ND (0.246)	0.66 J
Xylene, o-	ND (0.116)	ND (0.116)	ND (0.116)

J = analyte concentration is considered an estimated value
ND = not detected
ppbv = parts per billion by volume
SVE = soil vapor extraction
( ) = detection limit

Table 5
Soil Vapor Analytical Data for March 2009 – West Transfer and Treatment Plant

Constituent	4 March 2009 (ppbv)	
	WTTPV-203	WTTPV-204
Volatile Organics		
Benzene	ND (0.124)	ND (0.62)
Bromodichloromethane	ND (0.19)	ND (0.95)
Bromomethane	ND (0.149)	ND (0.745)
Carbon Tetrachloride	ND (0.221)	ND (1.1)
Chloroform	1.44	1.75 J
Chloromethane	0.28 J	ND (0.62)
cis-1,2-Dichloroethene	3.94	30.3
trans-1,2-Dichloroethene	0.46 J	4.85
1,1-Dichloroethane	ND (0.166)	ND (0.83)
1,2-Dichloroethane	ND (0.249)	ND (1.24)
1,1-Dichloroethene	ND (0.124)	ND (0.62)
Ethylbenzene	ND (0.141)	ND (0.705)
Freon 11	ND (0.197)	ND (0.985)
Freon 12	0.55	ND (0.54)
Freon 113	ND (0.174)	ND (0.87)
Methylene Chloride	ND (0.11)	ND (0.55)
Methyl Ethyl Ketone (2-Butanone)	1.08	6.35
Tetrachloroethene	0.49 J	2.5
Toluene	ND (0.122)	2.35 J
1,1,1-Trichloroethane	ND (0.13)	ND (0.65)
1,1,2-Trichloroethane	ND (0.16)	ND (0.8)
Trichloroethene	45.5	344
Vinyl Chloride	ND (0.138)	ND (0.69)
Xylenes, m,p-	ND (0.246)	ND (1.23)
Xylene, o-	ND (0.116)	ND (0.58)

J = analyte concentration is considered an estimated value
ND = not detected
ppbv = parts per billion by volume
( ) = detection limit

Comparison Study: PDB and Low-flow Sampling Methodologies for the Evaluation of Groundwater Quality

April 2009
Travis AFB, California

Introduction

- GSAP 2007-2008 Annual Report proposed using polyethylene-based passive diffusion bag (PDB) sampler methodology as an alternative to low-flow sampling
- Optimization measure to reduce costs of long-term monitoring
- A side-by-side comparison study between PDB samplers and conventional low-flow sampling was performed during the 4Q08 GSAP event

Background

- The PDB sampler consists of a semi-permeable membrane (polyethylene) containing laboratory-grade, organic-free, water
- The PDB sampler is placed in a well
- Contaminants diffuse across the semi-permeable membrane into the reagent-grade organic-free water
- Contaminant concentrations within the PDB come into equilibrium with the surrounding groundwater (2 week equilibration period recommended)

Background, Cont.

- “PDB sampling technology has been validated by both laboratory and field tests.” (Interstate Technology and Regulatory Council [ITRC], 2004)
- It is a sampling technology accepted by the U.S. EPA, CA DTSC, and CA RWQCB, as well as the Air Force

Field Study Objective

- Guidance generally recommends that a site-specific field study be performed prior to changing sampling techniques
- Objective is to ensure PDB samplers obtain VOC analytical results comparable to those obtained by conventional sampling methods historically used at Travis AFB

Field Activities

- Side-by-side field comparison between PDB samplers and low-flow samplers performed
- 10 wells selected from sites FT004, FT004, LF007, SS015, SS016, SS029, SS030, SD031, SD037, and DP039
  - geographical variability
  - VOC concentration variability

Field Activities, Cont.

- In 4Q08 GSAP event, field-ready PDB samplers (prefilled, custom made harnesses) deployed in 10 monitoring wells at 10 different sites (MW131x04, MW765x05, MW620x07, MW216x15, MW1712x16, PZ01Dx29, MW05x30, MW570x31, MW518x37, MW751x39)
- PDB sampler consisted of 1.25-inch-diameter, 2 foot-log section of low-density polyethylene tubing, heat sealed on both ends

Field Activities, Cont.

- Prior to deployment, depth to water and total depth of well measured (ensures placement of the PDB below the water table and above the bottom of the well)
- PDB samplers lowered to the midpoint of the saturated screen interval (same depth as the pump intake during low-flow sampling)

Field Activities, Cont.

- Minimum of 2 weeks (recommended equilibration time) passed before collection of the groundwater samples
- Groundwater sample was obtained from the PDB sampler as follows
  - pulled up the PDB sampler using the harness
  - used the disposable straw provided by the vendor to pierce the sampler
  - decanted water into the sample containers

Field Activities, Cont.

- Groundwater samples using the previously-used low-flow purge methodology were collected immediately following the PDB sample recovery and collection at each well
- Samples were analyzed using US EPA method SW8260B

Summary of Findings

- For the purposes of this comparison study, only site-specific VOCs of concern, at sites where PDBs are being considered as an alternative to the low-flow technique, were evaluated
- The site-specific VOCs that were detected during the study, and were therefore included in the evaluation, are:1,2-dichloroethane (DCA); benzene; cis-1,2-DCE; methylene chloride; tetrachloroethene (PCE); trichloroethene (TCE); and vinyl chloride
- Of these TCE is the most prevalent across the Base

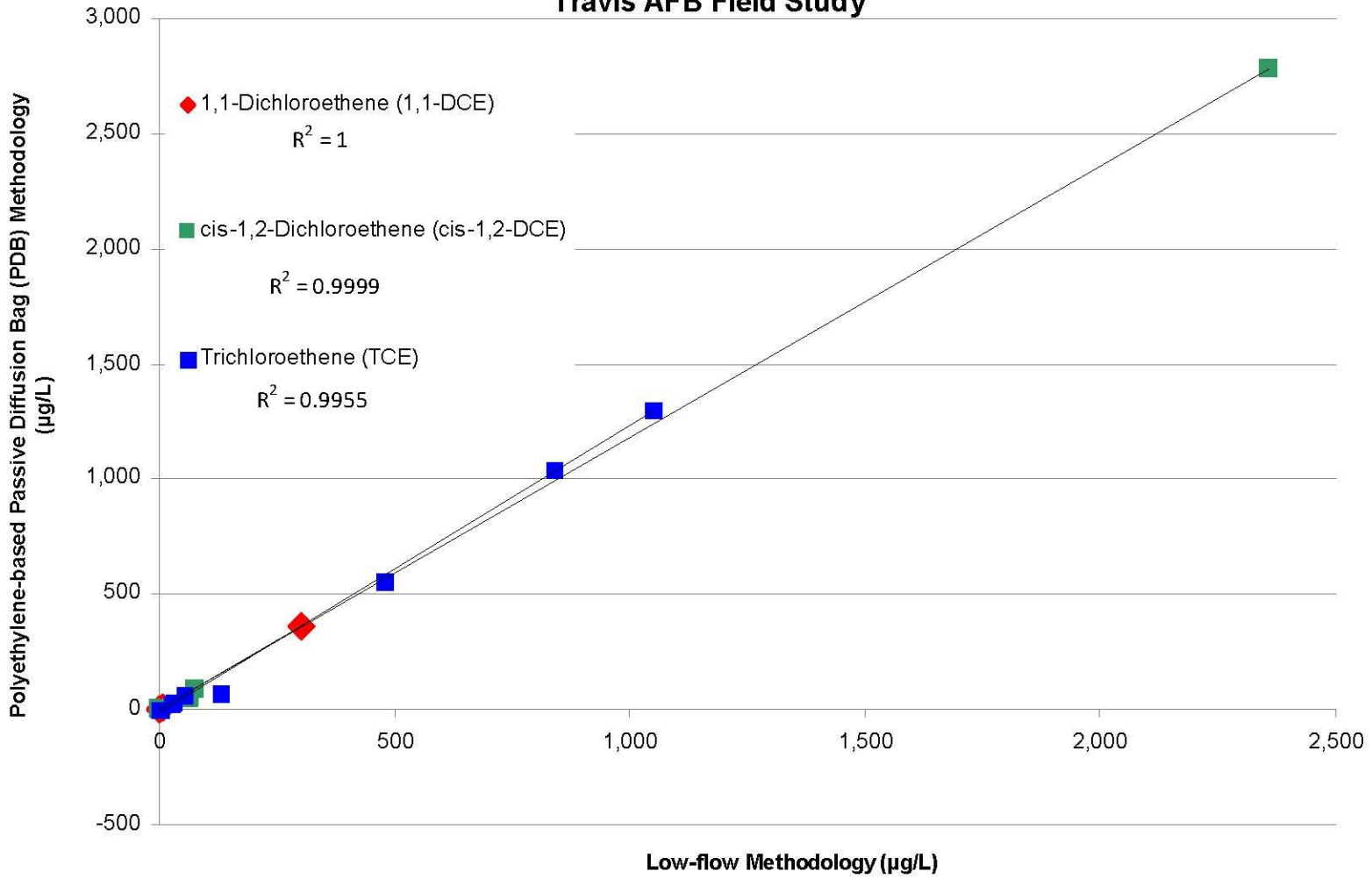
Summary of Findings

- The relative percent difference (RPD) between the analytical results obtained from the two methods were calculated
- 23 of the 26 results that could be compared (analytes were detected) had an RPD under 50%, within the acceptable range for field duplicates samples per the Travis AFB Quality Assurance Project Plan (QAPP)
- This is an excellent correlation; particularly as the samples are not in fact field duplicates
- PDB sampler results represent an average of VOC concentrations over an approximately 2 week period; purged samples are instantaneous results

Summary of Findings, Cont.

- A linear regression was performed for the most commonly detected COCs (TCE, cis-1,2-DCE, and 1,1-DCE)
- The R^2 values for these COCs ranged from 0.995 to 1 (perfect correlation represented by 1)
- No consistent bias (high or low) in the PDB sampler data compared with the low-flow data

Figure 1
Field Comparison Results
PDBs versus Conventional Low-flow Methodologies
Travis AFB Field Study



Conclusions

- There was an excellent correlation between PDB and low-flow sampling methodologies for the most commonly detected VOCs at Travis AFB.
- VOC results obtained from PDB samplers are representative of site conditions and comparable to data collected using the low-flow method
- PDB samplers are an appropriate method for long-term groundwater monitoring at Travis AFB VOC sites

Conclusions; cont.

- PDB samplers will provide a cost-savings to the GSAP by eliminating well purging, reducing equipment decontamination and waste disposal costs, and decreasing field labor costs
- PDB samplers will improve the safety of the field crew by reducing the amount of equipment carried and allowing for quick departure from dangerous areas (such as the flightline)
- Travis AFB intends to employ PDB samplers at all sites where VOCs are the only site COC monitored: FT004, FT005, LF007, SS015, SS016, SS029, SS030, SD031, and DP039

2Q09 Event

- Starts next week (last week in April)
- We will deploy PDBs at the appropriate sites during this event

Questions?

Travis AFB
Groundwater Program

Management Overview Briefing

RPM Meeting

April 24, 2009

Completed Documents & Field Work

Documents

- Basewide Health & Safety Plan (HSP)
- LF008 Rebound Study Work Plan
- DP039 Bioreactor Work Plan
- LF007C RPO Work Plan
- 2007/2008 GSAP Annual Report
- ST027B Site Characterization WP
- SS030 RPO Work Plan
- ST032 POCO Technical Memo

Field Work

- GSAP 2008 Semi-annual Event
- ST027B Gore Sorber Survey
- ST027B Field Sampling – Phase 2

In-Progress Documents & Field Work

Documents

- Action Plan (Draft)
- RD/RA QAPP Update (Draft)
- SS014 Tier 1 POCO Evaluation WP (Draft)
- 2008 Annual GWTP RPO Report (Draft)
- Passive Diffusion Bag (PDB) Technical Memo (Draft)
- Phytostabilization Demonstration Technical Memo (Pre-draft)

Upcoming Documents & Field Work

Documents

• Field Sampling Plan (FSP)	May
• Natural Attenuation Assessment Report (NAAR)	May
• DP039 RPO Work Plan	May
• ST032 POCO Evaluation Work Plan	May
• SS016 RPO Work Plan	May
• Comprehensive Site Evaluation Phase II	May
• SD036/SD037 RPO Work Plan	June
• ST018 RA Work Plan	July
• Phases 1, 2 and 3 Vapor Intrusion Report	TBD
• Focused Feasibility Study	Oct

Field Work

• GSAP Annual Sampling Event	May
• SS014 Site Characterization	May
• ST027B Installation of Wells – Phase 3	May
• SS030 Site Characterization	June
• SS016 Site Characterization	June
• LF007C Site Characterization	June