

**Travis Air Force Base  
Environmental Restoration Program  
Restoration Program Manager's  
Meeting Minutes**

**17 February 2016, 0930 Hours**

Mr. Mark Smith, of the Air Force Civil Engineer Center (AFCEC) Restoration Installation Support Team (IST) conducted the Restoration Program Manager's (RPM) meeting on 17 February 2016 at 0930 hours in Building 248 at Travis AFB, California. Attendees included:

- Mark Smith AFCEC/CZOW
- Glenn Anderson AFCEC/CZOW
- Lonnie Duke AFCEC/CZOW
- Angel Santiago Jr. AFCEC/CZOW
- Kurt Grunawalt Travis AFB 60 AMW/JA
- Merrie Schilter-Lowe Travis AFB 60 AMW/PA
- William Hall AFCEC/CZRW
- Adriana Constantinescu California Regional Water Quality Control Board  
(via telephone) (RWQCB)
- Ben Fries California Department of Toxic Substances Control  
(DTSC)
- Nadia Hollan Burke United States Environmental Protection Agency  
(USEPA)
- Indira Balkissoon Techlaw, Inc  
(via telephone)
- Mike Wray CH2M
- Tony Chakurian CH2M

Handouts distributed at the meeting, discussions and presentations included:

- Attachment 1 Meeting Agenda
- Attachment 2 Master Meeting and Document Schedule
- Attachment 3 SBBGWTP Monthly Data Sheet (January 2016)
- Attachment 4 CGWTP Monthly Data Sheet (January 2016)
- Attachment 5 ST018 Monthly Data Sheet (January 2016)
- Attachment 6 Presentation: SD031 Remedial Investigation Work Plan
- Attachment 7 Presentation: Program Update

## 1. ADMINISTRATIVE

### A. Previous Meeting Minutes

The 20 January 2016 RPM meeting minutes were approved and finalized as written.

### B. Action Item Review.

Action items from January 2016 were reviewed.

Action item 1 removed: AFCEC's Travis Restoration Installation Support Team and Travis AFB will continue to pursue opportunities for the beneficial reuse of treated water. Mr. Smith suggested action item (AI) to be removed. Adding the AI was intended to increase awareness and not lose sight of the best management practice to find a beneficial use for treated water. Mr. Smith stated that the AI had served its purpose and is now should be tracked internally. Mr. Fries expressed concern with discharging treated water to the Duck Pond without knowing the residual contamination. He gave a historical example of Kesterson National Wild Life Refuge where there was a high concentration of selenium due to agriculture runoff causing deformity in the nearby wildlife. Adding Travis AFB may need to run it by United States Fish and Wildlife Service (USFWS) before using treated water. Mr. Smith explained the USFWS was consulted about the beneficial reuse of treated groundwater from Site LF007 being discharged to the Duck Pond during the dry season, and the discharge of treated water from the CGWTP and SBBGWTP to Union Creek; adding this was agreed to in the Groundwater Record of Decision (ROD). Ms. Burke said she supports removing this AI and suggested if Travis AFB found beneficial reuse of the treated water from the CGWTP or SBBGWTP that this would need to be included as an AI again. Mr. Duke added that the Department of Defense (DOD) just came out with a policy where they are looking at getting away from irrigation; the base is looking into xeriscaping.

Action item 2 is ongoing: Mr. Smith to provide updates on PFOS and PFOA as he becomes aware of them. 17 February 2016: Preliminary assessment has been completed. The next step is the extended site inspection, to include spot sampling. Mr. Smith said that the spot sampling that is going to be conducted will not include the sampling of the treatment plant's effluent. Mr. Smith learned in the kick off meeting that a current method of treating PFOS and PFOA is with carbon. If these chemicals exist in the groundwater and are reaching the treatment plants, they will be removed by the carbon. Sample collections will not be taken at the treatment plant effluent points, but will take place at the outfalls and at the Union Creek discharge points.

Action item 3 is closed: Travis AFB to provide Ms. Constantinescu/RWQCB one week notification via email before construction begins at Site SS014 Bioreactor Installation. 17 February 2016: This will be tracked through the Program Update Briefings.

### **C. Master Meeting and Document Schedule Review (see Attachment 2)**

The Travis AFB Master Meeting and Document Schedule (MMDS) was discussed during this meeting (see Attachment 2).

#### **Travis AFB Annual Meeting and Teleconference Schedule**

The next RPM meeting will be a teleconference, held on Wednesday, 16 March 2016, at 0930.

#### **Travis AFB Master Document Schedule**

- Community Involvement Plan: No change to the schedule. A questionnaire is currently being drafted and will be mailed to the RAB members to solicit their input.
- Site SD031 Remedial Investigation Work Plan: Draft to Agencies date changed to 10 February 2016, no other changes were made to the schedule.
- Site SS016 Remedial Design/Remedial Action Soil Work Plan: No change made to the schedule.
- Site TS060 Action Memorandum: Dates changed from TBD to actual dates.
- Potrero Hills Annex (FS, PP, and ROD): No change to the schedule.
- Data Gap Investigation Technical Memorandum for Soil Sites SD033, SD043, and SS046: No changes made to the schedule.
- Corrective Action Plan for DERA-Funded Oil Water Separators (POCO): Predraft to AF/Service Center due date changed to 10 February 2016 to reflect the actual date. The rest of the dates were changed accordingly.
- Site CG508 Well Abandonment Work Plan: Predraft to AF/Service Center date was changed to 01 February 2016 to reflect the actual date, the rest of the dates were changed accordingly. Note that Mr. Fries expressed a preference to change “Abandonment” to “Decommissioning”. As such, the document title will be changed.
- Site SD034 Technology Demonstration Work Plan: Dates changed from TBD to actual dates.
- Site TS060 Removal Action Work Plan: Dates changed from TBD to actual dates.
- Quarterly Newsletter (April 2016): Draft to Agencies date updated to 29 March 2016 to reflect the second quarter 2016 newsletter, the rest of the dates were changed accordingly.
- 2014 Annual GRISR: The Response to Comment Due and Final Due dates changed to 03 March 2016.
- 2015 Annual GRISR: No change made to the schedule.

- Site SS015 Remedial Action Construction Completion Report: The Response to Comments Due and Final Due dates changed to 22 January 2016.
- Site ST032 POCO Completion Report: Dates changed from TBD to actual dates.
- Site FT004 Groundwater Technology Demonstration Construction Completion Report: No change made to the schedule.
- Site ST028 POCO Completion Report: Dates changed from TBD to actual dates.
- 2015 Annual CAMU Monitoring Report: No change made to the schedule.
- Site FT005 Technology Demonstration Construction Completion Report: No change made to the schedule.
- Site DP039 Remedial Action Construction Completion Report: No change made to the schedule
- Sites SD036 and SD037 Remedial Action Construction Completion Report: Moved to History.
- Site SS016 Groundwater Remedial Action Construction Completion Report: Moved to History.
- Site SS030 Remedial Action Construction Completion Report: Moved to History.

## **2. CURRENT PROJECTS**

### **Treatment Plant Operation and Maintenance Update**

#### **South Base Boundary Groundwater Treatment Plant, January 2016 (see Attachment 3)**

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 100% uptime, and 3.51 million gallons of groundwater were extracted and treated during the month of January 2016. All of the treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 86.1 gallons per minute (gpm). Electrical power usage was 9,660 kWh, and approximately 13,234 pounds of CO<sub>2</sub> were created (based on DOE calculation). Approximately 1.0 pounds of volatile organic compounds (VOCs) were removed in January. The total mass of VOCs removed since startup of the system is 472.3 pounds.

Optimization Activities for SBBGWTP: No optimization activities reported for the month of January 2016.

#### **Central Groundwater Treatment Plant, January 2016 (see Attachment 4)**

The Central Groundwater Treatment Plant (CGWTP) performed at 81.0% uptime with approximately 1.06 million gallons of groundwater extracted and treated during the month of January 2016. All treated water was discharged to the storm drain. The average flow rate for the CGWTP was 32.3 gpm. Electrical power usage was 2,288 kWh for all equipment connected to the Central Plant, and approximately 3,135 pounds of CO<sub>2</sub> were generated. Approximately 1.74 pounds of VOCs were removed from groundwater by the treatment plant in January. The total mass of VOCs removed since the startup of the system is 11,423 pounds.

Optimization Activities for CGWTP: No optimization activities are reported for the month of January 2016.

### **LF007C Groundwater Treatment Plant**

*The LF007C Groundwater Treatment Plant was taken offline as of 24 December 2015, in accordance with the USFWS, due to the presence of standing water in the vernal pools.*

### **ST018 Groundwater (MTBE) Treatment Plant, January 2016 (see Attachment 5)**

The Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 100% uptime with approximately 145,700 gallons of groundwater extracted and treated during the month of January 2016. All treated water was diverted to the sanitary sewer. The average flow rate for the ST018 GWTP was 3.6 gpm. Electrical power usage for the month was 88 kWh for all equipment connected to the ST018 GWTP, which equates to approximately 121 pounds of CO<sub>2</sub>. Approximately 0.86 pounds of BTEX, MTBE and TPH was removed from groundwater in January by the treatment plant. Approximately 0.06 pounds of MTBE was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 34.7 pounds, and the total MTBE mass removed since startup of the system is 8.3 pounds.

Note: Electrical power use at the ST018 GWTP is only for the alarm system and a pump that pushes water through the GAC vessels for treatment. The extraction pumps in the system are all solar powered.

Optimization Activities for ST018GWTP: No optimization activities to report for the month of January 2016.

## **Presentations:**

### **Presentation: Site SD031 Soil Remedial Investigation Work Plan (see Attachment 6)**

Mr. Chakurian presented on the Site SD031 Soil Remedial Investigation Work Plan. For details see attachment 6, which includes maps and figures.

Mr. Chakurian covered the following topics in the presentation: the site background, discovery of soil staining, preliminary soil sampling, historical records/reports review, interviews, second round of soil sampling, work plan objectives, conceptual design, soil sampling, soil vapor sampling, risk assessments, feasibility study, and reporting.

#### **Background:**

- Site SD031 consists of facility 1205, built in 1957, and the concrete and asphalt lot to the southeast. It is used by the Civil Engineer Maintenance, Inspection and Repair Team (CEMIRT), for the maintenance and repair of diesel generators.
- This is currently a groundwater site only, with 1,1,-dichloroethene (DCE) as the dominant COC.
- Soil had been determined to have a “no further action” designation in the North/East/West Industrial Operable Unit Soil, Sediment and Surface Water Record of Decision – Travis AFB, 2006. *Previous soil investigations were performed primarily in the vicinity of the wash rack, which is adjacent to the southeast corner of building 1205.*

#### **Discovery of Soil Staining:**

- In 2014 Site SD031 was chosen as a suitable location for a groundwater technology demonstration. The location of the technology demonstration was to the southeast of where the previous soil investigations had been conducted.
- During the air knifing activities for the utility clearance to 5 feet bgs it was observed that a large area of soil staining and strong hydrocarbon odor was present in 14 out of the 15 boring locations. The PID readings of the stained soil ranged from 0 to 1,118 ppm.

#### **Preliminary Soil Sampling:**

- Based on the observed soil staining and hydrocarbon odors, a preliminary round of soil samples was conducted on 30 October 2014.
- The analytical results from the preliminary soil sampling indicated that VOCs were not above the RWQCB residential environmental screening levels (ESLs) and EPA regional screening levels (RSL). The low VOC results could have been due to the impact of the air knifing activities. Soil samples were not analyzed for TPH, SVOCs, or CCR Title 22 metals. Because of the potential impacts from the air knifing affecting the VOC results, it was determined to collect a second round of sampling to include TPH, SVOCs, and metals.

- Before collecting the second set of samples it was decided to conduct an investigation as to what the soil impacts may have been to determine what analytical methods are needed to identify potential COCs.
- The investigation included a review of historical records, reports, and interviews with long-time personnel of CEMIRT.

#### Historical Records, Reports Review:

- Reports and records reviewed included: East Industrial Operable Unit Remedial Investigation, Interim Groundwater Remedial Design/Remedial Action Reports, Groundwater O&M Reports from 2002 to 2004 and RPM Meeting Minutes from October 2002 to January 2004.
- Results of the historical records and reports review indicated: No historical soil sampling had been conducted where the soil staining was observed. The asphalt/concrete paved area where the soil staining was observed had been used from 1958 to 1963 as a parking area for interceptor aircraft. Soil staining was observed in 1999 during the installation of extraction wells and monitoring wells. In September 2002 the PID measurements and soil vapor sampling identified the presence of high concentration of petroleum hydrocarbons/Stoddard solvent in the dual phase extraction well EW566x31, and shut down the vapor portion of that well. (Dual phase wells are used to treat vapor and groundwater.)
- The petroleum hydrocarbon/Stoddard solvent concentrations were too high for the SVE system to run using vapor-phase granular activated carbon (VGAC). Travis AFB removed 4,860 pounds of vapor phase contaminant mass using a temporary portable catalytic oxidation (CatOx) system from 27 July 2003 to 17 September 2003. During that period, petroleum hydrocarbons, 1,1-DCE, TCE, Freon 113, vinyl chloride, and cis-1,2-DCE were detected in soil vapor samples.
- The CatOx system was shut down on 17 September 2003 due to lack of additional funding. According to the October 2003 RPM Meeting Minutes it was planned to be brought back online in 2004. However in that same meeting the need for bringing back the CatOx system was questioned. (excerpts from that RPM meeting can be found in attachment 6)
- At the January 2004 RPM meeting both Travis AFB and the regulators agreed that there would be no further removal of TPH in the vapor phase at extraction well EW566x31.

#### Interviews:

- Several long-time personnel of CEMIRT were interviewed and the results of the interviews indicated: The area with the soil staining is in the vicinity where interceptor planes were parked and washed from the late 1950s to early 1970s. During the Vietnam Conflict transport aircraft returning from Southeast Asia parked in the area of the stained

soil to be washed in order to remove chemicals that they were exposed to. A chemical in question may have included Agent Orange.

- According to the personnel interviewed, the contamination associated with the stained soil would likely be associated with spillage of chemicals during the late 1950s to the early 1970s with the cleaning of interceptor jets and transport aircraft. Additionally, releases from historical and current maintenance activities of the diesel generators and large HVAC systems at building 1205 contributed to the stained soil.

#### Second Round of Soil Sampling:

- It was determined that the second round of soil samples would be analyzed for TPH, VOCs, SVOCs, PAHs, herbicides, dioxins and furans.
- Soil samples were collected at depths of 2, 3, and 5 feet bgs by hand auger on 5 January 2015 at soil borings SB2197Ax31, SB2203Ax31, GC2334Ax31, and GC2335Ax31. The analytical results of the soil samples indicated the presence of TPH-g, TPH-d, TPH-MO, acetone, total xylenes, PAHs, 2,3,7,8-tetrachlorodibenzodioxin (TCDD), and 2,4-dimethylphenol at concentrations greater than the Regional Water Quality Control Board and EPA residential limits. (see attachment 6 for analytical results).

#### Work Plan Objectives:

- Drill and collect soil samples to determine the chemicals of potential concern (COPCs).
- Laterally and vertically delineate the extent of the COPCs in the soil. Collect soil vapor samples to evaluate the vapor intrusion pathway.
- Conduct a human health risk assessment and an ecological risk assessment to determine if there is a significant potential risk in the soil to human and/or ecological risk. If there is a significant potential risk, identify the chemicals of concern – evaluate remedial options for the soil in a Feasibility Study.

#### Conceptual Design:

- The first phase will consist of 13 primary borings.
- The second phase will consist of up to 16 initial step-out borings that will be drilled as a halo around the primary borings based on primary boring results.
- The need for additional step-out boring locations will be determined using the Triad-like approach employed at Travis AFB.
- Should the analytical results of the second round of step-out borings exceed either the ESLs or RSLs, additional borings will be drilled as appropriate based on the CSM.
- Soil vapor samples will be collected from four primary soil boring locations to evaluate the vapor intrusion pathway.

- Soil samples will be collected from 8 primary boring locations 3 feet into the saturated zone to evaluate the smear zone.

Ms. Constantinescu asked if Travis AFB has groundwater data that shows the same COCs were tested for in the groundwater at Site SD031. Mr. Chakurian said the groundwater was tested for VOCs, and possibly TPH, not sure about the other COCs. Ms. Constantinescu said that the RWQCB needs to have the same COCs tested for groundwater as the soil. Ms. Burke said she assumes Travis AFB would be evaluating the risk to groundwater receptors. Mr. Chakurian said the focus on this work plan was on the soil and vadose zone.

#### Soil Sampling:

- Up to 29 soil borings; 13 primary soil borings and up to 16 initial step-out borings, are planned to be drilled, 21 out of the 29 soil boring locations will be drilled to the water table interface, which is anticipated to be at 15 feet bgs.
- Soil samples will be collected at 2 feet bgs, 5, 10, and 15 feet bgs, and just above the water table interface.
- Eight (8) of the 29 soil boring locations will be drilled to 3 feet into the saturated zone, which is anticipated to be 18 feet bgs.

#### Soil Vapor Sampling:

- HHRA and EcoRA will be performed to evaluate the potential risk to human and ecological receptors under current and potential future conditions.
- If significant potential risk exists in the soil for human and or ecological receptors, then a feasibility study will be performed.
- The feasibility study would evaluate up to three remedial alternatives to address the identified potential risks to human health and or the environment, as appropriate.

#### Reporting:

- Results of the soil remedial investigation will be reported in the Site SD031 Soil Remedial Investigation Report.
- If a feasibility study is needed for the soil, the results will be documented in a separate report.

### **Program Update: Activities Completed, In Progress, and Upcoming (see Attachment 7)**

Mr. Wray reported on the status of field work and documents which are completed, in progress, and upcoming. Updates from the briefing this month included:

Newly Completed Documents: None.

Newly Completed Field Work: TA500 Groundwater Sampling.

In-Progress Documents (CERCLA): 2014 Annual GRISR.

In-Progress Documents (POCO): None.

In-Progress Field Work: FT005 EVO Injection, DP039 EVO Injection.

Upcoming Documents (CERCLA): Site SD031 Soil Remedial Investigation Work Plan (February), Data Gap Investigation Tech Memo for Soil Sites SD033, SD043, and SS046 (February), Site CG508 Well Abandonment Work Plan (March), Community Involvement Plan (March), Site FT004 Technology Demonstration Construction Completion Report (March), 2015 Annual CAMU Monitoring Report (March), Site TS060 Action Memorandum (March), Site SD034 Technology Demonstration Work Plan (April), 2015 Annual GRISR (June), Site FT005 Technology Demonstration Construction Completion Report (TBD), Site DP039 RD/RA Construction Completion Report (TBD), SS016 RD/RA Soil Work Plan (TBD).

Upcoming Documents (POCO): Site ST032 POCO Completion Report (February), Corrective Action Plan for DERA-Funded Oil Water Separators (March), Site ST028 POCO Completion Report (March).

Field Work Planned (CERCLA): SD031 Soil Remedial Investigation (May), SD034 Technology Demonstration Installation (TBD), TS060 Removal Action (TBD).

Field Work Planned (POCO): Oil Water Separators (12) Removal (May), CG508 Well Decommissioning (June), SS014 Bioreactor Installation (June).

#### **4. New Action Item Review**

None.

#### **5. PROGRAM/ISSUES/UPDATE**

None.

## 6. Action Items

Item #	Responsible	Action Item Description	Due Date	Status
1.	Travis AFB	AFCEC's Travis Restoration Team and Travis AFB will continue to pursue opportunities for the beneficial reuse of treated water. Current possibilities include: Rerouting treated water from the central plant to the duck pond or as irrigation as an energy reduction project with the intent of reducing on-base water usage. Update: Mr. Duke informed the group that Travis AFB is considering the use of treated water during EVO injection at Site FT005 as opposed to potable water. New opportunities for treated water beneficial reuse will be presented to the regulatory agencies when they are identified.	17 February 2016	Removed from this forum and tracked internally.
2.	Mark Smith	Mr. Smith to provide updates on PFOS and PFOA as he becomes aware of them. Update: Mr. Smith stated that a kickoff meeting for a follow on extended SI took place the week of 25 January. EPA asked if the intent was to sample GWTP effluent. Mr. Smith said that the treatment plants effluent will not be sampled during the SI, however, sample collections will take place at the outfalls and at the Union Creek discharge points. Mr. Smith learned in the kick off meeting that if PFOS and PFOA were reaching the treatment plants, they would be removed by the carbon.	Ongoing	Open
3.	Travis AFB	Provide Ms. Constantinescu/RWQCB one week notification via email before construction begins at Site SS014 Bioreactor Installation	17 February 2016	Closed

TRAVIS AIR FORCE BASE  
ENVIRONMENTAL RESTORATION PROGRAM  
RESTORATION PROGRAM MANAGER'S MEETING  
BLDG 248 Conference Room  
17 February 2016, 9:30 A.M.  
AGENDA

1. ADMINISTRATIVE

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

2. CURRENT PROJECTS

- A. TREATMENT PLANT OPERATION AND MAINTENANCE UPDATE

3. PRESENTATIONS

- A. SD031 RI WP PRESENTATION
- B. PROGRAM UPDATE:  
DOCUMENTS & ACTIVITIES COMPLETED, IN PROGRESS AND PLANNED

4. NEW ACTION ITEM REVIEW

5. PROGRAM/ISSUES/UPDATE

- A. MEETING SCHEDULE

**NOTES: FOR THOSE OF YOU CALLING IN, PLEASE DIAL - 1-866-203-7023. Enter the Participation code 5978-75-9736 then enter #.**

THE ERP STAFF WILL REMAIN AVAILABLE FOR A POST RPM MEETING GRISR DISCUSSION FOR THOSE REGULATORY AGENCIES AVAILABLE TO DISCUSS.

**(2016)**  
**Annual Meeting and Teleconference Schedule**

Monthly RPM Meeting <sup>1</sup> (Begins at time noted)	RPM Teleconference (Begins at time noted)	Restoration Advisory Board Meeting (Begins at 7:00 p.m.) (Poster Session at 6:30 p.m.)
—	01-20-16	—
02-17-16	—	—
—	03-16-16	—
04-21-16 (Thursday 2:00 PM)	—	04-21-16
—	05-18-16	—
06-15-16	—	—
—	07-20-16	—
08-17-16	—	—
—	09-21-16	—
10-20-16 (Thursday 2:00 PM)	—	10-20-16 <sup>2</sup>
—	11-16-16	—
—	—	—

<sup>1</sup> Note: Meetings and teleconferences will be held at 09:30 AM on the third Wednesday of each month unless otherwise noted.

<sup>2</sup> Note: Tentative RAB tour date in lieu of RAB meeting.

## Travis AFB Master Meeting and Document Schedule

<b>PRIMARY DOCUMENTS</b>				
<b>Life Cycle</b>	<b>Community Involvement Plan Travis AFB, Glenn Anderson CH2M HILL, Tricia Carter</b>	<b>Site SD031 Remedial Investigation Work Plan Travis AFB, Lonnie Duke CH2M HILL, Tony Chakurian</b>	<b>Site SS016 Remedial Design/Remedial Action Soil Work Plan Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick CAPE, Meg Greenwald</b>	<b>Site TS060 Action Memorandum Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick CAPE, Meg Greenwald</b>
<b>Scoping Meeting</b>	NA	NA	NA	NA
Predraft to AF/Service Center	NA	01-13-16	TBD	02-24-16
AF/Service Center Comments Due	NA	01-28-16	TBD	03-09-16
Draft to Agencies	03-16-16	02-10-16	TBD	03-23-16
Draft to RAB	03-16-16	02-10-16	TBD	03-23-16
Agency Comments Due	04-15-16	03-14-16	TBD	04-22-16
<b>Response to Comments Meeting</b>	<b>04-21-16</b>	<b>03-16-16</b>	<b>TBD</b>	<b>05-18-16</b>
Agency Concurrence with Remedy	NA	NA	TBD	NA
Public Comment Period	NA	NA	TBD	NA
<b>Public Meeting</b>	<b>NA</b>	<b>NA</b>	<b>TBD</b>	<b>NA</b>
Response to Comments Due	05-23-16	03-30-16	TBD	06-06-16
Draft Final Due	05-23-16	03-30-16	TBD	06-06-16
Final Due	06-23-16	04-29-16	TBD	07-07-16

## Travis AFB Master Meeting and Document Schedule

<b>PRIMARY DOCUMENTS</b>			
<b>Life Cycle</b>	<b>Potrero Hills Annex Travis, Glenn Anderson</b>		
	<b>FS</b>	<b>Proposed Plan</b>	<b>ROD</b>
<b>Scoping Meeting</b>	<b>180 days after Water Board Order Rescinded</b>	<b>+470 days</b>	<b>+735 days</b>
Predraft to AF/Service Center	+ 270 days	+530 days	+ 915 days
AF/Service Center Comments Due	+ 300 days	+560 days	+ 975 days
Draft to Agencies	+330 days	+590 days	+ 1035 days
Draft to RAB	+ 330 days	+590 days	+ 1035 days
Agency Comments Due	+390 days	+650 days	+ 1095 days
<b>Response to Comments Meeting</b>	<b>+ 405 days</b>	<b>+665 days</b>	<b>+ 1110 days</b>
Agency Concurrence with Remedy	NA	NA	+ 1130 days
Public Comment Period	NA	+735 to 765 days	NA
<b>Public Meeting</b>	<b>NA</b>	<b>+745 days</b>	<b>NA</b>
Response to Comments Due	+430 days	+695days	+ 1190 days
Draft Final Due	+430 days	+695 days	+ 1190 days
Final Due	+460 days	+725 days	+ 1250 days

## Travis AFB Master Meeting and Document Schedule

<b>SECONDARY DOCUMENTS</b>			
<b>Life Cycle</b>	<b>Data Gap Investigation Technical Memorandum for Soil Sites SD033, SD043, and SS046  Travis AFB, Glenn Anderson CH2M HILL, Leslie Royer</b>	<b>Corrective Action Plan for DERA-Funded Oil Water Separators  Travis AFB, Lonnie Duke CH2M HILL, Doug Berwick</b>	<b>Site CG508 Well Abandonment Work Plan  Travis AFB, Lonnie Duke CH2M HILL, Levi Pratt</b>
<b>Scoping Meeting</b>	NA	NA	NA
Predraft to AF/Service Center	01-15-16	02-10-16	02-01-16
AF/Service Center Comments Due	02-01-16	02-25-16	02-16-16
Draft to Agencies	02-17-16	03-10-16	03-01-16
Draft to RAB	02-17-16	03-10-16	03-01-16
Agency Comments Due	03-18-16	04-11-16	03-31-16
<b>Response to Comments Meeting</b>	<b>04-21-16</b>	<b>04-21-16</b>	<b>04-21-16</b>
Response to Comments Due	05-06-16	05-05-16	05-09-16
Draft Final Due	NA	NA	NA
Final Due	05-06-16	05-05-16	05-09-16
Public Comment Period	NA	NA	NA
<b>Public Meeting</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

## Travis AFB Master Meeting and Document Schedule

<b>SECONDARY DOCUMENTS</b>		
<b>Life Cycle</b>	Site SD034 Technology Demonstration Work Plan Travis AFB, Lonnie Duke CH2M HILL, Levi Pratt	Site TS060 Removal Action Work Plan Travis AFB, Glenn Anderson CH2M HILL, Doug Berwick CAPE, Meg Greenwald
<b>Scoping Meeting</b>	NA	NA
Predraft to AF/Service Center	03-16-16	03-17-16
AF/Service Center Comments Due	03-30-16	03-31-16
Draft to Agencies	04-13-16	04-14-16
Draft to RAB	04-13-16	04-14-16
Agency Comments Due	05-13-16	05-16-16
<b>Response to Comments Meeting</b>	<b>05-18-16</b>	<b>05-18-16</b>
Response to Comments Due	06-02-16	06-03-16
Draft Final Due	NA	NA
Final Due	06-02-16	06-03-16
Public Comment Period	NA	NA
<b>Public Meeting</b>	NA	NA

## Travis AFB Master Meeting and Document Schedule

<b>INFORMATIONAL DOCUMENTS</b>				
<b>Life Cycle</b>	<b>Quarterly Newsletters (April 2016) Travis, Glenn Anderson</b>	<b>2014 Annual GRISR Travis AFB, Lonnie Duke CH2M HILL, Leslie Royer</b>	<b>2015 Annual GRISR Travis AFB, Lonnie Duke CH2M HILL, Leslie Royer</b>	<b>Site SS015 Remedial Action Construction Completion Report Travis AFB, Glenn Anderson CH2M HILL, Leslie Royer</b>
<b>Scoping Meeting</b>	NA	NA	NA	NA
Predraft to AF/Service Center	NA	04-24-15	04-26-16	09-02-15
AF/Service Center Comments Due	NA	05-22-15	05-26-16	09-17-15
Draft to Agencies	03-29-16	06-10-15	06-10-16	09-25-15
Draft to RAB	NA	06-10-15	06-10-16	09-25-15
Agency Comments Due	04-12-16	09-08-15	07-11-16	10-28-15
<b>Response to Comments Meeting</b>	<b>TBD</b>	<b>09-16-15</b>	<b>07-20-16</b>	<b>11-05-15</b>
Response to Comments Due	04-13-16	09-30-15 (03-03-16)	08-03-16	11-19-15 (01-22-16)
Draft Final Due	NA	NA	NA	NA
Final Due	04-15-16	09-30-15 (03-03-16)	08-03-16	11-19-15 (01-22-16)
Public Comment Period	NA	NA	NA	NA
<b>Public Meeting</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

## Travis AFB Master Meeting and Document Schedule

<b>INFORMATIONAL DOCUMENTS</b>			
<b>Life Cycle</b>	Site ST032 POCO Completion Report Travis AFB, Lonnie Duke CH2M HILL, Doug Berwick CAPE, Meg Greenwald	Site FT004 <b>Groundwater</b> Technology Demonstration Construction Completion Report Travis AFB, Lonnie Duke CH2M HILL, Levi Pratt	Site ST028 POCO Completion Report Travis AFB, Lonnie Duke CH2M HILL, Doug Berwick CAPE, Meg Greenwald
<b>Scoping Meeting</b>	NA	NA	NA
Predraft to AF/Service Center	01-25-16	02-16-16	02-19-16
AF/Service Center Comments Due	02-08-16	03-01-16	03-04-16
Draft to Agencies	02-23-16	03-15-16	03-18-16
Draft to RAB	02-23-16	03-15-16	03-18-16
Agency Comments Due	03-24-16	04-14-16	04-18-16
<b>Response to Comments Meeting</b>	<b>04-21-16</b>	<b>04-21-16</b>	<b>04-21-16</b>
Response to Comments Due	05-11-16	05-10-16	05-12-16
Draft Final Due	NA	NA	NA
Final Due	05-11-16	05-10-16	05-12-16
Public Comment Period	NA	NA	NA
<b>Public Meeting</b>	NA	NA	NA

## Travis AFB Master Meeting and Document Schedule

<b>INFORMATIONAL DOCUMENTS</b>			
<b>Life Cycle</b>	<b>2015 Annual CAMU Monitoring Report Travis AFB, Lonnie Duke CH2M HILL, Levi Pratt</b>	<b>Site FT005 Technology Demonstration Construction Completion Report Travis AFB, Lonnie Duke CH2M HILL, Levi Pratt</b>	<b>Site DP039 Remedial Action Construction Completion Report Travis AFB, Lonnie Duke CH2M HILL, Levi Pratt</b>
<b>Scoping Meeting</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
Predraft to AF/Service Center	02-26-16	TBD	TBD
AF/Service Center Comments Due	03-11-16	TBD	TBD
Draft to Agencies	03-29-16	TBD	TBD
Draft to RAB	03-29-16	TBD	TBD
Agency Comments Due	04-28-16	TBD	TBD
<b>Response to Comments Meeting</b>	<b>05-18-16</b>	<b>TBD</b>	<b>TBD</b>
Response to Comments Due	06-01-16	TBD	TBD
Draft Final Due	NA	NA	NA
Final Due	06-01-16	TBD	TBD
Public Comment Period	NA	NA	NA
<b>Public Meeting</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

## Travis AFB Master Meeting and Document Schedule

<b>HISTORY</b>			
<b>Life Cycle</b>	<b>Sites SD036 and SD037 Remedial Action Construction Completion Report Travis AFB, Glenn Anderson CH2M HILL, Leslie Royer</b>	<b>Site SS016 Groundwater Remedial Action Construction Completion Report Travis AFB, Glenn Anderson CH2M HILL, Leslie Royer</b>	<b>Site SS030 Remedial Action Construction Completion Report Travis AFB, Lonnie Duke CH2M HILL, Leslie Royer</b>
<b>Scoping Meeting</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
Predraft to AF/Service Center	06-24-15	07-24-15	10-09-15
AF/Service Center Comments Due	07-08-15	08-07-15	10-23-15
Draft to Agencies	07-30-15	08-21-15	11-06-15
Draft to RAB	07-30-15	08-21-15	11-06-15
Agency Comments Due	08-31-15	09-21-15	12-07-15
<b>Response to Comments Meeting</b>	<b>09-16-15</b>	<b>10-22-15</b>	<b>01-20-16</b>
Response to Comments Due	09-30-15 (12-04-15)	11-20-15 (12-14-15)	02-04-16 (01-18-16)
Draft Final Due	NA	NA	NA
Final Due	09-30-15 (12-04-15)	11-20-15 (12-14-15)	02-04-16 (01-18-16)
Public Comment Period	NA	NA	NA
<b>Public Meeting</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

# South Base Boundary Groundwater Treatment Plant Monthly Data Sheet

Report Number: 185

Reporting Period: 30 December 2015 – 27 January 2016

Date Submitted: 11 February 2016

This monthly data sheet presents information regarding the South Base Boundary Groundwater Treatment Plant (SBBGWTP) and associated remedial process optimization (RPO) activities.

## System Metrics

Table 1 presents operational data from the January 2016 reporting period.

<b>Table 1 – Operations Summary – January 2016</b>			
<b>Initial Data Collection:</b>	12/30/2015 12:15	<b>Final Data Collection:</b>	1/27/2016 16:10
Operating Time:	Percent Uptime:	Electrical Power Usage:	
<b>SBBGWTP: 680 hours</b>	<b>SBBGWTP: 100%</b>	<b>SBBGWTP: 9,660 kWh (13,234 lbs CO<sub>2</sub> generated<sup>a</sup>)</b>	
Gallons Treated: <b>3.51 million gallons</b>		Gallons Treated Since July 1998: <b>921 million gallons</b>	
Volume Discharged to Union Creek: <b>3.51 million gallons</b>		Gallons Treat From Other Sources: <b>0 gallons<sup>b</sup></b>	
VOC Mass Removed: <b>1.0 lbs<sup>c</sup></b>		VOC Mass Removed Since July 1998: <b>472.3 lbs</b>	
Rolling 12-Month Cost per Pound of Mass Removed: \$2,876 <sup>d</sup>			
Monthly Cost per Pound of Mass Removed: \$4,777 <sup>d</sup>			
lbs = pounds			
<sup>a</sup> Based on Department of Energy estimate that 1 kilowatt hour generated produces 1.37 pounds of GHG.			
<sup>b</sup> Decontamination water from investigation activities, processed through the SBBGWTP from the external settling tank			
<sup>c</sup> Calculated using January 2016 EPA Method SW8260C analytical results.			
<sup>d</sup> Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system.			

Table 2 presents individual extraction well flow rates along with the average system flow during the monthly reporting period. In January 2016, there was a communication failure between the PLC and the SCADA system; therefore, no flow rates were recorded. The communication failure is being investigated. However, the total system flow rate was measured from the system flow totalizer.

<b>Table 2 – SBBGWTP Average Flow Rate (gpm)<sup>a</sup> – January 2016</b>							
<b>FT005<sup>b</sup></b>				<b>SS029</b>		<b>SS030</b>	
EW01x05	Offline	EW736x05	Offline	EW01x29	0.0 <sup>b</sup>	EW01x30	0.0 <sup>b</sup>
EW02x05	0.0 <sup>b</sup>	EW737x05	Offline	EW02x29	0.0 <sup>b</sup>	EW02x30	0.0 <sup>b</sup>
EW03x05	Offline	EW742x05	Offline	EW03x29	0.0 <sup>b</sup>	EW03x30	0.0 <sup>b</sup>
EW731x05	Offline	EW743x05	Offline	EW04x29	0.0 <sup>b</sup>	EW04x30	0.0 <sup>b</sup>
EW732x05	Offline	EW744x05	Offline	EW05x29	0.0 <sup>b</sup>	EW05x30	0.0 <sup>b</sup>
EW733x05	Offline	EW745x05	Offline	EW06x29	0.0 <sup>b</sup>	EW2174x30	0.0 <sup>b</sup>
EW734x05	0.0 <sup>b</sup>	EW746x05	Offline	EW07x29	0.0 <sup>b</sup>	EW711x30	0.0 <sup>b</sup>
EW735x05	Offline						
<b>FT005 Total: 0.0<sup>b</sup></b>				<b>SS029 Total: 0.0<sup>b</sup></b>		<b>SS030 Total: 0.0<sup>b</sup></b>	
<b>SBBGWTP Average Monthly Flow<sup>c</sup>: 86.1 gpm</b>							
<sup>a</sup> Most extraction wells at FT005 were taken offline in accordance with the <i>2008 Annual Remedial Process Optimization Report for the Central Groundwater Treatment Plant, North Groundwater Treatment Plant, and South Base Boundary Groundwater Treatment Plant.</i> <sup>b</sup> The extraction well is operational but the flow rate is not registering on the SCADA. <sup>c</sup> The average SBBGWTP groundwater flow rate was calculated using the Union Creek Discharge Totalizer and dividing it by the total time in the reporting period. gpm – gallons per minute SBBGWTP – South Base Boundary Groundwater Treatment Plant							

Table 3 presents a summary of system shutdowns during the monthly reporting period.

<b>Table 3 – Summary of System Shutdowns</b>					
<b>Location</b>	<b>Shutdown<sup>a</sup></b>		<b>Restart<sup>a</sup></b>		<b>Cause</b>
	<b>Date</b>	<b>Time</b>	<b>Date</b>	<b>Time</b>	
SBBGWTP	None.	--		--	None.
-- = Time not recorded <sup>a</sup> Shutdown and restart times estimated based on field notes. NA = not applicable SBBGWTP = South Base Boundary Groundwater Treatment Plant					

## Summary of O&M Activities

Analytical data from the 6 January 2016 sampling event are presented in Table 4. The total VOC concentration (34.22 µg/L) in the influent sample decreased from the December 2015 sample results (46.25 µg/L). TCE (31.7 µg/L), cis-1,2-DCE (2.17 µg/L), and 1,2-DCA (0.35 J µg/L) were detected at the influent sampling location. TCE (4.70 µg/L), cis-1,2-DCE (3.15 µg/L), 1,2-DCA (0.48 J µg/L), and chloroform (0.21 J µg/L) were detected at the midpoint location. No contaminants were detected at the effluent sampling location.

The lead granular activated carbon (GAC) vessel is nearly spent, and a change-out of the carbon is being arranged. A carbon change out of the primary GAC vessel is expected to be completed in February 2016.

Figure 1 presents a plot of influent concentrations and average flow at the SBBGWTP over the past twelve (12) months. An overall slight increase in the flow rate has been observed in the past twelve months. The average flow rate at the SBBGWTP decreased in January 2016 to 86.1 gpm from the December 2015 flow rate of 100.8 gpm.

## Optimization Activities

No optimization activities occurred at the SBBGWTP in January 2016.

## Sustainability

Travis AFB is committed to decreasing the amount of GHG produced directly (waste streams discharging GHG) or indirectly (GHG produced as related to electrical energy consumption) from all systems across Travis AFB. Travis AFB continues to optimize each treatment plant to reduce the amount of electrical energy consumed, and to implement sustainable treatment plant optimization programs, such as taking extraction pumps off line that are no longer necessary for contaminant plume capture.

Figure 2 presents the historical GHG production from the SBBGWTP. The SBBGWTP produced approximately 13,234 pounds of GHG during January 2016. A new power monitor was installed in the control room to monitor the SBBGWTP electric reading.

TABLE 4

Summary of Groundwater Analytical Data For January 2016 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	6 January 2016 (µg/L)		
				Influent	Midpoint	Effluent
<b>Halogenated Volatile Organics</b>						
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.15	0	ND	0.21 J	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	0.35 J	0.48 J	ND
1,1-Dichloroethene	5.0	0.15	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	2.17	3.15	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND
Trichloroethene	5.0	0.15	0	31.7	4.7	ND
Vinyl Chloride	0.5	0.15	0	ND	ND	ND
<b>Non-Halogenated Volatile Organics</b>						
Benzene	1.0	0.15	0	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND
Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND
<b>Other</b>						
Total Suspended Solids (mg/L)	NE	0.6	0	5.6	NM	NM
Total Petroleum	50	30	0	NM	NM	ND
Hydrocarbons – Gasoline						
Total Petroleum	50	29	0	NM	NM	ND
Hydrocarbons – Diesel						

\* In accordance with Appendix B of the Travis AFB South Base Boundary Groundwater Treatment Plant Operations and Maintenance Manual (CH2M HILL, 2004).

## Notes:

J = analyte concentration is considered an estimated value due to a detected concentration value between the reporting limit and method detection limit for the contaminant

mg/L = milligrams per liter

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

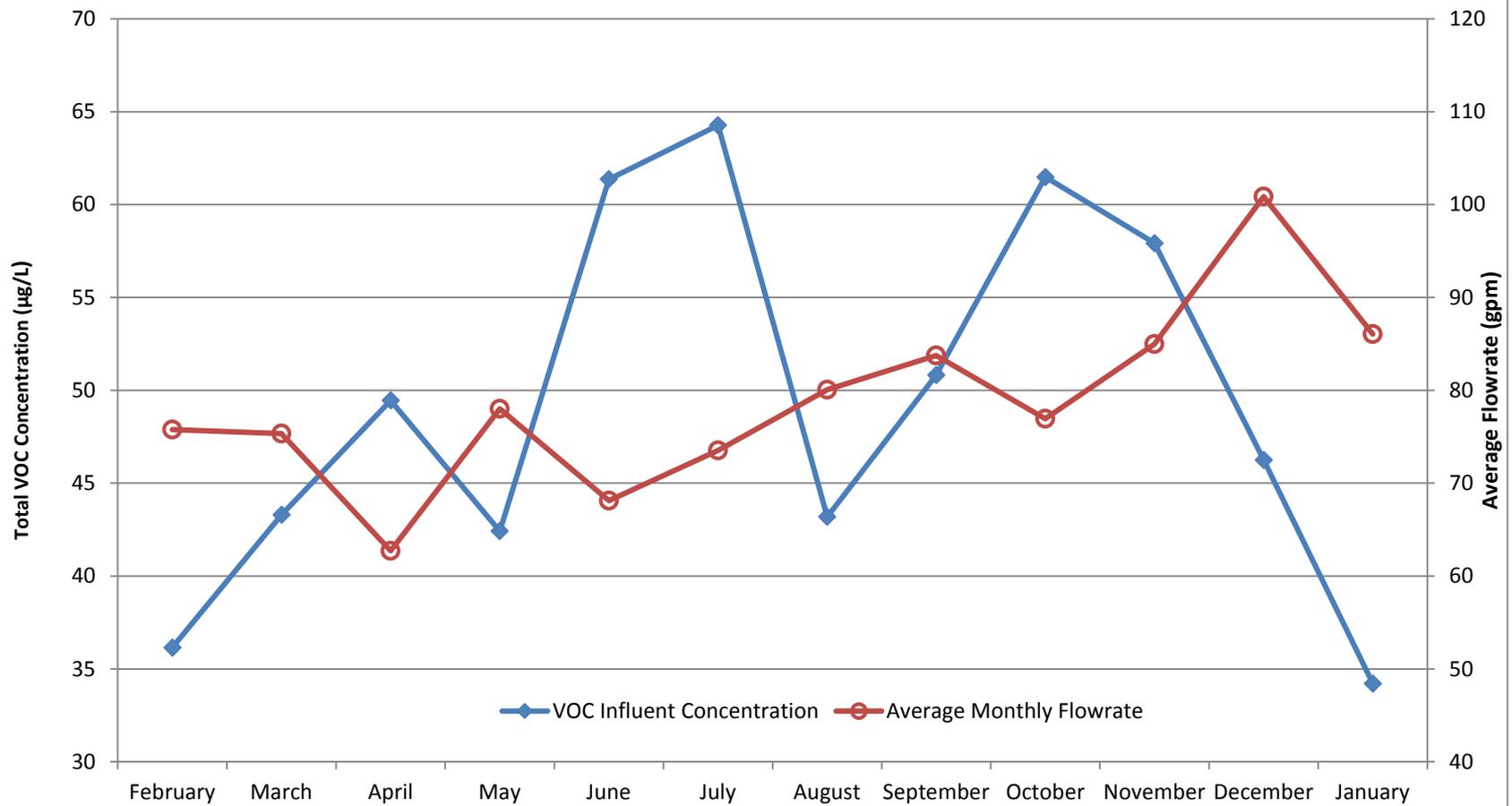
ND = not detected

NE = not established

NM = not measured

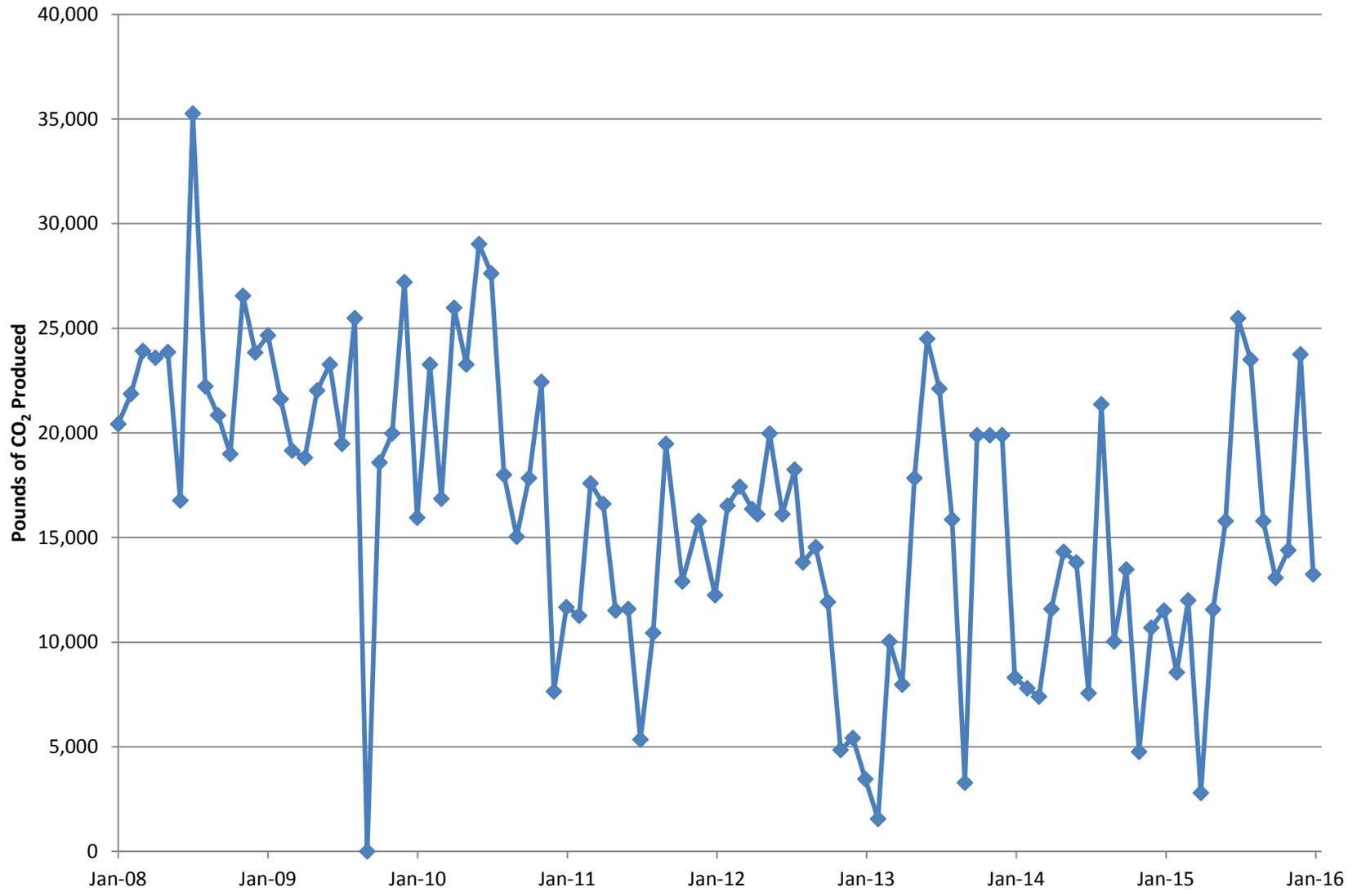
µg/L = micrograms per liter

**Figure 1**  
**SBBGWTP Total VOC Influent Concentrations and Average Flowrate**  
**Twelve Month History**  
**Travis Air Force Base, California**



**Figure 2**

**Equivalent Pounds of CO<sub>2</sub> Produced by the South Base Boundary Groundwater Treatment Plant**



# Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 198

Reporting Period: 30 December 2015 – 27 January 2016

Date Submitted: 11 February 2016

This monthly data sheet presents information regarding the Central Groundwater Treatment Plant (CGWTP) and its associated technology demonstrations. The ongoing technology demonstrations related to the CGWTP include various emulsified vegetable oil (EVO) injections and two (2) bioreactor treatability studies.

## System Metrics

Table 1 presents operational data from the January 2016 reporting period.

<b>Table 1 – Operations Summary – January 2016</b>			
<b>Initial Data Collection:</b>	12/30/2015 09:45	<b>Final Data Collection:</b>	1/27/2016 13:35
Operating Time:		Percent Uptime:	Electrical Power Usage:
<b>CGWTP:</b> 547 hours		<b>CGWTP:</b> 81.0%	<b>CGWTP:</b> 2,288 kWh (3,135 lbs CO <sub>2</sub> generated <sup>a</sup> )
Gallons Treated: <b>1,060,900 gallons</b>		Gallons Treated Since January 1996: <b>521.0 million gallons</b>	
VOC Mass Removed from groundwater:		VOC Mass Removed Since January 1996:	
<b>1.74 lbs<sup>b</sup></b>		<b>2,737 lbs from groundwater</b>	
		<b>8,686 lbs from vapor</b>	
Rolling 12-Month Cost per Pound of Mass Removed: \$1,286 <sup>c</sup>			
Monthly Cost per Pound of Mass Removed: \$2,452 <sup>c</sup>			
<sup>a</sup> Based on Department of Energy estimate that 1 kilowatt hour generated produces 1.37 pounds of GHG.			
<sup>b</sup> Calculated using January 2016 EPA Method SW8260C analytical results.			
<sup>c</sup> Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system.			

Table 2 presents individual extraction well flow rates during the monthly reporting period.

<b>Table 2 – CGWTP Average Flow Rates<sup>a</sup> – January 2016</b>	
<b>Location</b>	<b>Average Flow Rate Groundwater (gpm)</b>
EW001x16	14.4
EW002x16	6.8
EW003x16	0.2
EW605x16	5.8
EW610x16	3.3
CGWTP	32.3

<sup>a</sup> Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the instantaneous readings.  
gpm = gallons per minute

Table 3 presents a summary of shutdowns during the monthly reporting period.

<b>Table 3 – Summary of System Shutdowns</b>					
<b>Location</b>	<b>Shutdown<sup>a</sup></b>		<b>Restart<sup>a</sup></b>		<b>Cause</b>
	<b>Date</b>	<b>Time</b>	<b>Date</b>	<b>Time</b>	
CGWTP	16 January 2016	00:05	19 January 2016	15:35	Rainwater flooded the containment area and tripped the containment high alarm.
CGWTP	23 January 2016	16:35	25 January 2016	09:25	High level alarm from influent tank.

-- = Time not recorded  
<sup>a</sup> Shutdown and restart times estimated based on field notes  
CGWTP = Central Groundwater Treatment Plant

## Summary of O&M Activities

Monthly groundwater samples were collected at the CGWTP on 6 January 2016. Sample results are presented in Table 4. The total VOC concentration (196.8 µg/L) in the January 2016 influent sample has slightly decreased from the December 2015 sample (201.13 µg/L). Vinyl chloride was detected in the influent sample at 0.17 µg/L, at 0.20 J µg/L after the first carbon vessel, and at 0.29 J µg/L after the second carbon vessel. Vinyl chloride was not detected in the effluent sample. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in January 2016. Total petroleum hydrocarbons were not detected in the effluent sample.

Figure 1 presents a plot of influent concentrations (total VOCs) and the influent flow rate at the CGWTP versus time for the past twelve (12) months. The overall flow rate through the treatment plant has decreased slightly over the past 12 months. A slow and steady decrease in the EW001x16 flow rate has been observed.

The two shutdowns at CGWTP in January were because of rainwater flooding the containment area and tripping the containment high alarm. When this occurs, a shunt also trips the main breaker to the influent transfer pumps and the sump pump. It is likely that the sump pump was not able to keep up with the rain and flooded the containment area. In both cases, the sump pump and transfer pumps were placed in manual mode, and the rainwater was processed through the system. Once the water was drawn down, the alarms were reset and the CGWTP was restarted without issue.

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The Site DP039 bioreactor continues to operate in a “pulsed mode” in order to improve the rate of remediation and to preserve the amount of total organic carbon being produced within the bioreactor. The “pulsed mode” operation continued on a two (2) week transition schedule in January 2016. The bioreactor was taken off line on 31 December 2015 and was brought back on line on 15 January 2016. The bioreactor is scheduled to continue the 2-week operating schedule.

## Optimization Activities

No optimization activities occurred at the CGWTP in January 2016.

## Sustainability

Travis AFB is committed to decreasing the amount of GHG produced directly (waste streams discharging GHG) or indirectly (GHG produced as related to electrical energy consumption) from all systems across Travis AFB. Travis AFB continues to optimize each treatment plant to reduce the amount of electrical energy consumed, and to implement sustainable treatment plant optimization programs, such as bioreactors and EVO injection well networks.

Figure 2 presents the historical GHG production from the systems associated with the CGWTP. The CGWTP produced approximately 3,135 pounds of GHG during January 2016. This is a decrease from the December 2015 amount of 4,087 pounds.

TABLE 4

Summary of Groundwater Analytical Data for January 2016 – Central Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	6 January 2016 (µg/L)			
				Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent
<b>Halogenated Volatile Organics</b>							
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND	ND
Chloroform	5.0	0.15	0	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	38.9	ND	ND	ND
1,2-Dichlorobenzene	5.0	0.15	0	0.31 J	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	0.35 J	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	0.19 J	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.15	0	0.43 J	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND	ND
Methyl tert-Butyl Ether	1.0	0.15	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	0.47 J	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
Trichloroethene	5.0	0.15 – 1.5	0	154	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	1.98	ND	ND	ND
Vinyl Chloride	0.5	0.15	0	0.17 J	0.20 J	0.29 J	ND
<b>Non-Halogenated Volatile Organics</b>							
Benzene	1.0	0.15	0	ND	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND	ND
Total Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND	ND
<b>Other</b>							
Total Suspended Solids (mg/L)	NA	0.6	0	0.8 J	NM	NM	NM
Total Petroleum Hydrocarbons – Gasoline	50	30	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	29	0	NM	NM	NM	ND

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

Notes:

J = analyte concentration is considered an estimated value due to a detected concentration value between the reporting limit and method detection limit for the contaminant

NA = not applicable

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

ND = not detected

NM = not measured

µg/L = micrograms per liter

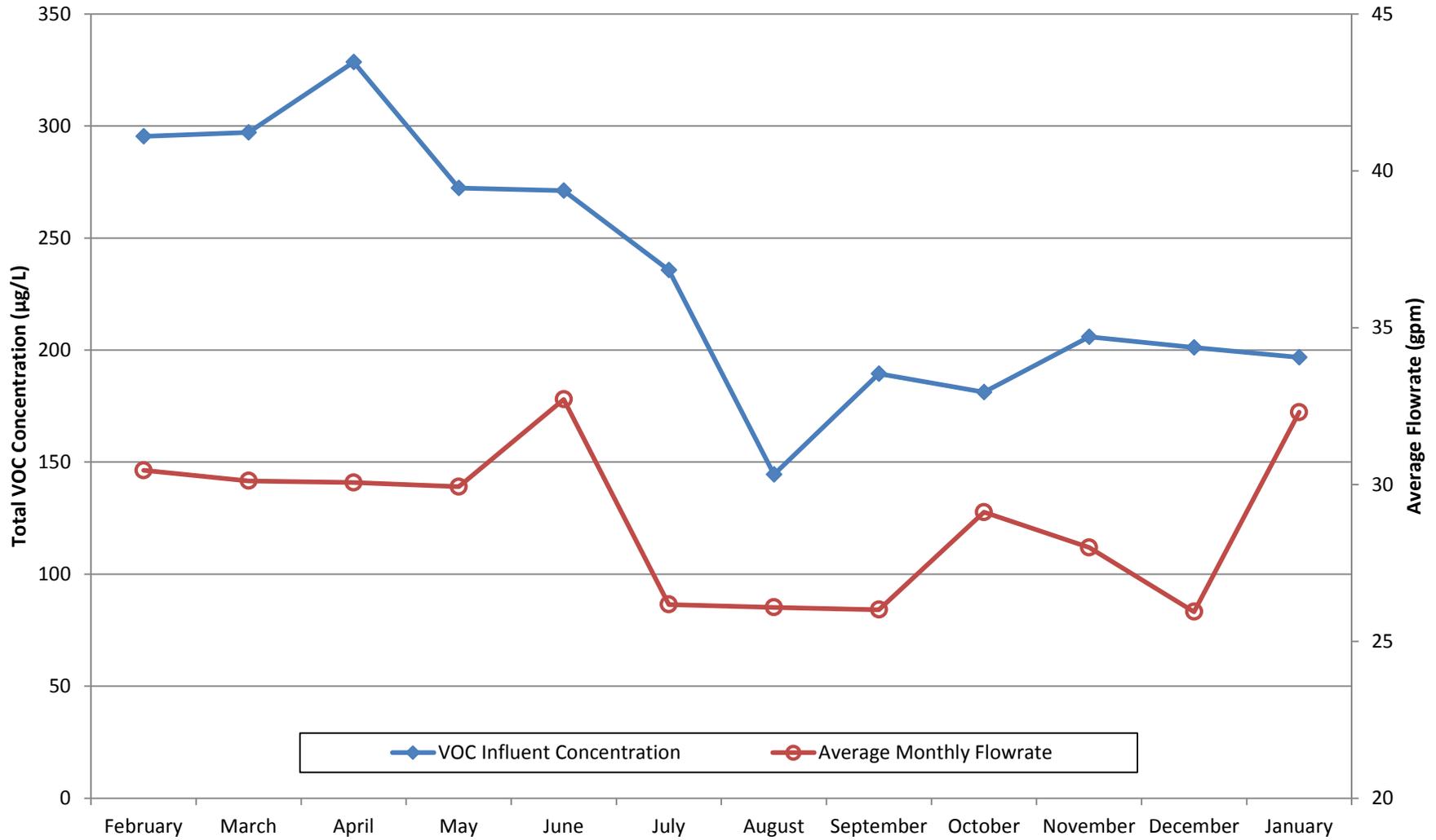
mg/L = milligrams per liter

Table 5 presents a twelve month summary of the Site DP039 bioreactor recirculation well pulsing dates.

<b>Table 5 – Summary of DP039 Bioreactor “Pulsed Mode” Operations</b>		
<b>Location</b>	<b>Pulse On Start Date</b>	<b>Pulse Off Start Date</b>
MW750x39	19 December 2014	January 2, 2015
	16 January 2015	29 January 2015
	13 February 2015	27 March 2015
	10 April 2015	24 April 2015
	8 May 2015	22 May 2015
	5 June 2015	19 June 2015
	3 July 2015	17 July 2015
	31 July 2015	14 August 2015
	28 August 2015	11 September 2015
	1 October 2015	9 October 2015
	23 October 2015	6 November 2015
	20 November 2015	8 December 2015
	21 December 2015	31 December 2015
	15 January 2016	

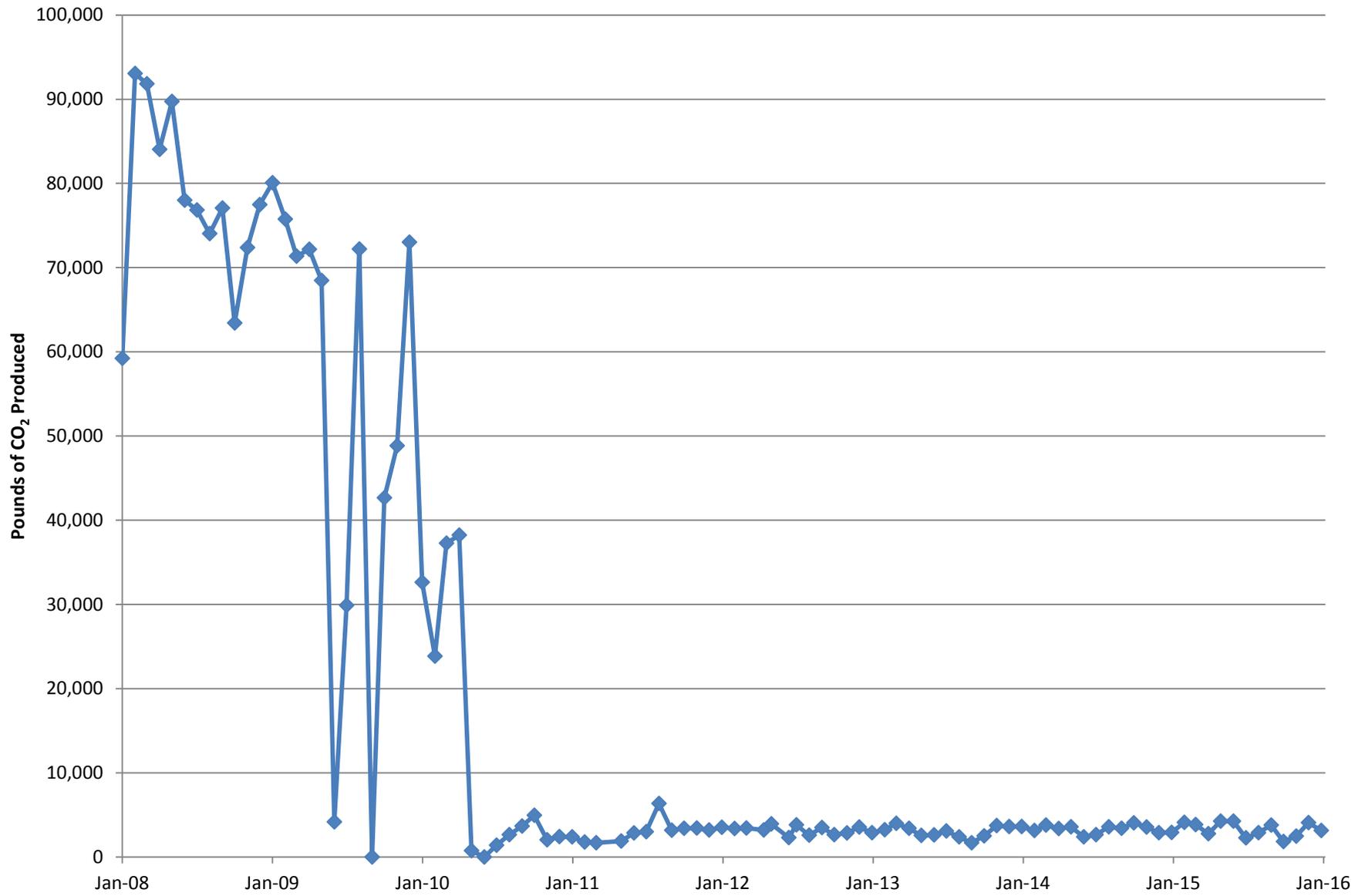
MW = Monitoring Well

**Figure 1**  
**CGWTP Total VOC Influent Concentrations and Average Flowrate**  
**Twelve Month History**  
**Travis Air Force Base, California**



**Figure 2**

**Equivalent Pounds of CO<sub>2</sub> Produced by the Central Groundwater Treatment Plant**



# Site ST018 Groundwater Treatment Plant Monthly Data Sheet

Report Number: 059

Reporting Period: 30 December 2015 – 27 January 2016

Date Submitted: 11 February 2016

This monthly data sheet presents information regarding the Site ST018 Groundwater Treatment Plant (ST018GWTP).

## System Metrics

Table 1 presents operation data from the January 2016 reporting period.

<b>Table 1 – Operations Summary – January 2016</b>			
<b>Initial Data Collection:</b>	12/30/2015 10:30	<b>Final Data Collection:</b>	1/27/2016 14:10
Operating Time:		Percent Uptime:	Electrical Power Usage:
<b>ST018GWTP: 676 hours</b>		<b>ST018GWTP: 100%</b>	<b>ST018GWTP: 88 kWh (121 lbs CO<sub>2</sub> generated<sup>a</sup>)</b>
Gallons Treated: <b>145,700 gallons</b>		Gallons Treated Since March 2011: <b>9.02 million gallons</b>	
Volume Discharged to Sanitary Sewer: <b>145,700 gallons</b>		Final Totalizer Reading: <b>9,023,400 gallons</b>	
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: <b>2,527,200 gallons</b>			
MTBE, BTEX, VOC, TPH Mass Removed: <b>0.86 lbs<sup>b</sup></b>		MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: <b>34.7 lbs</b>	
MTBE (Only) Removed: <b>0.06 lbs<sup>b</sup></b>		MTBE (Only) Mass Removed Since March 2011: <b>8.3 lbs</b>	
Rolling 12-Month Cost per Total Pounds of Mass Removed: \$10,292 <sup>bc</sup>			
Monthly Cost per Pound of Mass Removed: \$4,789 <sup>bc</sup>			
<sup>a</sup> Based on Department of Energy estimate that 1 kilowatt hour generated produces 1.37 pounds of GHG.			
<sup>b</sup> Calculated using January 2016 EPA Method SW8260C and SW8015B analytical results.			
<sup>c</sup> Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system.			
kWh = kilowatt hour			
lbs = pounds			

Table 2 presents individual extraction well flow rates along with the average system flow during the monthly reporting period.

<b>Table 2 – ST018GWTP Average Flow Rates – January 2016</b>		
<b>Location</b>	<b>Average Flow Rate Groundwater (gpm)<sup>a</sup></b>	<b>Hours of Operation</b>
EW2014x18	0.8	676
EW2016x18	0.7	670
EW2019x18	1.2	676
EW2333x18	1.1	593
Site ST018 GWTP	3.6	676

<sup>a</sup> Flow rates calculated by dividing total gallons processed by amount of operating time of the pump/system.

gpm = gallons per minute  
 ST018GWTP = Site ST018 Groundwater Treatment Plant

Table 3 presents a summary of shutdowns during the monthly reporting period.

<b>Table 3 – Summary of System Shutdowns</b>					
<b>Location</b>	<b>Shutdown<sup>a</sup></b>		<b>Restart<sup>a</sup></b>		<b>Cause</b>
	<b>Date</b>	<b>Time</b>	<b>Date</b>	<b>Time</b>	
ST018GWTP	None.	--		--	None.

-- = Time not recorded  
<sup>a</sup> Shutdown and restart times estimated based on field notes  
 ST018GWTP = Site ST018 Groundwater Treatment Plant

## Summary of O&M Activities

Monthly groundwater treatment samples were collected at the ST018GWTP on 6 January 2016. Results are presented in Table 4. The complete January 2016 laboratory data report is available upon request.

The influent concentration for MTBE during the January 2016 sampling event was 49.7 µg/L, which is a decrease from the December 2015 sample result of 86.8 µg/L. TPH-d (52.7 J µg/L), TPH-g (552 µg/L), and benzene (5.3 µg/L) are a few of the other contaminants detected in the influent sample. No TPH contaminant concentrations were detected after the first carbon vessel. MTBE was detected after the second carbon vessel at a concentration of 3.0 µg/L. No contaminant concentrations were detected at the effluent sampling location, except for chloromethane (0.52 µg/L). All detected concentrations of TPH are well below the Fairfield-Suisun Sewer District effluent limitation for TPH of 50,000 µg/L. Travis AFB will continue to monitor effluent contaminant concentrations and evaluate the condition of the carbon filter beds.

Figure 1 presents plots of the flow rate and influent total contaminant (TPH-g, TPH-d, MTBE, BTEX, and VOCs) and MTBE concentrations at the ST018GWTP over the past twelve (12) months. As shown on Figure 1, the influent concentrations have increased to a new peak because of the high TPH-g concentration. However, MTBE concentrations have fluctuated slightly during the past twelve months. The average flow rate through the ST018GWTP has been seasonally variable with a slight decreasing trend. The January 2016 flow rate of 3.6 gpm has decreased since the December 2015 flow rate of 4.2 gpm.

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On 30 December 2015, the tertiary carbon vessel was taken off line because of a corroded pipe on the outlet of the vessel. On 4 January 2016, a new fitting was installed and the tertiary carbon vessel was reconnect to the treatment system. The system remains operating with three (3) carbon vessels.

Various minor shutdowns of individual extraction wells took place throughout January 2016 due to flooding (rain water) within the extraction well vaults. These vaults were pumped down and restarted when discovered during routine O&M visits. The Site ST018GWTP remained on line despite intermittent shutdowns of individual extraction wells over the course of the month.

## Optimization Activities

No optimization activities occurred at the ST018GWTP in January 2016.

## Sustainability

Travis AFB is committed to decreasing the amount of GHG produced directly (waste streams discharging GHG) or indirectly (GHG produced as related to electrical energy consumption) from all systems across Travis AFB. Travis AFB continues to optimize each treatment plant to reduce the amount of electrical energy consumed, and to implement sustainable treatment plant optimization programs, such as the solar arrays employed to power the ST018GWTP system.

The ST018GWTP produced 121 pounds of GHG during January 2016 and treated 145,700 gallons of water, which was a decrease from the amount of GHG produced during December 2015 (181 pounds, treating 220,500 gallons). Figure 2 presents the historical GHG production from the ST018GWTP. The overall GHG generation has been decreasing since a 2012 peak , and remains considerably lower than traditional GWTPs since the system is predominantly powered by solar arrays. The previous increasing GHG production reflected an inverse relationship between solar exposure in the fall and winter relative to GHG production.

TABLE 4

Summary Of Groundwater Analytical Data for January 2016 – Site ST018 Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	6 January 2016 (µg/L)			
				Influent	After Carbon 1	After Carbon 2	System Effluent
<b>Fuel Related Constituents</b>							
Methyl tert-Butyl Ether	6,400	0.15	0	49.7	NM	3.0	ND
Benzene	25,000 <sup>a</sup>	0.15	0	5.3	NM	ND	ND
Ethylbenzene	25,000 <sup>a</sup>	0.15	0	1.66	NM	ND	ND
Toluene	25,000 <sup>a</sup>	0.15	0	0.44 J	NM	ND	ND
Total Xylenes	25,000 <sup>a</sup>	0.15 – 0.30	0	2.34	NM	ND	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 <sup>b</sup>	30	0	552	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50,000 <sup>b</sup>	28.3	0	52.7 J	ND	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	100,000	29	0	42.1 J	ND	NM	ND
<b>Other</b>							
Chloromethane	0.5	0.15	0	0.22 J	NM	0.23 J	0.52
1,2-Dichloroethane	0.5	0.15	0	0.74	NM	ND	ND

\* In accordance with the Fairfield-Suisun Sewer District Effluent Limitations Laboratory data available on request.

a – The limit of 25,000 µg/L is a combined limit for BTEX.

b – The limit of 50,000 µg/L is a combined limit for TPH-g and TPH-d

µg/L = micrograms per liter

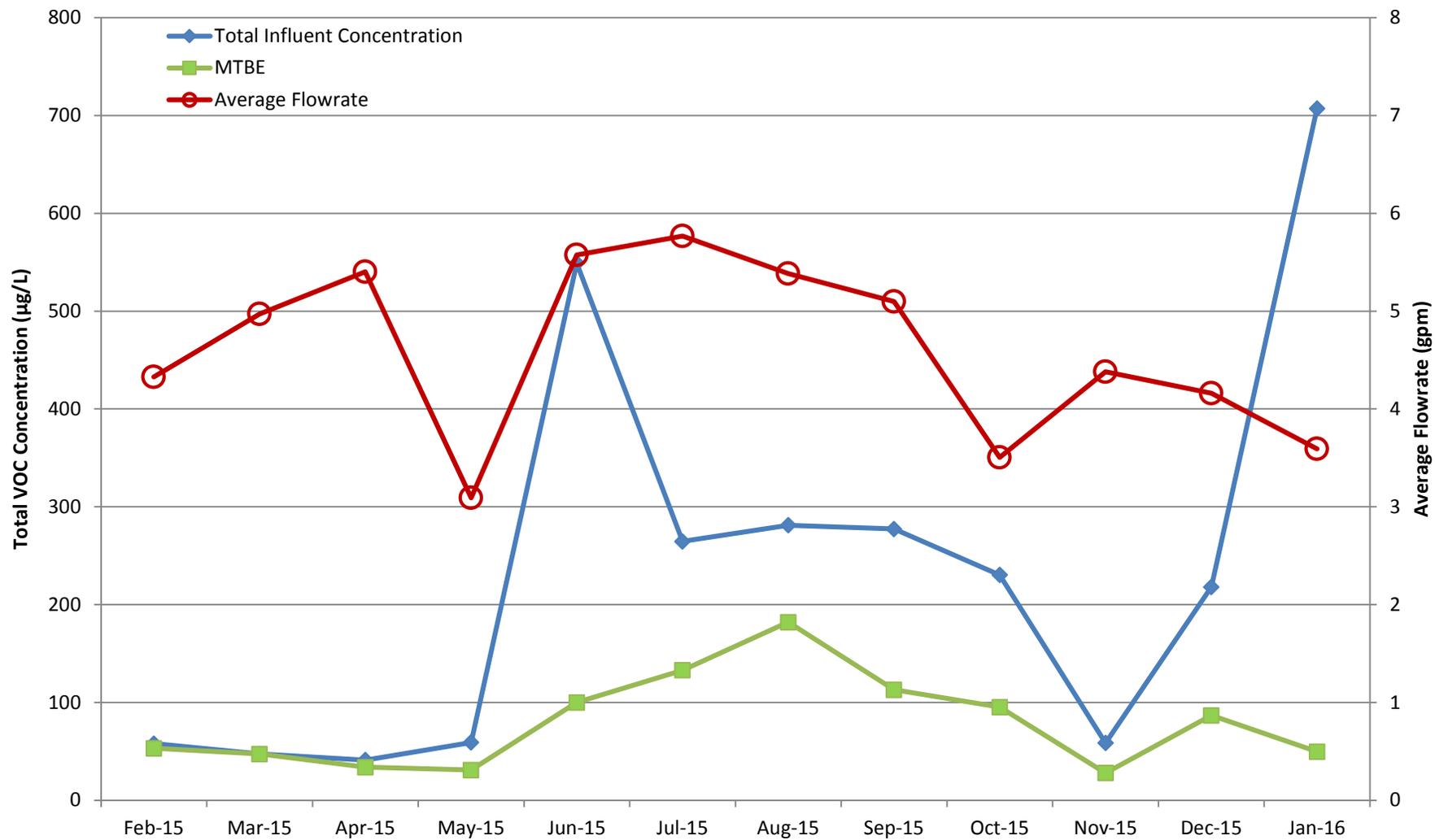
J = analyte concentration is considered an estimated value due to a detected concentration value between the reporting limit and method detection limit for the contaminant

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

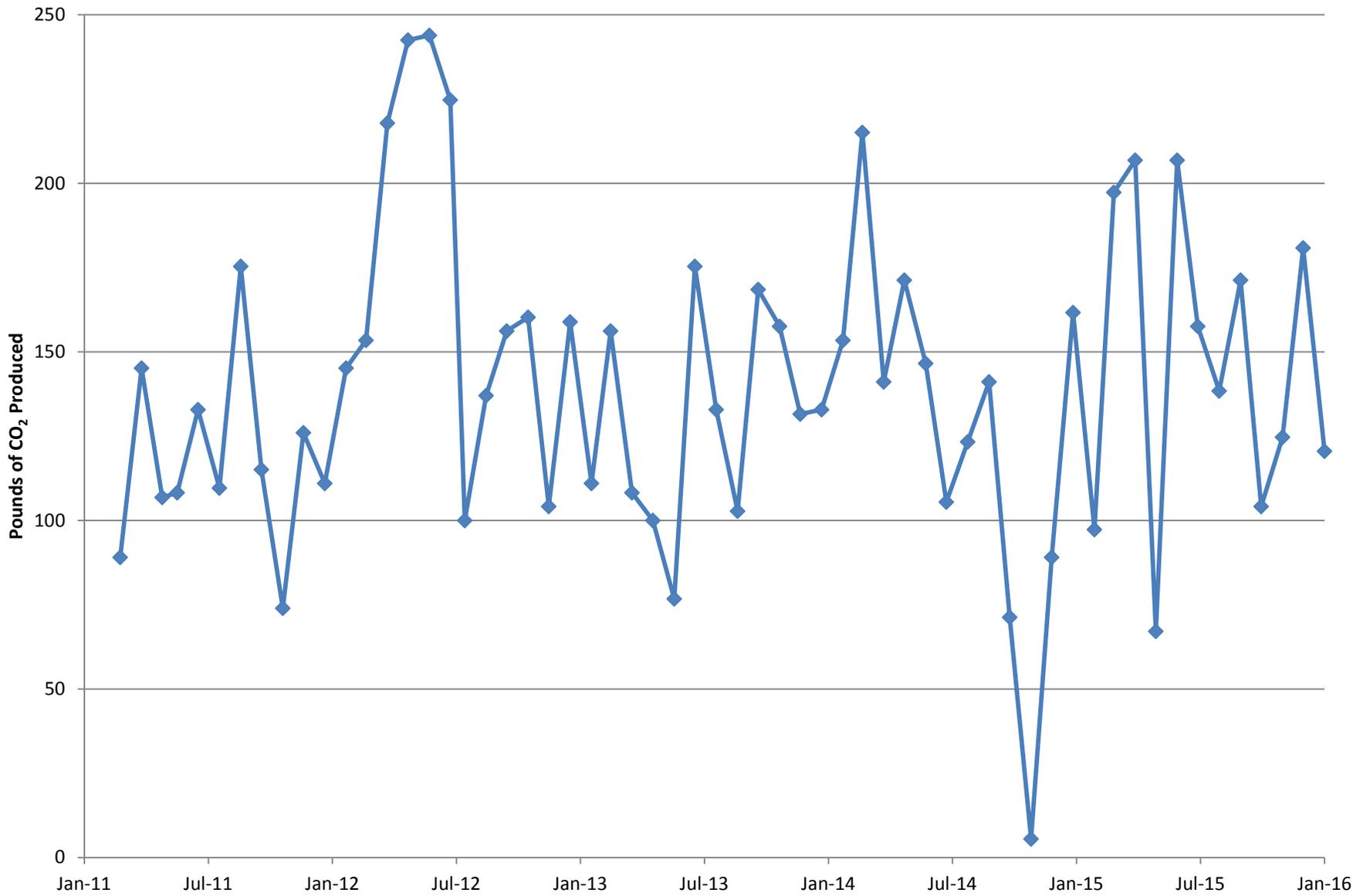
ND = not detected above method detection limit

NM = not measured this month

**Figure 1**  
**ST018GWTP Total VOC and MTBE Influent Concentrations**  
**and Average Flowrate Twelve Month History**  
**Travis Air Force Base, California**



**Figure 2**  
**Equivalent Pounds of CO<sub>2</sub> Produced by the Site ST018 Groundwater Treatment Plant**

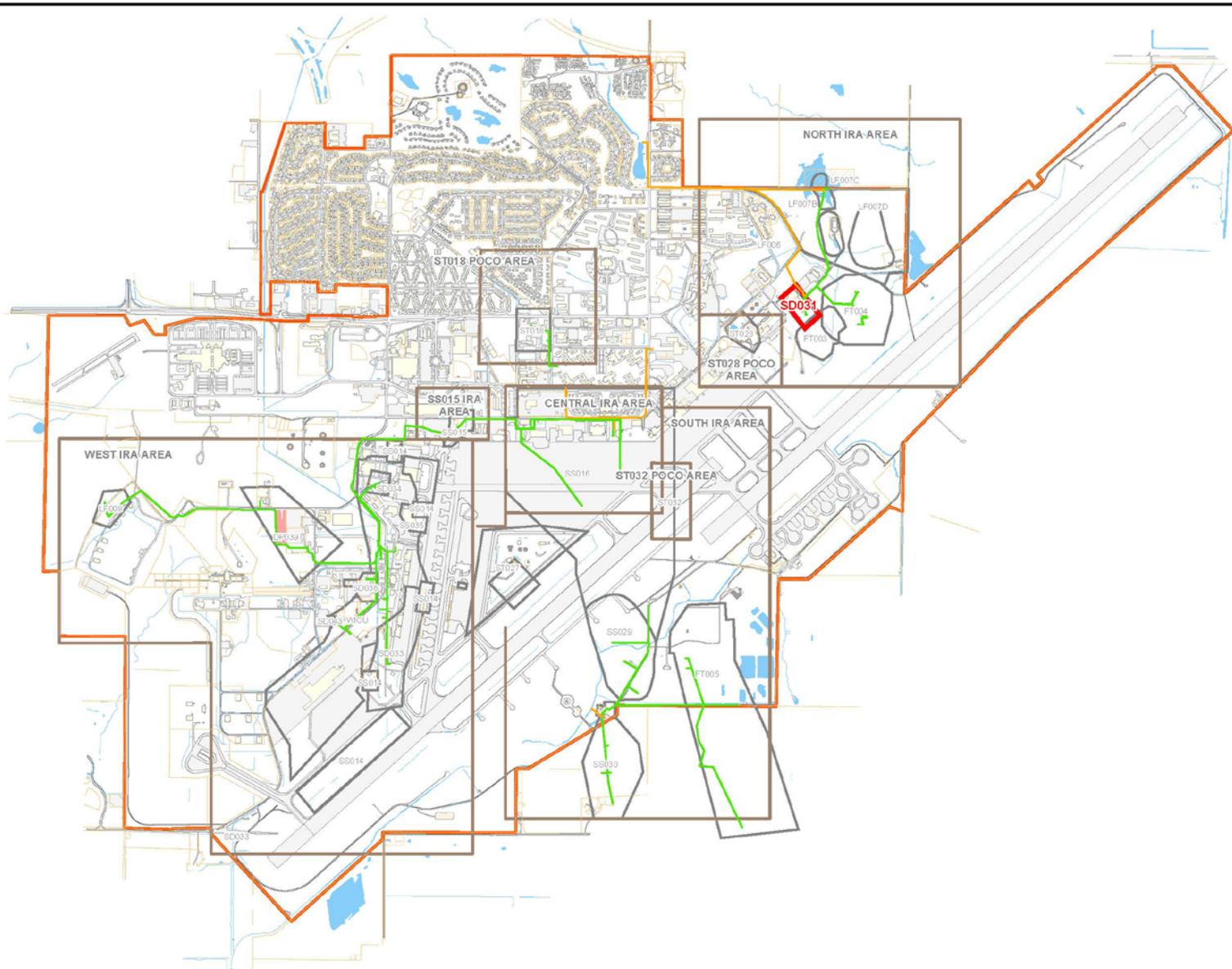


# Site SD031 Soil Remedial Investigation Work Plan

RPM Meeting  
February 17, 2016

# Agenda

- Background
- Discovery of Soil Staining
- Preliminary Soil Sampling
- Historical Records/Reports Review
- Interviews
- Second Round of Soil Sampling
- Work Plan Objectives
- Conceptual Design
- Soil Sampling
- Soil Vapor Sampling
- Risk Assessments
- Feasibility Study
- Reporting



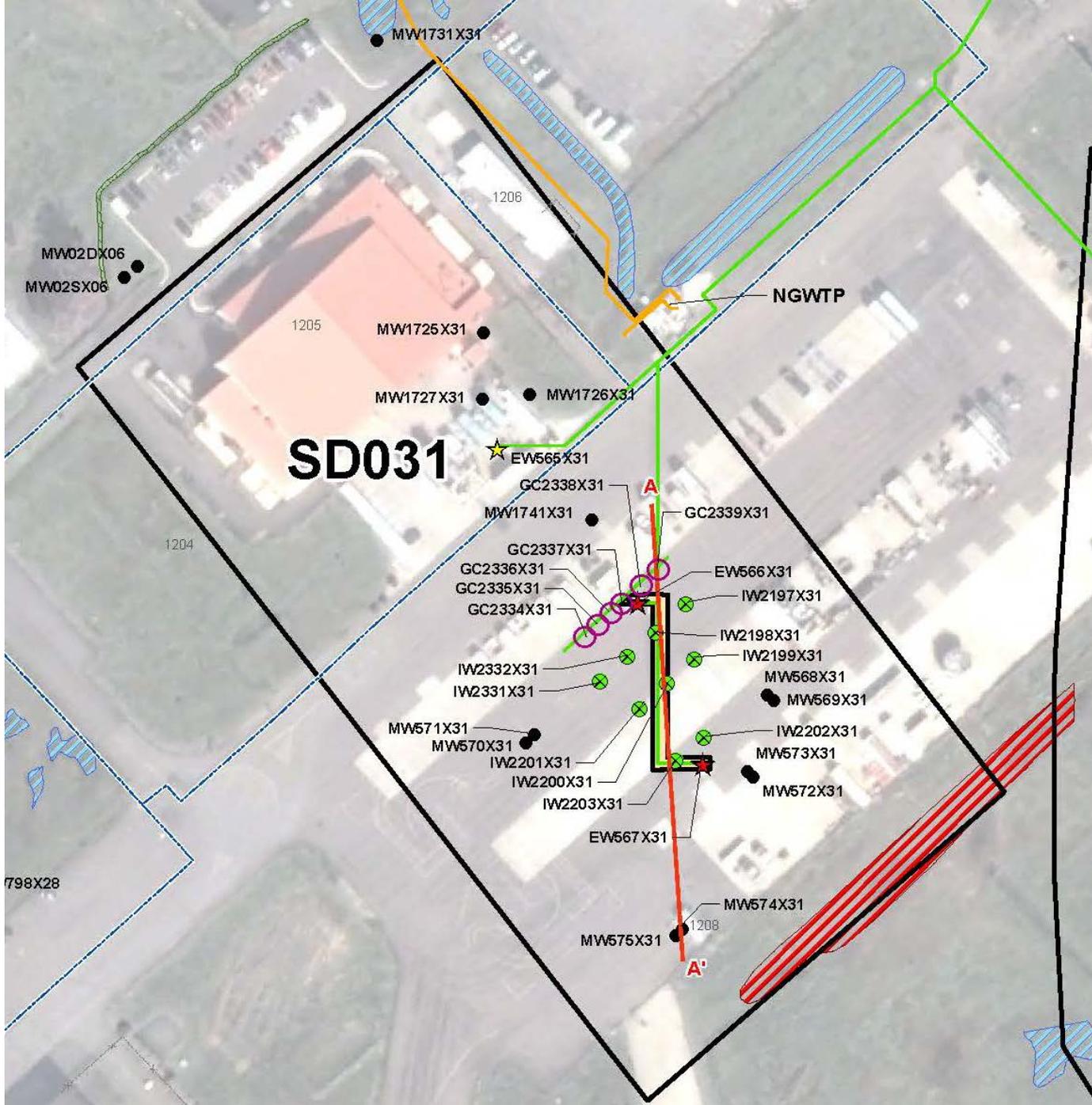
**LEGEND**

- BASE BOUNDARY
- FENCE
- UNTREATED WATER PIPING
- TREATED WATER PIPING
- ▭ SITE SD031 BOUNDARY
- ▭ BUILDING
- ▭ ROAD
- ▭ UNPAVED AREA
- ▭ PAVED AREA
- ▭ SURFACE WATER
- ▭ LF007C EASEMENT
- ▭ ERP SITE BOUNDARY

N

0 1,000 2,000 Feet

**FIGURE ES-1**  
**SITE SD031 LOCATION**  
 SITE SD031 SOIL REMEDIAL INVESTIGATION  
 WORK PLAN  
 TRAVIS AIR FORCE BASE, CALIFORNIA



# Background

- Site SD031 consists of Facility 1205, which was built in 1957 and is used by the Civil Engineer Maintenance and Inspection and Repair Team (CMIRT) for the maintenance and repair of diesel generators.
- Site SD031 is a groundwater site with a 1,1-dichloroethene (DCE) plume.
- Soil at Site SD031 was determined to be “No Further Action” in the *North/East/West Industrial Operable Unit Soil, Sediment and Surface Water Record of Decision* (Travis AFB, 2006).
  - Previous soil investigations at Site SD031 were performed primarily in the vicinity of the wash rack, which is adjacent to the southeast of Building 1205.

# Discovery of Soil Staining

- In 2014 Site SD031 was chosen to have a groundwater technology demonstration performed.
- The location of the technology demonstration was to the southeast of where previous soil investigations had been conducted at.
- During air knifing activities for utility clearance to 5 feet bgs for the installation of the technology demonstration infrastructure, it was observed that a large area of soil staining and strong hydrocarbon odor was present.
  - Soil staining and hydrocarbon odors were observed in 14 of the 15 borings that were cleared for utilities.

# Discovery of Soil Staining

- PID readings of the stained soil ranged from 0 to 1,118 ppm.
  - Highest readings in borings IW2197x31 and IW2203x31.
- Each of the 15 soil borings that were drilled for the technology demonstration were within the current boundary of the 1,1-DCE groundwater plume.

TABLE 10-1

PID Readings for the Stained Soil Area Site SD031

Site SD031 Soil Remedial Investigation Work Plan, Travis Air Force Base, California

Depth (feet bgs)	GC2334x31 <sup>a</sup>	GC2334Ax31 <sup>b</sup>	GC2335x31	GC2336x31	GC2336Ax31 <sup>c</sup>	GC2337x31	GC2338x31	GC2339x31 <sup>d</sup>	IW2197x31	IW2197Ax31 <sup>e</sup>	IW2198x31	IW2332x31	IW2331x31	IW2199x31	IW2200x31	IW2201x31	IW2202x31	IW2203x31	IW2203Ax31 <sup>f</sup>
2	-	0.0	-	-	4.3	-	-	-	-	0.8	-	-	-	-	-	-	-	-	593.5
2.5	-	-	-	-	-	-	-	-	0.0	-	0.4	0.2	0.4	1.2	0.5	0.0	137.0	1118.0	-
3	-	0.6	-	-	136.4	-	-	-	-	76.9	-	-	-	-	-	-	-	-	478.8
4	304.6	-	160.4	286.2	-	106.8	-	-	-	-	-	-	-	-	-	-	-	-	-
5	21.5	461.6	24.2	-	683.8	-	138.6	-	1054.6	184.9	629.7	60.9	49.7	45.2	19.5	17.9	3.8	17.2	115.9
10	216	-	18.9	7.6	-	8.2	12.4	-	14.5	-	2.6	14.3	0.7	137.5	34.4	77.4	5.0	0.9	-
15	7.4	-	2.3	2.3	-	0.7	0.9	-	0.5	-	0.7	0.4	0.4	6.0	4.6	6.1	4.8	0.5	-
20	-	-	-	0.4	-	-	-	-	1.3	-	0.4	0.3	0.3	2.2	1.8	1.2	2.6	0.2	-
25	-	-	-	-	-	-	-	-	0.5	-	0.4	0.6	0.2	1.8	1.4	2.5	3.0	0.3	-
30	-	-	-	-	-	-	-	-	0.3	-	0.9	0.2	0.2	1.3	1.0	1.1	2.5	0.6	-
35	-	-	-	-	-	-	-	-	0.2	-	1.1	0.2	0.1	1.2	2.9	2.6	2.0	0.7	-
38.5	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	0.2	-
39	-	-	-	-	-	-	-	-	-	-	0.3	-	-	0.9	-	0.4	1.1	-	-
39.5	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	0.6	-	-	-	-

<sup>a</sup> Concrete debris from 4 to 4.5 feet bgs at GC2334x31; PID reading of 137.8 ppm against surface of debris. Subrounded gravel is present in the concrete debris.

<sup>b</sup> Hand auger location, approximately 6 feet southwest from GC2334x31.

<sup>c</sup> Hand auger location, approximately 5 feet southwest from GC2336x31.

<sup>d</sup> No staining or odor observed at this location.

<sup>e</sup> Hand auger location, approximately 10 feet southwest from IW2197x31.

<sup>f</sup> Hand auger location, approximately 12 feet northeast from IW2203x31. Metal debris encountered from 4.5 to 5 feet bgs.

## Notes:

No continuous core obtained at gravel chimney locations; observations are from cuttings obtained during drilling or air knifing; depths are estimated.

Total depth at hand auger locations is 5 feet bgs.

Depth of head space readings for the bottom interval varies, depending on where the borehole was terminated.



# Preliminary Soil Sampling

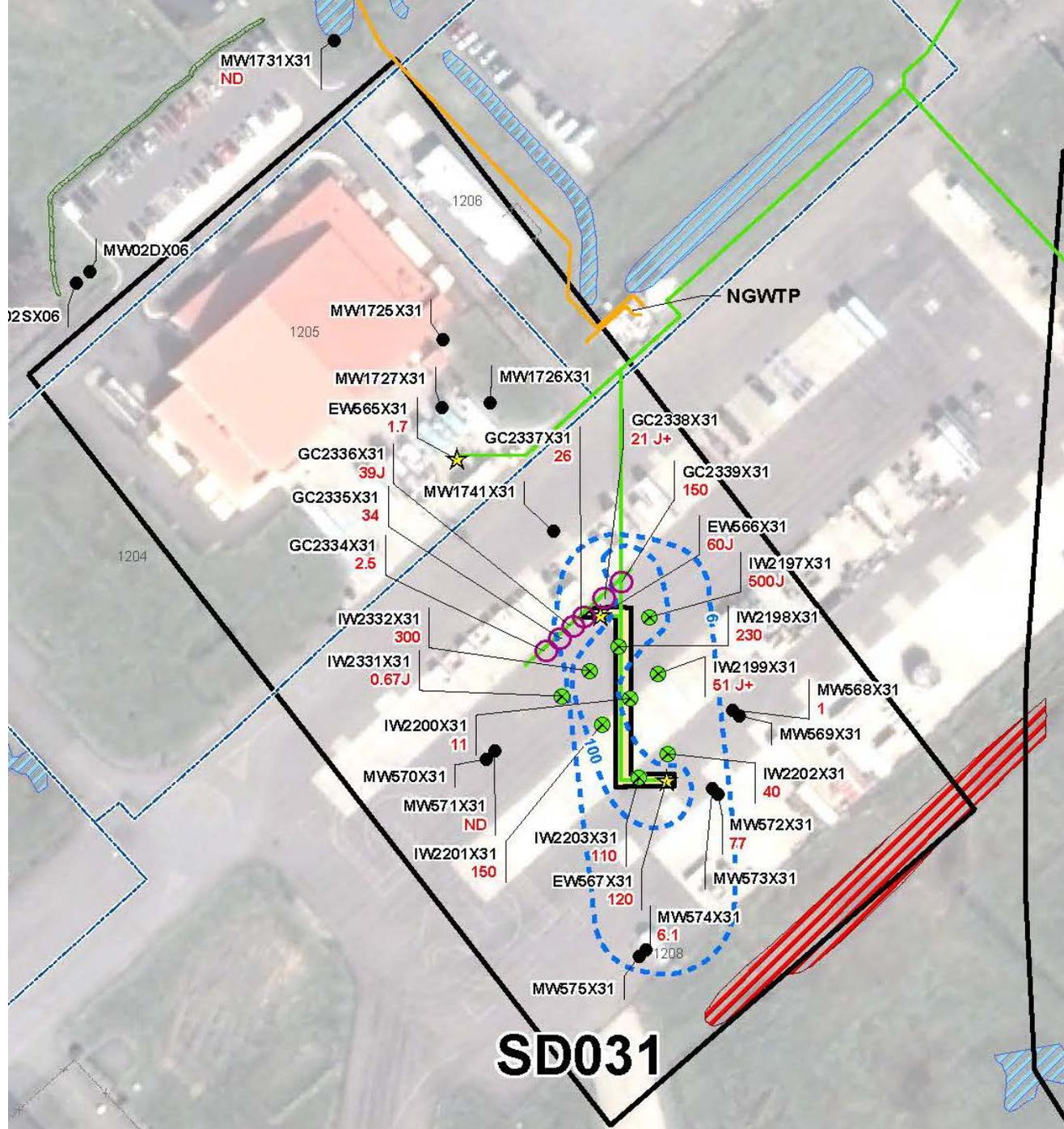
- Based on the observed soil staining and hydrocarbon odors, a preliminary round of soil samples was conducted on October 30, 2014.
  - Soil samples were collected at borings IW2197x31 and IW2198x31 at 5.5 feet bgs for VOCs.
- Analytical results from the preliminary soil sampling indicated that VOCs were not above the Water Board Residential Environmental Screening Levels (ESLs) and the EPA Residential Regional Screening Levels (RSLs).
- Although the concentrations of VOCs were low, there was potential that the soil samples were impacted by the air knifing activities, thus potentially reducing VOC concentrations.
- Additionally, the soil samples were not analyzed for TPH, SVOCs, or Title 22 metals (CAM 17 metals).

# Preliminary Soil Sampling

- Because of potential impacts to the VOC results by the air knifing activities and the lack of sampling for TPH, SVOCs, and metals it was determined that a second round of sampling would be needed and would be conducted.
- However, prior to collecting the second round of soil samples, an investigation was needed to determine what the source of the soil impacts may have been and also determine what analytical methods was needed to identify potential COCs.
- The investigation included a review of historical records and reports and interviews with longtime personnel of CEMIRT.

# Historical Records/Reports Review

- Reports and records reviewed included:
  - East Industrial Operable Unit Remedial Investigation.
  - Interim Groundwater Remedial Design/Remedial Action Reports.
  - Groundwater O&M Reports from 2002 to 2004.
  - RPM Meeting Minutes from October 2002 to January 2004.
- Results of the historical records and reports review indicated:
  - No historical soil sampling had been conducted where the soil staining was observed.
  - The asphalt/concrete area where the staining was observed was used from 1958 to 1963 as a parking area for interceptor aircraft.
  - Soil staining was observed during the drilling installation of extraction wells EW566x31, EW567x31 and monitoring wells MW568x31, MW569x31, and MW571x31 through MW573x31.
  - In September 2002 PID measurements and soil vapor sampling identified the presence high concentrations of petroleum hydrocarbons/Stoddard solvent in dual phase extraction well EW566x31 and shut down the vapor portion of the well.



**SD031**

# Historical Records/Reports Review

- The petroleum hydrocarbons/Stoddard solvent concentrations (1,300,000 parts per billion by volume [ppbv]) were too high for the SVE system to run using vapor-phase granular activated carbon (VGAC).
- Travis AFB removed 4,860 pounds of vapor phase contaminant mass using a temporary catalytic oxidation (CatOx) system from July 17, 2003 to September 17, 2003.
- During the soil vapor removal, petroleum hydrocarbons, 1,1-DCE, TCE, Freon 113, vinyl chloride, and cis-1,2-DCE were detected in soil vapor samples.
- On September 16, 2003 the petroleum hydrocarbon vapor concentration was 480,000 ppbv, which was still too high to economically be treated by VGAC.
- A soil vapor sample from EW566x31 collected on December 9, 2003 still had concentrations of 1,1-DCE (61 ppbv), Freon 113 (58 ppbv), and cyclohexane (1,600 ppbv).

# Historical Records/Reports Review

- The CatOx system was shut down on September 17, 2003 due to lack of additional funding, but according to the October 2003 RPM Meeting Minutes it was planned to be brought back in 2004.
- However, the following questions/comments by the Water Board at the same October 2003 RPM Meeting questioned the need for bringing back the CatOX system:
  - “What is the source of the TPH? Is the Air Force attacking something without knowing the source? And if it is an old phantom plume, is it necessary to extract? If there is no source and/or no risk to human health, is it necessary to continue pumping? It is her opinion that there is no need to extract and spend funds on something that is not defined and/or a problem.”
  - Travis AFB responded to the Water Board by stating that the extraction “is based on the remedial investigation data, which shows that a source is in the area; however, it is a good issue to ponder” and they will further investigate the issue.

# Historical Records/Reports Review

- At the January 2004 RPM Meeting it was agreed to by Travis AFB and the regulators that there would be no further removal of TPH in the vapor phase at extraction well EW566x31.
- As a result, the remaining contamination in the vadose zone in the vicinity of extraction well EW566x31 was not removed.

# Interviews

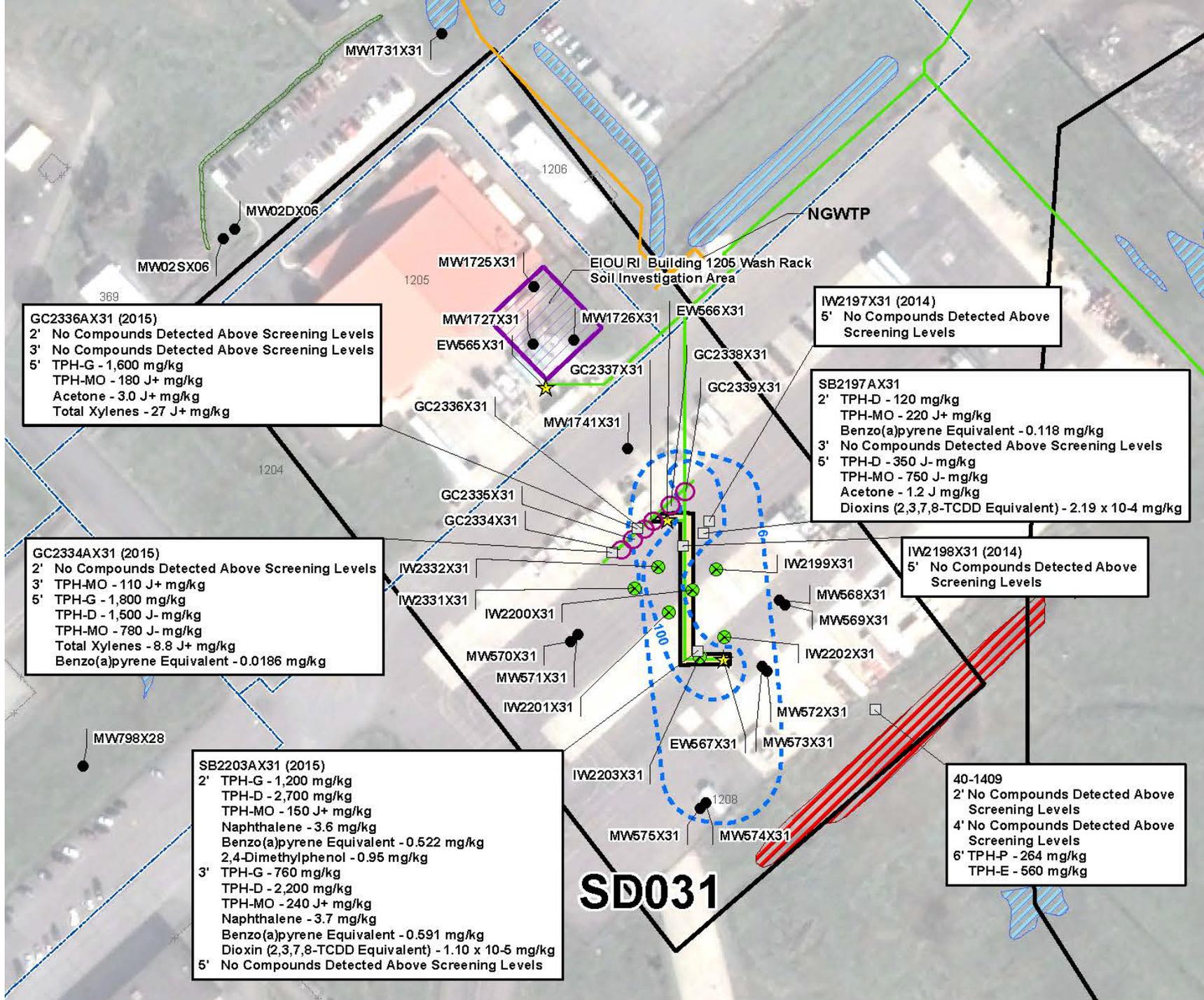
- In 2014, subsequent to reviewing the historical reports/records associated with Site SD031, several long-time personnel of CEMIRT were interviewed.
- The results of the interviews indicated:
  - The area with the soil staining is in the vicinity where interceptor planes were parked and washed from the late 1950s to early 1970s.
  - During the Vietnam Conflict transport planes returning from southeast Asia were parked in the area of the stained soil and were washed to remove chemicals that the planes were exposed to, which may have included Agent Orange.
  - Building 1205 was historically used by CEMIRT to repair large heating, ventilation, and air conditioning (HVAC) systems in addition to the large diesel generators.

# Interviews

- According to the personnel interviewed, the contamination associated with the stained soil would likely be associated with spillage of chemicals during the late 1950s to the early 1970s with the cleaning of interceptor jets and transport planes.
- Based on the review of the historical records and reports and the interviews conducted with long-time CEMIRT personnel, it is likely that spillage associated with cleaning and refueling activities of the interceptor jets and transport planes from the late 1950s to the early 1970s as well as releases from historical and current maintenance activities of the diesel generators and large HVAC systems at Building 1205 contributed to the stained soil that was observed during air knifing and drilling activities in 2014 and 2015 at site SD031.

# Second Round of Soil Sampling

- Based on the records review and interviews, it was determined that the second round of soil samples would be analyzed for TPH, VOCs, SVOCs, PAHs, herbicides, and dioxins and furans.
- Soil samples were collected at depths of 2, 3, and 5 feet bgs by hand auger on January 5, 2015 at soil borings SB2197Ax31, SB2203Ax31, GC2334Ax31, and GC2336Ax31.
  - The soil samples were collected 5 feet away from the primary borings (IW2197x31, IW2203x31, GC2334X31, and GC2336x31) to limit the effects of the air knifing activities at the primary boring locations.
- Analytical results of the soil samples indicated the presence of TPH-G; TPH-D; TPH-MO; acetone, total xylenes; PAHs; 2,3,7,8-tetrachlorodibenzodioxin (TCDD); and 2,4-dimethylphenol at concentrations greater than either the Water Board Residential ESL of the EPA Residential RSL.



GC2336AX31 (2015)  
 2' No Compounds Detected Above Screening Levels  
 3' No Compounds Detected Above Screening Levels  
 5' TPH-G - 1,600 mg/kg  
 TPH-MO - 180 J+ mg/kg  
 Acetone - 3.0 J+ mg/kg  
 Total Xylenes - 27 J+ mg/kg

IW2197X31 (2014)  
 5' No Compounds Detected Above Screening Levels

SB2197AX31  
 2' TPH-D - 120 mg/kg  
 TPH-MO - 220 J+ mg/kg  
 Benzo(a)pyrene Equivalent - 0.118 mg/kg  
 3' No Compounds Detected Above Screening Levels  
 5' TPH-D - 350 J- mg/kg  
 TPH-MO - 750 J- mg/kg  
 Acetone - 1.2 J mg/kg  
 Dioxins (2,3,7,8-TCDD Equivalent) - 2.19 x 10<sup>-4</sup> mg/kg

GC2334AX31 (2015)  
 2' No Compounds Detected Above Screening Levels  
 3' TPH-MO - 110 J+ mg/kg  
 5' TPH-G - 1,800 mg/kg  
 TPH-D - 1,500 J- mg/kg  
 TPH-MO - 780 J- mg/kg  
 Total Xylenes - 8.8 J+ mg/kg  
 Benzo(a)pyrene Equivalent - 0.0186 mg/kg

IW2198X31 (2014)  
 5' No Compounds Detected Above Screening Levels

SB2203AX31 (2015)  
 2' TPH-G - 1,200 mg/kg  
 TPH-D - 2,700 mg/kg  
 TPH-MO - 150 J+ mg/kg  
 Naphthalene - 3.6 mg/kg  
 Benzo(a)pyrene Equivalent - 0.522 mg/kg  
 2,4-Dimethylphenol - 0.95 mg/kg  
 3' TPH-G - 760 mg/kg  
 TPH-D - 2,200 mg/kg  
 TPH-MO - 240 J+ mg/kg  
 Naphthalene - 3.7 mg/kg  
 Benzo(a)pyrene Equivalent - 0.591 mg/kg  
 Dioxin (2,3,7,8-TCDD Equivalent) - 1.10 x 10<sup>-5</sup> mg/kg  
 5' No Compounds Detected Above Screening Levels

40-1409  
 2' No Compounds Detected Above Screening Levels  
 4' No Compounds Detected Above Screening Levels  
 6' TPH-P - 264 mg/kg  
 TPH-E - 560 mg/kg

**SD031**

# Work Plan Objectives

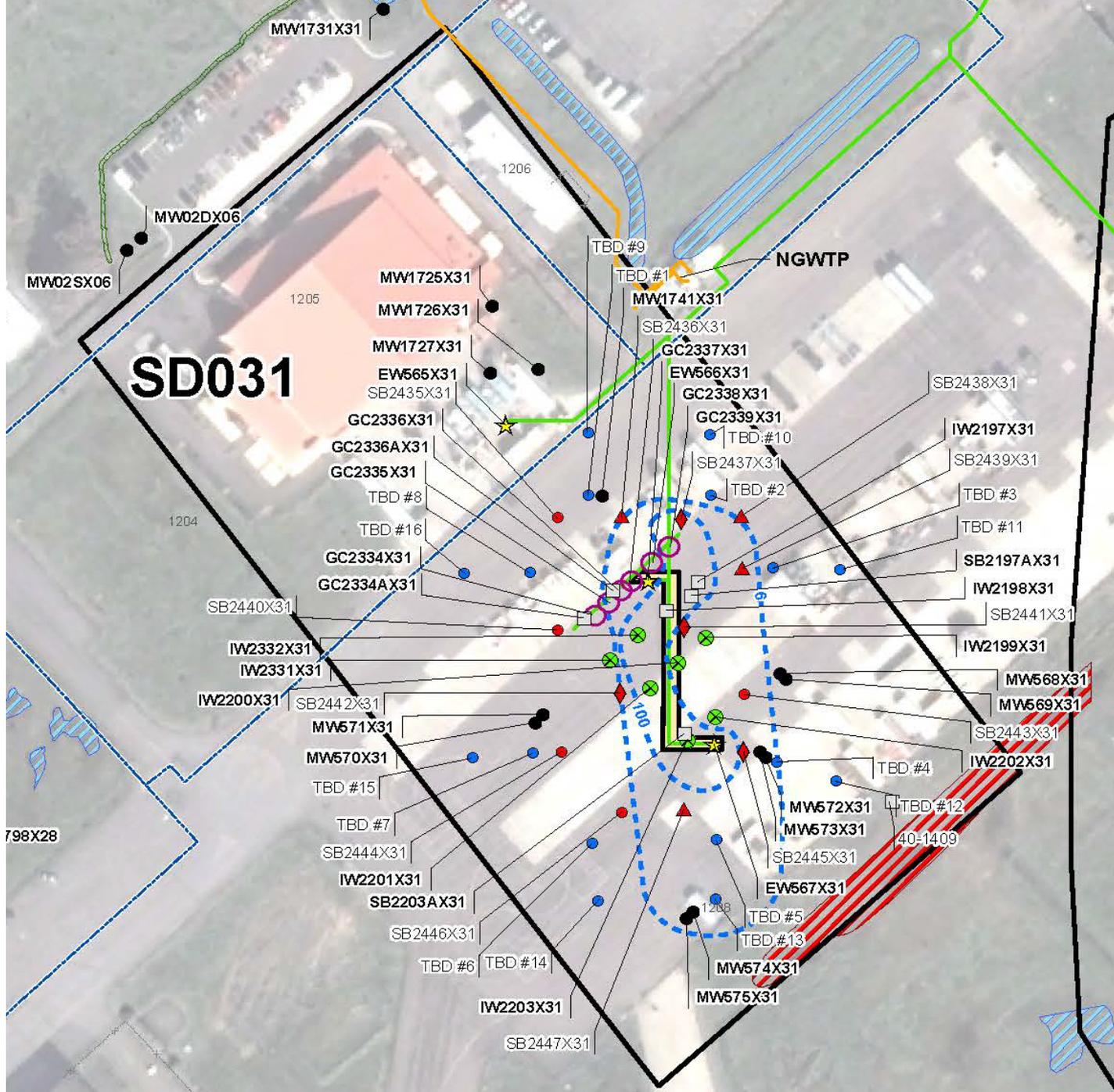
- Drill and collect soil samples to determine the chemicals of potential concern (COPCs) in the soil at Site SD031.
- Laterally and vertically delineate the extent of the COPCs in the soil using the Water Board and the EPA screening levels, as appropriate based on the conceptual site model (CSM).
- Collect soil vapor samples to evaluate the vapor intrusion pathway.
- Conduct a human health risk assessment (HHRA) and an ecological risk assessment (EcoRA) to determine if there is a significant potential risk in the soil to human and/or ecological receptors.
- If there is a significant potential risk, identify the chemicals of concern (COCs) for the Site SD031 soil.
- Then evaluate remedial options for the soil in a Feasibility Study.

# Conceptual Design

- The conceptual design for the soil investigation is to collect samples in a phased approach to delineate the lateral and vertical extent of the soil contamination.
  - The first phase will consist of 13 primary borings.
  - The second phase will consist of up to 16 initial step-out borings that will be drilled as a halo around the primary borings based on the results of the primary borings.
  - The need for additional step-out boring locations will be determined using the Triad-like approach employed at Travis AFB.
- The soil samples will be analyzed for TPH-G, TPH-D, TPH-MO, VOCs (including Freon 113), SVOCs, PAHs, herbicides, and dioxins and furans.
- The step-out borings will be drilled where exceedances of either the Water Board ESLs or the EPA RSLs occur, as appropriate based on the CSM.

# Conceptual Design

- Should the analytical results of second round step-out borings exceed either the ESLs or the RSLs, additional borings will be drilled, as appropriate based on the CSM.
- Soil vapor samples will be collected from four (4) for the primary soil boring locations to evaluate the vapor intrusion pathway.
- Soil samples will be collected from eight (8) primary boring locations 3 feet into the saturated zone to evaluate the smear zone.



# Soil Sampling

- Up to 29 soil borings (13 primary soil borings and up to 16 initial step-out borings) are planned to be drilled using the direct push technology (DPT) method.
- 21 of the 29 soil boring locations will be drilled to the water table interface, which is anticipated at 15 feet bgs.
  - Five (5) primary borings and up to 16 step-out borings.
- Soil samples will be collected at 2 feet bgs, 5 feet bgs, 10 feet bgs, and just above the water table interface.
  - For the four (4) borings where soil vapor samples will be collected, the soil sample that will be collected from 5 feet bgs will be sampled at 4 feet bgs.

# Soil Sampling

- Eight (8) of the 29 soil borings locations will be drilled to 3 feet into the saturated zone, which is anticipated will be 18 feet bgs.
  - Eight (8) primary borings.
  - Soil samples will also be collected at 18 feet bgs in these borings.

# Soil Vapor Sampling

- Eight (8) soil vapor samples will be collected from four (4) primary borings.
- Soil vapor samples will be collected from each of the borings at 4 and 14 feet bgs into 1-liter summa canisters using the post-run tubing (PRT) method with helium leak check.
- Each of the soil vapor samples will be analyzed by VOCs (including Freon-113 and naphthalene) by EPA Method TO-15.

# Risk Assessments/Feasibility Study

- HHRA and EcoRA will be performed to evaluate the potential risk to human and ecological receptors under current and potential future conditions.
- Should significant potential risk exist in the soil for human and/or ecological receptors a feasibility study will be performed.
- The feasibility study will evaluate up to three (3) remedial alternatives to address the identified risks to human health and/or the environment, as appropriate.

# Reporting

- Results of the soil remedial investigation will be reported in the Site SD031 Soil Remedial Investigation Report.
- Should a feasibility study be needed for the soil, it will be reported in a separate report.

# Questions

# Travis AFB Restoration Program

## Program Update

*RPM Meeting*  
*February 17, 2016*

# Completed Documents

- Vapor Intrusion Assessment Update Technical Memorandum
- 2012 CAMU Annual Report
- Old Skeet Range Action Memorandum
- 3<sup>rd</sup> Five-Year Review
- 2012 Annual Groundwater Remediation Implementation Status Report (GRISR)
- Subarea LF007C and Site SS030 Remedial Process Optimization Work Plan
- Pre-Design Site Characterization of SS029 Report
- Old Skeet Range Removal Action Work Plan
- 2013 CAMU Inspection Annual Report
- Groundwater Record of Decision (ROD)
- CG508 POCO Work Plan
- 2013 Annual GRISR
- FT004 Technology Demonstration Work Plan
- Kinder Morgan LF044 Land Use Control Report
- SD031 Technology Demonstration Work Plan
- TA500 Data Gap Investigation Work Plan
- ST018 POCO Work Plan Addendum
- SD037 GW RD/RA Work Plan
- Travis AFB UFP-QAPP
- DP039 Lead Excavation Technical Memo

# Completed Documents (cont'd)

- Proposed Plan for ROD Amendment to WABOU Soil ROD
- Proposed Plan for ROD Amendment to NEWIOU Soil, Sediment, & Surface Water ROD
- SD034 Data Gap Investigation Work Plan
- POCO Investigation Work Plan for Oil-Water Separators
- ST032 POCO Soil Excavation Work Plan
- SD036 GW RD/RA Work Plan
- SS016 GW RD/RA Work Plan
- SS015 GW RD/RA Work Plan
- FT005 Technology Demonstration Work Plan
- 2014 Annual CAMU Monitoring Report
- Old Skeet Range PAH Delineation Report
- ST028 POCO Work Plan
- SS014 POCO TD Work Plan
- CG508 Site Investigation/Site Closure Request Report
- 2014 Annual CAMU Monitoring Report
- DP039 GW RD/RA Work Plan
- SD031 TDCCR
- ST018 POCO CCR
- Site SS030 Groundwater RA CCR
- Sites SD036 and SD037 Groundwater RACCR
- Site SS016 Groundwater RACCR
- Site SS015 Groundwater RACCR

# Completed Field Work

- Replace battery banks at ST018 Groundwater Treatment Plant
- Annual Groundwater Remediation Implementation Program (GRIP) Sampling event
- Well Decommissioning (9 Wells)
- Electrical repairs to FT005 extraction system (well EW01x05)
- Electrical repairs to Site SS029 extraction system
- Site ST018 carbon vessels upgrade
- 2014 GRIP Semiannual Sampling Event
- Pump repairs to Site SS016 well (EW610x16)
- Subsite LF007C optimization upgrades
- 2014 Annual GRIP Sampling Event
- Biological Resource Assessment
- Site CG508 Site Investigation
- Old Skeet Range Characterization Sampling
- 4Q Semiannual GRIP Sampling Event
- SD031 Technology Demonstration Well Installation
- SD037 Well Installation
- SD031 Trench/Conveyance/Power Installation
- SD031 EVO Injection
- ST018 Well Installation
- SS015 Well Installation
- SS016 Well Installation
- Well Development (SD036, SD037)
- ST018 Trench/Conveyance/Power Installation
- SD036 EVO Injection
- Well Development (SS015, SS016)
- Baseline Sampling (SS015, SS016)
- SS014 Data Gap Investigation
- SS016 EVO Injection
- TA500 Data Gaps Investigation

# Completed Field Work

- 2015 Annual GRIP Sampling
- SD037 EVO Injection
- SD034 Data Gaps Investigation
- SS015 EVO Injection
- FT005 Injection Well Installation
- OWS 47, 48, 49 Site Investigations
- SS030 Trench/Conveyance/Power Installation
- FT005 Trench Installation
- FT005 Well Development
- FT004 Well Installation, Well Development, Baseline Sampling
- FT005 Baseline Sampling
- DP039 Well Installation, Well Development, Baseline Sampling
- FT004 EVO Injection
- FT004 Trench/Conveyance/Power Installation
- DP039 Infiltration Trench Installation
- ***TA500 Groundwater Sampling***

# Documents In-Progress

CERCLA

- 2014 Annual GRISR

# Documents In-Progress

POCO

- None

# Field Work In-Progress

- FT005 EVO Injection
- DP039 EVO Injection

# Documents Planned

## CERCLA

- Site SD031 Soil Remedial Investigation Work Plan Feb
- Data Gap Investigation TM for Soil Sites SD033, SD043, & SS046 Feb
- Site CG508 Well Decommissioning Work Plan Mar
- Community Involvement Plan Mar
- Site FT004 TD Construction Completion Report Mar
- 2015 Annual CAMU Monitoring Report Mar
- Site TS060 Action Memorandum Mar
- Site SD034 Technology Demonstration Work Plan Apr
- Site TS060 Removal Action Work Plan Apr
- 2015 Annual GRISR Jun
- Site FT005 TD Construction Completion Report TBD
- Site DP039 RD/RA Construction Completion Report TBD
- Site SS016 RD/RA Soil Work Plan TBD

# Documents Planned

## POCO

- Site ST032 POCO Completion Report Feb
- Corrective Action Plan for DERA-Funded Oil Water Separators Mar
- Site ST028 POCO Completion Report Mar

# Field Work Planned

## CERCLA

- SD031 Soil Remedial Investigation May
- SD034 Technology Demonstration Installation TBD
- TS060 Removal Action TBD

Note: Contact Lonnie Duke if you would like to observe planned field work events

# Field Work Planned

POCO

- Oil Water Separators (12) Removal May
- CG508 Well Decommissioning Jun
- SS014 Bioreactor Installation Jun

Note: Contact Lonnie Duke if you would like to observe planned field work events

# Completed Documents (Historical1)

- Basewide Health & Safety Plan (HSP)
- Action Plan
- 2007/2008 GSAP Annual Report
- LF007C RPO Work Plan
- LF008 Rebound Study Work Plan
- SS014 Tier 1 POCO Evaluation Work Plan
- ST027B Site Characterization Work Plan
- SS030 RPO Work Plan
- ST032 POCO Technical Memo
- DP039 Bioreactor Work Plan
- 2008 Annual GWTP RPO Report
- Passive Diffusion Bag (PDB) Technical Memo
- RD/RA QAPP Update
- ST032 Tier 1 POCO Evaluation Work Plan
- Phytostabilization Demonstration Technical Memo
- Model QAPP
- LF008 Rebound Test Technical Memo
- Comprehensive Site Evaluation Phase II Work Plan
- Field Sampling Plan (FSP)
- SS016 RPO Work Plan
- ST018 POCO RA Work Plan
- Vapor Intrusion Assessment Report
- GSAP 2008/2009 Annual Report
- FT005 Data Gap Work Plan
- First, Second, & Third Site DP039 Sustainable Bioreactor Demonstration Progress Reports
- DP039 RPO Work Plan
- SD036/SD037 RPO Work Plan
- ST027B Site Characterization Report
- 2009 GWTP RPO Annual Report
- Natural Attenuation Assessment Report (NAAR)
- Union Creek Sites SD001 & SD033 Remedial Action Report
- CAMU 2008-2009 Monitoring Annual Report

# Completed Documents (Historical 2)

- Phytostabilization Study Report
- 2009/2010 Annual GSAP Report
- SS015 Remedy Optimization Field Implementation Plan
- Sites SS014 and ST032 Tier 1 POCO Evaluation Report
- SD036 Remedy Optimization Field Implementation Plan
- 2010 Annual CAMU Inspection Report
- Site ST018 POCO Baseline Implementation Report
- FT005 Data Gaps Investigation Report
- Comprehensive Site Evaluation Phase II Report
- 2010 Groundwater RPO Annual Report
- Focused Feasibility Study (FFS)
- Site ST027-Area B Human Health Risk Assessment
- Site ST027-Area B Ecological Risk Assessment
- Work Plan for Assessment of Aerobic Chlorinated Cometabolism Enzymes
- 2010/2011 Annual GSAP Report
- Baseline Implementation Report (Sites SS015, SS016, SD036, SD037, and DP039)
- 2011 CAMU Annual Report
- Technical and Economic Feasibility Analysis (TEFA)
- Work Plan for RPO of Sites SS016 and SS029
- Site LF007C Data Gaps Investigation Technical Memorandum
- Technical Memorandum for Assessment of Aerobic Chlorinated Cometabolism Enzymes
- Old Skeet Range Engineering Evaluation/Cost Analysis
- 2011 Groundwater Treatment RPO Annual Report
- Groundwater Proposed Plan (PP)
- FT005 Remedial Action Completion Report
- 2012 GSAP Technical Memorandum<sup>14</sup>

# Completed Field Work (Historical1)

- ST027B Gore Sorber Survey–Phase 1
- ST027B Field Sampling – Phase 2
- GSAP 2008 Semi-annual Event
- ST027B Installation of Wells – Phase 3
- SS014 Site Characterization
- LF008 Rebound Study
- GSAP Annual Sampling Event - 2009
- SS030 Site Characterization–Phase 1
- ST027 Site Characterization -Phase 3
- ST014 Monitor Well Install - Subsite 3
- SD001/SD033 Sediment RA
- SS016 Site Characterization (OSA source area)
- ST018 Site Characterization
- SS030 Site Characterization (Off-base VOC Plume)
- DP039 Site Characterization (for Biobarrier Placement)
- SS014 & ST032 Q1 2010 MNA Sampling (2<sup>nd</sup> of 4 quarterly events)
- SD036 Additional Site Characterization (north & east)
- Therm/Ox System Removal
- SS016 Monitoring Well Installation
- SD037 EVO Injection Well Installation
- DP039 Monitoring Well & Injection Well Installation
- DP039 EVO Injection
- SD037 Monitoring Well Installation
- GSAP 2010 Annual Sampling Event
- SD037 EVO Injection
- SS015 Site Characterization
- South Plant GAC Change-out
- FT005 Data Gap Investigation
- SS016 Position Survey of EW03
- SS016 Bioreactor Installation
- SS016 Bioreactor Baseline Sampling
- DP039 Biobarrier Quarterly Performance Sampling

# Completed Field Work (Historical 2)

- DP039 Bioreactor Quarterly Performance Sampling
- SD037 EVO Quarterly Performance Sampling
- SS015 EVO Baseline Sampling
- SD036 EVO Baseline Sampling
- SS016 Bioreactor Startup
- SD036 Injection Wells Installation
- SS015 Injection Wells Installation
- ST018 GETS Installation
- SD036 EVO Injection
- 2010 Semiannual GSAP
- SS015 EVO Injection
- Quarterly RPO Performance Monitoring (Feb 2011)
- ST018 GETS Startup
- Quarterly RPO Performance Monitoring (May 2011)
- 2011 Annual GSAP Sampling
- SS029 GET Shutdown Test (System Optimization analysis)
- Quarterly RPO Performance Monitoring (Aug 2011)
- Quarterly RPO Performance Monitoring (Nov 2011)
- 2011 Semiannual GSAP Sampling
- LF007C Site Characterization (Wetlands)
- FT005 Soil Remedial Action
- Performance Monitoring SS015 (4<sup>th</sup> Quarterly event)
- Sampling for Assessment of Aerobic Chlorinated Cometabolism Enzymes (Feb 21-22)
- 2012 Annual GSAP Sampling
- CAMU Lysimeter Removal
- LF007C GET System Optimization
- SS029/SS016 System Optimization Analysis
- GSAP Semiannual Sampling Event
- Replace electrical wiring for well field at Site SS030