Final

Travis Air Force Base
Environmental Restoration Program
Restoration Program Manager's
Meeting Minutes
19 September 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 19 September 2018 at 0930 hours in Building 248 at Travis AFB, California. Attendees included:

Lonnie Duke	AFCEC/CZOW
Glenn Anderson	AFCEC/CZOW
Gene Clare	AFCEC/CZOW
Merrie Schilter-Lowe	Travis AFB/PA
Angel Santiago Jr.	AFCEC/CZOW
Haekyung Kim (via telephone)	AFCEC/CZRW
Ben Fries (via telephone)	DTSC
Nadia Hollan Burke (via telephone)	USEPA
Adriana Constantinescu (via telephone)	RWQCB
Mike Wray	CH2M/JACOBS
Leslie Royer	CH2M/JACOBS
Jill Dunphy	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 (August 2018)
Attachment 4	CGWTP Monthly Data Sheet (August 2018)
Attachment 5	LF007C Monthly Data Sheet (August 2018)
Attachment 6	ST018 Monthly Data Sheet (August 2018)
Attachment 7	Presentation: Program Update

1. ADMINISTRATIVE

A. Previous Meeting Minutes

Ms. Burke requested that the 5th sentence for the Five-Year Review Report (page 4) be changed to indicate that the EPA "must issue a protectiveness statement by September 27, 2018."

B. Action Item Review

Action items from August 2018 were reviewed.

Action item 1 is ongoing: Ms. O'Sullivan to provide updates on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). September 2018 update: Mr. Duke conveyed that Ms. O'Sullivan had no updates; however, Mr. Duke noted that the Deputy Assistant Secretary of the Air Force for Installations, Environment and Energy was briefed on the Site Inspection during his visit to Travis AFB, and was happy to hear that drinking water at the base has not been affected.

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. September 2018 update: Soil vapor sampling was conducted. Sampling was difficult due to tight clay lithology. The field team was not able to collect a second sample from the hard clayey soil beneath the Building 21 location, so the original sampling point was decommissioned to allow activity in this building to continue. A new sample well will be installed in this building, and soil vapor samples will be collected and analyzed sometime in September.

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 face-to-face meeting, held on Wednesday, 17 October 2018, at 0930 hours.

Due to conflict with the Thanksgiving holiday, the November 2018 RPM Teleconference is rescheduled for Wednesday 28 November at 0930,

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, 18 October, to Wednesday, 17 October, at 0930.

- Community Relations Plan Update (CRP): There was no change to the schedule.
- Amendment to the WABOU Soil ROD for Travis AFB ERP Sites DP039, SD043, and SS046: The Final due date has changed to 9 October 2018. Mr. Anderson noted that the Air Force, Water Board, and EPA legal teams will be meeting to discuss comments regarding the ARAR tables. Any necessary changes to the Draft Final ROD Amendment resulting from that discussion will be submitted in redline format to all parties. Mr. Anderson noted that document coordination with Travis AFB leadership has been completed. Mr. Fries indicated that DTSC has signed the Amendment, but the Air Force has not yet received the signature page. The Water Board has also signed. In the meantime, all preparations for field work described in the ROD are being made so that field work can commence as soon as possible. **This is a super critical document**.
- Amendment to the NEWIOU Soil ROD for the Travis AFB ERP Sites SS016 and SD033: The Response to Comments due date changed to 8 October 2018. The Air Force is working on responses to regulator comments; Ms. Burke noted that the EPA legal team has not yet sent their comments to her, but that the progress being made on the WABOU ROD Amendment regarding the ARARs table will likely be applicable in responding to this set of comments. **This is a super critical document** due to site work supporting planned KC-46 hangar construction.
- Site TS060 No Further Action Record of Decision for Old Skeet Range: There was no change to the schedule; however, DTSC and EPA requested additional review time. The team agreed to move the Agency Comments Due date to 30 November 2018. **This is an important but not critical document**.
- Site SD043 Remedial Design/Remedial Action Work Plan: No change was made to the schedule.
- Site SS046 Remedial Design/Remedial Action Work Plan: No change was made to the schedule.
- Site SS016 Remedial Design/Remedial Action Work Plan: The Response to Comments due date was changed to 12 October 2018, the rest of the dates were changed accordingly. This excavation project is located within the footprint of the future new KC-46 hangar, so **this document is critical**.
- Site SD031 Soil Remedial Investigation/Feasibility Study: The Air Force/Service Center Comments due date was changed to 1 October 2018. The due dates for items related to the Predraft and Draft versions changed accordingly. No change was made to the schedule for the Final version, because any follow-on work will come under the next contract; however, additional delays are anticipated. **This document is important but not critical**.
- Fourth Five-Year Review Report for Multiple Groundwater, Soil, and Sediment Sites: No change was made to the schedule. The Air Force has received comments

from the EPA, DTSC, and Water Board and is working on responses. Mr. Anderson noted that many comments could have a significant impact on the restoration program, and it will take time to finalize all Air Force responses and have all parties accept them. This document will likely not be finalized until January or February 2019, or later. **This document is very important but not critical**.

— Potrero Hills Annex (FS, PP, and ROD): No change was made to the schedule. Responses to Water Board comments on the risk assessment work plan are being prepared by the Potrero Hills contractor.

— Site LF006 Technology Demonstration Work Plan: No change was made to the schedule. Ms. Burke noted that the EPA will not review this document. Ms. Constantinescu added that Water Board comments would be provided by 28 September. DTSC's comments have been received by the Air Force.

— Site SS016 Horizontal Well Replacement Work Plan Technical Memorandum: This is a new document. Construction of the KC-46 hangar will require decommissioning and replacement of the horizontal well. Ms. Burke indicated that the EPA considers this a primary document. Mr. Anderson and Mr. Duke agreed to move it to the primary documents list. The work plan will be given to the construction contractor once it is finalized.

— Quarterly Newsletters (July 2018): The Predraft of the October 2018 newsletter will be sent to the AF Service Center on 26 September 2018. The regulatory agencies will receive the draft copy on 5 October 2018.

— 2017 Annual GRISR: There was no change to the schedule. Ms. Royer and Mr. Anderson noted that this document is not as critical as some others, and comments are not expected until November 2018. Ms. Royer requested that, if the agencies have comments on the 4Q2018 sampling plan, to please let her know in time for changes to be incorporated into the October/November monitoring event. If not, proposed changes will be incorporated into the 2Q2019 sampling event. Ms. Constantinescu requested that a discussion of the monitoring plan be added to the agenda for the October RPM Meeting, so that agency comments and concerns relating to the 4Q2018 sampling event are addressed ahead of the monitoring event.

— Site FT005 Extraction System Optimization Report: The Final was submitted on 23 August 2018. This document will be moved to the History section.

— Site LF044 Sediment Sampling Report: The Final was submitted on 24 August 2018. This document will be moved to the History section.

— 2017 Annual CAMU Monitoring Report: The Draft Final and Final due dates were changed to 18 September 2018.

— Emulsified Vegetable Oil Sites FT004, SS015, SD031, and SD036 Optimization Injections Report: No changes were made to the schedule; however, the Air Force person responsible for the document was changed to Gene Clare. This is a lower priority document.

— Site SS015 Soil Sampling Results Technical Memorandum. This is a new document intended to confirm the presence of soil contamination beneath the parking lot at Site SS015, so that future remedial action can be taken if necessary in the event that the Air Force requests use of this portion of the base to support the Travis AFB mission. Ms. Burke asked if the sampling results will change the land-use controls for the site. Mr. Anderson said it would not change them.

— Subarea LF007C Total Petroleum Hydrocarbon Chromatogram Review Technical Memorandum: This is a new document reviewing the TPH sampling, analysis, and data interpretation for the LF007C Groundwater Treatment System, to be provided to the Water Board.

— AOC TA500 POCO Well Decommissioning and Site Closeout Technical Memorandum: This is a new document; dates will be assigned ahead of the October RPM Meeting. Ms. Burke requested that "POCO" be removed from the document title since it is not a petroleum site. Mr. Anderson agreed to this change.

— Monitoring Well Installation Technical Memorandum for Site DP039, Addendum to the Site DP039 Remedial Action Construction Completion Report: This document has been moved to History.

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

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

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 99.2% uptime, and 6.7 million gallons of groundwater were extracted and treated in August 2018. All treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 157 gallons per minute (gpm). Electrical power usage was 17,752 kWh, and approximately 13,937 pounds of CO_2 were created (based on DOE calculation). Approximately 1.2 pounds of volatile organic compounds (VOCs) were removed in August. The total mass of VOCs removed since startup of the system is 504.2 pounds.

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

In August 2018, troubleshooting was performed on several extraction wells, and several maintenance activities were performed on the treatment system. The lead GAC vessel was changed out on 9 August, requiring the SBBGWTP to be shut down for approximately 6 hours.

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

The Central Groundwater Treatment Plant (CGWTP) performed at 100% uptime with approximately 1,131,622 gallons of groundwater extracted and treated in August 2018. All treated water was discharged to the storm sewer system which discharges to Union Creek. The average flow rate for the CGWTP was 27.9 gpm. Electrical power usage was 2,041 kWh for all equipment connected to the Central Plant, and approximately 2,398 pounds of CO_2 were generated. Approximately 2.6 pounds of VOCs were removed from groundwater by the treatment plant in August. The total mass of VOCs removed since the startup of the system is 11,500 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 August 2018.

LF007C Groundwater Treatment Plant, August 2018 (See Attachment 5)

The Subarea LF007C Groundwater Treatment Plant (LF007C GWTP) performed at 100% uptime with approximately 202,260 gallons of groundwater extracted and treated in August 2018. All treated water was discharged to the Duck Pond for beneficial reuse. The average flow rate was 4.7 gpm. Approximately 1.9×10^{-3} pound of VOCs was removed from groundwater by the treatment plant in August 2018. The total mass of VOCs removed since the startup of the system is 174.4 pounds. There was no electrical power usage statistics, because this plant operates on solar power only.

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

A forthcoming technical memo regarding TPH detections and chromatograms will recommend discontinuation of TPH sampling at the LF007C GWTP.

ST018 Groundwater (MTBE) Treatment Plant, July 2018 (see Attachment 6)

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 100% uptime with approximately 144,830 gallons of groundwater extracted and treated in August 2018. All treated water was discharged to the Fairfield – Suisun Sewer District. The average flow rate for the ST018 GWTP was 3.6 gpm. Electrical power usage for the month was 73 kWh for all equipment connected to the ST018 GWTP. The total CO_2 equivalent, including an estimate for the carbon change-out, equates to approximately 54 pounds. Approximately 0.13 pound of MTBE, BTEX, VOCs, and TPH was removed in August by the treatment plant, and approximately 0.05 pound of MTBE-only was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 45.8 pounds, and the total MTBE mass removed since startup of the system is 11.1 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 August 2018.

3. Presentations:

A) 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

Mr. Duke will add discussion of the 4Q2018 GRIP sampling to October RPM Meeting Agenda.

5. PROGRAM ISSUES/UPDATE

No program issues or updates were reported.

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

3.	Lonnie Duke	Mr. Duke will add discussion of the 4Q2018 GRIP sampling to October RPM Meeting Agenda.	17 October 2018	Closed

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

The RPM Teleconference is scheduled for 9:30 AM PST on 19 September 2018. **The call-in number is 1-866-203-7023. Enter the Participation code 5978-75-9736 then enter #.**

AGENDA

1. ADMINISTRATIVE

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

2. CURRENT PROJECTS

   A. TREATMENT PLANT OPERATION AND MAINTENANCE UPDATE

3. PRESENTATIONS

   A. PROGRAM UPDATE:
      DOCUMENTS & ACTIVITIES COMPLETED, IN PROGRESS AND PLANNED

4. NEW ACTION ITEM REVIEW

5. 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]
—	11-14-18	—
—	—	—

[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.

(2019)

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

[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	05-18-18
AF/Service Center Comments Due	09-07-16	11-08-17	03-30-18	06-01-18
Draft to Agencies	09-28-16 (03-22-18)	11-30-17	06-22-18	6-25-18
Draft to RAB	09-28-16 (03-22-18)	11-30-17	06-22-18	6-25-18
Agency Comments Due	10-28-16 (04-27-18)	01-31-18	08-22-18	9-24-18
Response to Comments Meeting	**TBD**	**02-21-18**	**09-06-18**	**10-17-18**
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	08-17-18	10-08-18	10-24-18
Draft Final Due	TBD	08-17-18	10-08-18	10-24-18
Final Due	TBD	09-17-18 (10-09-18)	11-07-18	11-26-18

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	06-04-18
AF/Service Center Comments Due	03-08-18	03-16-18	06-18-18
Draft to Agencies	04-10-18	04-12-18	07-31-18
Draft to RAB	04-10-18	04-12-18	07-31-18
Agency Comments Due	05-10-18	05-14-18	08-30-18
Response to Comments Meeting	**05-16-18**	**05-16-18**	**09-19-18**
Agency Concurrence with Remedy	NA	NA	NA
Public Comment Period	NA	NA	NA
Public Meeting	**NA**	**NA**	**NA**
Response to Comments Due	06-06-18	08-21-18	10-12-18
Draft Final Due	06-06-18	08-21-18	10-12-18
Final Due	TBD	TBD	TBD

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	08-31-18	03-14-18
AF/Service Center Comments Due	10-01-18	05-22-18
Draft to Agencies	10-17-18	6-5-18
Draft to RAB	10-17-18	6-5-18
Agency Comments Due	11-20-18	7-20-18
Response to Comments Meeting	**01-16-19**	**TBD**
Agency Concurrence with Remedy	NA	NA
Public Comment Period	NA	NA
Public Meeting	**NA**	**NA**
Response to Comments Due	02-07-19	TBD
Draft Final Due	02-07-19	TBD
Final Due	03-12-19	TBD

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
	Potrero Hills Annex Travis, Glenn Anderson		
Life Cycle	**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	**Site LF006 Technology Demonstration Work Plan Travis AFB, Glenn Anderson CH2M, Levi Pratt**	**Site SS016 Horizontal Well Replacement Work Plan Technical Memorandum Travis AFB, Lonnie Duke CH2M, Levi Pratt**
Scoping Meeting	**NA**	**NA**
Predraft to AF/Service Center	07-03-18	10-05-18
AF/Service Center Comments Due	07-18-18	10-19-18
Draft to Agencies	08-20-18	11-05-18
Draft to RAB	08-20-18	11-05-18
Agency Comments Due	09-20-18	12-06-18
Response to Comments Meeting	**10-04-18**	**01-16-19**
Response to Comments Due	10-18-18	01-31-19
Draft Final Due	NA	NA
Final Due	10-18-18	01-31-19
Public Comment Period	NA	NA
Public Meeting	**NA**	**NA**

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	**Quarterly Newsletter (October 2018) Travis, Glenn Anderson**	**2017 Annual GRISR Travis AFB, Glenn Anderson CH2M, Leslie Royer**
Scoping Meeting	**NA**	**NA**
Predraft to AF/Service Center	09-26-18	05-09-18
AF/Service Center Comments Due	NA	06-11-18
Draft to Agencies	10-05-18	07-19-18
Draft to RAB	NA	07-19-18
Agency Comments Due	10-19-18	11-19-18
Response to Comments Meeting	**10-20-18**	**01-16-19**
Response to Comments Due	10-25-18	01-30-19
Draft Final Due	NA	NA
Final Due	10-25-18	01-30-19
Public Comment Period	NA	NA
Public Meeting	**NA**	**NA**

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS			
Life Cycle	**Site FT005 Extraction System Optimization Technical Memorandum** **Travis AFB, Gene Clare** **CH2M, Levi Pratt**	**Site LF044 Sediment Sampling Technical Memorandum** **Travis AFB, Glenn Anderson** **CH2M, Doug Berwick** **CAPE, Meg Greenwald**	**2017 Annual CAMU Monitoring Report** **Travis AFB, Gene Clare** **CH2M HILL, Levi Pratt**
Scoping Meeting	**NA**	**NA**	**NA**
Predraft to AF/Service Center	03-08-18	04-12-18	04-19-18
AF/Service Center Comments Due	03-22-18	04-26-08	05-03-18
Draft to Agencies	05-01-18	05-17-18	05-15-18
Draft to RAB	05-01-18	05-17-18	05-15-18
Agency Comments Due	06-01-18	06-18-18	06-15-18
Response to Comments Meeting	**06-20-18**	**06-20-18**	**06-20-18**
Response to Comments Due	08-23-18	08-28-18 (08-24-18)	09-18-18
Draft Final Due	NA	NA	NA
Final Due	08-23-18	08-28-18 (08-24-18)	09-18-18
Public Comment Period	NA	NA	NA
Public Meeting	**NA**	**NA**	**NA**

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	**Emulsified Vegetable Oil Sites FT004, SS015, SD031, and SD036 Injections Technical Memorandum** **Travis AFB, Gene Clare** **CH2M, Levi Pratt**	**Site SS015 Soil Sampling Results Technical Memorandum** **Travis AFB, Glenn Anderson** **CH2M HILL, Levi Pratt**
Scoping Meeting	**NA**	**NA**
Predraft to AF/Service Center	06-12-18	TBD
AF/Service Center Comments Due	06-26-18	TBD
Draft to Agencies	08-31-18	TBD
Draft to RAB	08-31-18	TBD
Agency Comments Due	10-01-18	TBD
Response to Comments Meeting	**10-18-18**	**TBD**
Response to Comments Due	11-01-18	TBD
Draft Final Due	NA	NA
Final Due	11-01-18	TBD
Public Comment Period	NA	NA
Public Meeting	**NA**	**NA**

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	**Subarea LF007C Total Petroleum Hydrocarbon Chromatogram Review Technical Memorandum** **Travis AFB, Glenn Anderson** **CH2M HILL, Leslie Royer**	**AOC TA500 POCO Well Decommissioning and Site Closeout Technical Memorandum** **Travis AFB, Glenn Anderson** **CH2M HILL, Tony Chakurian**
Scoping Meeting	**NA**	**NA**
Predraft to AF/Service Center	09-05-18	TBD
AF/Service Center Comments Due	09-19-18	TBD
Draft to Agencies	09-24-18	TBD
Draft to RAB	09-24-18	TBD
Agency Comments Due	10-24-18	TBD
Response to Comments Meeting	11-21-18	**TBD**
Response to Comments Due	12-07-18	TBD
Draft Final Due	NA	NA
Final Due	12-07-18	TBD
Public Comment Period	NA	NA
Public Meeting	**NA**	**NA**

Travis AFB Master Meeting and Document Schedule

HISTORY	
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**
Scoping Meeting	**NA**
Predraft to AF/Service Center	02-26-18
AF/Service Center Comments Due	03-14-18
Draft to Agencies	04-19-18
Draft to RAB	04-19-18
Agency Comments Due	05-21-18
Response to Comments Meeting	**06-20-18**
Response to Comments Due	07-27-18 (07-26-18)
Draft Final Due	NA
Final Due	07-27-18 (07-26-18)
Public Comment Period	NA
Public Meeting	**NA**

South Base Boundary Groundwater Treatment Plant Monthly Data Sheet

Report Number: 214 **Reporting Period: 1 August 2018 – 31 August 2018** **Date Submitted: 10 September 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 August 2018 reporting period.

Table 1 – Operations Summary – August 2018

Initial Data Collection:	8/1/2018 14:00	**Final Data Collection:**	8/31/2018 13:55
Operating Time:	Percent Uptime:	Electrical Power Usage:	
SBBGWTP: 714 hours	**SBBGWTP:** 99.2%	**SBBGWTP:**	17,752 kWh (13,937 lbs CO_2 generated[a])
Gallons Treated: **6.7 million gallons**		Gallons Treated Since July 1998: **1,061 million gallons**	
Volume Discharged to Union Creek: **6.7 million gallons**		Gallons Treated from Other Sources: **0 gallons**	
VOC Mass Removed: **1.2 lbs**[b]		VOC Mass Removed Since July 1998: **504.2 lbs**	
Rolling 12-Month Cost per Pound of Mass Removed: $10,907[c]			
Monthly Cost per Pound of Mass Removed: $21,382[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 August 2018 EPA Method SW8260C analytical results.

[c] Costs include operations and maintenance, carbon change out, 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] – August 2018

FT005[b]				SS029		SS030	
EW01x05	Offline	EW743x05	Offline	EW01x29	Offline[c]	EW01x30	15.9
EW02x05	Offline	EW744x05	0.0[d]	EW02x29	Offline[c]	EW02x30	0.0[d]
EW03x05	Offline	EW745x05	10.0	EW03x29	2.9	EW03x30	15.6
EW731x05	6.8	EW746x05	Offline	EW04x29	10.7	EW04x30	24.3
EW732x05	Offline	EW2291x05	6.3	EW05x29	7.2	EW05x30	17.8
EW733x05	Offline	EW2782x05	6.3	EW06x29	8.2	EW2174x30	7.0
EW734x05	2.3	EW2783x05	3.8	EW07x29	12.9	EW711x30	9.2
EW735x05	10.7	EW2784x05	5.6			MW269x30	0.0[d]
EW736x05	Offline	EW2785x05	6.2				
EW737x05	Offline	EW2786x05	13.6				
EW742x05	Offline						
FT005 Total: 71.6				**SS029 Total: 41.9**		**SS030 Total: 89.8**	

SBBGWTP Average Monthly Flow[e]: 157.0 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 when field readings were collected.
[e] 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	9 August 2018	08:10	9 August 2018	14:15	Carbon change out and backwash on lead GAC vessel.

-- = 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 2 August 2018. Sample results are presented in Table 4. The total VOC concentration (22.1 µg/L) in the influent sample increased from the July 2018 sample results (19.20 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 21 J+ µg/L. Two VOCs were detected in the midpoint sampling location, including TCE and cis-1,2-DCE. No VOCs were detected in the final effluent sample.

On 9 August, the SBBGWTP was shut down for approximately 6 hours to conduct a carbon change out on the lead GAC vessel. Following the change out, the GAC vessel was backwashed before the system was restarted.

In August 2018, troubleshooting was performed on a couple Site FT005 extraction wells, as follows:

- EW734x05 - Replaced the pump end and cleaned the totalizer. Well is currently operating.
- EW735x05 – Replaced the totalizer. Well is currently operating.

Figure 1 presents the 1,2-DCA and TCE concentrations since January 2017. In the past 2 months, TCE concentrations have increased slightly, while 1,2-DCA concentrations have decreased to non-detect.

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 an overall decreasing trend over the past 12 months with a slight increasing trend since February 2018. 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

No optimization activities occurred at the SBBGWTP in August 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 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 August 2018, the SBBGWTP produced approximately 13,937 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 August 2018 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	2 August 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	ND	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	ND	ND	ND
1,1-Dichloroethene	5.0	0.14	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	**1.1 J+**	**1.6 J+**	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	**21 J+**	**2.7 J+**	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 Hydrocarbons – Gasoline	50	10	0	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	15	0	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	50	160	0	NM	NM	ND
1,4-Dioxane	NA	0.08	0	NM	NM	ND

* In accordance with current National Pollutant Discharge Elimination System permit – January 2018.

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, biased high
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

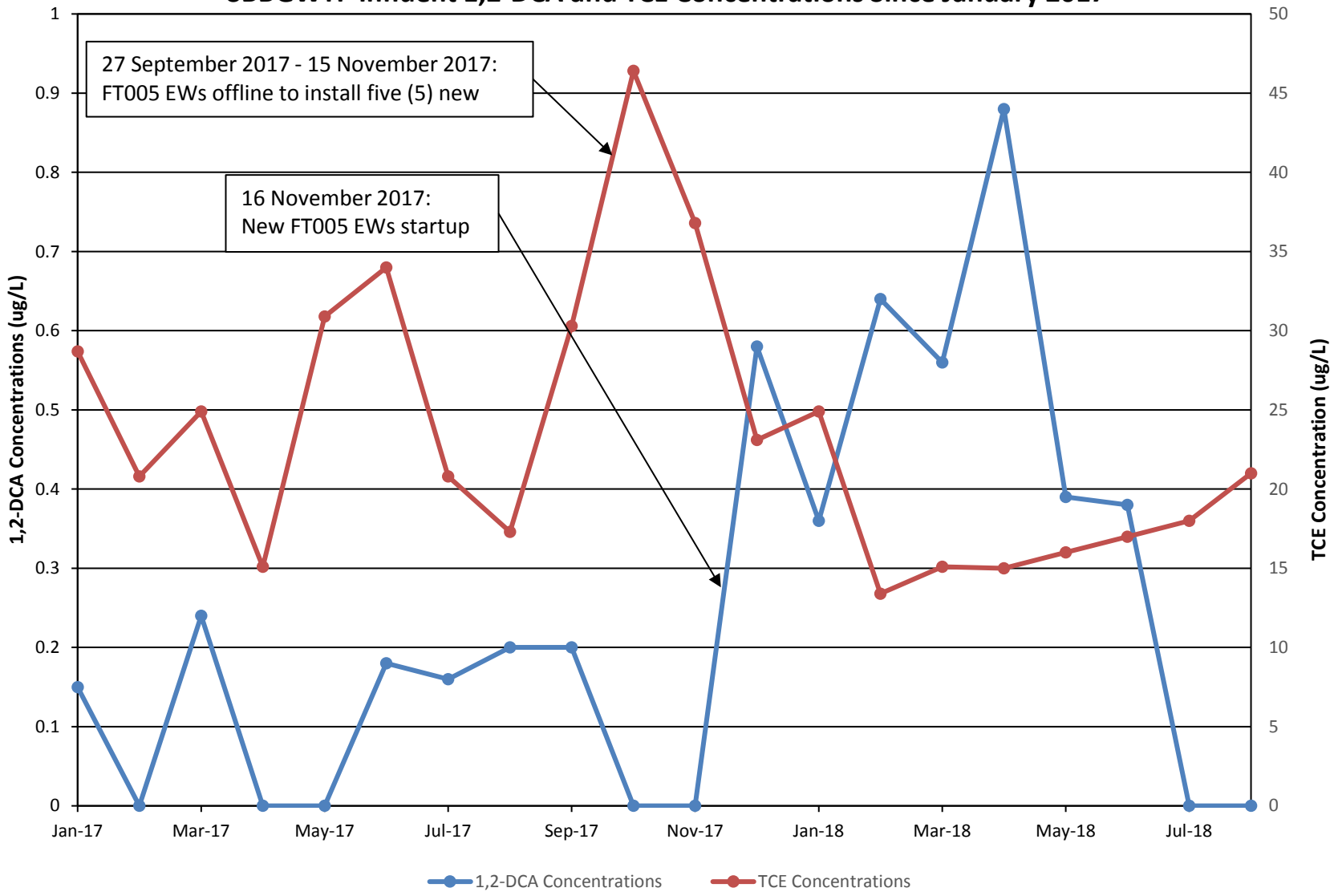


Figure 2

SBBGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

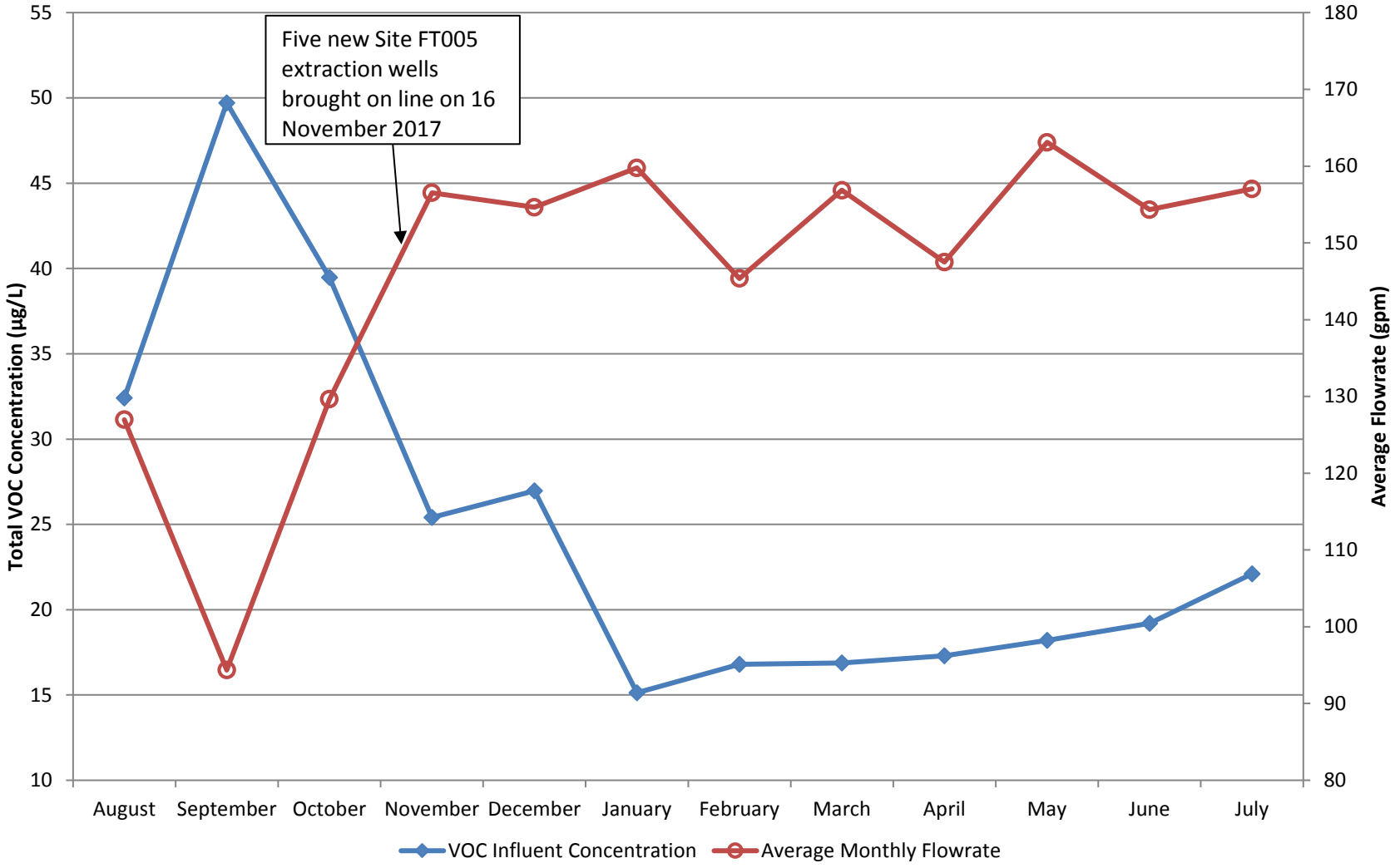
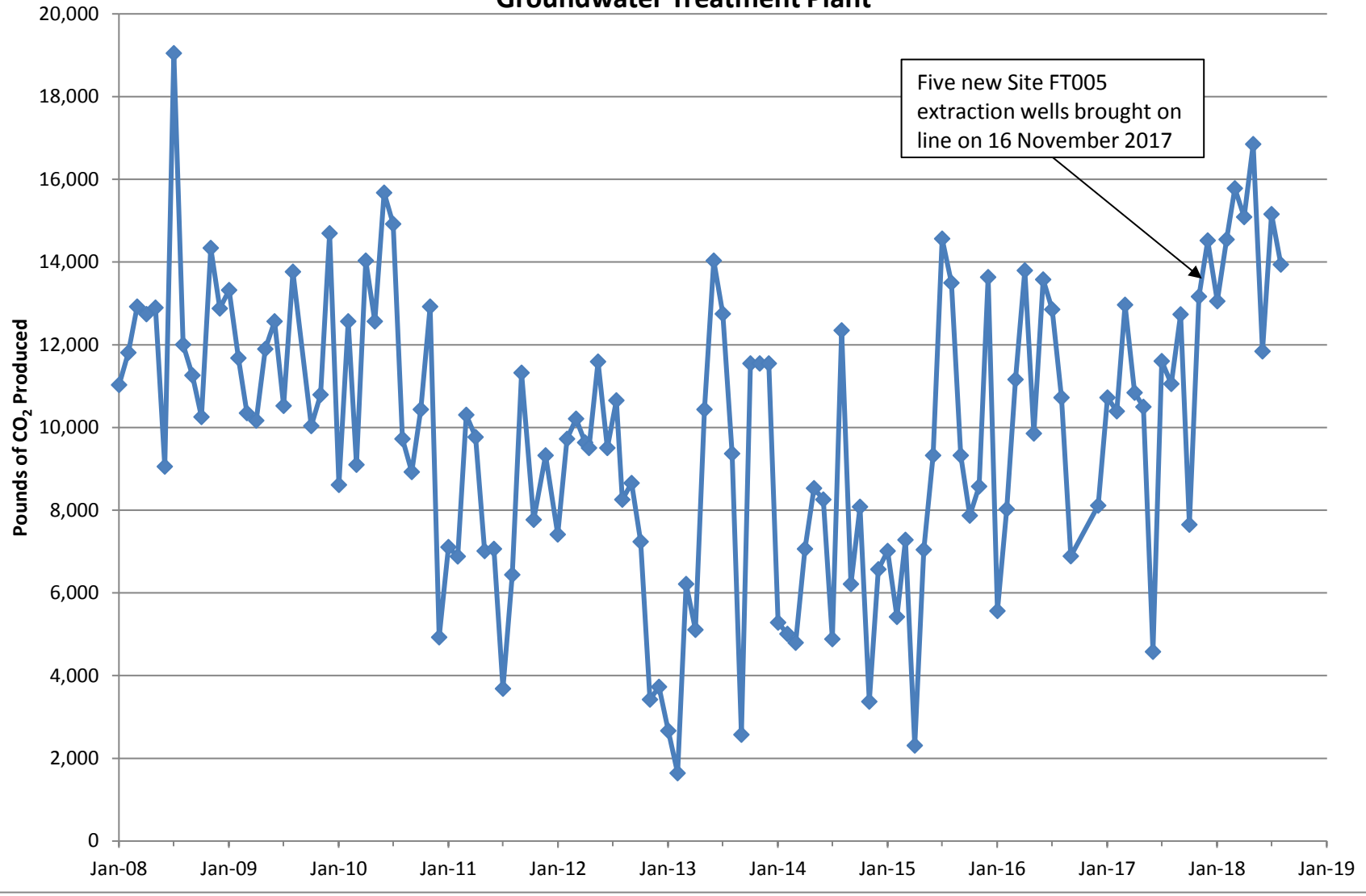


Figure 3

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



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 229 **Reporting Period: 1 August 2018 – 29 August 2018** **Date Submitted: 10 September 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 August 2018 reporting period.

Table 1 – Operations Summary – August 2018

Initial Data Collection:	8/1/2018 12:50		**Final Data Collection:**	8/29/2018 16:15	
Operating Time:		Percent Uptime:		Electrical Power Usage:	
CGWTP:	675 hours	**CGWTP:**	100%	**CGWTP:**	2,041 kWh (2,398 lbs CO_2 generated[a])

Gallons Treated (discharge to storm sewer): **1,131,622 gallons**

Gallons Treated Since January 1996: **559.0 million gallons**

VOC Mass Removed from groundwater: **2.6 lbs**[b]

VOC Mass Removed Since January 1996: **2,814 lbs from groundwater**; **8,686 lbs from vapor**

Rolling 12-Month Cost per Pound of Mass Removed: $3,160[c]

Monthly Cost per Pound of Mass Removed: $14,240[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 August 2018 EPA Method SW8260C analytical results.
[c] Costs include operations and maintenance, carbon change out, 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] – August 2018

Location	Average Flow Rate Groundwater (gpm)
EW001x16	13.4
EW002x16	6.1
EW003x16	0.1
EW605x16	6.0
EW610x16	2.6
CGWTP	27.9

[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.	--		--	

-- = 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	14 May 2018
	12 June 2018	9 July 2018
	7 August 2018	

MW = Monitoring Well

Summary of O&M Activities

Monthly groundwater treatment samples were collected at the CGWTP on 2 August 2018. Sample results are presented in Table 5. The total VOC concentration (272.32 µg/L) in the August 2018 influent sample has increased from the July 2018 sample (256.59 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 220 µg/L. The samples collected from before (influent) and after (midpoint) the primary carbon vessel had similar results, as shown in Table 5. This was likely due to a recent carbon change of the primary carbon vessel. Following the change out, the primary and secondary carbon vessels were reversed. Because of this, the previous (up until the carbon change event) midpoint sampling location had become another influent sampling location. These two (2) samples were likely collected from different points along the same process stream.

No VOCs were detected in the sample collected after the second carbon vessel and the effluent sample, except acetone. Acetone was detected in the effluent sample; however, acetone is a common laboratory contaminant. All detections in the effluent sample were less than effluent limits. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in August 2018.

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 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 7 August 2018 as planned.

Optimization Activities

No optimization activities occurred at the CGWTP in August 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 2,398 pounds of GHG during August 2018.

TABLE 5
Summary of Groundwater Analytical Data for August 2018 – Central Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	2 August 2018 (µg/L) Influent	After Carbon 1 Effluent**	After Carbon 2 Effluent	System Effluent
Halogenated Volatile Organics							
Acetone	NA	1.8	0	**3.0 J**	ND	ND	**1.9 J**
Chloroform	5.0	0.16	0	ND	ND	ND	ND
Chloromethane	NA	0.30	0	ND	ND	ND	ND
1,2-Dichlorobenzene	5.0	0.13	0	**0.40 J**	**0.25 J**	ND	ND
1,3-Dichlorobenzene	5.0	0.16	0	**0.47 J**	**0.23 J**	ND	ND
1,4-Dichlorobenzene	5.0	0.16	0	**0.27 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	**0.65 J**	**0.48 J**	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	**47**	**48**	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	**2.5**	**2.3**	ND	ND
Methylene Chloride	5.0	0.32	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.20	0	**0.51 J**	**0.43 J**	ND	ND
1,2,3-Trichlorobenzene	5.0	0.18	0	**0.18 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	**220**	**220**	ND	ND
Vinyl Chloride	0.5	0.10	0	**0.34 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	ND
Total Petroleum Hydrocarbons – Motor Oil (C28 – C40)	50 (trigger)	160	0	NM	NM	NM	ND
1,4-Dioxane	NA	0.08	0	NM	NM	NM	ND

* In accordance with current National Pollutant Discharge Elimination System permit – January 2018.

** The sample after the first carbon vessel was inadvertently collected from an influent location; however, the carbon treatment remained effective in August.

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

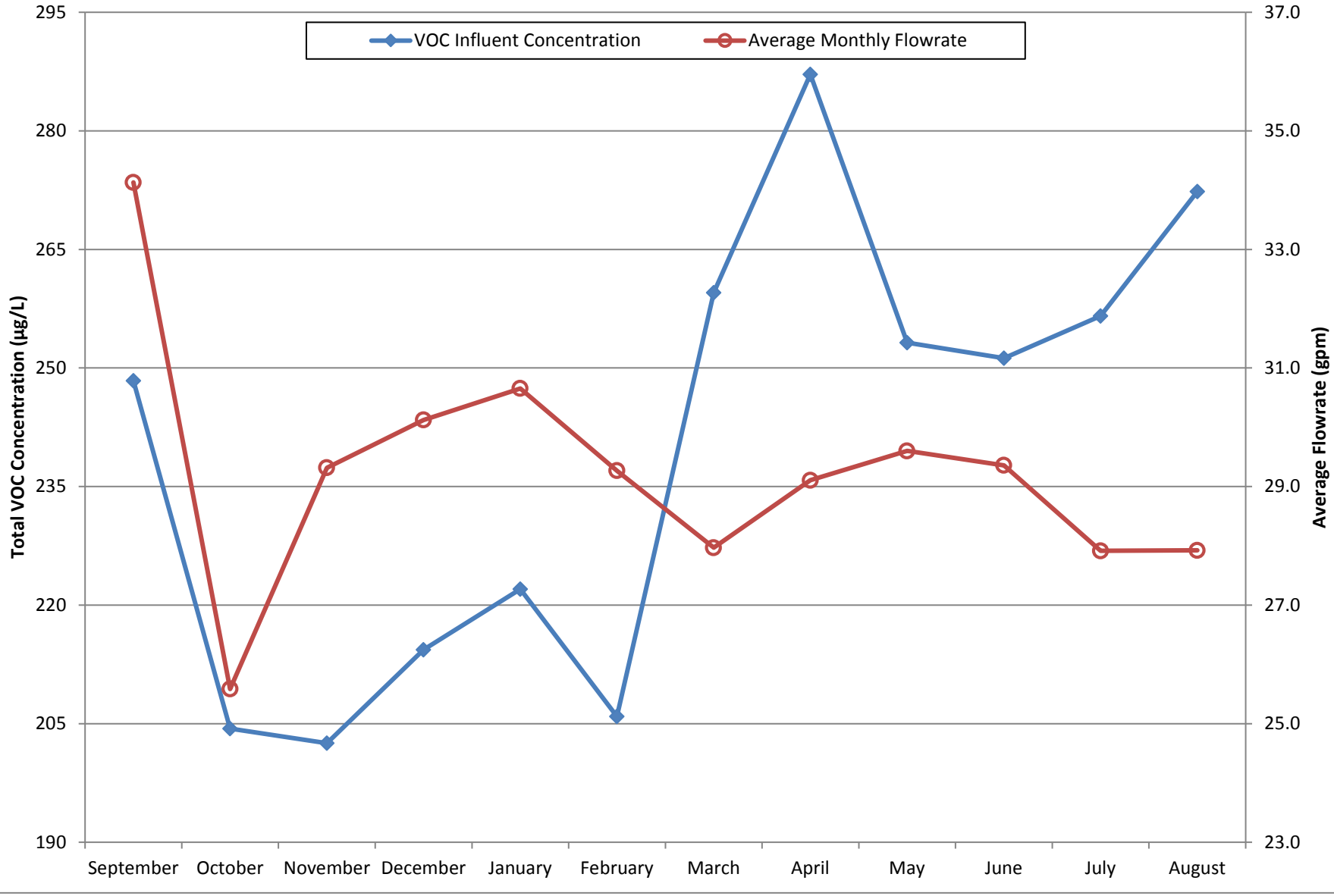
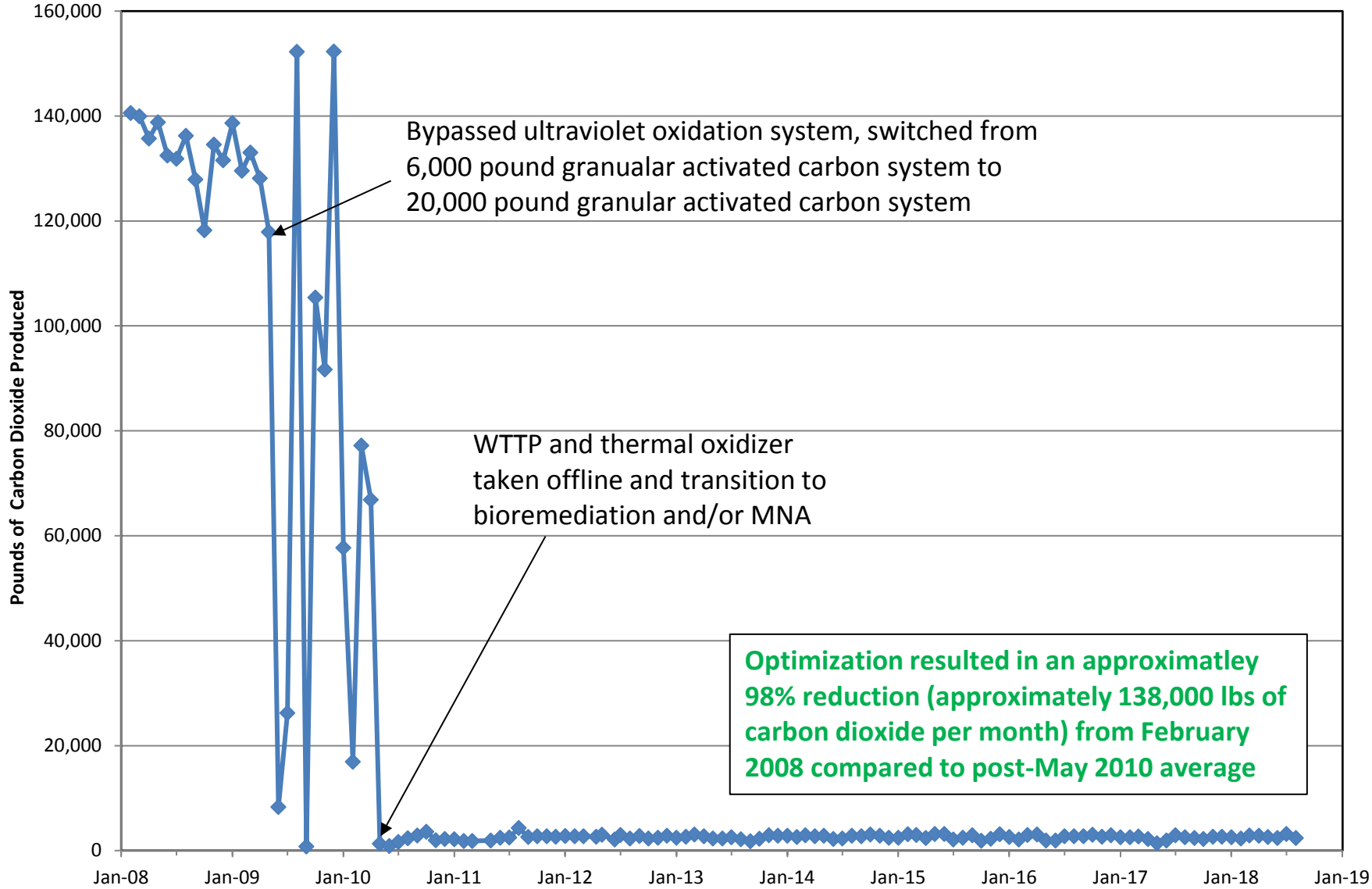


Figure 2

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



Subarea LF007C Groundwater Treatment Plant Monthly Data Sheet

Report Number: 172 **Reporting Period: 1 August 2018 - 31 August 2018** **Date Submitted: 10 September 2018**

This monthly data sheet presents information regarding the Subarea LF007C Groundwater Treatment Plant (LF007C GWTP) and associated remedial process optimization (RPO) activities.

System Metrics

Table 1 presents operational data from the August 2018 reporting period:

Table 1 – Operations Summary – August 2018

Initial Data Collection:	8/1/2018 13:15		**Final Data Collection:**	8/31/2018 13:35	
Operating Time:		Percent Uptime:		Electrical Power Usage[a]:	
LF007C GWTP:	720 hours	**LF007C GWTP**	100%	**LF007C GWTP:**	0 kWh
Gallons Treated: **202,260 gallons**				Gallons Treated Since March 2000: **88.0 million gallons**	
Volume Discharged to Duck Pond: **202,260 gallons**					
VOC Mass Removed: **1.9 x 10^{-3} pounds[b]**				VOC Mass Removed Since March 2000: **174.4 pounds (Groundwater)**	
Rolling 12-Month Cost per Pound of Mass Removed: **Not Measured[c]**					
Monthly Cost per Pound of Mass Removed: **Not Measured[c]**					

[a] The LF007C GWTP operates on solar power only.
[b] VOCs from August 2018 influent sample detected by EPA Method SW8260C.
[c] Value not calculated since measurement does not accurately represent the cost effectiveness of the system.

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

Table 2 – LF007C GWTP Average and Total Flow Rates – August 2018

Location	Average Flow Rate (gpm)[a]	Total Gallons Processed (gallons)
EW614x07	3.8	163,825
EW615x07	0.8	36,077
LF007C GWTP	**4.7**	**202,260**

[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[a]		Cause
	Date	Time	Date	Time	
LF007C GWTP	None.	--		--	

-- = Time not recorded

[a] Shutdown and restart times estimated based on field notes

LF007C GWTP = Subarea LF007C Groundwater Treatment Plant

Summary of O&M Activities

Monthly groundwater samples were collected at the LF007C GWTP on 2 August 2018. Sample results are presented in Table 4. TCE (0.82 J µg/L) and methylene chloride (0.32 J µg/L) were detected at the influent sample location. Cis-1,2-DCE (0.17 J µg/L) was detected in the midpoint sample location. TPH-d (120 µg/L) and TPH-mo (200 J+ µg/L) were detected in the effluent sample at concentrations in excess of the effluent limitation of 50 µg/L. The false-positive TPH issue has been researched and is discussed in a forthcoming technical memorandum, where it is concluded that sampling for TPH should be stopped. 1,4-dioxane was detected in the effluent sample at a concentration of 0.77 J- µg/L. There are no established effluent limits for 1,4-dioxane when discharging to non-drinking water receiving waters according to the current VOC and Fuel General Permit. Acetone was detected in the midpoint and effluent sample locations; however, acetone is a common laboratory contaminant.

Figure 1 presents a chart of influent concentrations (total VOCs) at the LF007C GWTP versus time for the past twelve (12) months. Over the last 12 months, the VOC concentration, primarily TCE, trend has been slightly decreasing. The average flow rate through the LF007C GWTP has slightly increased over the last 12 months.

Optimization Activities

No optimization activities occurred at the LF007C GWTP in August 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 system.

Figure 2 presents the historical GHG production from the systems associated with the NGWTP and LF007C GWTP. The LF007C GWTP is now a solar-only operated treatment system and no longer generates GHG, with exception of a small amount of GHG generated from changing out the GAC averaged to a per month basis.

TABLE 4
Summary of Groundwater Analytical Data for August 2018 – Subarea LF007C Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	2 August 2018 (µg/L)		
				Influent	After Carbon 1	Effluent
Halogenated Volatile Organics						
Acetone	NA	1.9	0	ND	**2.3 J**	**6.0 J**
Bromodichloromethane	5.0	0.15	0	ND	ND	ND
Bromoform	5.0	0.15	0	ND	ND	ND
2-Butanone	5.0	2.0	0	ND	ND	ND
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.15	0	ND	ND	ND
Dibromochloromethane	5.0	0.15	0	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND
1,1-Dichloroethene	5.0	0.15	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	ND	**0.17 J**	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
Methylene Chloride	5.0	0.15	0	**0.32 J**	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	**0.82 J**	ND	ND
Vinyl Chloride	0.5	0.15	0	ND	ND	ND
Non-Halogenated Volatile Organics						
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
Other						
Total Petroleum Hydrocarbons – Gasoline	50	35	0	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24	1	NM	NM	**120**
Total Petroleum Hydrocarbons – Motor Oil	50	24	1	NM	NM	**200 J+**
1,4-Dioxane	NA	0.19	0	NM	NM	**0.77 J-**

* In accordance with current National Pollutant Discharge Elimination System permit – January 2018.

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
J+ = analyte concentration is considered an estimated value, biased high
J- = analyte concentration is considered an estimated value, biased low
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

LF007CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

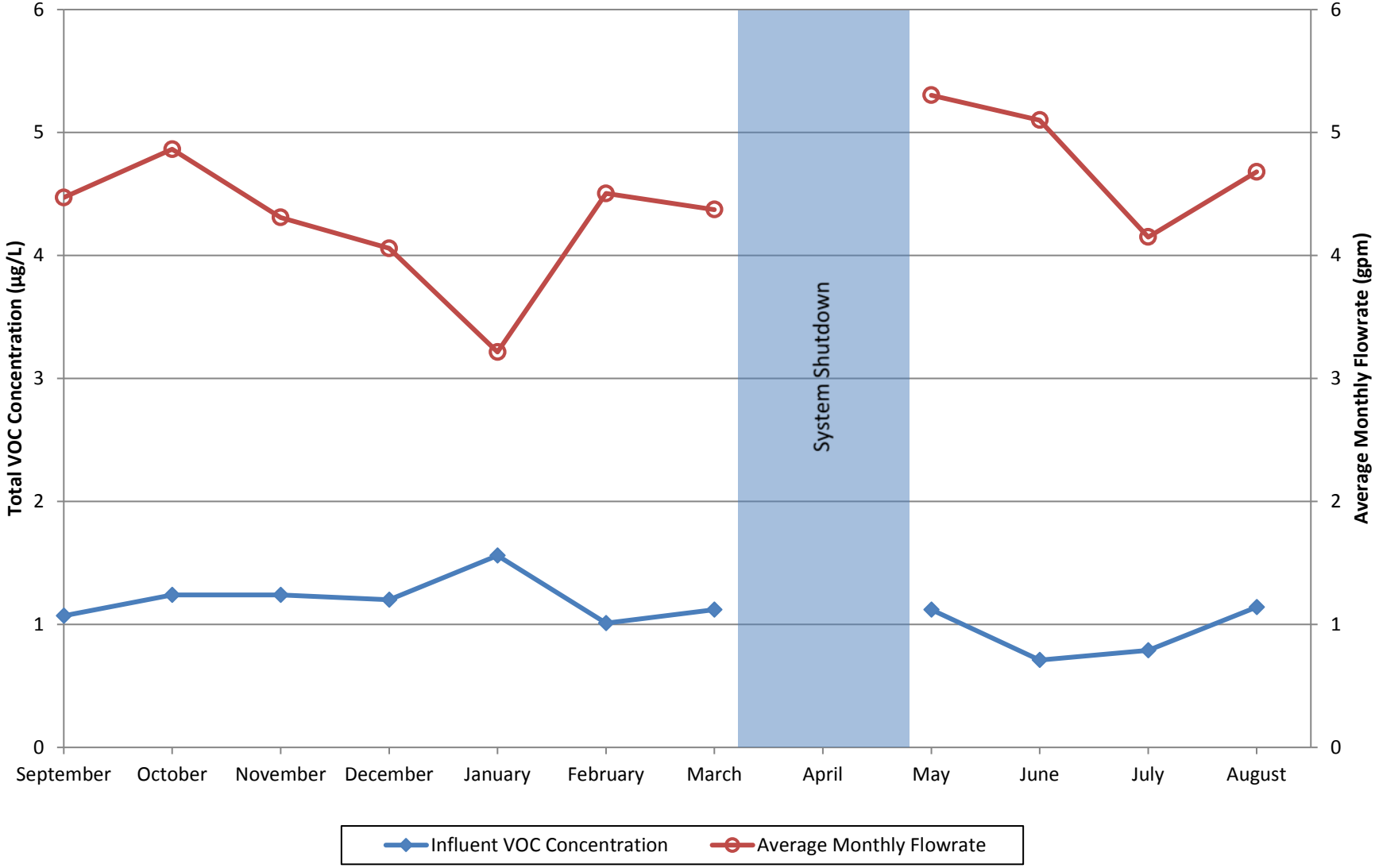
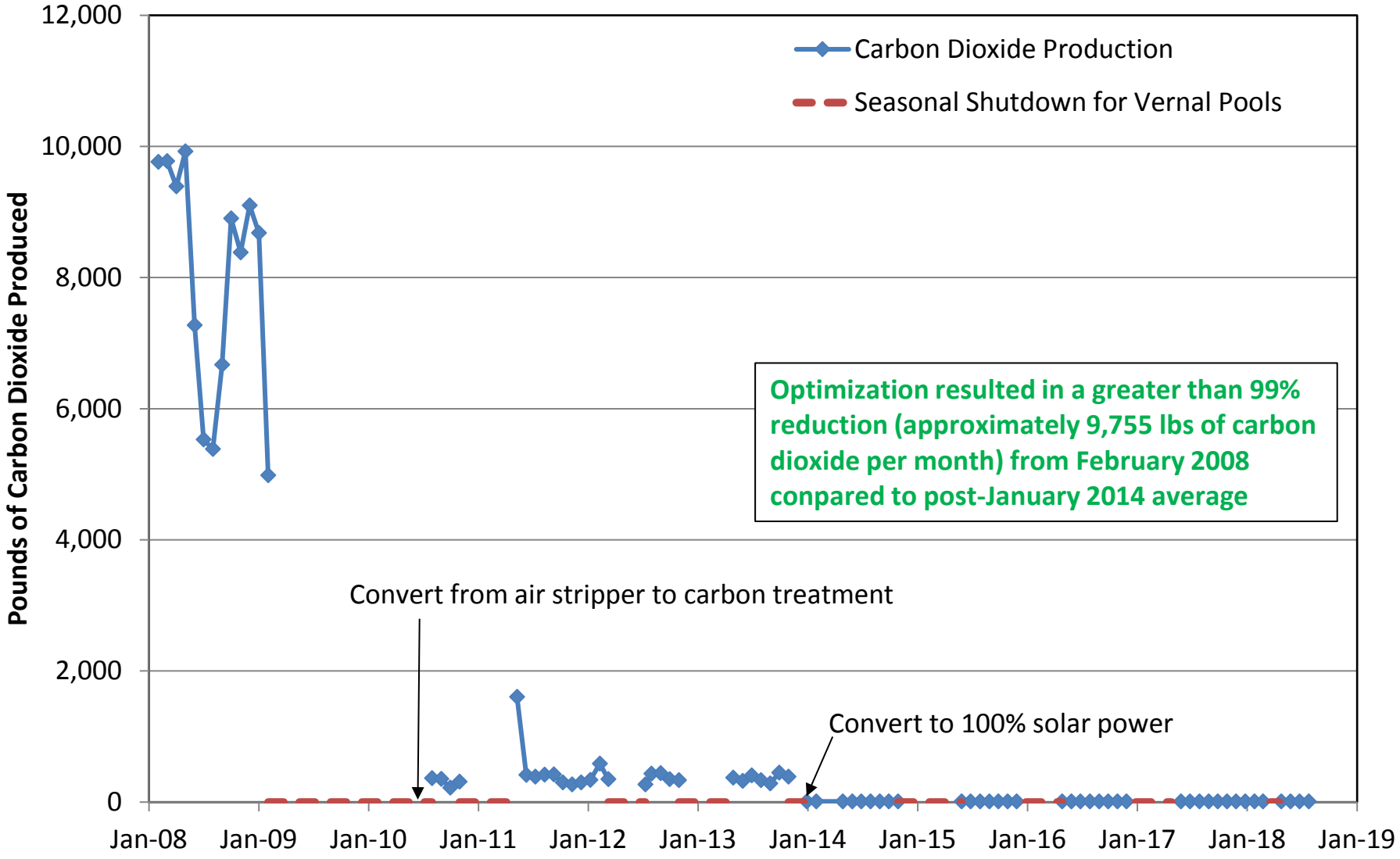


Figure 2

Equivalent Pounds of Carbon Dioxide Produced by the NGWTP/LF007C GWTP



Note: Dashed line represents seasonal shutdowns due to the presence of vernal pools at Site LF007C during which no carbon dioxide production occurred.

Site ST018 Groundwater Treatment Plant Monthly Data Sheet

Report Number: 090 **Reporting Period: 1 August 2018 – 29 August 2018** **Date Submitted: 10 September 2018**

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

System Metrics

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

Table 1 – Operations Summary – August 2018

Initial Data Collection: 8/1/2018 12:00	**Final Data Collection:** 8/29/2018 15:50	
Operating Time:	Percent Uptime:	Electrical Power Usage:
ST018GWTP: 676 hours	**ST018GWTP: 100**%	**ST018GWTP:** 73 kWh (54 lbs CO_2 generated[a])
Gallons Extracted: **144,830 gallons**	Gallons Extracted Since March 2011: **15.6 million gallons**	
Volume Discharged to Sanitary Sewer: **144,830 gallons**	Final Totalizer Reading: **15,571,619 gallons**	
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: **9,075,445 gallons**		
MTBE, BTEX, VOC, TPH Mass Removed: **0.13 lbs**[b]	MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: **45.8 lbs**	
MTBE (Only) Removed: **0.05 lbs**[b]	MTBE (Only) Mass Removed Since March 2011: **11.1 lbs**	
Rolling 12-Month Cost per Total Pounds of Mass Removed: $10,083[bc]		
Monthly Cost per Pound of Mass Removed: $19,834[bc]		

[a] SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG.
[b] Calculated using August 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 – August 2018

Location	Average Flow Rate Groundwater (gpm)[a]	Hours of Operation
EW2014x18	1.3	676
EW2016x18	0.0	0
EW2019x18	0.7	676
EW2333x18	1.0	676
ST018GWTP	3.6	676

[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.	--		--	

-- = 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 2 August 2018. Results are presented in Table 4. The complete August 2018 laboratory data report is available upon request. Beginning on 1 August 2018, the three (3) GAC vessels and bag filters were bypassed. Extracted groundwater from Site ST018 is currently discharged directly to the sanitary sewer. The MTBE concentration during the August 2018 sampling event was 45 J- µg/L, which is an increase from the July 2018 sample result of 12 µg/L. TPH-g and low concentrations of several VOCs were also detected in the system effluent sample.

The detected concentrations of TPH in the August 2018 effluent sample 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 effluent contaminant concentrations to maintain compliance with the Fairfield-Suisun Sewer District discharge permit.

Figure 1 presents plots of the average flow rate and 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 slightly increasing trend. The MTBE concentrations and total concentrations have generally been fluctuating over the past 12 months with a flat trend and a decreasing trend, respectively.

Optimization Activities

No optimization activities occurred at the ST018GWTP in August 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 54 pounds of GHG during August 2018 and removed 144,830 gallons of water. The amount of GHG produced is directly attributed to the amount of water removed through the system because the only line-power electrical use is for a transfer pump to push the water from the system to the sanitary sewer. Since the GAC vessels were removed, a slightly less amount of electricity will be required.

TABLE 4
Summary of Groundwater Analytical Data for August 2018– Site ST018 Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	2 August 2018 (µg/L)
				System Effluent
Fuel Related Constituents				
Methyl tert-Butyl Ether	6,400	0.25	0	**45 J-**
Benzene	25,000[a]	0.16	0	**2.0 J-**
Ethylbenzene	25,000[a]	0.16	0	**0.44 J-**
Toluene	25,000[a]	0.17	0	ND
Total Xylenes	25,000[a]	0.19 – 0.34	0	ND
Total Petroleum Hydrocarbons – Gasoline	50,000[b]	10	0	**56 J-**
Total Petroleum Hydrocarbons – Diesel	50,000[b]	16	0	ND
Total Petroleum Hydrocarbons – Motor Oil	100,000	160 – 170	0	ND
Other				
1,2-Dichloroethane	20	0.15	0	**0.42 J-**
Naphthalene	NA	0.22	0	**0.28 J-**
n-Propylbenzene	NA	0.16	0	**0.26 J-**

* 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, biased low
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 Concentrations and Average Flowrate Twelve Month History

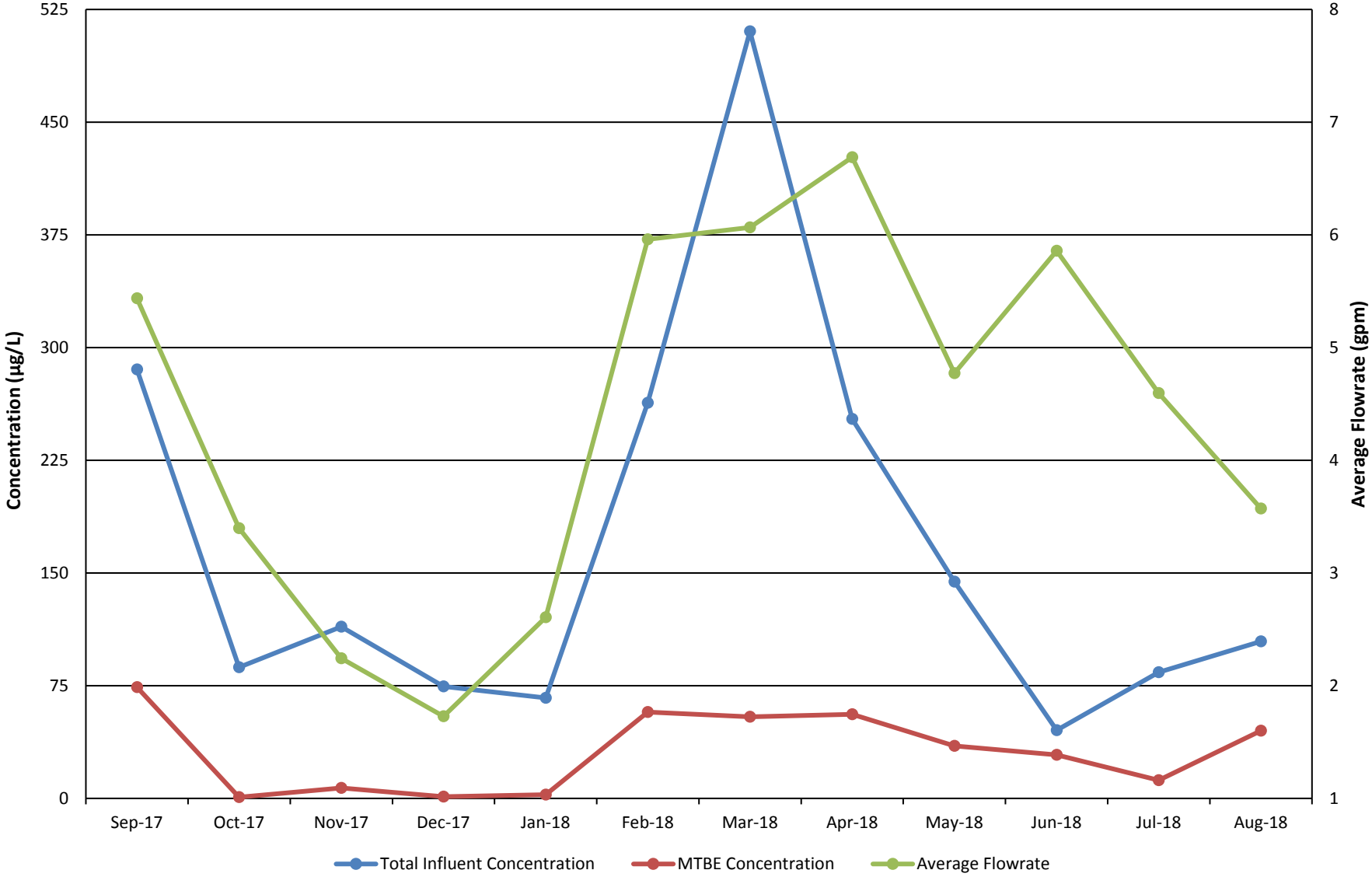
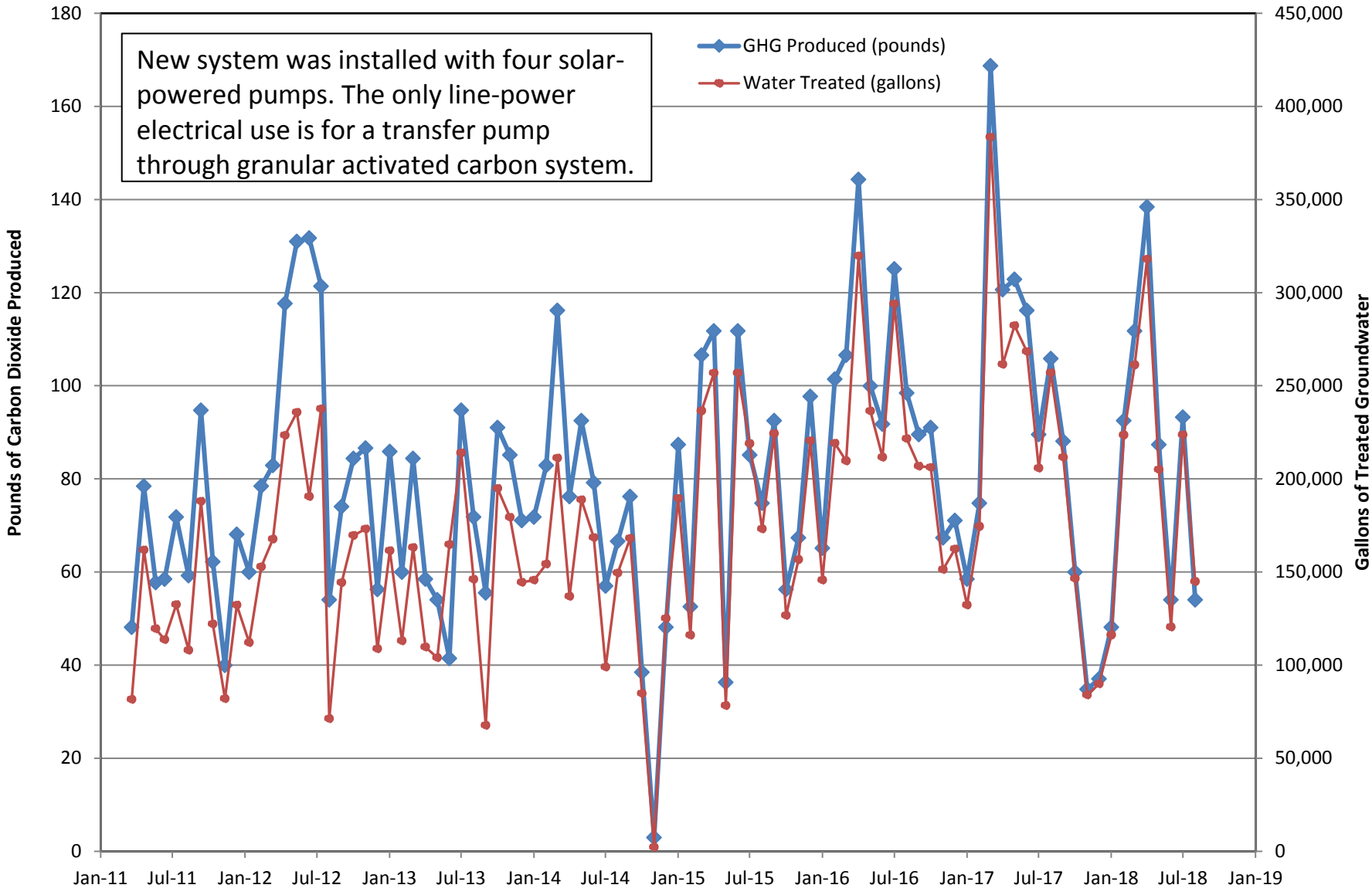


Figure 2

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



Travis AFB
Restoration Program

Program Update

RPM Meeting

September 19, 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 Documents (5)

- Data Gap Investigation Results, Technical Memorandum for Soil Site SS016
- LF006, SS030, SD031 Aquifer Test Activities Technical Memorandum
- SS015 Soil Sampling Plan
- Monitoring Well Installation Tech Memo for Site DP039, Addendum to the RACCR
- ***FT005 Extraction System Optimization Tech Memo***
- ***2017 Annual CAMU Monitoring Report***
- ***LF044 Sediment Sampling Report***

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
- Q2 2018 GRIP Sampling
- SS015 Soil sampling
- TA500 Well Decommissioning
- FT005 EVO injection
- FT004 POCO Soil Investigation
- ***3Q 2018 GRIP Sampling***

Documents In-Progress

CERCLA

- Amendment to the WABOU Soil ROD for sites DP039, SD043, and SS046
- Amendment to the NEWIOU Soil ROD for Sites SS016 and SD033
- SD043 RD/RA Work Plan
- SS046 RD/RA Work Plan
- Community Relations Plan Update (revised draft)
- 4th Five Year Review Report for Multiple Groundwater, Soil, and Sediment Sites
- SS016 RD/RA Work Plan
- 2017 Annual GRISR
- ***EVO Sites FT004, SS015, SD031, & SD036 Optimization Injections Tech Memo***
- ***LF006 Technology Demonstration Work Plan***

Documents In-Progress

MMRP

- NFA ROD for Old Skeet Range (TS060 MRA)

POCO

- None

Field Work In-Progress

CERCLA

- ***LF006 Well Installations and Injections***

POCO

- None

Documents Planned

CERCLA

- SD031 Soil RI/FS — Oct
- ***SS016 Horizontal Well Replacement Work Plan Tech Memo*** — ***Nov***
- ***SS015 Soil Sampling results Tech Memo*** — ***TBD***

MMRP

- None

POCO

- ***Subarea LF007C TPH Chromatogram Review Tech Memo*** — ***Sep***
- ***AOC TA500 POCO Well Decommissioning and Site Closeout Tech Memo*** — ***TBD***

Field Work Planned

CERCLA

- ***4Q 2018 GRIP Sampling*** ***Oct***
- SD043 Soil excavation Oct
- SS046 Soil excavation Oct
- SS016 Soil excavation Nov

POCO

- None

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 15 months
    - TPH-G: 99% reduction in source area (1,900 to 15 J μg/L), 51% for remaining 6 site wells (was 34% after 9 months and 18% after 3 months)
    - TPH-D: 98% reduction in source area (5,500 to 92 μg/L), 38% for remaining 6 site wells (was 61% after 9 months and 33% after 3 months)
    - Benzene: 98% reduction in source area (22 to <0.4 μg/L), 87% for remaining 6 site wells (was 61% after 9 months and 49% after 3 months)

* SBGR = Subgrade Biogeochemical Reactor

Updates in Green Font

Petroleum Technology Demonstration Projects (2)

- 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 15 months
    - TPH-D baseline 9,600 ug/L reduced to 40 J ug/L (99.6% reduction – was 98% after 9 months)
    - TPH-MO baseline 2,300 ug/L reduced to 89 J ug/L (96% reduction – was 91% after 9 months)
  - Plume hot spot monitoring well (MW02x34) through first 15 months
    - TPH-D baseline 8,300 ug/L reduced to 6,800 ug/L (18% reduction – was 87% after 9 months, seeing some fluctuations)
    - TPH-MO baseline 1,500 ug/L reduced to 660 J ug/L (56% reduction – was 72% after 9 months, seeing some fluctuations)

* SBGR = Subgrade Biogeochemical Reactor

Updates in Green Font

CVOC Technology Demonstration Projects (3)

- 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
  - Waiting on 4Q18 data to evaluate progress

- 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
  - FT005 north area: Slightly elevated TOC and reduced COC concentrations (below MCLs)**;**
  - FT005 central area: TOC increase has only been observed at EW02x05, near injection area. Injected EVO may be adsorbed to sediments or being consumed faster than spread can be observed. “Natural” TOC increase (3.5 to 14 mg/L) observed in central plume near MW766x05, away from injections (from infiltration of natural organics/cattle?). Reinjected this area in 2018.
  - FT005 south area: Optimized the GETs in 2017, which may help accelerate TOC dispersal to support this TD

Updates in Green Font

CVOC Technology Demonstration Projects (4)

- 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
  - Waiting on 4Q18 data to evaluate progress

Updates in Green Font

CVOC Technology Demonstration Projects (5)

- 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:
    - Recirculation through chimneys has been successful relative to our design assumptions, TOC increased to >10 mg/L within majority of target area and COCs decreased to below MCLs (most wells ND, max 1,1-DCE reduced from 390 ug/L to ND)
    - 1,1-DCE (primary COC) concentrations have reduced by 99% (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 99% (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 cross-gradient area), conducted reinjection of EVO in 2017
    - Waiting on 4Q18 data to evaluate effects of 2017 injections

Updates in Green Font

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

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