

**Travis Air Force Base
Environmental Restoration Program
Restoration Program Manager's
Meeting Minutes
16 May 2018, 0930 Hours**

Mr. Lonnie Duke of the Air Force Civil Engineer Center (AFCEC) Restoration Installation Support Section (ISS) conducted the Restoration Program Manager's (RPM) teleconference on 16 May at 0930 hours in Building 248 at Travis AFB, California. Attendees included:

Lonnie Duke	AFCEC/CZOW	
Glenn Anderson	AFCEC/CZOW	
Milton 'Gene' Clare	AFCEC/CZOW	
Angel Santiago Jr.	AFCEC/CZOW	
Monika O'Sullivan	AFCEC/CZOW	
Haekyung Kim (via telephone)	AFCEC/CZRW	
Greg Capra	AFCEC/CZOW	KC-46 Discussion only
Kurt Grunawalt (via telephone)	Travis AFB Legal (60 AMW/JA)	
Dezso Linbrunner (via telephone)	USACE-Omaha	
Sarah Miller (via telephone)	USACE-Omaha	
Adriana Constantinescu (via telephone)	RWQCB	
David Elias (via telephone)	RWQCB	
Ben Fries (via telephone)	DTSC	
Nadia Hollan Burke (via telephone)	USEPA	
Dan Stralka (via telephone)	USEPA	KC-46 Discussion only
Indira Balkissoon (via telephone)	Techlaw, Inc.	
Nicole Goers (via telephone)	Techlaw, Inc.	KC-46 Discussion only
Mike Bedan (via telephone)	CH2M/JACOBS	KC-46 Discussion only
Leslie Royer (via telephone)	CH2M/JACOBS	KC-46 Discussion only
Jeff Minchak (via telephone)	CH2M/JACOBS	KC-46 Discussion only
Tony Chakurian	CH2M/JACOBS	

Handouts distributed prior to or at the meeting, discussions, and presentations included:

Attachment 1	Meeting Agenda
Attachment 2	Master Meeting and Document Schedule
Attachment 3	SBBGWTP Monthly Data Sheet (April 2018)
Attachment 4	CGWTP Monthly Data Sheet (April 2018)
Attachment 5	ST018 Monthly Data Sheet (April 2018)
Attachment 6	Presentation: Site SS015 Soil Sampling Plan
Attachment 7	Presentation: Program Update

1. ADMINISTRATIVE

A. Previous Meeting Minutes

Ms. Constantinescu requested that the Action Item 2 Update be revised to say: “Ms. Constantinescu mentioned the 2014 EPA’s Memorandum that changed the decision-making process for trichloroethylene (TCE) vapor intrusion (VI) risk, as TCE now poses acute risk to pregnant women. Since it is acute risk, we must ensure that there is effectively no exposure of TCE to workers at the KC-46 hangar that is currently being designed. Ms. Constantinescu added that a different venting system might be in order depending on results of sampling; additional soil vapor sampling can be performed during the geotechnical investigation.”

B. Action Item Review

Action items from April 2018 were reviewed.

Action item 1 is ongoing: Ms. O’Sullivan to provide updates on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). May 2018 update: Ms. O’Sullivan said that the SI report is almost complete, and it should be going out to the regulatory agencies in June.

Action Item 2 is ongoing: Mr. Duke will continue to provide design and construction information for the new KC-46 Hangar construction project for agency input ahead of the Air Force/Civil Engineering awarding the construction contract. May 2018 update: Mr. Duke presented the Air Force plans to address vapor intrusion of TCE in the office spaces and KC-46 hangar bays (currently in design), in a conference call with the regulators. The regulatory agencies voiced their concerns related to screening levels of TCE for soil vapor and indoor air, passive venting system design, and pre- and post-construction monitoring suggestions. The

risk assessors from USEPA and CH2M, along with the site manager from CH2M, clarified and responded to concerns.

Mr. Duke summarized the points of agreement resulting from the discussion, noting that these measures are the most prudent for ensuring protection of future occupants of the facility, and will ensure that the Air Force will be in compliance with the requirements agreed to in the 2014 Groundwater ROD:

- Collect soil vapor samples from near the source area and the office areas prior to construction to provide baseline TCE data.
- A geomembrane vapor barrier will be installed under the slabs\sub-base for the office spaces as well as the main hangar.
- The office spaces will have a passive ventilation system that can easily be converted to an active system if increasing sub slab concentrations of TCE indicate that VI could become an issue.
- Sub-slab vapor sampling probes will be installed both above and below the geomembrane and beneath both the office and the main hangar areas.
- Vapor sampling of the sub slab probes for TCE will be conducted post construction; prior to occupying the facility.
- When the post construction sampling data is available and prior to occupancy, the results will be compared to the TCE indoor air response action levels presented in the July 2014 EPA memo on this subject to ensure workers are protected from possible exposure to TCE concentrations above the response action levels stated in the memo.

Mr. Duke will inquire with the design engineers about the stem wall depth and geomembrane attachment method, and will report back as soon as he has answers.

Updates on recently closed action items:

March 2018 Action Item 3: Mr. Santiago and Mr. Duke will check past TPH-G data for the CGWTP influent samples. May 2018 update: Jeff Gamlin will present the most recent TPH data in June. This action item remains closed.

March 2018 Action Item 4: Mr. Duke will follow up on 1,4-dioxane detections in the Subarea LF007C GWTP effluent. May 2018 update: The LF007C GWTP was offline in April due to standing water, but will be back up and running later this week. This action item remains closed.

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 held on Wednesday 20 June 2018, at 0930 hours.

Reminder: The annual RAB tour (which historically has been held in October) will not be formally scheduled and will instead be individual tours given when an interested party would like to see field work this summer. As a result, since there will not be a formal RAB meeting, all agencies agreed to move the October RPM meeting from Thursday, October 18, to Wednesday, October 17, at 0930.

Travis AFB Master Document Schedule

- Community Relations Plan Update (CRP): The remaining submittal dates for this document have been changed to “TBD” to allow for completion, submittal, and review of higher priority documents related to achieving site closure.
- Amendment to the WABOU Soil ROD for Travis AFB ERP Sites DP039, SD043, and SS046: The Response to Comments date was changed to 24 May 2018. The rest of the schedule was changed accordingly.
- Amendment to the NEWIOU Soil ROD for the Travis AFB ERP Sites SS016 and SD033: The Response to Comments date was changed to 29 August 2018. The rest of the schedule was changed accordingly.
- Site TS060 No Further Action Record of Decision: This is a new document. The Working Copy is currently being reviewed internally and will be sent to San Antonio for a two-week legal review.
- Site SD031 Soil Remedial Investigation/Feasibility Study: The submittal date of the pre-draft version was changed to 15 June 2018; the rest of the schedule was changed accordingly.
- Site SD043 Remedial Design/Remedial Action Work Plan: There are no changes to the schedule. EPA and DTSC comments have been received; the Water Board will not review, and defers to EPA and DTSC comments.
- Site SS046 Remedial Design/Remedial Action Work Plan: There are no changes to the schedule. Comments were received ahead of schedule from all agencies.
- Site SS016 Remedial Design/Remedial Action Work Plan: There are no changes to the schedule, but this document will hopefully be submitted early so that field work can be conducted in 2018. This excavation project is located within the footprint of the future new KC-46 hangar.
- Site SD031 Remedial Investigation/Feasibility Study: The submittal date of the predraft version was changed to 15 June 2018; the rest of the schedule was changed accordingly.

- Fourth Five-Year Review Report for Multiple Groundwater, Soil, and Sediment Sites: This is a new document; dates will be assigned after internal review is complete.
- Potrero Hills Annex (FS, PP, and ROD): No change was made to the schedule. The work plan for the Human Health and Ecological Risk Assessments has been submitted. The responsible parties are complying with the schedule set forth in the Administrative Order.
- Data Gap Investigation Results Technical Memorandum for Soil Site SS016: No change has been made to the schedule. The Water Board will provide comments by 17 May 2018. Responses to EPA comments are all approved.
- Site SS015 Soil Sampling Plan: No change was made to the schedule.
- Site LF006 Technology Demonstration Work Plan: This is a new document.
- Quarterly Newsletters (June 2018): No changes have been made to the schedule for the July 2018 issue.
- 2017 Annual GRISR: No change was made to the schedule.
- Monitoring Well Installation Technical Memorandum for Site DP039, Addendum to the Site DP039 Remedial Action Construction Completion Report: No change was made to the schedule. The Water Board will not be providing comments on this document. DTSC provided comments previously, but since they were not received, Mr. Fries indicated he would re-send the DTSC comments.
- Sites LF006, SS030, and SD031 Aquifer Test Activities Technical Memorandum: No changes were made to the schedule.
- Site FT005 Extraction System Optimization Report: No change was made to the schedule.
- 2017 Annual CAMU Monitoring Report: The Draft to Agencies date was changed to 15 May 2018 to reflect the actual submittal date. The rest of the schedule was changed accordingly.
- Emulsified Vegetable Oil Sites FT004, SS015, SD031, and SD036 Optimization Injections Report: No changes were made to the schedule.
- Site LF044 Sediment Sampling Report. The Draft to Agencies date was changed to 15 May 2018 to reflect the actual submittal date. The rest of the schedule was updated accordingly.
- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW050, OW052, OW055, OW056, and OW057: The Final Due date was changed to 8 May 2018 to reflect actual submittal date. Ms. Constantinescu noted that the Water Board has made this a priority, and anticipates providing the NFA letters for all OWSs by late June.

The following documents were moved to History:

— Area of Concern TA500 Data Gap Investigation and Closure Report

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

South Base Boundary Groundwater Treatment Plant, April 2018 (see Attachment 3)

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 99.2% uptime, and 7.4 million gallons of groundwater were extracted and treated in April 2018. All treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 156.9 gallons per minute (gpm). Electrical power usage was 19,307 kWh, and approximately 15,087 pounds of CO₂ were created (based on DOE calculation). Approximately 1.04 pounds of volatile organic compounds (VOCs) were removed in April. The total mass of VOCs removed since startup of the system is 500.1 pounds.

April 2018 Optimization Activities: Monitoring well MW269x30 was converted into an extraction well to help capture and treat a small area of TCE contamination. An aquifer test has been conducted at this site as part of optimization activities. Plans for re-purposing well MW269x30 are included in the 2017 GRISR. No other optimization activities are reported for the month of April 2018.

Piping that used to be connected to the air stripper for the SBBGWTP was replaced in April 2018 due to accumulation of scale from when the air stripper was in operation. Buildup of scale is not expected to be a recurring problem since the air stripper is no longer being used.

Central Groundwater Treatment Plant, April 2018 (see Attachment 4)

The Central Groundwater Treatment Plant (CGWTP) performed at 100% uptime with approximately 1,428,080 gallons of groundwater extracted and treated in April 2018. All treated water was discharged to the storm sewer system which discharges to Union Creek. The average flow rate for the CGWTP was 29.1 gpm. Electrical power usage was 2,642 kWh for all equipment connected to the Central Plant, and approximately 2,843 pounds of CO₂ were generated. Approximately 3.42 pounds of VOCs were removed from groundwater by the treatment plant in April. The total mass of VOCs removed since the startup of the system is 11,490 pounds.

Optimization Activities for CGWTP: The DP039 bioreactor continues to operate in a four-week “pulsed mode.” No other optimization activities are reported for the month of April 2018.

Two extraction wells were temporarily offline, because the OSA vault was flooded. Rainwater was pumped out, and the wells were restarted. Maintenance and upgrade activities included replacement of bag filters, installation of an emergency on/off button, and replacement of a damaged power supply for two extraction wells.

LF007C Groundwater Treatment Plant, April 2018

There is no report for the LF007C GWTP for April; the plant was shut down, in accordance with U.S. Fish and Wildlife Service requirements, due to formation of vernal pools in the area resulting from seasonal rains.

ST018 Groundwater (MTBE) Treatment Plant, April 2018 (see Attachment 5)

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 100% uptime with approximately 318,060 gallons of groundwater extracted and treated in April 2018. All treated water was discharged to the Fairfield – Suisun Sewer District. The average flow rate for the ST018 GWTP was 6.7 gpm. Electrical power usage for the month was 187 kWh for all equipment connected to the ST018 GWTP. The total CO₂ equivalent, including an estimate for the carbon change-out, equates to approximately 138 pounds. Approximately 0.67 pound of MTBE, BTEX, VOCs, and TPH was removed in April by the treatment plant, and approximately 0.15 pound of MTBE was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 45.2 pounds, and the total MTBE mass removed since startup of the system is 11.0 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 four groundwater extraction pumps in the system are all solar powered.

No optimization activities are reported for the month of April 2018.

3. Presentations:

A) Site SS015 Soil Sampling Plan (Attachment 6)

Mr. Tony Chakurian provided an overview of the upcoming work planned for Site SS015. Please refer to Attachment 6 for details.

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

Mr. Wray reported on the status of fieldwork and documents which are completed, in progress, and upcoming. Please refer to Attachment 7 for the full briefing.

4. New Action Item Review

No new action items were identified.

5. PROGRAM/ISSUES/UPDATE

Mr. Anderson noted that the Air Force now needs to closely monitor the document schedule and provide regular updates to Congress, including notification when documents related to SC or RC are delayed, even by one day. This is a directive to the Air Force related to distribution of DSMOA funding, not a program-level decision. Mr. Anderson and Mr. Duke acknowledged that the regulator review timeline as described in the Travis Federal Facility Agreement for draft documents is 60 days but that the requested 30-day Air Force timeline is often met, and said that they will also report to Congress when documents are reviewed in under the Air Force's 30-day timeframe.

Mr. Duke noted that he will be out of the office next week but will try to reply to emails as he is able. After that, he will be out for approximately two weeks recuperating from a minor surgical procedure. He requested that Mr. Anderson be copied on all correspondence during this time.

6. Action Items

Item #	Responsible	Action Item Description	Due Date	Status
1.	Monika O'Sullivan	Ms. O'Sullivan to provide updates on PFOS and PFOA as she becomes aware of them.	Ongoing	Open
2.	Lonnie Duke	Mr. Duke will continue to provide design and construction information for the KC-46 Hangar for agency input ahead of the Air Force/Civil Engineering awarding the construction contract.	Ongoing	Open

TRAVIS AIR FORCE BASE
ENVIRONMENTAL RESTORATION PROGRAM
RESTORATION PROGRAM MANAGER'S MEETING

The RPM Teleconference is scheduled for 9:30 AM PST on 16 May 2018. **The call-in number is 1-866-203-7023. Enter the Participation code 5978-75-9736 then enter #.**

AGENDA

1. KC-46 DESIGN DISCUSSION
2. ADMINISTRATIVE
 - A. INTRODUCTIONS
 - B. PREVIOUS MEETING MINUTES
 - C. ACTION ITEM REVIEW
 - D. MASTER MEETING AND DOCUMENT SCHEDULE REVIEW
3. CURRENT PROJECTS
 - A. TREATMENT PLANT OPERATION AND MAINTENANCE UPDATE
4. PRESENTATIONS
 - A. SS015 SOIL SAMPLING PLAN
 - B. PROGRAM UPDATE:
DOCUMENTS & ACTIVITIES COMPLETED, IN PROGRESS AND PLANNED
5. NEW ACTION ITEM REVIEW
6. PROGRAM/ISSUES/UPDATE
 - A. MEETING SCHEDULE

NOTES: AFTER THE RPM TELECONFERENCE, BASED ON THE DISCUSSION DURING THE REVIEW OF THE MASTER MEETING AND DOCUMENT SCHEDULE, WE ALLOW TIME TO HOLD A SEPARATE SPLINTER MEETING TO DISCUSS RESPONSES TO AGENCY COMMENTS ON THOSE DOCUMENTS THAT ARE IN PROGRESS, OR OTHER ISSUES IF NEEDED. ALL PARTICIPANTS ARE WELCOME TO PARTICIPATE.

(2018)
Annual Meeting and Teleconference Schedule

Monthly RPM Meeting ¹ (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.)
—	01-17-18	—
02-21-18	—	—
—	03-21-18	—
04-19-18 (Thursday 2:00 PM)	—	04-19-18
—	05-16-18	—
06-20-18	—	—
—	07-18-18	—
08-15-18	—	—
—	09-19-18	—
10-17-18	—	May through October ²
—	11-21-18	—
—	—	—

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

² Note: Tentative RAB tour(s) during construction season.

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS				
Life Cycle	Community Relations Plan Update Travis AFB, Glenn Anderson CH2M, Jill Dunphy	Amendment to the WABOU Soil ROD for the Travis AFB ERP Sites DP039, SD043, and SS046 Travis AFB, Glenn Anderson CH2M, Latonya Coleman	Amendment to the NEWIOU Soil ROD for the Travis AFB ERP Sites SS016 and SD033 Travis AFB, Glenn Anderson CH2M, Latonya Coleman	No Further Action ROD for Old Skeet Range (TS060 MRA) Travis AFB, Glenn Anderson
Scoping Meeting	NA	NA	NA	NA
Predraft to AF/Service Center	08-23-16	10-09-17	02-28-18	TBD
AF/Service Center Comments Due	09-07-16	11-08-17	03-30-18	TBD
Draft to Agencies	09-28-16 (03-22-18)	11-30-17	06-06-18	TBD
Draft to RAB	09-28-16 (03-22-18)	11-30-17	06-06-18	TBD
Agency Comments Due	10-28-16 (04-27-18)	01-31-18	08-06-18	TBD
Response to Comments Meeting	TBD	02-21-18	08-15-18	TBD
Agency Concurrence with Remedy	NA	NA	NA	NA
Public Comment Period	NA	NA	NA	NA
Public Meeting	NA	NA	NA	NA
Response to Comments Due	TBD	05-24-18	08-29-18	TBD
Draft Final Due	TBD	05-24-18	08-29-18	TBD
Final Due	TBD	06-25-18	10-01-18	TBD

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
Life Cycle	Site SD043 Remedial Design/Remedial Action Work Plan Travis AFB, Glenn Anderson CH2M, Levi Pratt	Site SS046 Remedial Design/Remedial Action Work Plan Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald	Site SS016 Remedial Design/Remedial Action Work Plan Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	02-22-18	03-02-18	05-17-18
AF/Service Center Comments Due	03-08-18	03-16-18	06-01-18
Draft to Agencies	04-10-18	04-12-18	06-18-18
Draft to RAB	04-10-18	04-12-18	06-18-18
Agency Comments Due	05-10-18	05-14-18	07-19-18
Response to Comments Meeting	05-16-18	05-16-18	08-02-18
Agency Concurrence with Remedy	NA	NA	NA
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA
Response to Comments Due	05-31-18	06-01-18	08-16-18
Draft Final Due	05-31-18	06-01-18	08-16-18
Final Due	07-02-18	07-03-18	09-17-18

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS		
Life Cycle	Site SD031 Soil Remedial Investigation/Feasibility Study Travis AFB, Glenn Anderson CH2M, Nikki Carlton	Fourth Five-Year Review Report for Multiple Groundwater, Soil, and Sediment Sites Travis AFB, Glenn Anderson Tetra Tech, Joachim Eberharter
Scoping Meeting	NA	NA
Predraft to AF/Service Center	06-15-18	TBD
AF/Service Center Comments Due	07-16-18	TBD
Draft to Agencies	07-31-18	TBD
Draft to RAB	07-31-18	TBD
Agency Comments Due	10-01-18	TBD
Response to Comments Meeting	10-17-18	TBD
Agency Concurrence with Remedy	NA	NA
Public Comment Period	NA	NA
Public Meeting	NA	NA
Response to Comments Due	10-31-18	TBD
Draft Final Due	10-31-18	TBD
Final Due	11-30-18	TBD

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
Life Cycle	Potrero Hills Annex Travis, Glenn Anderson		
	FS	Proposed Plan	ROD
Scoping Meeting	180 days after Water Board Order Rescinded	+470 days	+735 days
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
Response to Comments Meeting	+ 405 days	+665 days	+ 1110 days
Agency Concurrence with Remedy	NA	NA	+ 1130 days
Public Comment Period	NA	+735 to 765 days	NA
Public Meeting	NA	+745 days	NA
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

SECONDARY DOCUMENTS			
Life Cycle	Data Gap Investigation Results Technical Memorandum for Soil Site SS016 Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald	Site SS015 Soil Sampling Plan Travis AFB, Glenn Anderson CH2M, Levi Pratt	Site LF006 Technology Demonstration Work Plan Travis AFB, Glenn Anderson CH2M, Levi Pratt
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	10-04-17	03-13-18	06-19-18
AF/Service Center Comments Due	10-18-17	03-27-18	07-03-18
Draft to Agencies	11-30-17	04-30-18	07-20-18
Draft to RAB	11-30-17	04-30-18	07-20-18
Agency Comments Due	01-02-18	05-31-18	08-20-18
Response to Comments Meeting	01-17-18	06-20-18	09-05-18
Response to Comments Due	03-21-18 (05-24-18)	07-16-18	09-19-18
Draft Final Due	NA	NA	NA
Final Due	03-21-18 (05-24-18)	07-16-18	09-19-18
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	Quarterly Newsletter (July 2018) Travis, Glenn Anderson	2017 Annual GRISR Travis AFB, Glenn Anderson CH2M, Leslie Royer
Scoping Meeting	NA	NA
Predraft to AF/Service Center	06-26-18	05-09-18
AF/Service Center Comments Due	NA	06-11-18
Draft to Agencies	07-03-18	07-13-18
Draft to RAB	NA	07-13-18
Agency Comments Due	07-17-18	08-13-18
Response to Comments Meeting	07-18-18	08-22-18
Response to Comments Due	07-19-18	09-12-18
Draft Final Due	NA	NA
Final Due	07-19-18	09-12-18
Public Comment Period	NA	NA
Public Meeting	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS			
Life Cycle	Monitoring Well Installation Technical Memorandum for Site DP039, Addendum to the Site DP039 Remedial Action Construction Completion Report Travis AFB, Glenn Anderson CH2M, Levi Pratt	Sites LF006, SS030 and SD031 Aquifer Test Activities Technical Memorandum Travis AFB, Glenn Anderson CH2M, Renee Caird	Site FT005 Extraction System Optimization Technical Memorandum Travis AFB, Gene Clare CH2M, Levi Pratt
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	02-26-18	02-15-18	03-08-18
AF/Service Center Comments Due	03-14-18	03-02-18	03-22-18
Draft to Agencies	04-19-18	03-21-18	05-01-18
Draft to RAB	04-19-18	03-21-18	05-01-18
Agency Comments Due	05-21-18	04-23-18	06-01-18
Response to Comments Meeting	06-20-18	05-16-18	06-20-18
Response to Comments Due	07-27-18	06-04-18	07-18-18
Draft Final Due	NA	NA	NA
Final Due	07-27-18	06-04-18	07-18-18
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS			
Life Cycle	2017 Annual CAMU Monitoring Report Travis AFB, Gene Clare CH2M HILL, Levi Pratt	Emulsified Vegetable Oil Sites FT004, SS015, SD031, and SD036 Optimization Injections Technical Memorandum Travis AFB, Glenn Anderson CH2M, Levi Pratt	Site LF044 Sediment Sampling Technical Memorandum Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	04-19-18	05-22-18	04-12-18
AF/Service Center Comments Due	05-03-18	06-06-18	04-26-08
Draft to Agencies	05-15-18	06-25-18	05-17-18
Draft to RAB	05-15-18	06-25-18	05-17-18
Agency Comments Due	06-15-18	07-26-18	06-18-18
Response to Comments Meeting	06-20-18	08-15-18	06-20-18
Response to Comments Due	07-10-18	08-31-18	07-13-18
Draft Final Due	NA	NA	NA
Final Due	07-10-18	08-31-18	07-13-18
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL POCO DOCUMENTS	
Life Cycle	POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW052, OW055, OW056, and OW057 Travis AFB, Glenn Anderson CH2M, Doug Berwick
Scoping Meeting	NA
Predraft to AF/Service Center	02-01-17
AF/Service Center Comments Due	02-15-17
Draft to Agencies	12-19-17
Draft to RAB	12-19-17
Agency Comments Due	01-30-18
Response to Comments Meeting	02-21-18
Response to Comments Due	03-07-18 (05-08-18)
Draft Final Due	NA
Final Due	03-07-18 (05-08-18)
Public Comment Period	NA
Public Meeting	NA

Travis AFB Master Meeting and Document Schedule

HISTORY	
Life Cycle	Area of Concern TA500 Data Gap Investigation and Closure Report Travis AFB, Glenn Anderson CH2M, Renee Caird
Scoping Meeting	NA
Predraft to AF/Service Center	12-21-17
AF/Service Center Comments Due	01-08-18
Draft to Agencies	01-23-18
Draft to RAB	01-23-18
Agency Comments Due	02-23-18 (03-16-18)
Response to Comments Meeting	03-09-18
Response to Comments Due	03-27-18 (04-04-18)
Draft Final Due	NA
Final Due	03-27-18 (04-04-18)
Public Comment Period	NA
Public Meeting	NA

South Base Boundary Groundwater Treatment Plant Monthly Data Sheet

Report Number: 210

Reporting Period: 30 March 2018 – 2 May 2018

Date Submitted: 11 May 2018

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 April 2018 reporting period.

Table 1 – Operations Summary – April 2018				
Initial Data Collection:		3/30/2018 12:00	Final Data Collection:	5/2/2018 12:30
Operating Time:		Percent Uptime:	Electrical Power Usage:	
SBBGWTP:	786 hours	SBBGWTP:	99.2%	SBBGWTP: 19,307 kWh (15,087 lbs CO ₂ generated ^a)
Gallons Treated: 7.4 million gallons			Gallons Treated Since July 1998: 1,036 million gallons	
Volume Discharged to Union Creek: 7.4 million gallons			Gallons Treated From Other Sources: 0 gallons	
VOC Mass Removed: 1.04 lbs ^b			VOC Mass Removed Since July 1998: 500.1 lbs	
Rolling 12-Month Cost per Pound of Mass Removed: \$9,654 ^c				
Monthly Cost per Pound of Mass Removed: \$14,470 ^c				
lbs = pounds				
^a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 800 pounds of GHG from GAC change out services averaged to a per month basis.				
^b Calculated using April 2018 EPA Method SW8260C analytical results.				
^c 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.

Table 2 – SBBGWTP Average Flow Rate (gpm) ^a – April 2018							
FT005 ^b				SS029		SS030	
EW01x05	Offline	EW743x05	Offline	EW01x29	Offline ^c	EW01x30	13.0
EW02x05	Offline	EW744x05	0.0 ^d	EW02x29	Offline ^c	EW02x30	0.0 ^d
EW03x05	Offline	EW745x05	11.8	EW03x29	2.9	EW03x30	8.1
EW731x05	6.7	EW746x05	Offline	EW04x29	4.0	EW04x30	23.1
EW732x05	Offline	EW2291x05	6.5	EW05x29	6.6	EW05x30	19.4
EW733x05	Offline	EW2782x05	7.1	EW06x29	7.6	EW2174x30	8.5
EW734x05	0.6	EW2783x05	9.5	EW07x29	12.0	EW711x30	6.4
EW735x05	12.2	EW2784x05	Offline ^e			MW269x30	0.5
EW736x05	Offline	EW2785x05	6.2				
EW737x05	Offline	EW2786x05	17.7				
EW742x05	Offline						
FT005 Total: 78.3				SS029 Total: 33.1		SS030 Total: 79.0	
SBBGWTP Average Monthly Flow ^f : 156.9 gpm							
^a Flow rates presented are instantaneous measurements taken at the end of the reporting period.							
^b Most extraction wells at FT005 were taken offline in accordance with the 2008 Annual Remedial Process Optimization Report for the Central Groundwater Treatment Plant, North Groundwater Treatment Plant, and South Base Boundary Groundwater Treatment Plant.							
^c Extraction wells taken off line because of persistent fouling of the well pumps and associated discharge piping.							
^d Extraction well was operational but water levels were recharging field readings were collected.							
^e Extraction well was off line because of low flow alarm.							
^f The average SBBGWTP groundwater flow rate was calculated using the Union Creek Discharge Totalizer and dividing it by the total time the system was operational.							
gpm – gallons per minute							
SBBGWTP – South Base Boundary Groundwater Treatment Plant							

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

Table 3 – Summary of System Shutdowns					
Location	Shutdown ^a		Restart ^a		Cause
	Date	Time	Date	Time	
SBBGWTP	23 April 2018	09:00	23 April 2018	15:30	Backwashed lead GAC vessel and inspect treatment plant piping.
-- = Time not recorded ^a Shutdown and restart times estimated based on field notes SBBGWTP = South Base Boundary Groundwater Treatment Plant					

Summary of O&M Activities

Monthly groundwater treatment samples were collected at the SBBGWTP on 3 April 2018. Sample results are presented in Table 4. The total VOC concentration (16.88 µg/L) in the influent sample remained steady from the March 2018 sample results (16.80 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 15 µg/L. Several VOCs were detected in the midpoint sampling location, including 1,2-DCA, cis-1,2-DCE, and chloroform. No VOCs were detected at the effluent sampling location; however, TPH-d (40 J µg/L) was detected in the effluent sample at a concentration less than the effluent limitation. The overall decrease in the total VOC influent concentration is a result of the five (5) new Site FT005 extraction wells pumping groundwater with lower TCE concentrations but higher 1,2-DCA concentrations. Figure 1 presents the 1,2-DCA and TCE concentrations since January 2017.

The SBBGWTP was temporarily shut down in April 2018 for approximately 6.5 hours to backwash the lead GAC vessel and inspect the treatment plant piping. Significant scale buildup was observed on the effluent piping. The effluent piping will be replaced in May 2018.

Monitoring well MW269x30 was converted into an extraction well during April 2018. A small Poseidon pump and control box was installed at the wellhead, and the extracted water is pumped directly into the main backwash tank, which is then processed through the treatment plant.

Figure 2 presents a plot of influent concentrations and average flow at the SBBGWTP over the past twelve (12) months. The VOC influent concentrations have generally been fluctuating over the past 12 months with an overall decreasing trend. However, an overall increasing flow rate trend was observed in the past 12 months with the addition of the new extraction wells at Site FT005 in November 2017.

Optimization Activities

In April 2018, monitoring well MW269x30 was converted into an extraction well to help capture and treat a small area of TCE contamination.

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 3 presents the historical GHG production from the SBBGWTP. In April 2018, the SBBGWTP produced approximately 15,087 pounds of GHG, which includes approximately 800 pounds of GHG generated from GAC change out services averaged to a per month basis.

TABLE 4

Summary of Groundwater Analytical Data for April 2018 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	3 April 2018 (µg/L)		
				Influent	Midpoint	Effluent
Halogenated Volatile Organics						
Acetone	NA	1.9	0	ND	ND	ND
Bromodichloromethane	NA	0.17	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.19	0	ND	ND	ND
Chloroform	5.0	0.16	0	ND	0.37 J	ND
Chloromethane	NA	0.30	0	ND	ND	ND
1,1-Dichloroethane	5.0	0.16	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.13	0	0.88 J	0.92 J	ND
1,1-Dichloroethene	5.0	0.14	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	1.0	1.8	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
Methylene Chloride	5.0	0.32	0	ND	ND	ND
Tetrachloroethene	5.0	0.20	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.16	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.32	0	ND	ND	ND
Trichloroethene	5.0	0.16	0	15	ND	ND
Vinyl Chloride	0.5	0.10	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	1.0	0.16	0	ND	ND	ND
Ethylbenzene	5.0	0.16	0	ND	ND	ND
Toluene	5.0	0.17	0	ND	ND	ND
Xylenes	5.0	0.19 – 0.34	0	ND	ND	ND
Other						
Total Petroleum	50	10	0	NM	NM	ND
Hydrocarbons – Gasoline						
Total Petroleum	50	15	0	NM	NM	40 J
Hydrocarbons – Diesel						
Total Petroleum Hydrocarbons – Motor Oil	50	160	0	NM	NM	ND
1,4-Dioxane	NA	0.08	0	ND	NM	ND

* 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

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

Figure 1

SBBGWTP Influent 1,2-DCA and TCE Concentrations Since January 2017

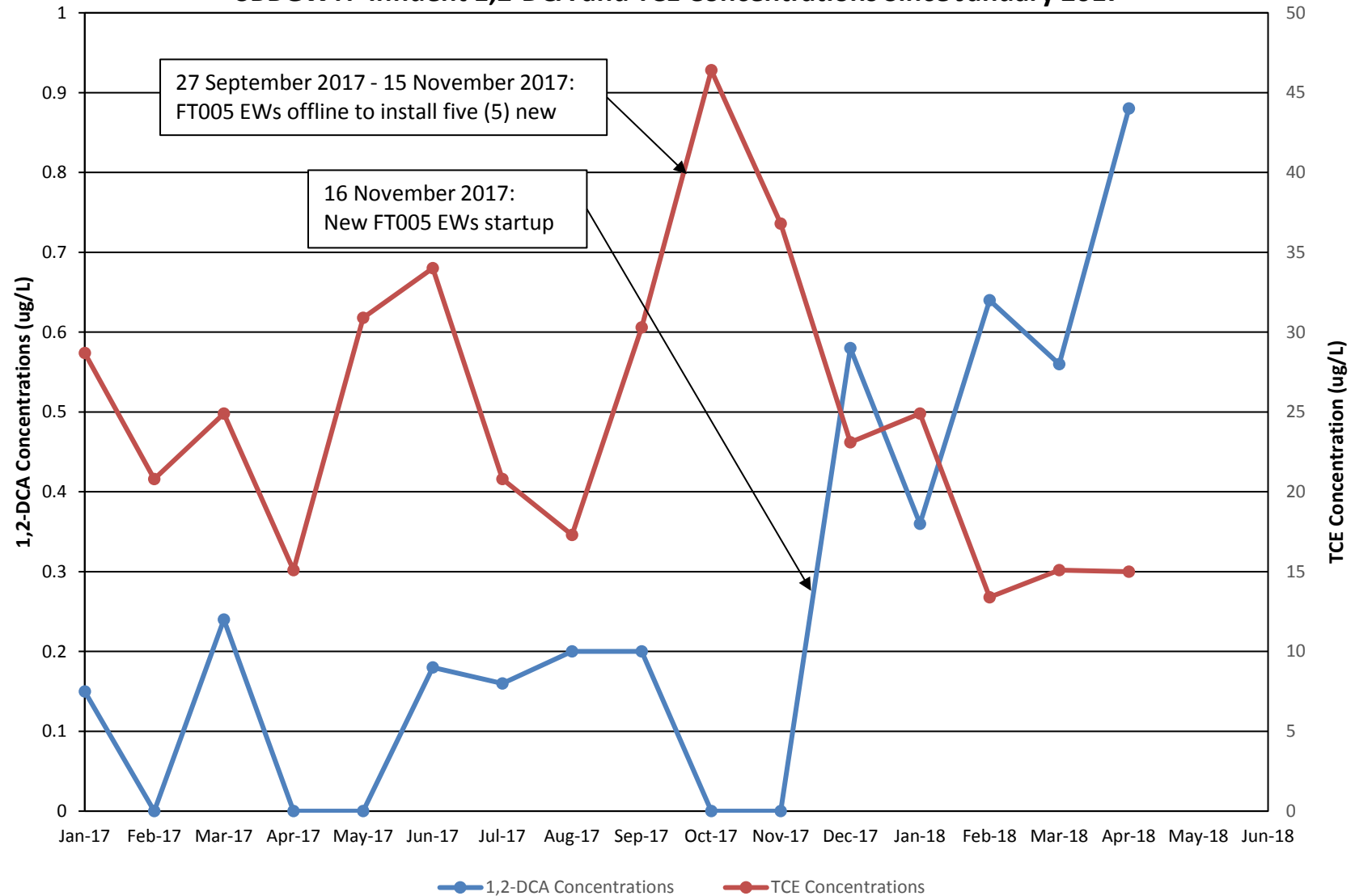


Figure 2
SBBGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

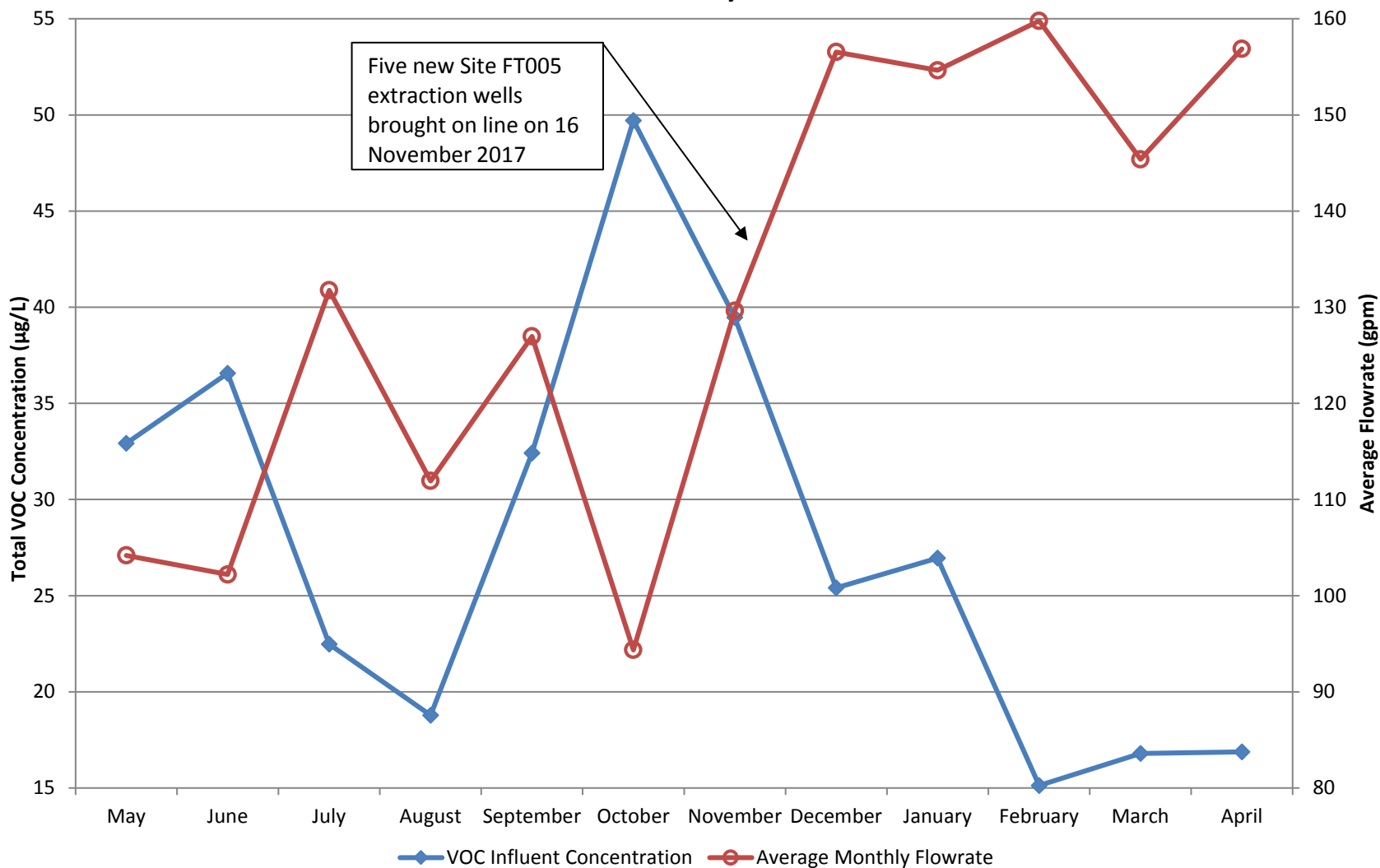
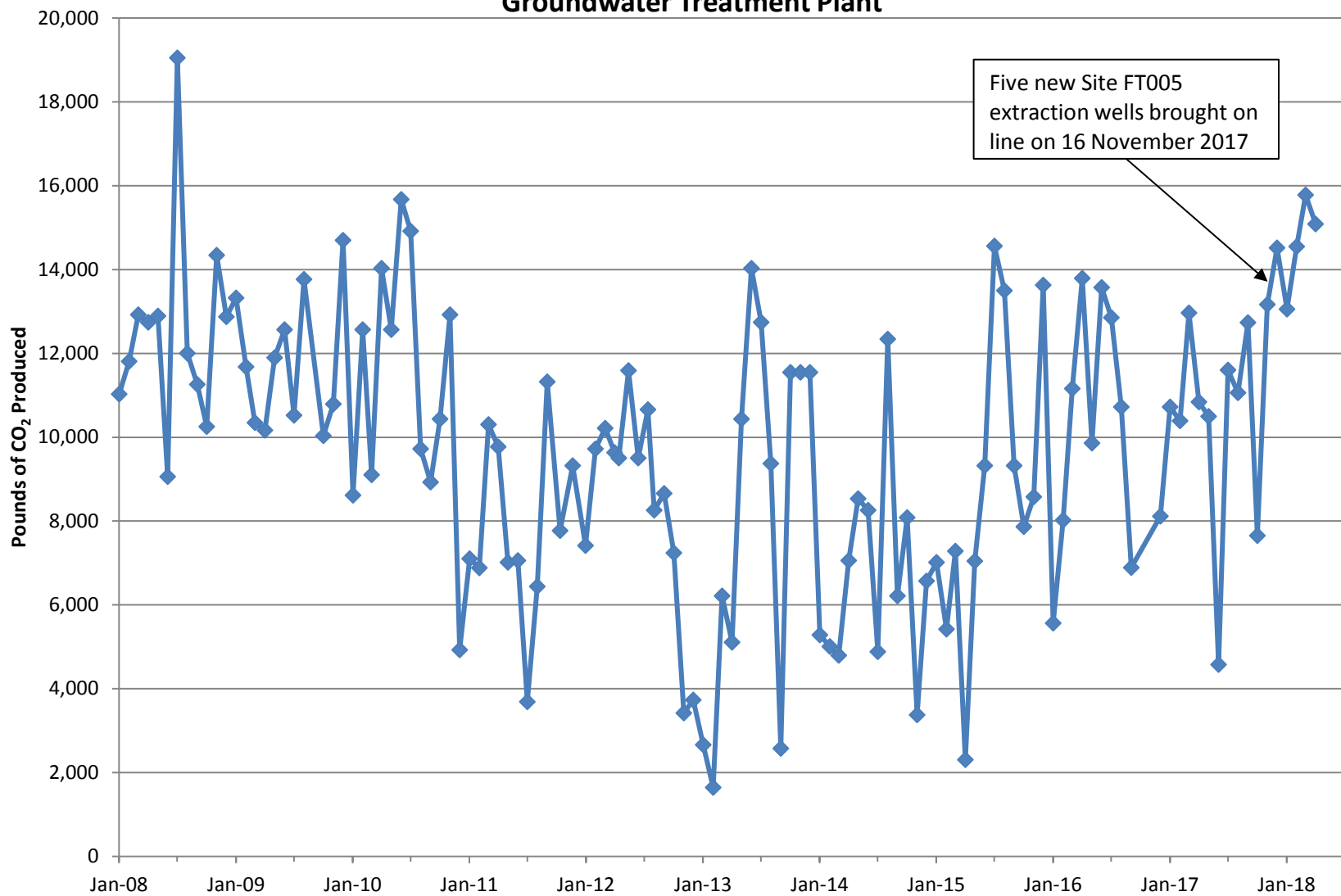


Figure 3
Equivalent Pounds of Carbon Dioxide Produced by the South Base Boundary
Groundwater Treatment Plant



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 225

Reporting Period: 30 March 2018 – 3 May 2018

Date Submitted: 11 May 2018

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 April 2018 reporting period.

Table 1 – Operations Summary – April 2018				
Initial Data Collection:		3/30/2018 10:20	Final Data Collection:	5/3/2018 12:05
Operating Time:		Percent Uptime:	Electrical Power Usage:	
CGWTP:	818 hours	CGWTP:	100%	CGWTP: 2,642 kWh (2,843 lbs CO ₂ generated ^a)
Gallons Treated (discharge to storm sewer):		Gallons Treated Since January 1996: 554.3 million gallons		
1,428,080 gallons				
VOC Mass Removed from groundwater:		VOC Mass Removed Since January 1996:		
3.42 lbs^b		2,804 lbs from groundwater		
		8,686 lbs from vapor		
Rolling 12-Month Cost per Pound of Mass Removed: \$2,280 ^c				
Monthly Cost per Pound of Mass Removed: \$2,239 ^c				
^a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 888 pounds of GHG from GAC change out services averaged to a per month basis.				
^b Calculated using April 2018 EPA Method SW8260C analytical results.				
^c 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.

Table 2 – CGWTP Average Flow Rates ^a – April 2018	
Location	Average Flow Rate Groundwater (gpm)
EW001x16	13.3
EW002x16	11.1
EW003x16	0.3
EW605x16	5.6
EW610x16	2.3
CGWTP	29.1
^a 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.

Table 3 – Summary of System Shutdowns					
Location	Shutdown^a		Restart		Cause
	Date	Time	Date	Time	
CGWTP	None.	--		--	None.
-- = Date/Time not recorded					
^a Shutdown and restart times estimated based on field notes					
CGWTP = Central Groundwater Treatment Plant					

Table 4 presents a twelve-month summary of the Site DP039 bioreactor recirculation well pulsing dates.

Table 4 – Summary of DP039 Bioreactor “Pulsed Mode” Operations		
Location	Pulse-on Date	Pulse-off Date
MW750x39	5 April 2017	7 August 2017
	7 September 2017	2 October 2017
	6 November 2017	27 November 2017
	26 December 2017	22 January 2018
	19 February 2018	21 March 2018
	16 April 2018	
MW = Monitoring Well		

Summary of O&M Activities

Monthly groundwater treatment samples were collected at the CGWTP on 3 April 2018. Sample results are presented in Table 5. The total VOC concentration (287.15 µg/L) in the April 2018 influent sample has increased from the March 2018 sample (259.51 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 240 µg/L. Cis-1,2-DCE (29 µg/L) and chloroform (0.18 J µg/L) were detected in the sample collected after the first carbon vessel. No VOC constituents were detected in the samples collected after the second carbon vessel and the effluent. TPH-d (19 J µg/L) was detected in the effluent sample at a concentration less than the effluent limitation of 50 µg/L. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in April 2018. A carbon change out on the lead GAC vessel is being coordinated.

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 influent concentrations show an increasing trend over the past 12 months along with an overall decreasing trend for the flow rate through the treatment plant.

The two (2) OSA extraction wells, EW605x16 and EW610x16, were off line for several days because the OSA vault was flooded from the recent rain events. The rainwater in the vault was pumped out, and the wells were restarted. In addition, a pump, level switch, and battery were mounted inside the vault. The pump will

automatically remove rainwater from inside the vault when the water reaches a certain level. The battery will be periodically removed during dry periods and recharged before being placed back in the vault.

The Site DP039 subgrade biogeochemical reactor (SBGR), also known as a bioreactor, continued to operate in a four-week “pulsed mode” to optimize distribution of total organic carbon (TOC). The bioreactor was brought back on line on 16 April 2018 as planned.

Optimization Activities

No optimization activities occurred at the CGWTP in April 2018.

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 2,843 pounds of GHG during April 2018.

TABLE 5

Summary of Groundwater Analytical Data for April 2018 – Central Groundwater Treatment Plant

				3 April 2018 (µg/L)			
Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent
Halogenated Volatile Organics							
Acetone	NA	1.9	0	ND	ND	ND	ND
Carbon Tetrachloride	0.5	0.19	0	ND	ND	ND	ND
Chloroform	5.0	0.16	0	ND	0.18 J	ND	ND
Chloromethane	NA	0.30	0	ND	ND	ND	ND
1,2-Dichlorobenzene	5.0	0.13	0	0.34 J	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.16	0	0.40 J	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.16	0	0.25 J	ND	ND	ND
1,1-Dichloroethane	5.0	0.16	0	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.13	0	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.14	0	0.62 J	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	42	29	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	2.9	ND	ND	ND
Methylene Chloride	5.0	0.32	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.20	0	0.42 J	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.16	0	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.32	0	ND	ND	ND	ND
Trichloroethene	5.0	0.16 – 1.6	0	240	ND	ND	ND
Vinyl Chloride	0.5	0.10	0	0.22 J	ND	ND	ND
Non-Halogenated Volatile Organics							
Benzene	1.0	0.16	0	ND	ND	ND	ND
Ethylbenzene	5.0	0.16	0	ND	ND	ND	ND
Toluene	5.0	0.17	0	ND	ND	ND	ND
Total Xylenes	5.0	0.19 – 0.34	0	ND	ND	ND	ND
Other							
Total Petroleum Hydrocarbons – Gasoline (C6 – C10)	50	10	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel (C10 – C28)	50	15	0	NM	NM	NM	19 J
Total Petroleum Hydrocarbons – Motor Oil (C28 – C40)	50 (trigger)	160	0	NM	NM	NM	ND
1,4-Dioxane	NA	0.08	0	ND	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

Figure 1

CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

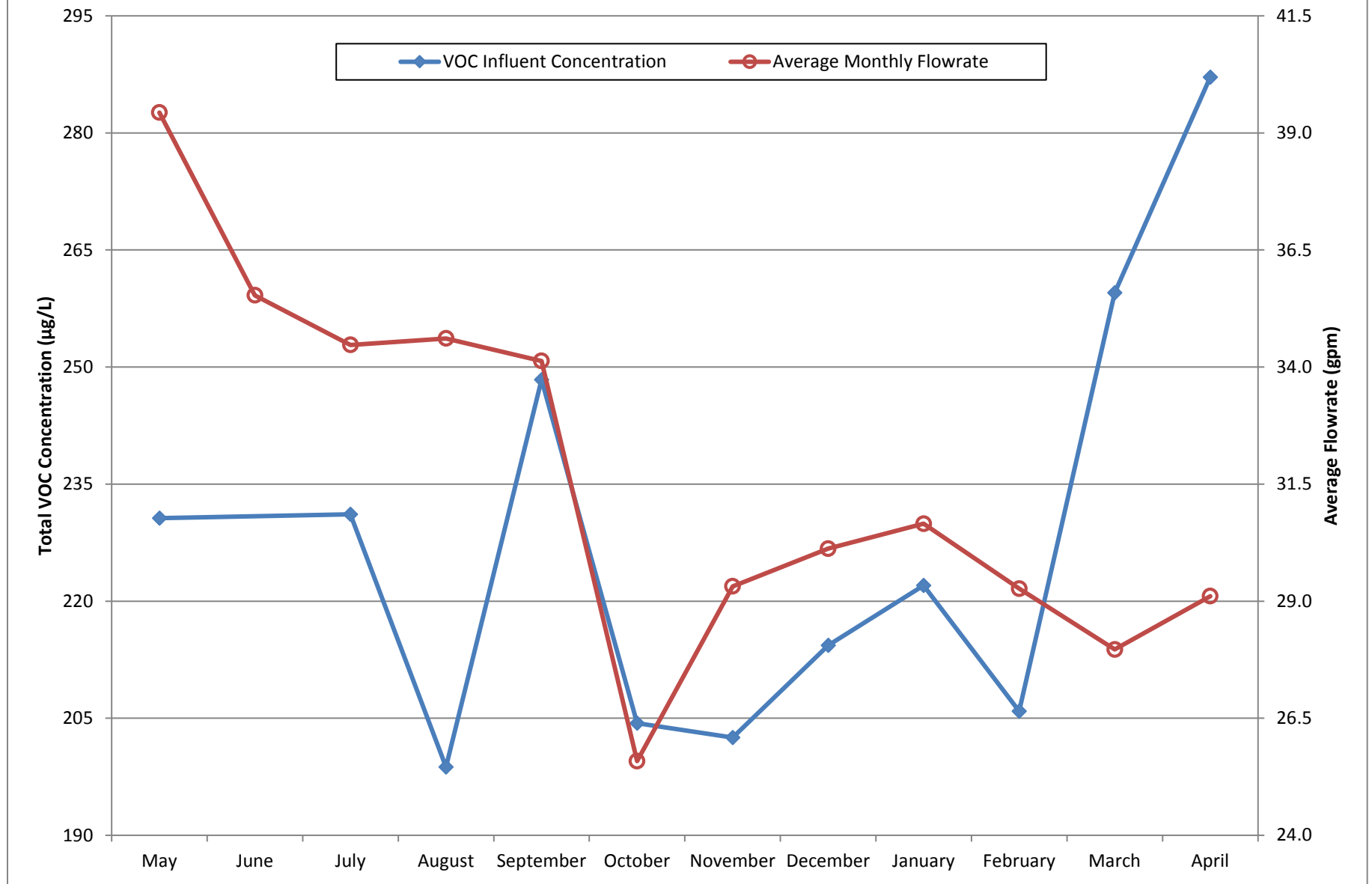
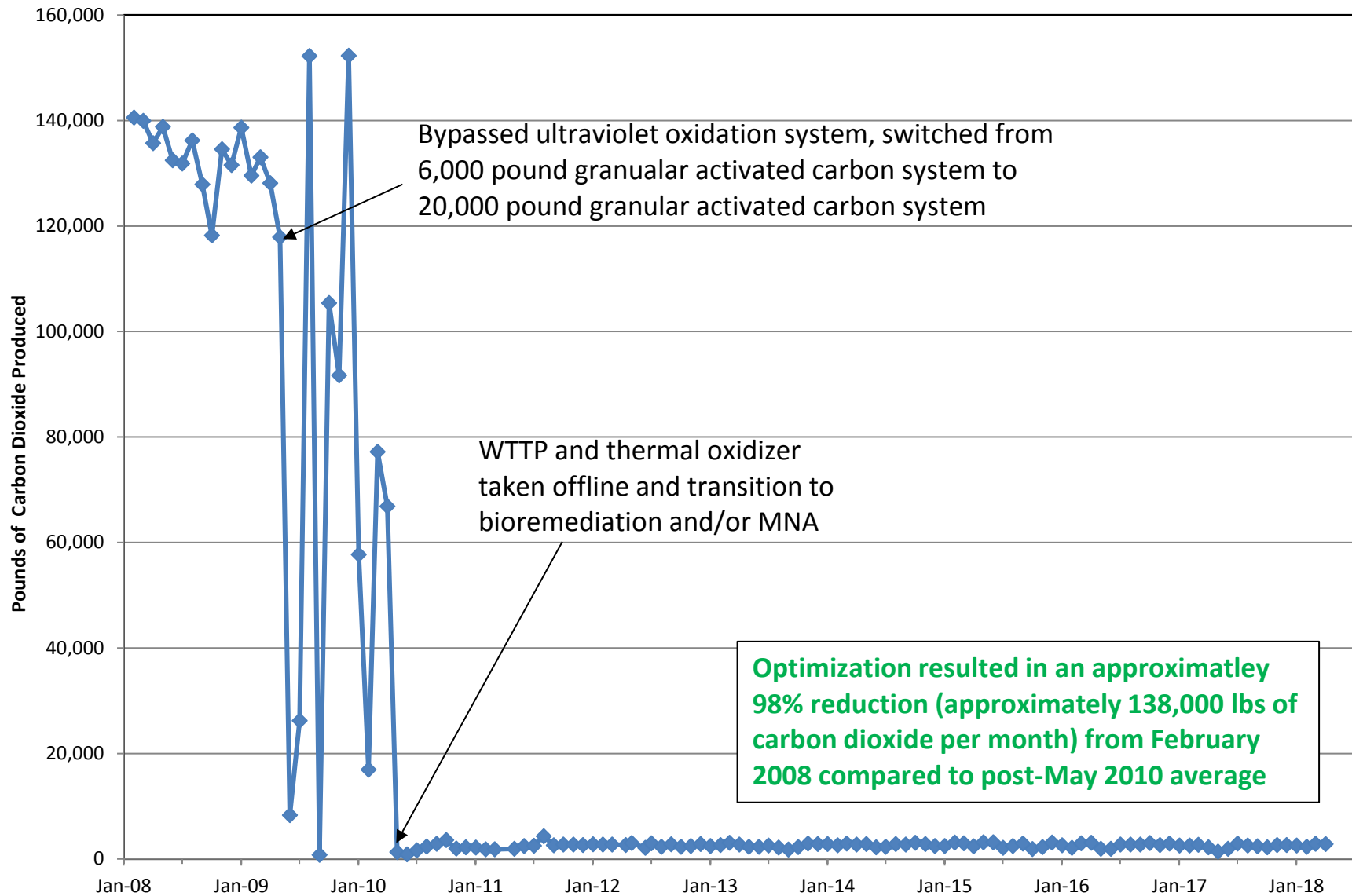


Figure 2

Equivalent Pounds of Carbon Dioxide Produced by the Central Groundwater Treatment Plant



Site ST018 Groundwater Treatment Plant

Monthly Data Sheet

Report Number: 086

Reporting Period: 30 March 2018 – 2 May 2018

Date Submitted: 11 May 2018

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

System Metrics

Table 1 presents operation data from the April 2018 reporting period.

Table 1 – Operations Summary – April 2018			
Initial Data Collection: 3/30/2018 13:10		Final Data Collection: 5/2/2018 13:35	
Operating Time:		Percent Uptime:	
ST018GWTP: 792 hours		ST018GWTP: 100%	
		ST018GWTP: 187 kWh (138 lbs CO ₂ generated ^a)	
Gallons Treated: 318,060 gallons		Gallons Treated Since March 2011: 14.9 million gallons	
Volume Discharged to Sanitary Sewer: 318,060 gallons		Final Totalizer Reading: 14,877,749 gallons	
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: 8,381,575 gallons			
MTBE, BTEX, VOC, TPH Mass Removed: 0.67 lbs^b		MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: 45.2 lbs	
MTBE (Only) Removed: 0.15 lbs^b		MTBE (Only) Mass Removed Since March 2011: 11.0 lbs	
Rolling 12-Month Cost per Total Pounds of Mass Removed: \$10,214 ^{bc}			
Monthly Cost per Pound of Mass Removed: \$6,716 ^{bc}			
^a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG.			
^b Calculated using April 2018 EPA Method SW8260C and SW8015B analytical results.			
^c 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.

Table 2 – ST018GWTP Average Flow Rates – April 2018		
Location	Average Flow Rate Groundwater (gpm)^a	Hours of Operation
EW2014x18	1.3	792
EW2016x18	1.2	792
EW2019x18	1.5	792
EW2333x18	1.6	792
ST018GWTP	6.7	792
^a 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.

Table 3 – Summary of System Shutdowns					
Location	Shutdown^a		Restart^a		Cause
	Date	Time	Date	Time	
ST018GWTP	None.	--		--	None.
-- = Time not recorded ^a 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 3 April 2018. Results are presented in Table 4. The complete April 2018 laboratory data report is available upon request. The influent concentration for MTBE during the April 2018 sampling event was 56 µg/L, which is a slight increase from the March 2018 sample result of 54.3 µg/L. TPH-d, TPH-g, BTEX components, and several other fuels-related VOCs were also detected in the influent sample. MTBE was detected in the system effluent sampling location at a concentration less than the effluent limitations.

All concentrations of TPH are well below the Fairfield-Suisun Sewer District effluent limitation of 50,000 µg/L for TPH-g and TPH-d, or 100,000 µg/L for TPH-mo. Additionally, the Fairfield-Suisun Sewer District does not currently have a local limit for MTBE, but a limit of 6,400 µg/L is advised based on worker health and safety. Travis AFB will continue to monitor influent and effluent contaminant concentrations to maintain compliance with the Fairfield-Suisun Sewer District discharge permit.

Figure 1 presents plots of the average flow rate and influent total contaminant (MTBE, TPH-g, TPH-d, TPH-mo, BTEX, and VOCs) and MTBE concentrations at the ST018GWTP over the past twelve (12) months. The average flow rate through the ST018GWTP has been cyclical with flow rates decreasing during the dry season (summer and fall) and increasing during the rainy season (winter and spring). The overall average flow rates in the past 12 months show a decreasing trend because of the “pulse-mode” operations that were

evaluated between October 2017 and January 2018. The MTBE concentration and total influent concentrations have generally been fluctuating over the past 12 months with a flat trend and an increasing trend, respectively.

Optimization Activities

No optimization activities occurred at the ST018GWTP in April 2018.

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.

Figure 2 presents the historical GHG production from the ST018GWTP. The ST018GWTP produced 138 pounds of GHG during April 2018 and treated 318,060 gallons of water. The amount of GHG produced is directly attributed to the amount of water treated through the system because the only line-power electrical use is for a transfer pump through the GAC system.

TABLE 4

Summary of Groundwater Analytical Data for April 2018– Site ST018 Groundwater Treatment Plant

Summary of Groundwater Analytical Data for April 2018 Site C-120 Groundwater Treatment Plant					
Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	3 April 2018 (µg/L)	
				Influent	System Effluent
Fuel Related Constituents					
Methyl tert-Butyl Ether	6,400	0.25	0	56	3.9 J
Benzene	25,000 ^a	0.16	0	11	ND
Ethylbenzene	25,000 ^a	0.16	0	7.6	ND
Toluene	25,000 ^a	0.17	0	0.40 J	ND
Total Xylenes	25,000 ^a	0.19 – 0.34	0	3.35	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 ^b	10	0	ND	ND
Total Petroleum Hydrocarbons – Diesel	50,000 ^b	16	0	150	ND
Total Petroleum Hydrocarbons – Motor Oil	100,000	160 – 170	0	ND	ND
Other					
Acetone	NA	1.0	0	15	ND
n-Butylbenzene	NA	0.32	0	0.77 J	ND
1,2-Dichloroethane	20	0.15	0	ND	ND
Isopropylbenzene	NA	0.19	0	0.77 J	ND
Naphthalene	NA	0.22	0	5.4	ND
n-Propylbenzene	NA	0.16	0	1.8	ND
1,2,4-Trimethylbenzene	NA	0.14	0	11	ND
1,3,5-Trimethylbenzene	NA	0.14	0	4.3	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

NA = not applicable

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

ND = not detected above method detection limit

Figure 1
ST018GWTP Total VOC and MTBE Influent Concentrations
and Average Flowrate Twelve Month History

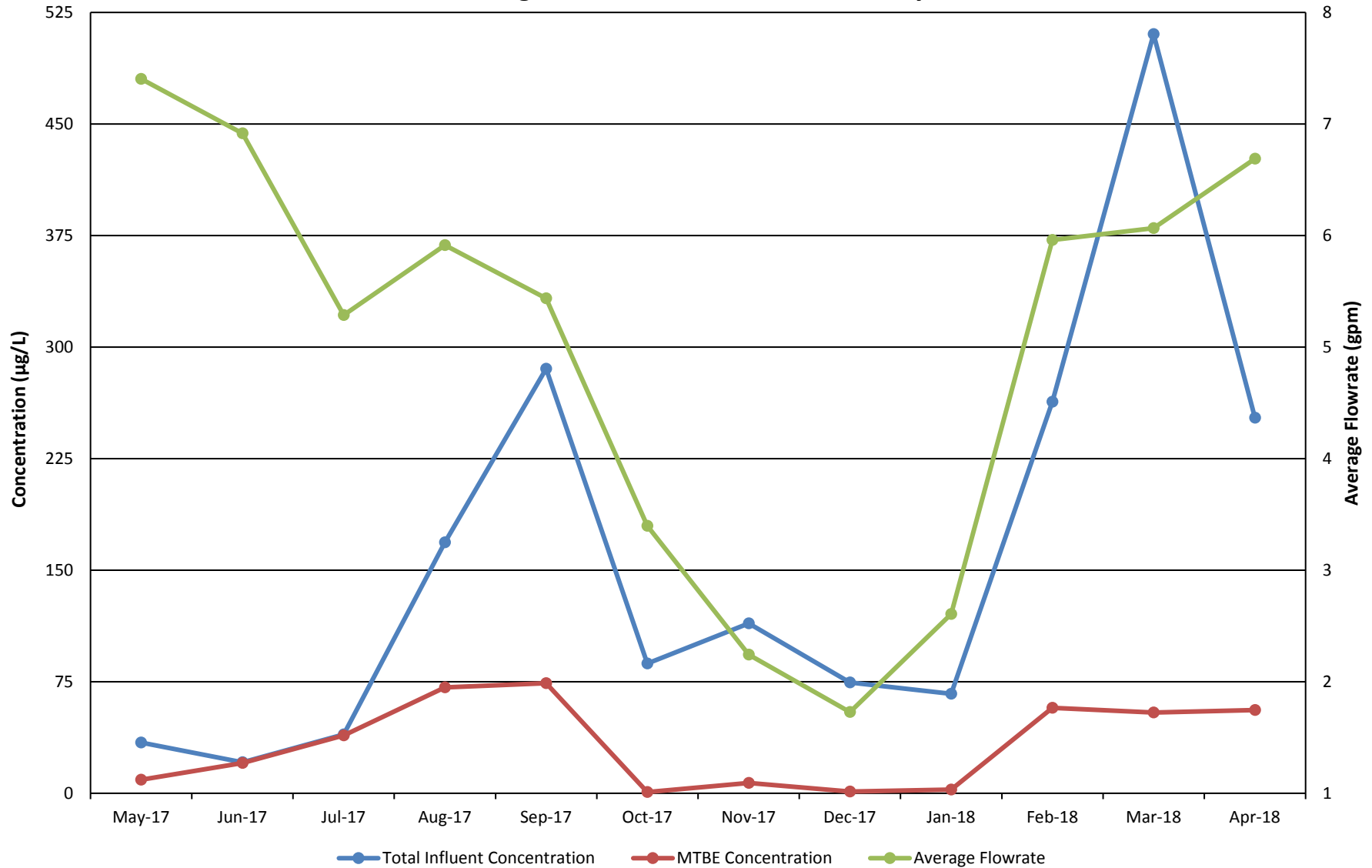
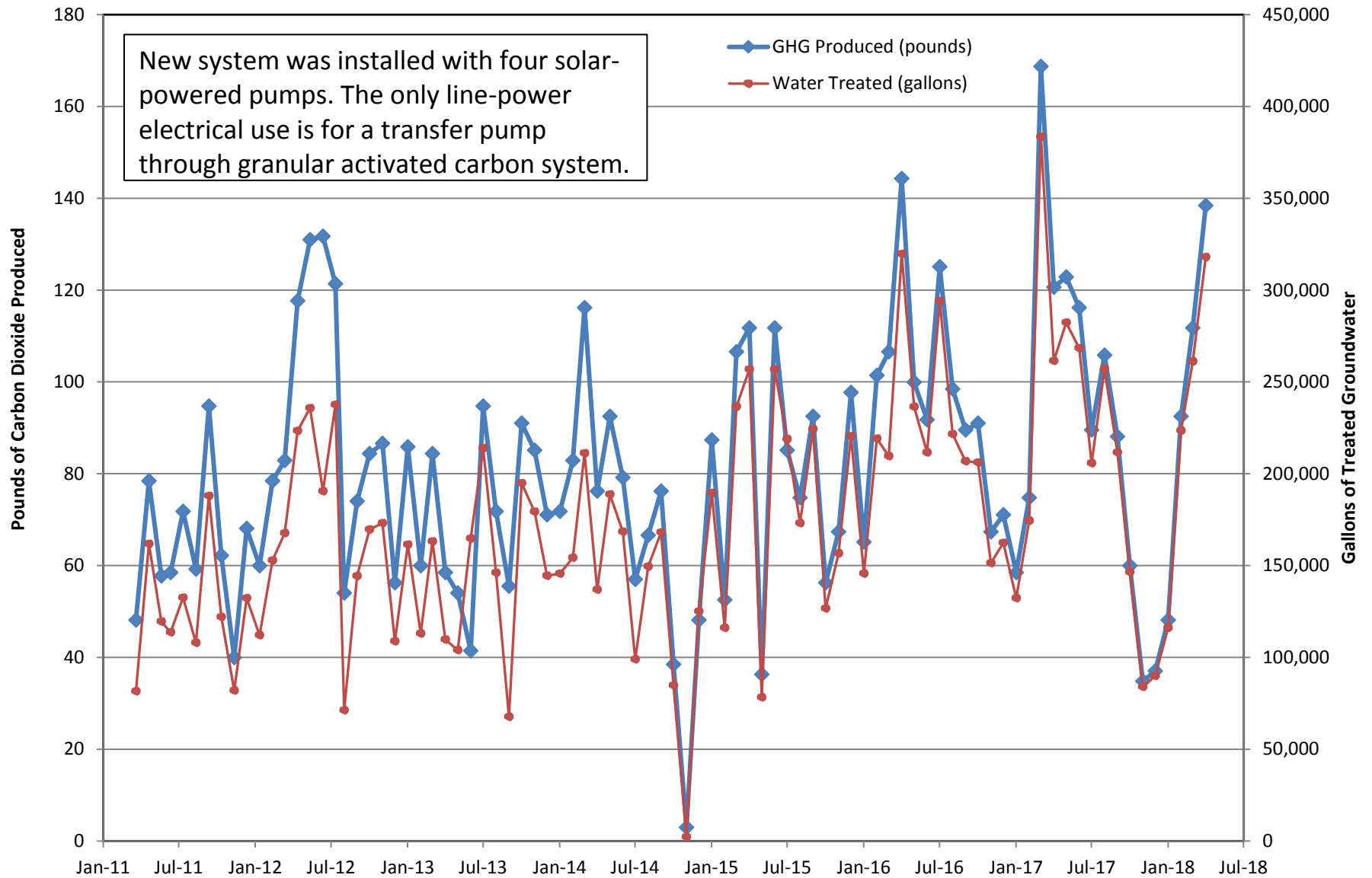


Figure 2

Equivalent Pounds of Carbon Dioxide Produced by the Site ST018 Groundwater Treatment Plant



Site SS015 Soil Sampling Plan

RPM Meeting

May 16, 2018



Background

- Site SS015 is located in the western-central portion of Travis AFB and is part of the East Industrial Operable Unit (EIOU).
- The site consists of former Facilities 550 and 552 and the Solvent Spill Area (SSA).
- Former Facility 550 was constructed in 1952 and housed a corrosion control shop, a metals processing shop, and a fiberglass shop.
- Former Facility 552 was a fenced, bermed compound that was used as a hazardous waste collection point. Former Facility 552 also includes the oil/water separator (OWS) at Facility 1832.
- The SSA occupied approximately 1.4 acres east of Facility 550 and was where paint was stripped from aircraft for an undocumented period of time.

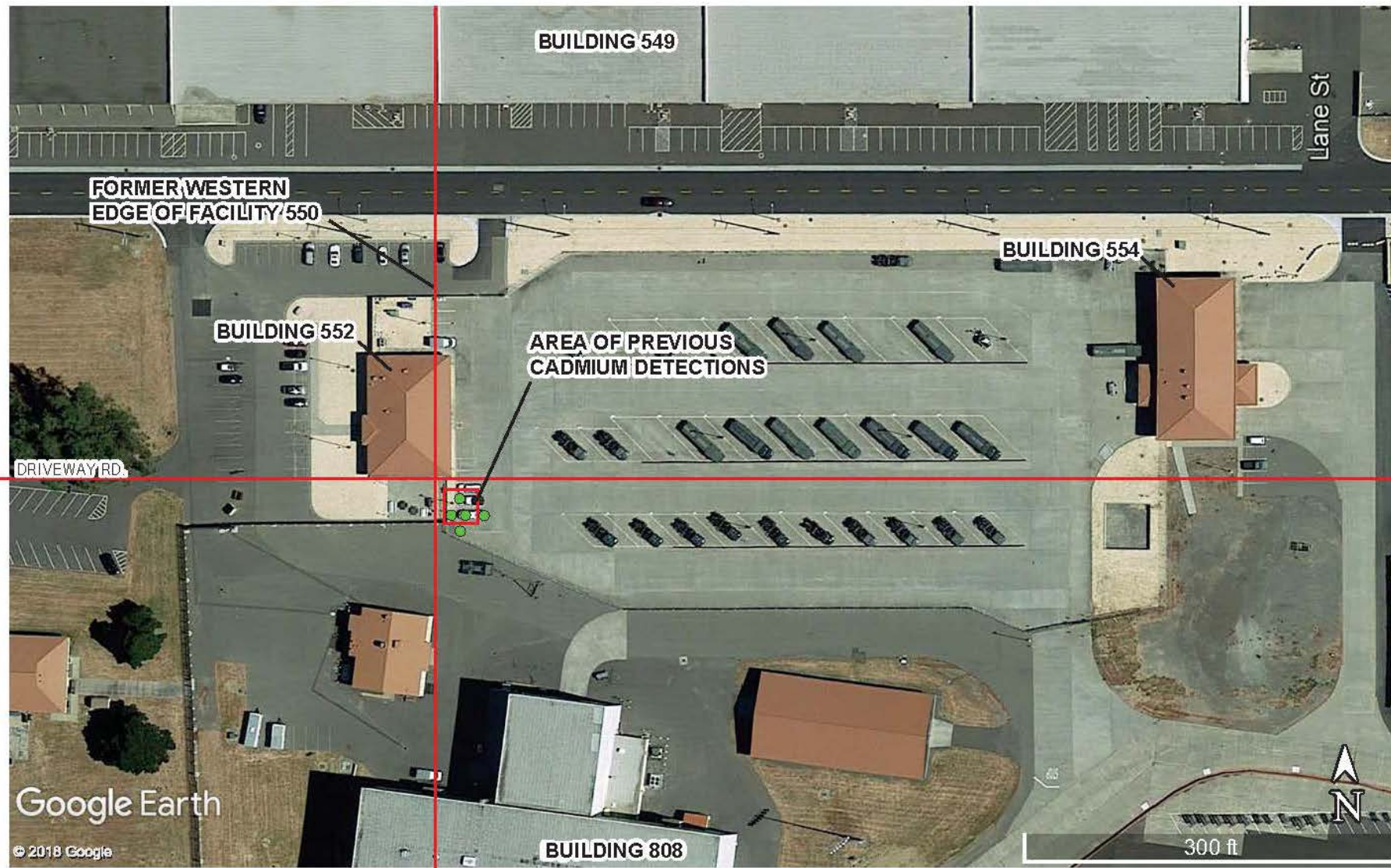


NOTE: THE TWO PERPENDICULAR RED LINES ARE PROVIDED TO HELP ORIENT THE HISTORICAL SOIL SAMPLING LOCATIONS. THE HORIZONTAL LINE SHOWS THE LOCATION OF DRIVEWAY ROAD AND THE VERTICAL LINE SHOWS THE LOCATION OF THE WESTERN EDGE OF FORMER FACILITY 550.

FIGURE 3
SITE SS015 HISTORICAL CADMIUM SOIL SAMPLE
LOCATIONS—APRIL 2003 AERIAL PHOTOGRAPH
 SITE SS015 SOIL SAMPLING PLAN
 TRAVIS AIR FORCE BASE, CALIFORNIA

Background

- In 2004, Facilities 550 and 552 were demolished to construct a petroleum, oil, and lubricant (POL) military compound, consisting of an office building, a fuel truck maintenance facility, and a large concrete parking area for fuel trucks.
- Currently, the main features of Site SS015 include Buildings 552 and 554, which are part of the POL military compound.
- During the EIOU Remedial Investigation (RI) it was determined that historical chemical waste handling, storage, and maintenance and repair of aircraft had resulted in local surface soil contamination at Site SS015.
- Lead and chromium contamination was detected in the soil at the hazardous waste accumulation area located at former Facility 552.



LEGEND

- NEW BORING LOCATION

NOTE: THE TWO PERPENDICULAR RED LINES ARE PROVIDED TO HELP ORIENT THE HISTORICAL SOIL SAMPLING LOCATIONS. THE HORIZONTAL LINE SHOWS THE LOCATION OF DRIVEWAY ROAD AND THE VERTICAL LINE SHOWS THE LOCATION OF THE WESTERN EDGE OF FORMER FACILITY 550.

FIGURE 4
SITE SS015 CADMIUM BORING
LOCATIONS—MAY 2017 AERIAL PHOTOGRAPH
 SITE SS015 SOIL SAMPLING PLAN
 TRAVIS AIR FORCE BASE, CALIFORNIA

Background

- Polycyclic aromatic hydrocarbons (PAHS) contamination was detected near the OWS at Facility 1832.
- In July 2003 a soil removal action was conducted at Site SS015 to remove the lead-, chromium-, and PAH-contaminated soil.
- Upon completion of the removal action, confirmation sampling results indicated that the resulting condition of the site was protective of human health under an industrial land use scenario and that no further action was needed.
- However, during the 2004 demolition and excavation of Facility 550, cadmium was found in construction debris associated with the concrete flooring of the former plating shop in the southwestern portion of the building.

Background

- After disposing of the contaminated debris, sampling of the remaining soil identified concentrations of cadmium (79 and 39 mg/kg at 2 feet [ft] below ground surface [bgs]) in two (2) of the four (4) soil samples.
- Given schedule and funding considerations, no additional actions were taken to evaluate the cadmium exceedances.
- The subject area currently lies beneath an approximate 2 ft thick concrete truck parking area.
- Since the cadmium soil sampling was conducted after the demolition of Facility 550, but before the construction of the new POL military compound, it is possible that the cadmium was removed during construction and grading activities.

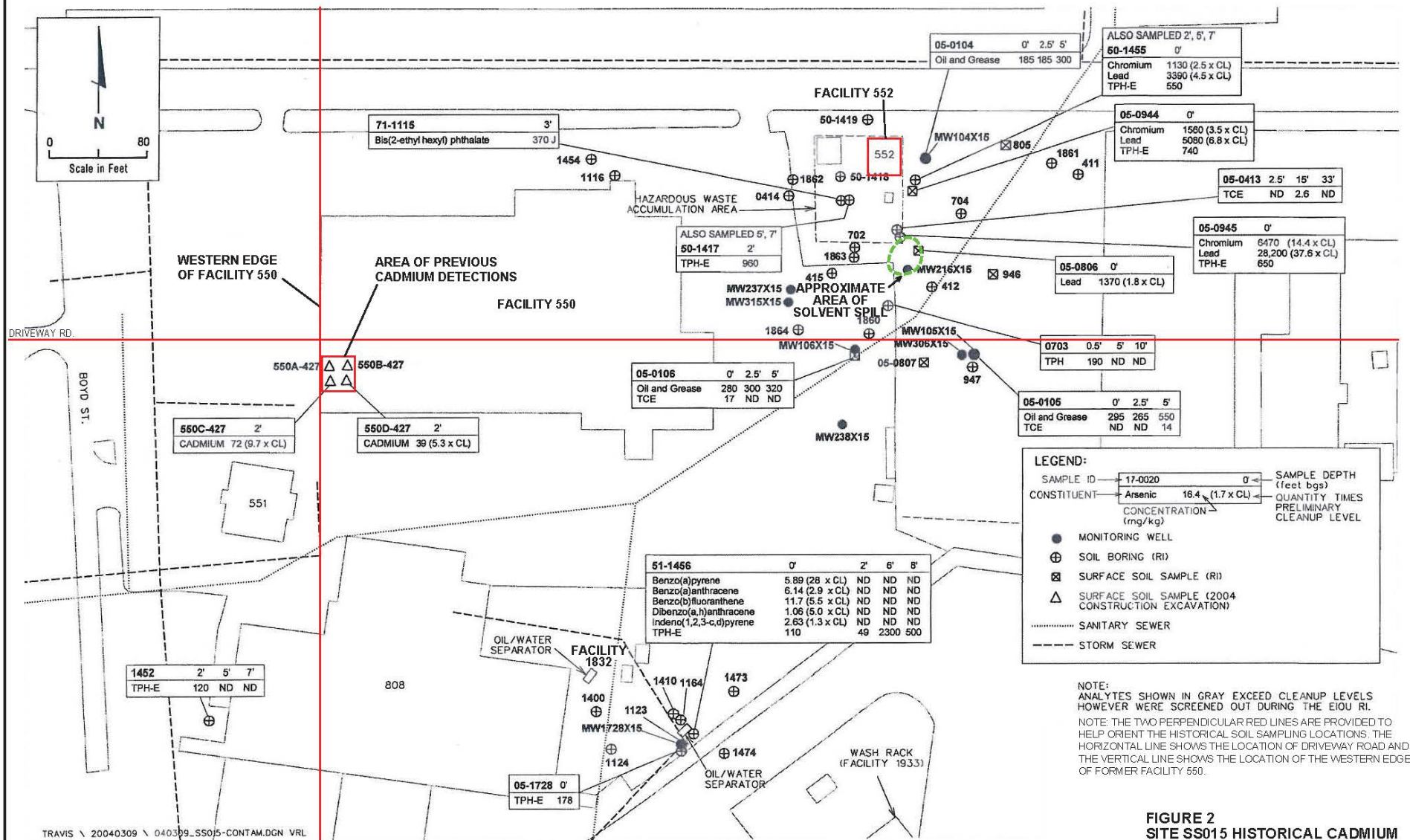


FIGURE 2
SITE SS015 HISTORICAL CADMIUM
SOIL SAMPLE LOCATIONS
SITE SS015 SOIL SAMPLING PLAN
TRAVIS AIR FORCE BASE, CALIFORNIA

NOTE: MODIFIED FROM FIGURE H-1 FROM THE 2004 URS GROUP REPORT "SUMMARY OF REMEDIAL INVESTIGATION DATA AND RISK MANAGEMENT DECISIONS FOR HUMAN HEALTH AT NEWIOU AT SOIL SITES TECHNICAL MEMORANDUM."

Background

- Evaluations described in the Human Health Technical Memorandum determined that the cadmium-contaminated soil is currently not a risk to human health as the concrete pavement prevents exposure to potential receptors.
- However, as a conservative measure, the Human Health Technical Memorandum proposed land use controls (LUCs) as a preliminary management decision for cadmium to protect future potential residents and workers should the cadmium be exposed in the future.
- As documented in the NEWIOU SSSW ROD, LUCs will be implemented for Site SS015 as long as cadmium concentrations in soil exceed levels that allow for unlimited use and unrestricted exposure.

Purpose/ Statement of Problem

- The purpose of this sampling event is to collect soil data to confirm the presence or absence of cadmium contamination within the area where cadmium detections were previously observed.
- At the time of discovery, given schedule and funding considerations, no additional action was taken to evaluate or confirm the cadmium exceedances before the POL military compound was completed.
- The cadmium discovery is summarized in the Human Health Technical Memorandum.
- However, the information provided in the Human Health Technical Memorandum is limited and only includes the sample locations, final analytical results, and a brief description of how the cadmium was discovered.

Purpose/ Statement of Problem

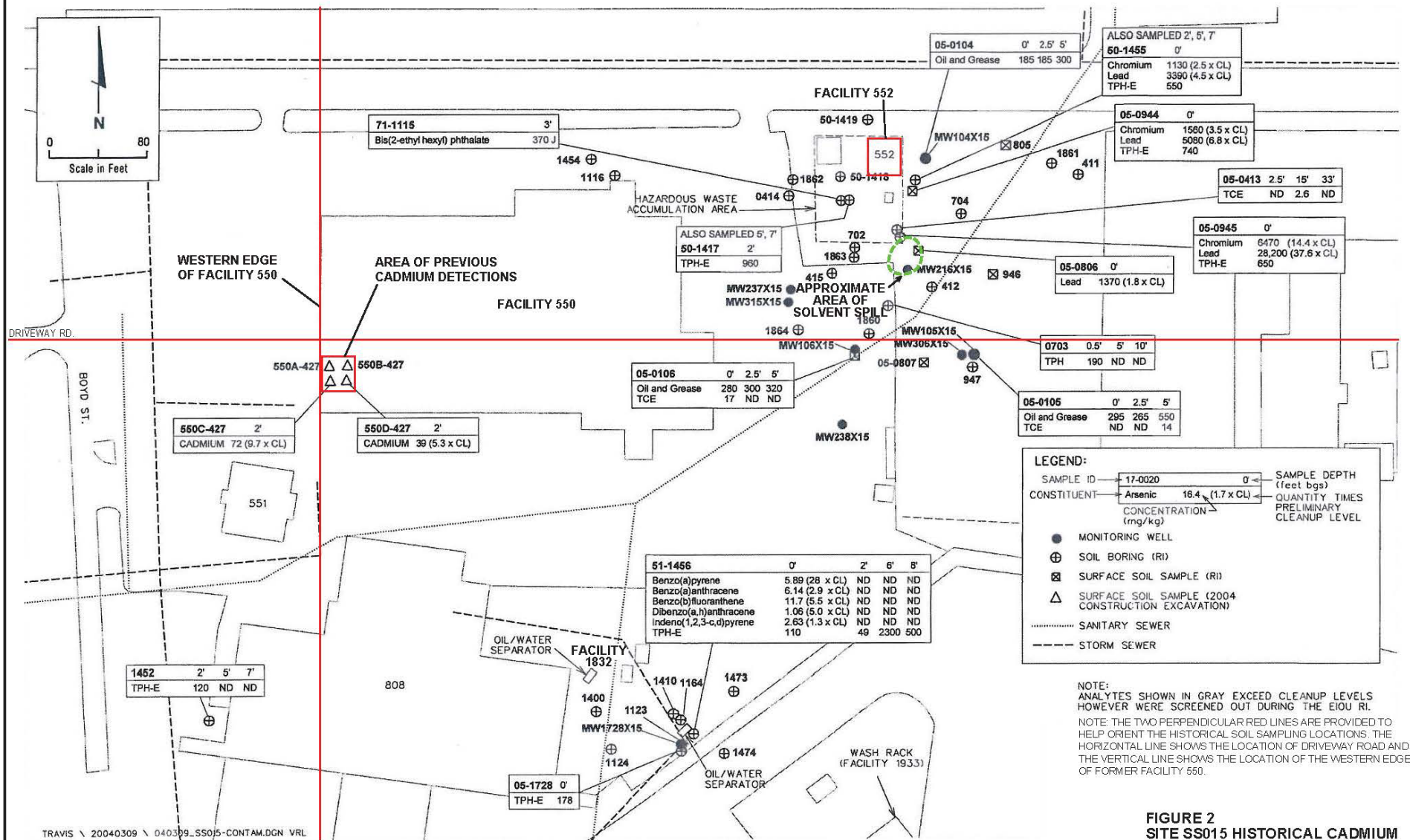
- A description of the actual field methods used to collect soil samples and the laboratory report containing the analytical data are not provided.
- It is also possible that the soil with cadmium exceedances may have been removed during grading and construction activities associated with the POL military compound.
- Since the initial discovery of the cadmium and the adding of LUCs to the soil at Site SS015, there has been no soil sampling performed at the site.

Locating the Historical Soil Borings

- The Human Health Technical Memorandum does not provide global positioning system (GPS) survey coordinates for the sampling locations, and there is no reference provided for survey coordinates.
- However, the cadmium sampling locations provided do align with the description of the former cadmium plating shop being located in the southwestern corner of the former Facility 550 in the 1992 RCRA Facility Assessment.
- Because survey coordinates for the historical cadmium samples are not available, existing site features were used to orient the historical sampling area as identified on the Human Health Technical Memorandum Site SS015 Sample Location figure within aerial photographs from 2003 and 2017.

Locating the Historical Soil Borings

- On the Human Health Technical Memorandum figure, the western edge of Building 550 was used as a vertical (north-south) reference point, and Driveway Road was used as a horizontal (east-west) reference point for the position of the cadmium area.
- The position of the horizontal and vertical lines with respect to these reference points and the scale distance from the intersection of these lines to the box around the historical cadmium sampling area as on the Human Health Technical Memorandum figure were then used to accurately position the sampling area on the 2003 aerial photograph.
- For example, the vertical line aligns with the western edge of Facility 550 and the horizontal line is aligned with Driveway Road.



NOTE: MODIFIED FROM FIGURE H-1 FROM THE 2004 URS GROUP REPORT "SUMMARY OF REMEDIAL INVESTIGATION DATA AND RISK MANAGEMENT DECISIONS FOR HUMAN HEALTH AT NEWIOU AT SOIL SITES TECHNICAL MEMORANDUM."



NOTE: THE TWO PERPENDICULAR RED LINES ARE PROVIDED TO HELP ORIENT THE HISTORICAL SOIL SAMPLING LOCATIONS. THE HORIZONTAL LINE SHOWS THE LOCATION OF DRIVEWAY ROAD AND THE VERTICAL LINE SHOWS THE LOCATION OF THE WESTERN EDGE OF FORMER FACILITY 550.

FIGURE 3
SITE SS015 HISTORICAL CADMIUM SOIL SAMPLE
LOCATIONS—APRIL 2003 AERIAL PHOTOGRAPH
 SITE SS015 SOIL SAMPLING PLAN
 TRAVIS AIR FORCE BASE, CALIFORNIA

Locating the Historical Soil Borings

- Maintaining the same scale for the cadmium sampling area and using the same scale distance from the intersection of the horizontal and vertical lines as shown on the Human Health Technical Memorandum figure, the cadmium sampling area was then positioned on the 2003 aerial photograph.
- Using the same approach, the vertical and horizontal lines from the 2003 aerial photograph were then scaled and recreated on the 2017 aerial photograph.
- Since Facility 550 was no longer present in 2017, in lieu of its western edge, the edge of one (1) of the roofing panels of Building 549 and the roof features of Building 808 were used as the reference points for the vertical line.

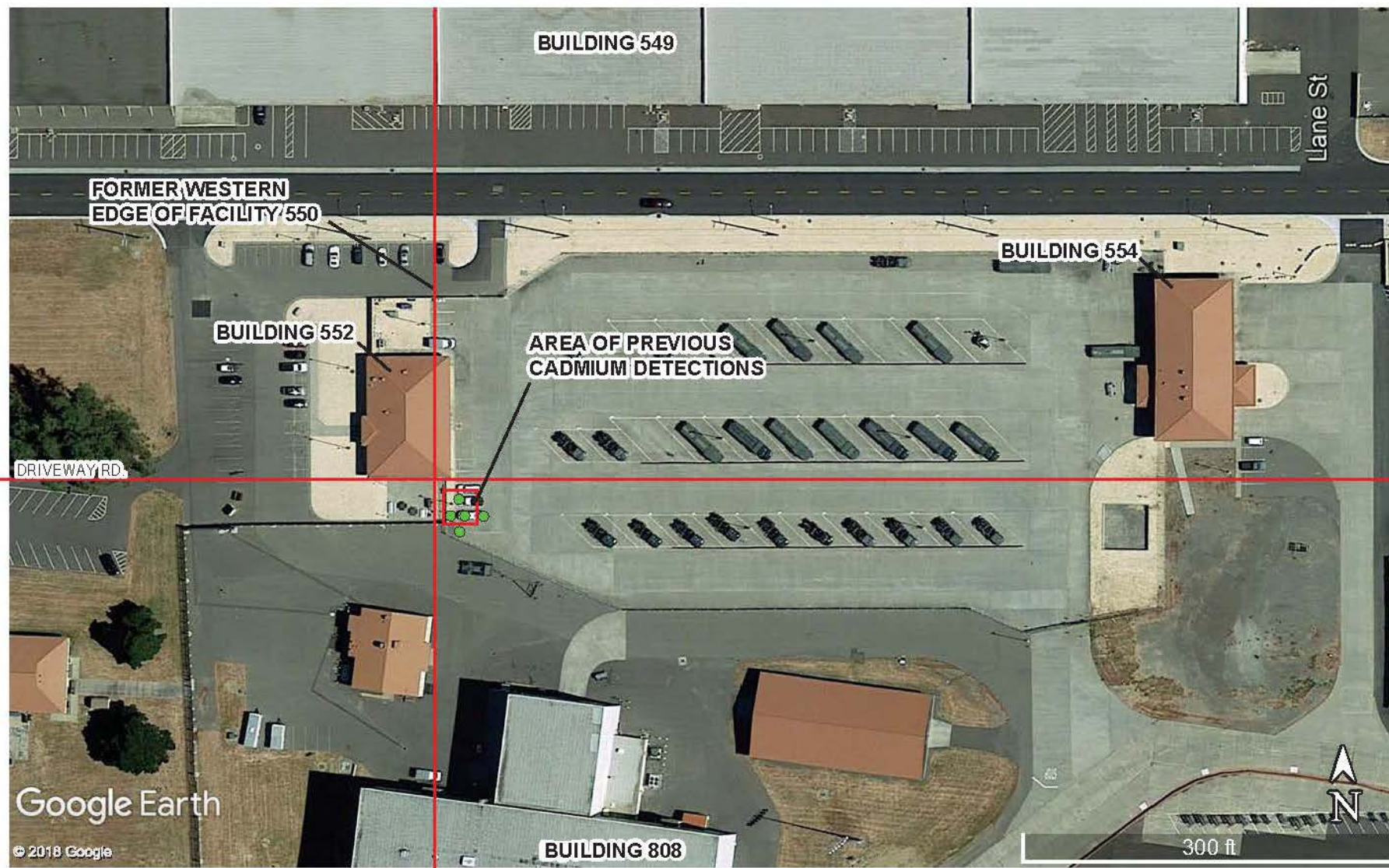
Locating the Historical Soil Borings

- The vertical line aligns with the western edge of the third roof tile from the east of Building 549, and to the west of the smaller square located between the two (2) larger squares on the roof of Building 808.
- The cadmium sampling area on the 2017 aerial photograph was also scaled and located the same distance from the intersection of the horizontal and vertical lines as shown on the Human Health Technical Memorandum figure.
- The new borings locations were then placed in and around the cadmium sampling area to ensure confirmation samples are collected from within the same area as those collected in 2004.
- Two (2) of the sampling locations are positioned outside of the historical cadmium sampling area to provide additional data from areas not previously sampled.



NOTE: THE TWO PERPENDICULAR RED LINES ARE PROVIDED TO HELP ORIENT THE HISTORICAL SOIL SAMPLING LOCATIONS. THE HORIZONTAL LINE SHOWS THE LOCATION OF DRIVEWAY ROAD AND THE VERTICAL LINE SHOWS THE LOCATION OF THE WESTERN EDGE OF FORMER FACILITY 550.

FIGURE 3
SITE SS015 HISTORICAL CADMIUM SOIL SAMPLE
LOCATIONS—APRIL 2003 AERIAL PHOTOGRAPH
 SITE SS015 SOIL SAMPLING PLAN
 TRAVIS AIR FORCE BASE, CALIFORNIA



LEGEND

- NEW BORING LOCATION

NOTE: THE TWO PERPENDICULAR RED LINES ARE PROVIDED TO HELP ORIENT THE HISTORICAL SOIL SAMPLING LOCATIONS. THE HORIZONTAL LINE SHOWS THE LOCATION OF DRIVEWAY ROAD AND THE VERTICAL LINE SHOWS THE LOCATION OF THE WESTERN EDGE OF FORMER FACILITY 550.

FIGURE 4
SITE SS015 CADMIUM BORING
LOCATIONS—MAY 2017 AERIAL PHOTOGRAPH
 SITE SS015 SOIL SAMPLING PLAN
 TRAVIS AIR FORCE BASE, CALIFORNIA

Soil Sampling

- Five (5) soil borings will be drilled using a hand auger.
- Soil samples will be collected from 1.5 to 2 ft and 4.5 to 5 ft from the top of native soil beneath any cover material (e.g., concrete and road base).
- The soil samples will be analyzed for cadmium using EPA Method SW6010C.

Reporting

- A technical memorandum presenting the results of the soil sampling will be prepared.
- If analytical results for cadmium are below residential screening levels (Water Board Environmental Screening Levels [ESLs] and EPA Regional Screening Levels [RSLs]), the Air Force will consider a ROD amendment to remove LUCs for soil at Site SS015.
- Should cadmium concentrations exceed the residential EPA RSL or Water Board ESL, the Air Force will consider options for further work including an additional round of sampling under a separate contract to address data gaps and further delineate the extent of cadmium in soil.

Questions

Travis AFB Restoration Program

Program Update

RPM Meeting

May 16, 2018

Completed Documents (1)

- Vapor Intrusion Assessment Update Technical Memorandum
- 2012 CAMU Annual Report
- Old Skeet Range Action Memorandum
- 3rd 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 (2)

- 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
- 2014 Annual GRISR
- Site CG508 Well Decommissioning Work Plan

Completed Documents (3)

- Data Gap Investigation TM for Soil Sites SD033, SD043, & SS046
- Site FT004 Technology Demonstration Construction Completion Report
- Site SD031 Soil Remedial Investigation Work Plan
- Corrective Action Plan for DERA-Funded Oil Water Separators
- Site ST032 POCO Completion Report
- Site ST028 POCO Completion Report
- 2015 Annual CAMU Monitoring Report
- Site SD031 Remedial Investigation Work Plan
- Site SD034 Technology Demonstration Work Plan
- Site SS016 Soil Data Gaps Investigation Work Plan
- Multi-Site Bioaugmentation Technology Demonstration Work Plan
- Sites ST028 and ST032 POCO Well Decommissioning Work Plan
- Site TS060 Action Memorandum
- 2015 Annual GRISR
- FT005 Technology Demonstration Construction Completion Report
- Site CG508 POCO Well Decommissioning and Site Closeout Technical Memorandum
- Site DP039 Remedial Action Construction Completion Report
- ST028 POCO Well Decommissioning/Site Closeout Technical Memorandum
- Site TS060 Removal Action Work Plan

Completed Documents (4)

- Multisite Technology Demonstration Construction Completion Report
- SS014 POCO Technology Demonstration Construction Completion Report
- Site LF044 Investigation Work Plan
- Site FT004 POCO Soil Data Gap Investigation Work Plan
- SD034 Technology Demonstration Construction Completion Report
- POCO Evaluation/Closeout Report for DERA-funded oil/water separators OW051, OW053, and OW054
- ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum
- 2016 Annual CAMU Monitoring Report
- Work Plan for Fourth Five-year Review
- 2016 Annual GRISR
- Data Gap Investigation Results, Technical Memorandum for Soil, Sites SD033, SD043, SS046
- TS060 Removal Action Completion Report
- SS035 Site Closure Report
- AOC TA500 Data Gaps Investigation and Closure Report
- Site TS060 No Further Action Proposed Plan
- ***POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW052, OW055, OW056, and OW057***

Completed Field Work (1)

- 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 (2)

- 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
- FT005 EVO Injection
- 2016 Q2 GRIP Sampling
- Data Gap Inv. for Soil Sites (SD043, SS046)
- SD031 Remedial Investigation Step-out Sampling (2nd round)
- DP039 EVO Injection
- CG508 Well Decommissioning
- SD033 Soil Sampling
- Multi-site Bioaugmentation Well Installation
- SD034 Technology Demonstration Well Installation
- SS014 Bioreactor Installation
- ST028 & ST032 Well Decommissioning

Completed Field Work (3)

- SS016 Soil Data Gaps Investigation
- SD031 Remedial Investigation Soil Sampling (3rd round)
- Oil Water Separators Step-out Drilling
- OW055 Close-in-place
- Q4 2016 GRIP Sampling
- OW040 Soil Excavation/Surface Restoration
- OW057 Soil Excavation/Surface Restoration
- Multi-site Bioaugmentation & EVO Injection
- SD034 Technology Demonstration Bioreactor Installation
- OW050 Soil Sampling at Former Location of OWS
- OW055 Sidewalk Repairs
- SD031 Finish Soil Delineation (NE portion of site)
- Q2 2017 GRIP Sampling Event
- SS015 Optimization: Injection Well Installation
- DP039 Down-gradient Monitoring Well Installation (1st round)
- SD036 Optimization: Injection Well Installation
- SD031 Optimization: Injection Well Installation
- OW056 Site Excavation/Closure
- Well Re-development
- TS060 Removal Action

Completed Field Work (4)

- FT004 POCO Soil Data Gaps Investigation
- LF044 Sediment Sampling
- FT004 EVO Optimization
- DP039 Install downgradient monitoring wells (2nd round)
- FT005 – Install Extraction Wells
- DP039 Repair SBGR distribution headers
- Q4 2017 GRIP Sampling
- SD036 EVO Optimization
- SS015 EVO Optimization
- SD031 EVO Optimization
- FT005 Installation of Pumps and Controls in 5 New Extraction Wells
- Q1 2018 GRIP Sampling
- SD037 EVO reinjection

Documents In-Progress

CERCLA

- Data Gap Investigation Results, Technical Memorandum for Site SS016
- Amendment to the WABOU Soil ROD for sites DP039, SD043, and SS046
- LF006, SS030, SD031 Aquifer Test Activities Tech Memo
- Monitoring Well Installation Tech Memo for Site DP039, Addendum to the RACCR
- SD043 RD/RA Work Plan
- Community Relations Plan (revised draft)
- SS046 RD/RA Work Plan
- ***SS015 Soil Sampling Plan***
- ***FT005 Extraction System Optimization Tech Memo***
- ***2017 Annual CAMU Monitoring Report***

Documents In-Progress

POCO

- None

Field Work In-Progress

CERCLA

- ***Q2 2018 GRIP Sampling***
- ***FT005 EVO injection***

POCO

- None

Documents Planned

CERCLA

- LF044 Sediment Sampling Report May
- Amendment to the NEWIOU Soil ROD for Sites
SS016 and SD033 Jun
- EVO Sites FT004, SS015, SD031, & SD036 Optimization
Injections Tech Memo Jun
- SS016 RD/RA Work Plan Jun
- SD031 Soil RI/FS Jul
- 2017 Annual GRISR Jul
- ***LF006 Technology Demonstration Work Plan*** Jul
- ***4th Five Year Review Report for Multiple Groundwater,
Soil, and Sediment Sites*** TBD

MMRP

- ***NFA ROD for Old Skeet Range (TS060 MRA)*** TBD

Documents Planned

POCO

- None

Field Work Planned

CERCLA

- SS015 Soil sampling Jun
- SD034 Repair collar around EW2450x34 Jul
- SD043 Soil excavation Jul
- SS046 Soil excavation Aug
- SS016 Soil excavation Aug

POCO

- FT004 POCO Soil Investigation Jun

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

Petroleum Technology Demonstration Projects (1)

- SS014: Recycled Drywall SBGR
 - Evaluate the effectiveness of sulfate (gypsum from crushed drywall) to enhance anaerobic biodegradation of petroleum in groundwater
 - Installation was completed November 2016
 - Results through first 9 months
 - TPH-G: 99% reduction in source area (1,900 to 15 J $\mu\text{g/L}$), 34% for remaining 6 site wells (was 18% after 3 months)
 - TPH-D: 98% reduction in source area (5,500 to 130 J $\mu\text{g/L}$), 61% for remaining 6 site wells (was 33% after 3 months)
 - Benzene: 98% reduction (22 to 0.24 J $\mu\text{g/L}$), 61% for remaining 6 site wells (was 49% after 3 months)
- SD034: Washboard SBGR
 - Evaluate the effectiveness of an oxygen-enhanced aerobic SBGR on reducing TPH as diesel (TPH-D) in groundwater
 - Installed six (6) SBGR trenches in November 2016
 - Below SBGR trench (MW811x34/PZSSAx34) through first 9 months
 - TPH-DRO baseline 9,600 $\mu\text{g/L}$ reduced to 160 $\mu\text{g/L}$ (98% reduction)
 - TPH-MRO baseline 2,300 $\mu\text{g/L}$ reduced to 210 $\mu\text{g/L}$ (91% reduction)
 - Plume hot spot monitoring well (MW02x34) through first 9 months
 - TPH-DRO baseline 8,300 $\mu\text{g/L}$ reduced to 1,100 $\mu\text{g/L}$ (87% reduction)
 - TPH-MRO baseline 1,500 $\mu\text{g/L}$ reduced to 420 $\mu\text{g/L}$ (72% reduction)

* SBGR = Subgrade Biogeochemical Reactor

Updates in Green Font

CVOC Technology Demonstration Projects (2)

- Multisite Bioaugmentation: EVO and KB-1 Plus
 - Evaluate if addition of bioaugmentation substrate to an EVO injection will increase the rate of CVOC degradation
 - Initial injections were completed (Nov 2016)
 - Limited TOC dispersal at SD036, so installed additional injection wells and reinjected with nanoEVO in 2017
 - Too early to evaluate degradation rates; however:
 - ~50-70% TCE reduction at ST027B bioaugmentation area and low/fluctuating reductions at EVO only area
 - TCE fluctuations at SD036 bioaugmentation area (but 62% DCE decrease) and 99% decrease at EVO only area
- FT005: Distribution of EVO and KB-1 Plus
 - Evaluate total organic carbon (TOC) dispersion distances and rates for optimizing the remediation of 1,2-dichloroethane (DCA) in groundwater
 - Installation completed May 2016
 - Slightly elevated TOC and reduced COC concentrations in the north, TOC increase has not yet been observed in the central test area yet (distance may be too far for TOC dispersal using EVO)
 - Optimized the GETs in southern portion of site in 2017, which may help accelerate TOC dispersal to support this TD

Updates in Green Font

CVOC Technology Demonstration Projects (3)

- FT004: Distribution of EVO via SBGR and/or Groundwater Extraction
 - Determine effectiveness of TOC distribution through two different enhanced reductive dechlorination (ERD) approaches: (1) groundwater TOC recirculation using a combination EVO injection, infiltration SBGR trenches, and groundwater extraction; and (2) EVO injection with groundwater extraction
 - Installation completed April 2016
 - COC concentrations declined through year 1
 - ~50% total molar reduction plume-wide through first year
 - Max monitoring well TCE concentration reduced from 560 to 140 µg/L
 - Limited TOC dispersal, additional EVO injection conducted with nanoEVO in 2017 to determine if this can enhance TOC dispersal (too early to evaluate results of reinjection)
 - Concentrations rebounded in 4Q17, but 2017 reinjection should support further reductions

Updates in Green Font

CVOC Technology Demonstration Projects (4)

- SD031: EVO distribution via Gravel Chimneys
 - Determine if EVO injection and recirculation of groundwater through gravel chimneys can effectively distribute TOC horizontally in the subsurface to support ERD of 1,1-dichloroethene (DCE)
 - Installation completed in April 2015
 - Early indications:
 - Reducing conditions have initiated as expected throughout the TD area and are supporting anaerobic degradation
 - TOC concentrations are increasing at several wells
 - Recirculation through chimneys has been successful relative to our design assumptions
 - 1,1-DCE (primary COC) concentrations have reduced by 96% (was 93%) (sum of key wells within TD area, excluding 2 wells to SW that increased)
 - Total Molar concentration (sum of CVOCs) has reduced by 93% (was 84%) (sum of key wells within TD area, excluding 2 wells to SW that increased)
 - Four (4) new EVO wells installed to SW to enhance TOC in problem areas (plume being pulled back towards extraction well causing increasing concentrations in this area), conducted reinjection of EVO in 2017
 - Too early to evaluate effect of reinjection on cross-gradient area

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)

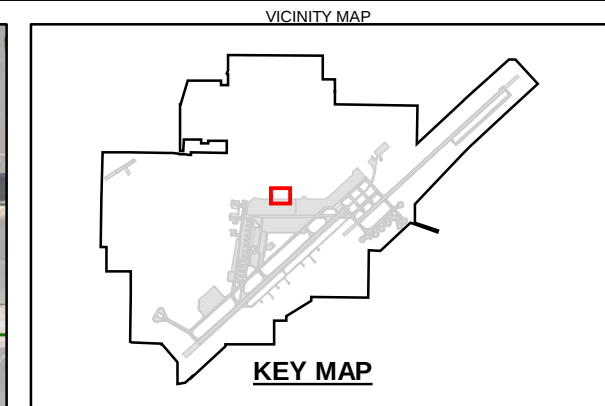
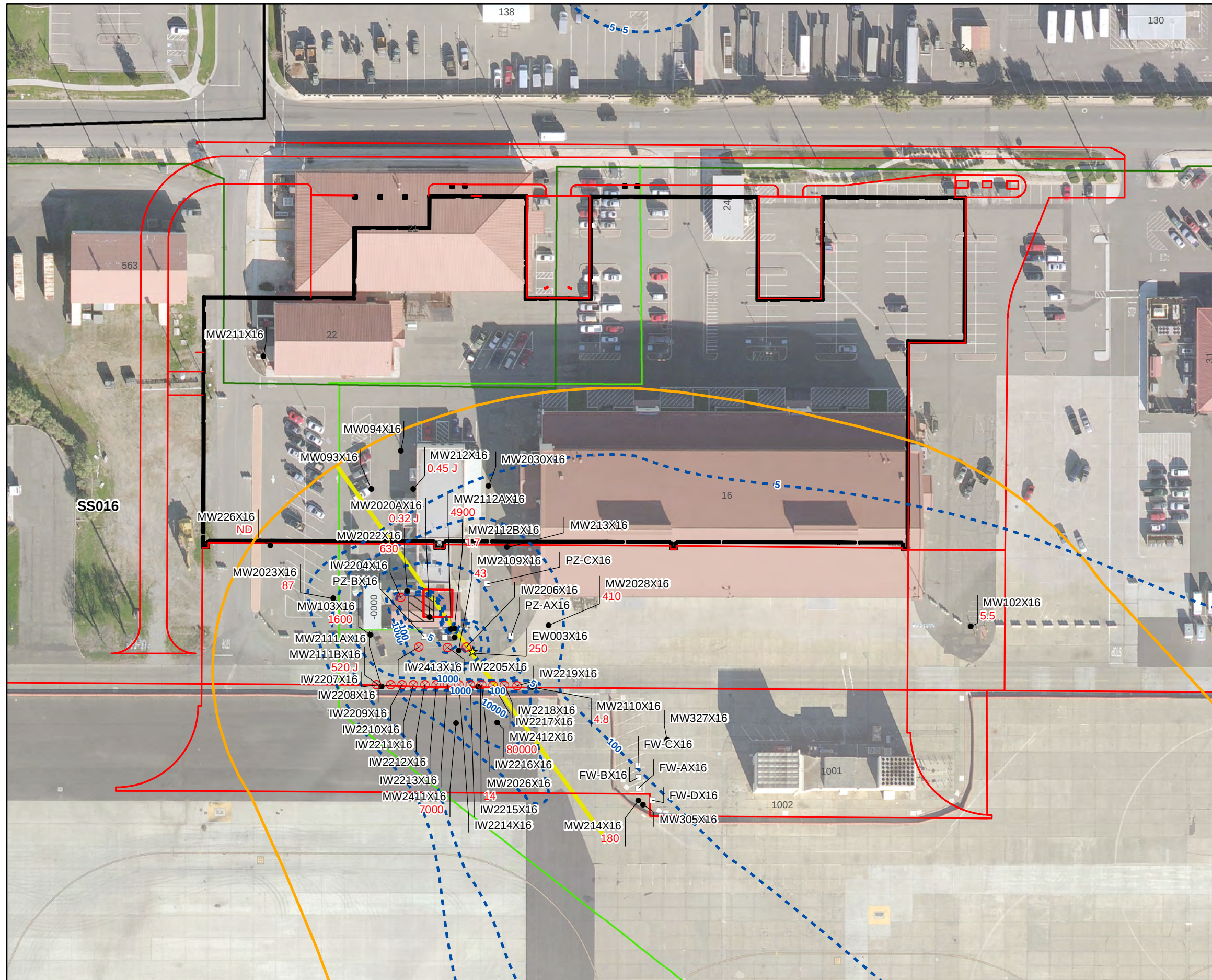
- Phytostabilization Study Report
- 2009/2010 Annual GSAP Report
- SS015 Remedy Optimization Field Implementation Plan
- Sites SS014 and ST032 Tier 1 POCO Evaluation Report
- SD036 Remedy Optimization Field Implementation Plan
- 2010 Annual CAMU Inspection Report
- Site ST018 POCO Baseline Implementation 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 Memorandum²¹

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 (2nd 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 (4th 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



- Legend**
- GROUNDWATER MONITORING WELL
 - ⊗ INJECTION WELL
 - ★ ACTIVE EXTRACTION WELL, 2Q17
 - PIEZOMETER
 - HORIZONTAL EXTRACTION WELL
 - - - FENCE
 - UNTREATED WATER PIPING
 - UNTREATED WATER FROM WWTP
 - ▨ BIOREACTOR
 - ▭ ERP SITE BOUNDARY
 - ▭ INDUSTRIAL GROUNDWATER-TO-INDOOR-AIR LAND USE CONTROL BOUNDARY
- CAD DATA**
- New Hangar (Ext Wall)
 - New Hangar (Pvmt)

SAMPLE LOCATION — **MW591X04**
TCE (µg/L) — **0.21J**
FLAG —

NOTES:
J = REPORTED ANALYTICAL DATA IS ESTIMATED
ND = NOT DETECTED; THE TCE METHOD DETECTION LIMIT FOR NONDETECTS IS 0.4 µg/L, EXCEPT AT WELLS EW563x39, EW782x39 WHERE IT IS 0.3 µg/L; AND IW2406X39 WHERE IT IS 16 µg/L
CONCENTRATION CONTOURS ARE BASED ON THE HIGHEST CONCENTRATION DETECTED WITHIN A WELL CLUSTER, SUCH THAT THIS FIGURE PRESENTS THE WORST-CASE EXTENT OF CONTAMINATION

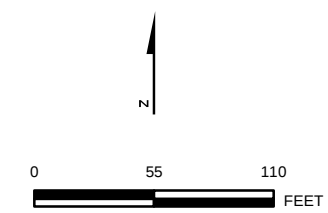


FIGURE 3
2017 TCE RESULTS AND LAND USE CONTROL LOCATION
HANGER PROJECT
TRAVIS AIR FORCE BASE, CALIFORNIA