Final

Travis Air Force Base
Environmental Restoration Program
Restoration Program Manager's
Meeting Minutes
18 January 2017, 0930 Hours

Mr. Lonnie Duke of the Air Force Civil Engineer Center (AFCEC) Restoration Installation Support Team (IST) conducted the Restoration Program Manager's (RPM) teleconference meeting on 18 January 2017 at 0930 hours in Building 248 at Travis AFB, California. Attendees included:

Lonnie Duke	AFCEC/CZOW
Glenn Anderson	AFCEC/CZOW
Angel Santiago Jr.	AFCEC/CZOW
Milton 'Gene' Clare	AFCEC/CZOW
Monika O'Sullivan	AFCEC/CZOW
William Hall (via telephone)	AFCEC/CZR
Merrie Schilter-Lowe	Travis AFB 60 AMW/PA
Dezso Linbrunner (via telephone)	USACE-Omaha
Adriana Constantinescu (via telephone)	California Regional Water Quality Control Board (RWQCB)
Ben Fries (via telephone)	DTSC
Nadia Hollan Burke (via telephone)	USEPA
Indira Balkissoon (via telephone)	Techlaw, Inc.
Mike Wray	CH2M

Handouts distributed at the meeting, discussions and presentations included:

Attachment 1	Meeting Agenda
Attachment 2	Master Meeting and Document Schedule
Attachment 3	SBBGWTP Monthly Data Sheet (December 2016)
Attachment 4	CGWTP Monthly Data Sheet (November/December 2016)
Attachment 5	LF007C Monthly Data Sheet (November/December 2016)
Attachment 6	ST018 Monthly Data Sheet (November/December 2016)
Attachment 7	Presentation: Program Update

1. ADMINISTRATIVE

A. Previous Meeting Minutes

The 16 November 2016 RPM meeting minutes were approved and finalized as written with the following exception. On page 5, 3rd paragraph, 4th sentence. Ms. Constantinescu requested the following sentence to read: "Ms. Constantinescu said that she would like to have a discussion regarding the SGC method; stating that the Water Board, Region 2, does not agree with the use of this methodology for testing the treated water. The SGC method removes both biogenic organic compounds and petroleum metabolites, and does not distinguish between the two. In addition, the SGC method is an additional cost to the extractable analysis."

The revision noted above were made to the 16 November 2016 RPM meeting minutes.

B. Action Item Review.

Action items from November 2016 were reviewed.

Action item 1 is ongoing: Ms. O'Sullivan to provide updates on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). 18 January 2017: Ms. O'Sullivan said that they are still in the process of getting the informal biological assessment from the contactor.

Action item 2 is closed: Mr. Duke to notify the regulatory agencies when SBBGWTP is back online. 18 January 2017: Update, Mr. Duke sent an email to the regulators over the holiday informing them that the treatment plant was restarted on 20 December 2016.

Action item 3 is closed: Mr. Wray will investigate why LF007CGWTP known for not being a TPHD/MO site, is getting TPHd detection when not using the SGC method. 18 January 2017: Update, Ms. Constantinescu suggested not to use SGC as it is an additional cost and the Water Board does not agree with this method. Mr. Wray said it appears that the TPHD/MO detections are still seen occasionally, and that if the Water Board agrees, the TPHD/MO hits will be documented as biogenic. Ms. Constantinescu said that the Water Board will support the explanation that this is not a known TPHD/MO site.

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, which will be held on Wednesday, 15 February 2017, at 0930 hours.

Travis AFB Master Document Schedule

— Community Involvement Plan (CIP): No change to the schedule. Mr. Anderson is reviewing EPA RTCs. A teleconference has been proposed to discuss EPA RTCs in the afternoon on 19 January 2017. Mr. Fries asked if Travis AFB has received any comments from DTSC, Regional 1, Public Information Specialists. Mr. Anderson said they have not heard anything yet. Mr. Fries will follow-up with DTSC Specialists. Ms. Burke said she will be on leave starting 20 January 2017 returning on 9 February 2017 and if anything urgent arises to email Loren Henning/EPA.

— Potrero Hills Annex (FS, PP, and ROD): No change to the schedule. Mr. Anderson said that Travis AFB has had some dialogue with the Water Board representative and they are close to completing their cleanup and abatement order. Yemia Hashimoto did provide some text for Travis AFB to review. Ms. Constantinescu indicated the proposed tentative order will be released to Travis AFB sometime before the end of January 2017 and will have a 30 day review period.

— Site TS060 Removal Action Work Plan: The Response to Comments date and Final Date was changed to 23 February 2017. No other changes were made to the schedule. Travis AFB is working on EPA RTCs.

— Site LF044 Investigation Work Plan: No change was made to the schedule. Travis AFB is working on EPA RTCs.

— Site SS016 Risk Assessment Technical Memorandum: Predraft to AF/Service Center was changed to 28 March 2017, the rest of the dates were changed accordingly.

— Sites SD033, SD043, and SS046 Risk Assessment Technical Memorandum: New document: Predraft to AF/Service Center scheduled for 30 March 2017, the rest of the dates were populated accordingly.

— Site FT004 POCO Soil Data Gap Investigation Work Plan: Response to Comments Due and Final Due date changed to 28 February 2017. No other changes were made to the schedule.

— Quarterly Newsletters (January 2017): Draft to Agencies date updated to 10 January 2017 to reflect the first quarter 2017 newsletter, the rest of the dates were changed accordingly.

— 2016 Annual GRISR: New document, and all dates are to-be-determined (TBD).

— Site DP039 Remedial Action Construction Completion Report: Response to Comments Due and Final Due dates were changed to 27 January 2017. No other changes were made to the schedule. Mr. Anderson provided RTCs to EPA.

— Multi-Site Technology Demonstration Construction Completion Report: The AF/Service Center Comments Due date was changed to 13 January 2017. The rest of the dates were updated accordingly.

— 2016 Annual CAMU Monitoring Report: New document populated with all new dates.

— Site SD034 Technology Demonstration Construction Completion Report: New document populated with all new dates.

— POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW051, OW053, and OW054: Draft to Agencies was changed to 19 January 2017, the rest of the dates were changed accordingly.

— Site ST028 POCO Well Decommissioning and Site Closeout Technical Memorandum: Draft to Agencies was changed to 13 January 2017 to reflect the actual date, the rest of the dates were changed accordingly.

— POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW055, and OW057. New document, populated with all new dates.

— Site SS014 POCO Technology Demonstration Construction Completion Report: Predraft to AF/Service Center date updated to 24 February 2017, the rest of the dates were changed accordingly.

— Action Memorandum for Non-Time Critical Removal Action at Site TS060 (Old Skeet Range): Moved to history.

— Sites ST028 and ST032 POCO Well Decommissioning Work Plan: Moved to history.

— Site FT005 Technology Demonstration Construction Completion Report: Moved to history.

— 2015 Annual GRISR: Moved to history.

— Site CG508 POCO Well Decommissioning and Site Closeout Technical Memorandum: Moved to history.

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

South Base Boundary Groundwater Treatment Plant, December 2016 (see Attachment 3)

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 68.9% uptime, and 2.0 million gallons of groundwater were extracted and treated during the month of December 2016. All of the treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 91.3 gallons per minute (gpm).

Electrical power usage was 9,883 kWh, and approximately 7,313 pounds of CO_2 were created (based on DOE calculation). Approximately 0.55 pound of volatile organic compounds (VOCs) was removed in December. The total mass of VOCs removed since startup of the system is 482.4 pounds.

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

Central Groundwater Treatment Plant, November 2016 (see Attachment 4)

The Central Groundwater Treatment Plant (CGWTP) performed at 100% uptime with approximately 1,419,000 gallons of groundwater extracted and treated during the month of November 2016. All treated water was discharged to the storm sewer. The average flow rate for the CGWTP was 35.1 gpm. Electrical power usage was 2,340 kWh for all equipment connected to the Central Plant, and approximately 2,620 pounds of CO_2 were generated. Approximately 2.43 pounds of VOCs were removed from groundwater by the treatment plant in November. The total mass of VOCs removed since the startup of the system is 11,449 pounds.

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

Note: The Site DP039 bioreactor is currently undergoing an optimization effort to determine the most effective pulse mode duration to optimize distribution of TOC in the subsurface.

Central Groundwater Treatment Plant, December 2016 (see Attachment 4)

The Central Groundwater Treatment Plant (CGWTP) performed at 100% uptime with approximately 1,620,650 gallons of groundwater extracted and treated during the month of December 2016. All treated water was discharged to the storm sewer. The average flow rate for the CGWTP was 35.0 gpm. Electrical power usage was 2,721 kWh for all equipment connected to the Central Plant, and approximately 2,902 pounds of CO_2 were generated. Approximately 3.0 pounds of VOCs were removed from groundwater by the treatment plant in December. The total mass of VOCs removed since the startup of the system is 11,452 pounds.

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

Note: The Site DP039 bioreactor is currently undergoing an optimization effort to determine the most effective pulse mode duration to optimize distribution of TOC in the subsurface.

LF007C Groundwater Treatment Plant, November 2016 (see Attachment 5)

Subarea LF007C Treatment Plant (LF007CGWTP) performed at 87.33% uptime with approximately 104,895 gallons of groundwater extracted, treated and released to the Duck Pond during the month of November 2016. The average flow rate at the LF007C was 2.9 gpm. Electrical power use was 0 kWh for all the equipment connected to the LF007C plant; and 0 pounds of CO_2 was generated; this system is 100 percent off the power grid. Approximately 1.16×10^{-3} pound of VOCs was removed from the groundwater in November. The total mass of VOCs removed since the startup of the system is 174.36 pounds.

Optimization Activities for LF007CGWTP: No optimization activities are reported for the month of November 2016.

LF007C Groundwater Treatment Plant, December 2016 (see Attachment 5)

Subarea LF007C Treatment Plant (LF007CGWTP) performed at 62.5% uptime with approximately 44,691 gallons of groundwater extracted, treated and released to the Duck Pond during the month of December 2016. The average flow rate at the LF007C was 3.6 gpm. Electrical power use was 0 kWh for all the equipment connected to the LF007C plant, and 0 pounds of CO_2 was generated; this system is 100 percent off the power grid. Approximately 7.60×10^{-4} pound of VOCs was removed from the groundwater in December. The total mass of VOCs removed since the startup of the system is 174.36 pounds.

Optimization Activities for LF007CGWTP: No optimization activities are reported for the month of December 2016.

The LF007C Groundwater Treatment Plant was taken offline as of 11 December 2017, in accordance with the US Fish and Wildlife Service requirements, due to the presence of standing water in the vernal pools.

Ms. Balkissoon asked why acetone is not listed in table 4, but is listed in the GRISR.

Ms. Burke asked why total dissolved solids (TDS) are measured when there isn't any limitation. She also questioned how the uptime for December's GWTP is calculated, and why the restart day is missing in table 1.

Mr. Wray will investigate and report back during next month's RPM meeting.

ST018 Groundwater (MTBE) Treatment Plant, November 2016 (see Attachment 6)

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 100% uptime with approximately 151,385 gallons of groundwater extracted and treated during the month of November 2016. All treated water was discharged to the sanitary sewer. The average flow rate for the ST018 GWTP was 3.7 gpm. Electrical power usage for the month was 91 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 467 pounds. Approximately 0.26 pound of BTEX, MTBE and TPH was removed in November by the treatment plant and approximately 0.06 pound of MTBE was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 40.0 pounds, and the total MTBE mass removed since startup of the system is 9.8 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.

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

ST018 Groundwater (MTBE) Treatment Plant, December 2016 (see Attachment 6)

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 99.9% uptime with approximately 162,380 gallons of groundwater extracted and treated during the month of December 2016. All treated water was discharged to the sanitary sewer. The average flow rate for the ST018 GWTP was 3.4 gpm. Electrical power usage for the month was 96 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 471 pounds. Approximately 0.15 pound of BTEX, MTBE and TPH was removed in December by the treatment plant and approximately 0.04 pound of MTBE was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 40.1 pounds, and the total MTBE mass removed since startup of the system is 9.8 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.

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

Presentation:

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. Updates from the briefing this month included:

Newly Completed Documents: FT005 Technology Demonstration Construction Completion Report; Site CG508 POCO Well Decommissioning and Site Closeout Technical Memorandum.

Newly Completed Fieldwork: Multi-site Bioaugmentation and EVO injection; SD034 Technology Demonstration Bioreactor Installation.

In-Progress Documents (CERCLA): Community Involvement Plan; Site DP039 Remedial Action Construction Completion Report; Site TS060 Removal Action Work Plan; Site LF044 Investigation Work Plan.

In-Progress Documents (POCO): Site FT004 POCO Soil Data Gap Investigation Work Plan; ST028 POCO Well Decommissioning/Site Closeout Technical Memorandum.

In-Progress Fieldwork (CERCLA): None.

In-Progress Fieldwork (POCO): None.

Planned Documents (CERCLA): Multi-site Technology Demonstration Construction Completion Report (January); 2016 Annual CAMU Monitoring Report (March); SD034 Technology Demonstration Construction Completion Report (April); SD033, SD043, SS046 Risk Assessment Tech Memo (April); SS016 Risk Assessment Technical Memorandum (April); 2016 Annual GRISR (TBD); SD031 Background Soil Study Work Plan (TBD).

Planned Documents (POCO): POCO Evaluation/Closeout Report for DERA-funded oil/water separators OW051, OW053 and OW054 (January); Site SS014 POCO Technology Demonstration Construction Completion Report (March); POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW055, and OW057 (March).

Fieldwork Planned (CERCLA): Site LF044 Sediment Sampling (2017); Site TS060 Removal Action (2017); DP039 Installation of Down-gradient Monitoring Wells (2017); SD031 Background Soil Sampling (2017).

Fieldwork Planned (POCO): Site FT004 POCO Soil Data Gap Investigation (2017); OW055 Sidewalk Repairs (2017); OW056 Site Excavation/Closure (2017).

Technology Demonstration Projects:

- SS014: Recycled Drywall SBGR.
  - Evaluate the effectiveness of sulfate (gypsum from crushed drywall) to enhance anaerobic biodegradation of petroleum in groundwater.
  - Installation to be completed November 2016.
  - Too early to evaluate performance data.
- Multisite Bioaugmentation: EVO and KB-1 Plus.
  - Evaluate if addition of bioaugmentation substrate to an EVO injection will increase the rate of CVOC degradation.
  - Injections not complete yet (Nov 2016).

  - Too early to evaluate performance data.
- SD034: Washboard SBGR.
  - Evaluate the effectiveness of an oxygen-enhanced aerobic SBGR on reducing TPH as diesel (TPH-D) in groundwater.
  - Installation to be completed November 2016.
  - Installed six (6) SBGR trenches, In process of evaluating need/constructability of installing the 7th trench.
  - Too early to evaluate performance data.
- 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.
  - Too early to evaluate performance data.
- 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.
  - Too early to evaluate performance data.
- 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.
  - 1,1-DCE (primary COC) concentrations have reduced by 57% (sum of key wells within TD area).
  - Total Molar concentration (sum of CVOCs) has reduced by 49% (sum of key wells within TD area).
  - Recirculation through chimneys has been successful relative to our design assumptions.

4. New Action Item Review

— Mr. Wray will investigate 1) Why acetone is not listed in table 4 of the South Base Boundary GWTP Report, but it is listed in the GRISR. 2) Why is total dissolved solids (TDS) measured when there isn't any discharge limitation. 3) The uptime calculation for December's LF007C GWTP, and the restart date is missing in table 1.

5. PROGRAM/ISSUES/UPDATE

None.

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.	Mike Wray	Mr. Wray will investigate 1) Why acetone is not listed in table 4 of the South Base Boundary GWTP, but it is listed in the GRISR. 2) Why is total dissolved solids (TDS) measured when there isn't any limitation. 3) The uptime calculation for December's LF007C GWTP Monthly Data Sheet, and the restart date is missing in table 1.	15 February 2017	Open

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

The RPM Teleconference is scheduled for 9:30 AM PST on 18 January 2017. **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.

(2017)

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

[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 date in lieu of RAB meeting.

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS	
Life Cycle	**Community Involvement Plan Travis AFB, Glenn Anderson CH2M HILL, Jill Dunphy**
Scoping Meeting	**NA**
Predraft to AF/Service Center	08-23-16
AF/Service Center Comments Due	09-07-16
Draft to Agencies	09-28-16
Draft to RAB	09-28-16
Agency Comments Due	10-28-16 (11-28-16)
Response to Comments Meeting	**01-18-17**
Agency Concurrence with Remedy	NA
Public Comment Period	NA
Public Meeting	**NA**
Response to Comments Due	02-03-17
Draft Final Due	02-03-17
Final Due	03-07-17

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 TS060 Removal Action Work Plan** **Travis AFB, Glenn Anderson** **CH2M HILL, Doug Berwick** **CAPE, Meg Greenwald**	**Site LF044 Investigation Work Plan** **Travis AFB, Glenn Anderson** **CH2M HILL, Doug Berwick** **CAPE, Meg Greenwald**	**Site SS016 Risk Assessment Technical Memorandum** **Travis AFB, Glenn Anderson** **CH2M HILL, Tony Chakurian**	**Sites SD033, SD043, and SS046 Risk Assessment Technical Memorandum** **Travis AFB, Glenn Anderson** **CH2M HILL, Tony Chakurian**
Scoping Meeting	**NA**	**NA**	**NA**	**NA**
Predraft to AF/Service Center	04-14-16	04-26-16	03-28-17	03-30-17
AF/Service Center Comments Due	04-28-16	05-10-16	04-11-17	04-13-17
Draft to Agencies	06-20-16	06-27-16	04-26-17	04-28-17
Draft to RAB	06-20-16	06-27-16	04-26-17	04-28-17
Agency Comments Due	07-27-16	07-28-16	05-26-17	05-30-17
Response to Comments Meeting	**08-17-16**	**08-17-16**	**06-21-17**	**06-21-17**
Response to Comments Due	08-31-16 (02-23-17)	08-31-16 (02-22-17)	07-07-17	07-10-17
Draft Final Due	NA	NA	NA	NA
Final Due	08-31-16 (02-23-17)	08-31-16 (02-22-17)	07-07-17	07-10-17
Public Comment Period	NA	NA	NA	NA
Public Meeting	**NA**	**NA**	**NA**	**NA**

Travis AFB Master Meeting and Document Schedule

SECONDARY POCO DOCUMENTS	
Life Cycle	**Site FT004 POCO Soil Data Gap Investigation Work Plan** **Travis AFB, Glenn Anderson** **CH2M HILL, Doug Berwick** **CAPE, Meg Greenwald**
Scoping Meeting	**NA**
Predraft to AF/Service Center	06-03-16
AF/Service Center Comments Due	06-17-16
Draft to Agencies	07-19-16
Draft to RAB	07-19-16
Agency Comments Due	08-19-16
Response to Comments Meeting	**09-21-16**
Response to Comments Due	10-06-16 (02-28-17)
Draft Final Due	NA
Final Due	10-06-16 (02-28-17)
Public Comment Period	NA
Public Meeting	**NA**

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	**Quarterly Newsletters (January 2017)** **Travis, Glenn Anderson**	**2016 Annual GRISR** **Travis AFB, Glenn Anderson** **CH2M HILL, Leslie Royer**
Scoping Meeting	**NA**	**NA**
Predraft to AF/Service Center	NA	TBD
AF/Service Center Comments Due	NA	TBD
Draft to Agencies	01-10-17	TBD
Draft to RAB	NA	TBD
Agency Comments Due	01-24-17	TBD
Response to Comments Meeting	**TBD**	**TBD**
Response to Comments Due	01-30-17	TBD
Draft Final Due	NA	NA
Final Due	01-30-17	TBD
Public Comment Period	NA	NA
Public Meeting	**NA**	**NA**

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS				
Life Cycle	**Site DP039 Remedial Action Construction Completion Report** **Travis AFB, Glenn Anderson** **CH2M HILL, Levi Pratt**	**Multi-Site Technology Demonstration Construction Completion Report** **Travis AFB, Glenn Anderson** **CH2M HILL, Levi Pratt**	**2016 Annual CAMU Monitoring Report** **Travis AFB, Glenn Anderson** **CH2M HILL, Levi Pratt**	**Site SD034 Technology Demonstration Construction Completion Report** **Travis AFB, Glenn Anderson** **CH2M HILL, Levi Pratt**
Scoping Meeting	**NA**	**NA**	**NA**	**NA**
Predraft to AF/Service Center	08-05-16	12-15-16	02-21-17	03-17-17
AF/Service Center Comments Due	08-19-16	01-13-17	03-07-17	03-31-17
Draft to Agencies	09-30-16	01-27-17	03-22-17	04-14-17
Draft to RAB	09-30-16	01-27-17	03-22-17	04-14-17
Agency Comments Due	10-31-16	02-27-17	04-21-17	05-15-17
Response to Comments Meeting	**11-16-16**	**03-15-17**	**05-17-17**	**05-17-17**
Response to Comments Due	01-27-17	03-29-17	06-01-17	06-02-17
Draft Final Due	NA	TBD	NA	NA
Final Due	01-27-17	03-29-17	06-01-17	06-02-17
Public Comment Period	NA	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 OW051, OW053, and OW054** **Travis AFB, Glenn Anderson** **CH2M HILL, Doug Berwick**	**Site ST028 POCO Well Decommissioning and Site Closeout Technical Memorandum** **Travis AFB, Glenn Anderson** **CH2M HILL, Doug Berwick**	**POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW055, and OW057** **Travis AFB, Glenn Anderson** **CH2M HILL, Doug Berwick**	**Site SS014 POCO Technology Demonstration Construction Completion Report** **Travis AFB, Glenn Anderson** **CH2M HILL, Levi Pratt**
Scoping Meeting	**NA**	**NA**	**NA**	**NA**
Predraft to AF/Service Center	11-07-16	11-11-16	01-31-17	02-24-17
AF/Service Center Comments Due	11-21-16	11-28-16	02-14-17	03-10-17
Draft to Agencies	01-19-17	01-13-17	03-03-17	03-28-17
Draft to RAB	01-19-17	01-13-17	03-03-17	03-28-17
Agency Comments Due	02-21-17	02-13-17	04-03-17	04-27-17
Response to Comments Meeting	**03-15-17**	**02-15-17**	**04-20-17**	**05-17-17**
Response to Comments Due	04-04-17	03-01-17	05-04-17	05-31-17
Draft Final Due	NA	NA	NA	NA
Final Due	04-04-17	03-01-17	05-04-17	05-31-17
Public Comment Period	NA	NA	NA	NA
Public Meeting	**NA**	**NA**	**NA**	**NA**

Travis AFB Master Meeting and Document Schedule

HISTORY - PRIMARY DOCUMENTS	
Life Cycle	**Action Memorandum for Non-Time Critical Removal Action at Site TS060 (Old Skeet Range)** **Travis AFB, Glenn Anderson** **CH2M HILL, Doug Berwick** **CAPE, Meg Greenwald**
Scoping Meeting	**NA**
Predraft to AF/Service Center	03-30-16
AF/Service Center Comments Due	04-13-16
Draft to Agencies	05-16-16
Draft to RAB	05-16-16
Agency Comments Due	06-27-16
Response to Comments Meeting	**07-20-16**
Agency Concurrence with Remedy	NA
Public Comment Period	7-7-16 to 8-7-16
Public Meeting	**NA**
Response to Comments Due	09-01-16 (10-13-16)
Draft Final Due	09-01-16 (10-13-16)
Final Due	10-03-16 (11-14-16)

Travis AFB Master Meeting and Document Schedule

HISTORY – SECONDARY DOCUMENTS	
Life Cycle	**Sites ST028 and ST032 POCO Well Decommissioning Work Plan** **Travis AFB, Glenn Anderson** **CH2M HILL, Doug Berwick** **CAPE, Meg Greenwald**
Scoping Meeting	**NA**
Predraft to AF/Service Center	09-01-16
AF/Service Center Comments Due	09-15-16
Draft to Agencies	09-29-16
Draft to RAB	09-29-16
Agency Comments Due	10-31-16
Response to Comments Meeting	**11-16-16**
Response to Comments Due	11-30-16 (10-21-16)
Draft Final Due	NA
Final Due	11-30-16 (10-21-16)
Public Comment Period	NA
Public Meeting	**NA**

Travis AFB Master Meeting and Document Schedule

HISTORY – INFORMATIONAL DOCUMENTS			
Life Cycle	**Site FT005 Technology Demonstration Construction Completion Report** **Travis AFB, Glenn Anderson** **CH2M HILL, Levi Pratt**	**2015 Annual GRISR** **Travis AFB, Glenn Anderson** **CH2M HILL, Leslie Royer**	**Site CG508 POCO Well Decommissioning and Site Closeout Technical Memorandum** **Travis AFB, Glenn Anderson** **CH2M HILL, Tony Chakurian**
Scoping Meeting	**NA**	**NA**	**NA**
Predraft to AF/Service Center	06-30-16	05-03-16	09-20-16
AF/Service Center Comments Due	07-15-16	06-03-16	10-04-16
Draft to Agencies	08-19-16	07-07-16	10-05-16
Draft to RAB	08-19-16	07-07-16	10-05-16
Agency Comments Due	09-19-16	08-29-16	11-04-16
Response to Comments Meeting	**10-20-16**	**09-21-16**	**11-16-16**
Response to Comments Due	11-03-16	11-09-16	12-01-16 (11-14-16)
Draft Final Due	NA	NA	NA
Final Due	11-03-16	11-09-16	12-01-16 (11-14-16)
Public Comment Period	NA	NA	NA
Public Meeting	**NA**		**NA**

South Base Boundary Groundwater Treatment Plant Monthly Data Sheet

Report Number: 194 **Reporting Period: 13 December 2016 – 4 January 2017** **Date Submitted: 12 January 2017**

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 December 2016 reporting period.

Table 1 – Operations Summary – December 2016

Initial Data Collection:	12/13/2016 08:00	**Final Data Collection:**	1/4/2017 12:00
Operating Time:		Percent Uptime:	
SBBGWTP:	367 hours	**SBBGWTP:**	68.9%
Electrical Power Usage:			
SBBGWTP:	9,883 kWh (7,313 lbs CO_2 generated[a])		
Gallons Treated: **2.0 million gallons**		Gallons Treated Since July 1998: **954 million gallons**	
Volume Discharged to Union Creek: **2.0 million gallons**		Gallons Treat From Other Sources: **0 gallons**	
VOC Mass Removed: **0.55 lbs**[b]		VOC Mass Removed Since July 1998: **482.4 lbs**	
Rolling 12-Month Cost per Pound of Mass Removed: $8,255[c]			
Monthly Cost per Pound of Mass Removed: $47,499[c]			

lbs = pounds

[a] SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG.

[b] Calculated using September 2016 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] – December 2016

FT005[b]				SS029		SS030	
EW01x05	Offline	EW736x05	Offline	EW01x29	1.8	EW01x30	0.1
EW02x05	Offline	EW737x05	Offline	EW02x29	3.3	EW02x30	0.2
EW03x05	Offline	EW742x05	Offline	EW03x29	4.0	EW03x30	7.8
EW731x05	Offline	EW743x05	7.0	EW04x29	7.6	EW04x30	31.5
EW732x05	Offline	EW744x05	Offline	EW05x29	3.2	EW05x30	0.7
EW733x05	Offline	EW745x05	Offline	EW06x29	4.3	EW2174x30	11.2
EW734x05	Offline	EW746x05	Offline	EW07x29	13.1	EW711x30	Offline
EW735x05	7.0	EW2291x05	0.5				
FT005 Total: 14.5				**SS029 Total: 37.3**		**SS030 Total: 51.5**	
SBBGWTP Average Monthly Flow[c]: 91.3 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] 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	15 September 2016	15:15	20 December 2016	09:20	Precautionary measure due to contaminant detection after carbon treatment.

[a] Shutdown and restart times estimated based on field notes
SBBGWTP = South Base Boundary Groundwater Treatment Plant

Summary of O&M Activities

On 15 September 2016, the SBBGWTP was shut down as a precautionary measure because of contaminant detection after the carbon treatment. On 12 December 2016, the carbon was removed from both the lead and lag vessels, including the removal of the calcified carbon. On 13 December 2016, the treatment plant was restarted to collect treatment plant samples. Following the sampling, the system was shut down while awaiting the analytical results.

Analytical data from the 13 December 2016 sampling event are presented in Table 4. The total VOC concentration (33.07 µg/L) in the influent sample has increased from the September 2016 sample results (29.66 µg/L). TCE (30.5 µg/L), cis-1,2-DCE (2.40 µg/L), and 1,2-DCA (0.17 J µg/L) were detected at the influent sampling location. No VOCs were detected at the midpoint sampling location. Chloroform (1.04 µg/L) and bromodichloromethane (0.26 J µg/L) were detected at the effluent sampling location. These contaminants are not typically detected at any point in the SBBGWTP treatment process. The contaminants detected in the effluent sample do not have effluent limitations, and the concentration of bromodichloromethane was less than its trigger value of 0.56 µg/L. Therefore, on 20 December 2016, the SBBGWTP was brought back online.

On 21 December at Site SS029, EW01x29 and EW02x29 were found to be fouled with manganese oxide. EW02x29 was cleaned, re-assembled, and restarted without issue. EW01x29 was kept off line so it could be more thoroughly cleaned. EW01x29 will be brought back on line in January 2017.

On 30 December, as part of the Site FT005 technology demonstration, troubleshooting was performed on several Site FT005 wells, as follows:

- EW734x05 – Pump was fouled with iron oxide. Pump needs to be placed and well is recommended for redevelopment.
- EW743x05 – Pump is too large for well. The flow rate needs to be decreased.
- EW744x05 – Pump was cycling rapidly, so the pump was taken off line to determine the cause.
- EW745x05 – The breaker continues to be tripped, so the pump was left offline to determine the cause.

Troubleshooting activities for these four (4) wells will continue in January 2017.

Figure 1 presents a plot of influent concentrations and average flow at the SBBGWTP over the past twelve (12) months. An overall decrease in the VOC influent concentration has been observed in the past twelve months; however, a slight overall increase in the flow rate has also been observed.

Optimization Activities

No optimization activities occurred at the SBBGWTP in December 2016.

Sustainability

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

Figure 2 presents the historical GHG production from the SBBGWTP. The SBBGWTP produced approximately 7,313 pounds of GHG between October and December 2016.

TABLE 4
Summary of Groundwater Analytical Data For December 2016 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	13 December 2016 (µg/L)		
				Influent	Midpoint	Effluent
Halogenated Volatile Organics						
Bromodichloromethane	NA	0.15	0	ND	ND	0.26 J
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND
Chloroform	5.0	0.15	0	ND	ND	1.04
Chloromethane	NA	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	0.17 J	ND	ND
1,1-Dichloroethene	5.0	0.15	0	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	2.4	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND
Trichloroethene	5.0	0.15	0	30.5	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 Suspended Solids (mg/L)	NA	0.6	0	3.0 J	NM	NM
Total Dissolved Solids (mg/L)	NA	4.2	0	NM	NM	1,430
Total Petroleum Hydrocarbons – Gasoline	50	30	0	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24	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 Total VOC Influent Concentrations and Average Flowrate Twelve Month History

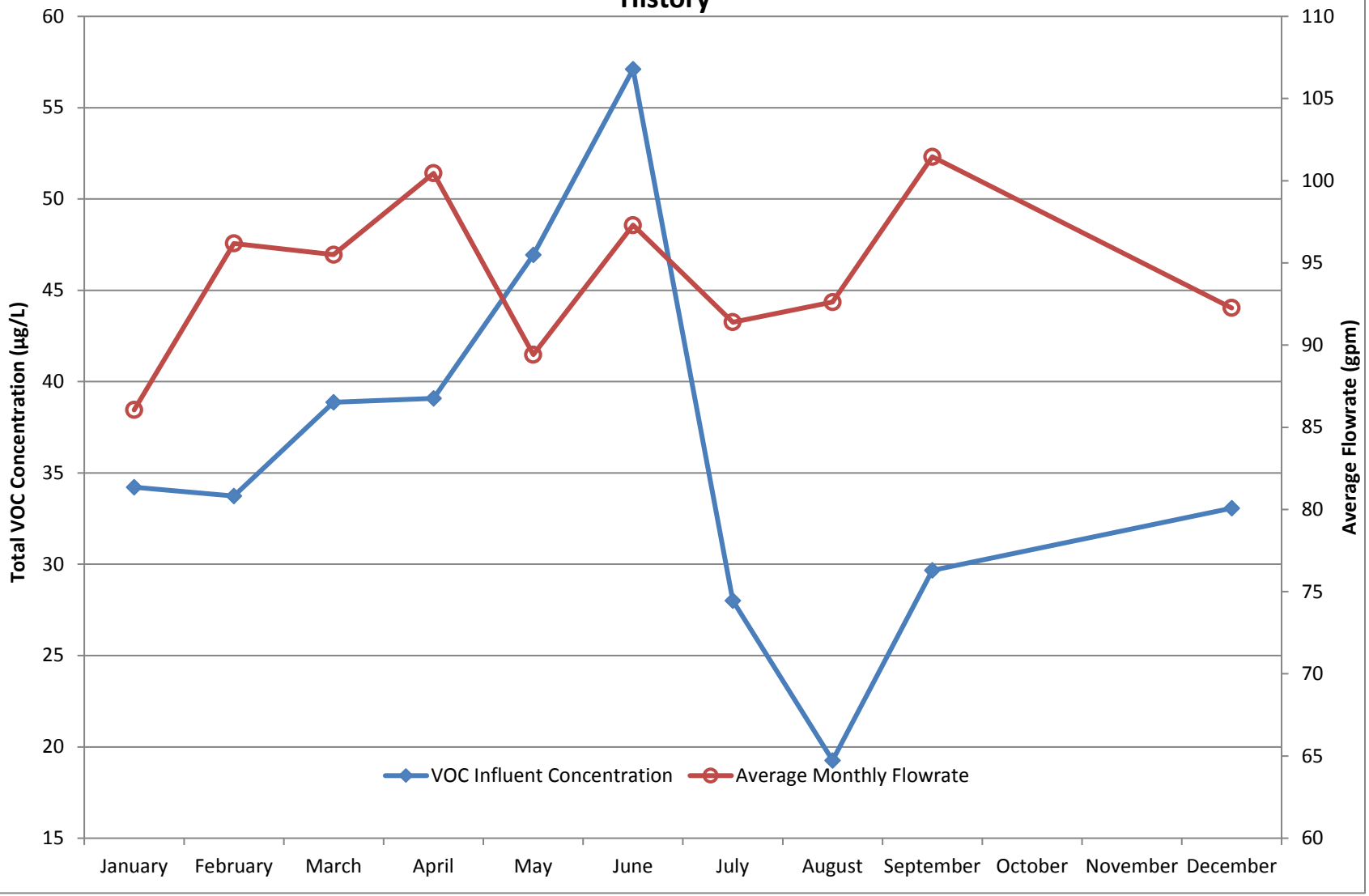
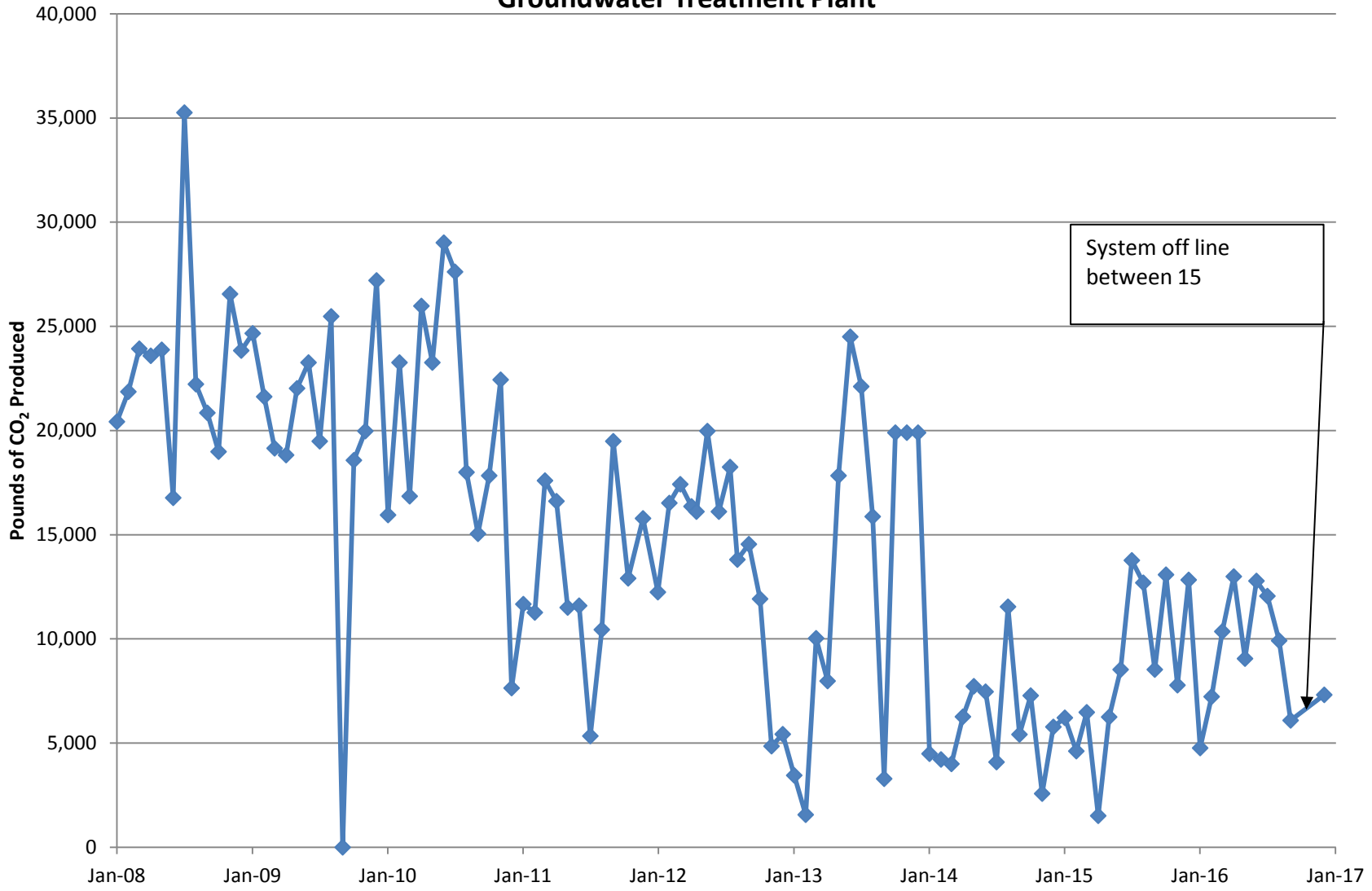


Figure 2

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



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 208 **Reporting Period: 4 November 2016 – 2 December 2016** **Date Submitted: 14 December 2016**

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

System Metrics

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

Table 1 – Operations Summary – November 2016

Initial Data Collection:	11/4/2016 08:50	**Final Data Collection:**	12/2/2016 09:25		
Operating Time:		Percent Uptime:		Electrical Power Usage:	
CGWTP:	673.5 hours	**CGWTP:**	100%	**CGWTP:**	2,340 kWh (2,620 lbs CO_2 generated[a])
Gallons Treated (discharge to storm sewer): **1,419,000 gallons**		Gallons Treated Since January 1996: **533.5 million gallons**			
VOC Mass Removed from groundwater:		VOC Mass Removed Since January 1996:			
2.43 lbs[b]		**2,763 lbs from groundwater**			
		8,686 lbs from vapor			
Rolling 12-Month Cost per Pound of Mass Removed: $2,403[c]					
Monthly Cost per Pound of Mass Removed: $1,723[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.
[b] Calculated using November 2016 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] – November 2016

Location	Average Flow Rate Groundwater (gpm)
EW001x16	15.1
EW002x16	7.8
EW003x16	0.1
EW605x16	6.7
EW610x16	3.2
CGWTP	35.1

[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.	--	None.

-- = Time not recorded
[a] Shutdown and restart times estimated based on field notes
CGWTP = Central Groundwater Treatment Plant

Summary of O&M Activities

Monthly groundwater samples were collected at the CGWTP on 7 November 2016. Sample results are presented in Table 4. The total VOC concentration (218.80 µg/L) in the November 2016 influent sample has decreased from the October 2016 sample (245.54 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 171 µg/L. Cis-1,2-DCE and vinyl chloride were detected at low concentrations in the sample collected after the first carbon vessel, and vinyl chloride was detected in the sample collected after second carbon vessel. No VOC constituents were detected in the system effluent sample. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in November 2016.

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 concentration has displayed an increasing trend over the past year. The overall flow rate through the treatment plant has also increased over the past 12 months.

The Site DP039 subgrade biogeochemical reactor (SBGR), also known as a bioreactor, continued to operate in a "pulsed mode" in an effort to optimize distribution of total organic carbon (TOC). During this optimization effort, the pulsed mode operation will consist of three (3) different time scales: one week, two week, and three week pulsed modes. Samples will be collected after each round of pulsed mode operation. This will help determine which duration of each pulsed mode cycle of the bioreactor is most effective.

On 2 November, the DP039 bioreactor was taken off line and remained offline until 29 November. On 29 November, the bioreactor began the two-week operational cycle for six (6) weeks (two weeks on, two weeks off, two weeks on). Samples will be collected after the six-week test in January 2017.

Optimization Activities

No optimization activities occurred at the CGWTP in November 2016. As discussed above, the Site DP039 bioreactor is currently undergoing an optimization effort to determine the most effective pulse mode duration to optimize distribution of TOC in the subsurface.

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 2,620 pounds of GHG during November 2016. This is a decrease from the October 2016 amount of 2,997 pounds.

TABLE 4
Summary of Groundwater Analytical Data for November 2016 – Central Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	7 November 2016 (µg/L)			
				Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent
Halogenated Volatile Organics							
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND	ND
Chloroform	5.0	0.15	0	ND	ND	ND	ND
Chloromethane	NA	0.15	0	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	42.9	1.98	ND	ND
1,2-Dichlorobenzene	5.0	0.15	0	0.51	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	0.61	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	0.31 J	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.15	0	0.49 J	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND	ND
Methyl tert-Butyl Ether	1.0	0.15	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	0.54	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	2.20	ND	ND	ND
Trichloroethene	5.0	0.15 – 1.5	0	171	ND	ND	ND
Vinyl Chloride	0.5	0.15	0	0.24 J	0.23 J	0.29 J	ND
Non-Halogenated Volatile Organics							
Benzene	1.0	0.15	0	ND	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND	ND
Total Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND	ND
Other							
Total Suspended Solids (mg/L)	NA	0.6	0	1.8 J	NM	NM	NM
1,4-Dioxane	NA	0.081	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Gasoline	50	35	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24.1	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	50 (trigger)	24.1	0	NM	NM	NM	ND

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

Notes:

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

NA = not applicable

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

ND = not detected

NM = not measured

µg/L = micrograms per liter

mg/L = milligrams per liter

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

Table 5 – Summary of DP039 Bioreactor "Pulsed Mode" Operations

Location	Pulse-on Date	Pulse-off Date
MW750x39	23 October 2015	6 November 2015
	20 November 2015	8 December 2015
	21 December 2015	31 December 2015
	15 January 2016	1 February 2016
	12 February 2016	26 February 2016
	11 March 2016	28 March 2016
	8 April 2016	22 April 2016
	4 May 2016	13 May 2016
	27 May 2016	17 June 2016
	1 July 2016	19 July 2016
	2 August 2016	12 August 2016
	26 August 2016	8 September 2016
	10 October 2016	17 October 2016
	25 October 2016	2 November 2016
	29 November 2016	

MW = Monitoring Well

Figure 1

CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

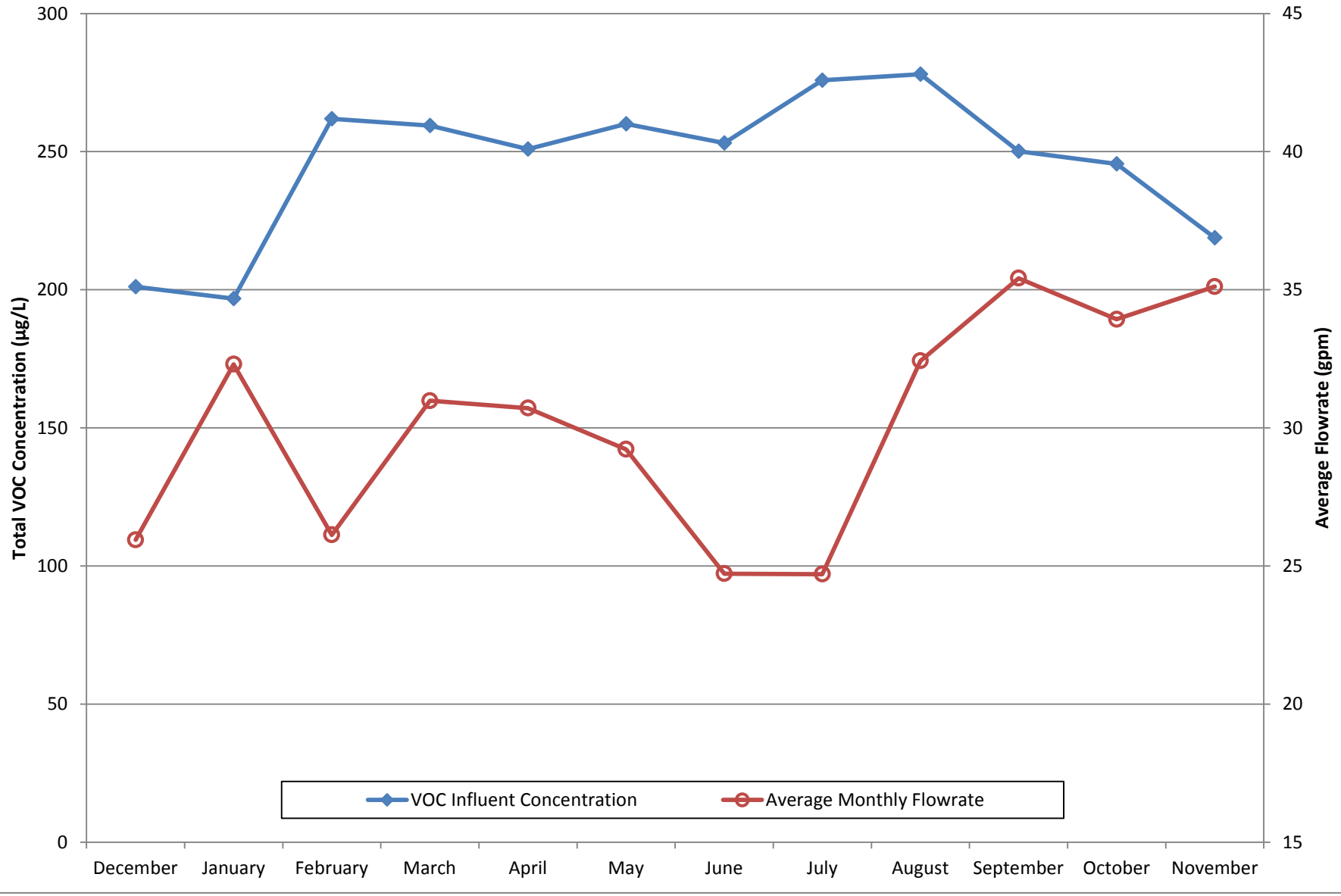
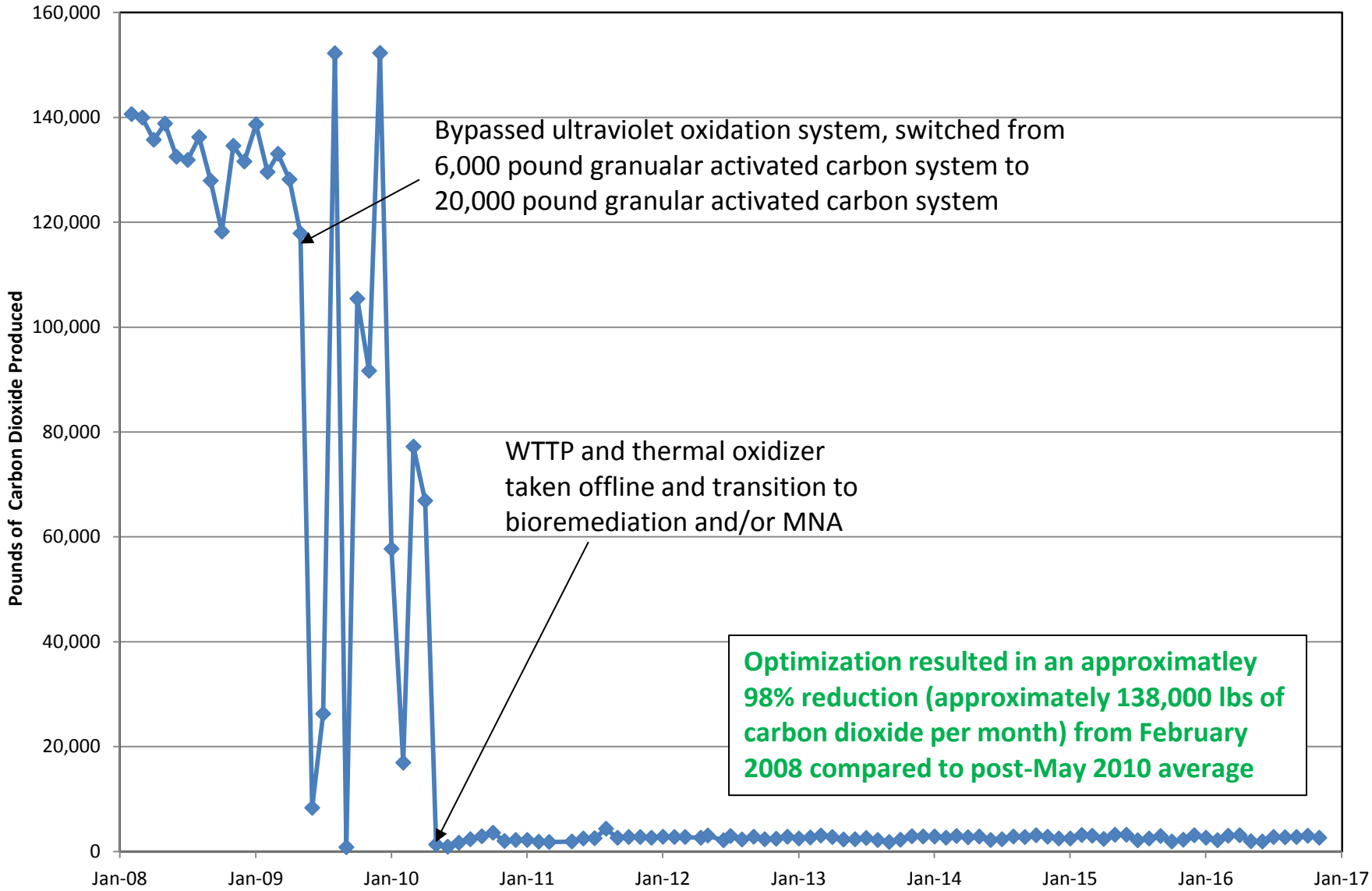


Figure 2

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



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 209 **Reporting Period: 2 December 2016 – 3 January 2017** **Date Submitted: 12 January 2017**

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 December 2016 reporting period.

Table 1 – Operations Summary – December 2016

Initial Data Collection:	12/2/2016 09:25	**Final Data Collection:**	1/3/2017 11:00		
Operating Time:		Percent Uptime:		Electrical Power Usage:	
CGWTP:	769.6 hours	**CGWTP:**	100%	**CGWTP:**	2,721 kWh (2,902 lbs CO_2 generated[a])

Gallons Treated (discharge to storm sewer): **1,620,650 gallons**

Gallons Treated Since January 1996: **535.1 million gallons**

VOC Mass Removed from groundwater: **3.00 lbs**[b]

VOC Mass Removed Since January 1996:

2,766 lbs from groundwater

8,686 lbs from vapor

Rolling 12-Month Cost per Pound of Mass Removed: $2,409[c]

Monthly Cost per Pound of Mass Removed: $2,120[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.
[b] Calculated using December 2016 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] – December 2016

Location	Average Flow Rate Groundwater (gpm)
EW001x16	14.8
EW002x16	8.5
EW003x16	0.1
EW605x16	6.7
EW610x16	2.9
CGWTP	35.0

[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.	--	None.

-- = Time not recorded
[a] Shutdown and restart times estimated based on field notes
CGWTP = Central Groundwater Treatment Plant

Summary of O&M Activities

Monthly groundwater samples were collected at the CGWTP on 7 December 2016. Sample results are presented in Table 4. The total VOC concentration (247.75 µg/L) in the December 2016 influent sample has increased from the November 2016 sample (218.80 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 190 µg/L. Cis-1,2-DCE (3.32 µg/L) was detected in the sample collected after the first carbon vessel, and vinyl chloride (0.21 J µg/L) was detected in the sample collected after the second carbon vessel. No VOC constituents were detected in the system effluent sample. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in December 2016.

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 concentration has displayed a slightly increasing trend over the past year. The overall flow rate through the treatment plant has also increased over the past 12 months.

The Site DP039 subgrade biogeochemical reactor (SBGR), also known as a bioreactor, continued to operate in a "pulsed mode" in an effort to optimize distribution of total organic carbon (TOC). During this optimization effort, the pulsed mode operation will consist of three (3) different time scales: one week, two week, and three week pulsed modes. Samples will be collected after each round of pulsed mode operation. This will help determine which duration of each pulsed mode cycle of the bioreactor is most effective.

On 29 November, the bioreactor began the two-week operational cycle for six (6) weeks (two weeks on, two weeks off, two weeks on). The bioreactor was taken off line on 13 December and brought back on line on 27 December. Samples will be collected after the six-week test in January 2017.

Optimization Activities

No optimization activities occurred at the CGWTP in December 2016. As discussed above, the Site DP039 bioreactor is currently undergoing an optimization effort to determine the most effective pulse mode duration to optimize distribution of TOC in the subsurface.

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 2,902 pounds of GHG during December 2016. This is an increase from the November 2016 amount of 2,620 pounds.

TABLE 4
Summary of Groundwater Analytical Data for December 2016 – Central Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	7 December 2016 (µg/L)			
				Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent
Halogenated Volatile Organics							
Carbon Tetrachloride	0.5	0.15	0	ND	ND	ND	ND
Chloroform	5.0	0.15	0	ND	ND	ND	ND
Chloromethane	NA	0.15	0	0.48 J	ND	ND	ND
cis-1,2-Dichloroethene	5.0	0.15	0	51.3	3.32	ND	ND
1,2-Dichlorobenzene	5.0	0.15	0	0.64	ND	ND	ND
1,3-Dichlorobenzene	5.0	0.15	0	0.80	ND	ND	ND
1,4-Dichlorobenzene	5.0	0.15	0	0.35 J	ND	ND	ND
1,1-Dichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.15	0	ND	ND	ND	ND
1,1-Dichloroethene	5.0	0.15	0	0.57	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND	ND
Methyl tert-Butyl Ether	1.0	0.15	0	ND	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	0.60	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	2.79	ND	ND	ND
Trichloroethene	5.0	0.15 – 1.5	0	190	ND	ND	ND
Vinyl Chloride	0.5	0.15	0	0.22 J	ND	0.21 J	ND
Non-Halogenated Volatile Organics							
Benzene	1.0	0.15	0	ND	ND	ND	ND
Ethylbenzene	5.0	0.15	0	ND	ND	ND	ND
Toluene	5.0	0.15	0	ND	ND	ND	ND
Total Xylenes	5.0	0.15 – 0.30	0	ND	ND	ND	ND
Other							
Total Suspended Solids (mg/L)	NA	0.6	0	ND	NM	NM	NM
Total Dissolved Solids (mg/L)	NA	4.2	0	NM	NM	NM	816
Total Petroleum Hydrocarbons – Gasoline	50	35	0	99.3 J	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	24.1	0	ND	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	50 (trigger)	24.1	0	ND	NM	NM	ND

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

Notes:

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

NA = not applicable

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

ND = not detected

NM = not measured

µg/L = micrograms per liter

mg/L = milligrams per liter

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

Table 5 – Summary of DP039 Bioreactor "Pulsed Mode" Operations

Location	Pulse-on Date	Pulse-off Date
MW750x39	21 December 2015	31 December 2015
	15 January 2016	1 February 2016
	12 February 2016	26 February 2016
	11 March 2016	28 March 2016
	8 April 2016	22 April 2016
	4 May 2016	13 May 2016
	27 May 2016	17 June 2016
	1 July 2016	19 July 2016
	2 August 2016	12 August 2016
	26 August 2016	8 September 2016
	10 October 2016	17 October 2016
	25 October 2016	2 November 2016
	29 November 2016	13 December 2016
	27 December 2016	

MW = Monitoring Well

Figure 1

CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

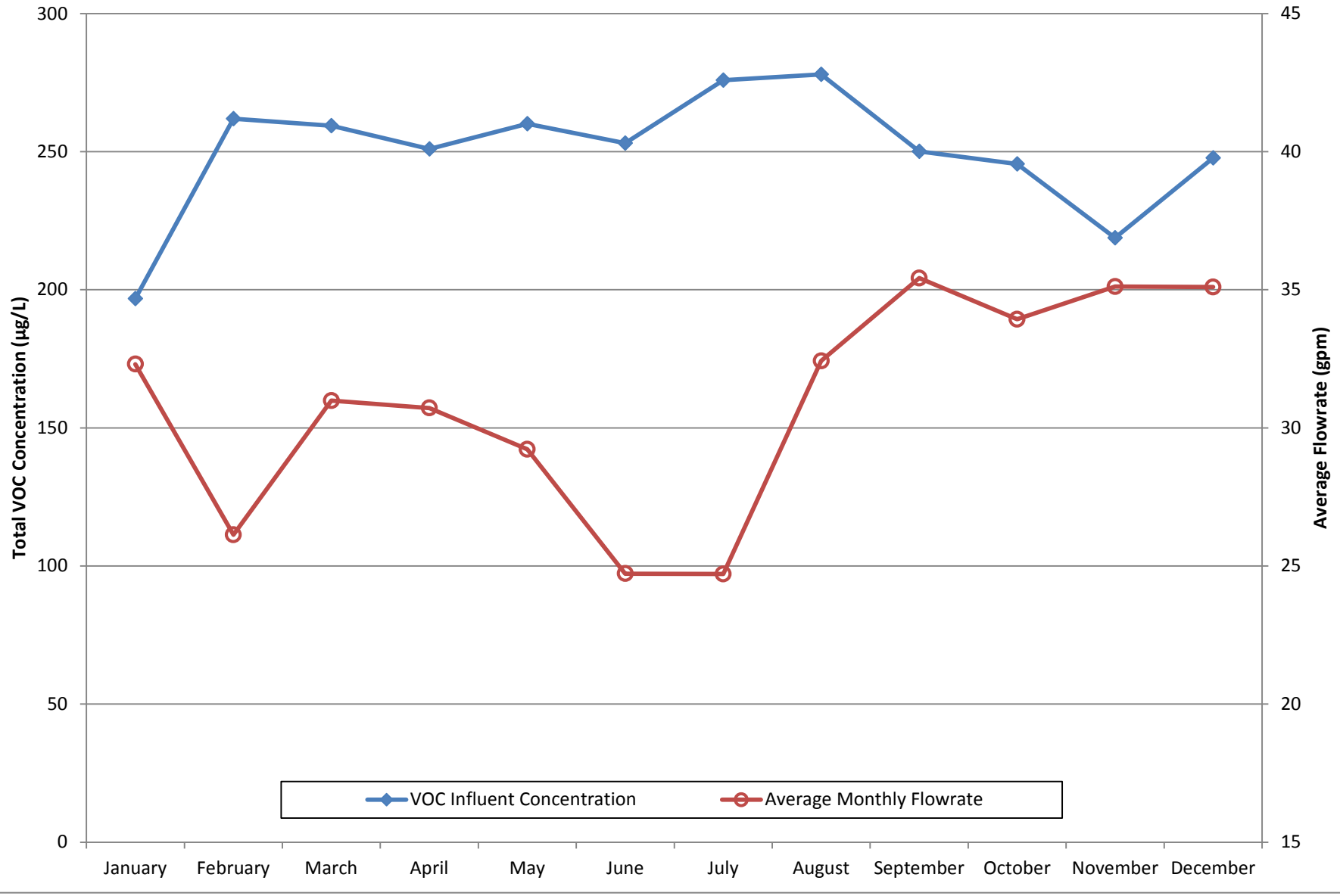
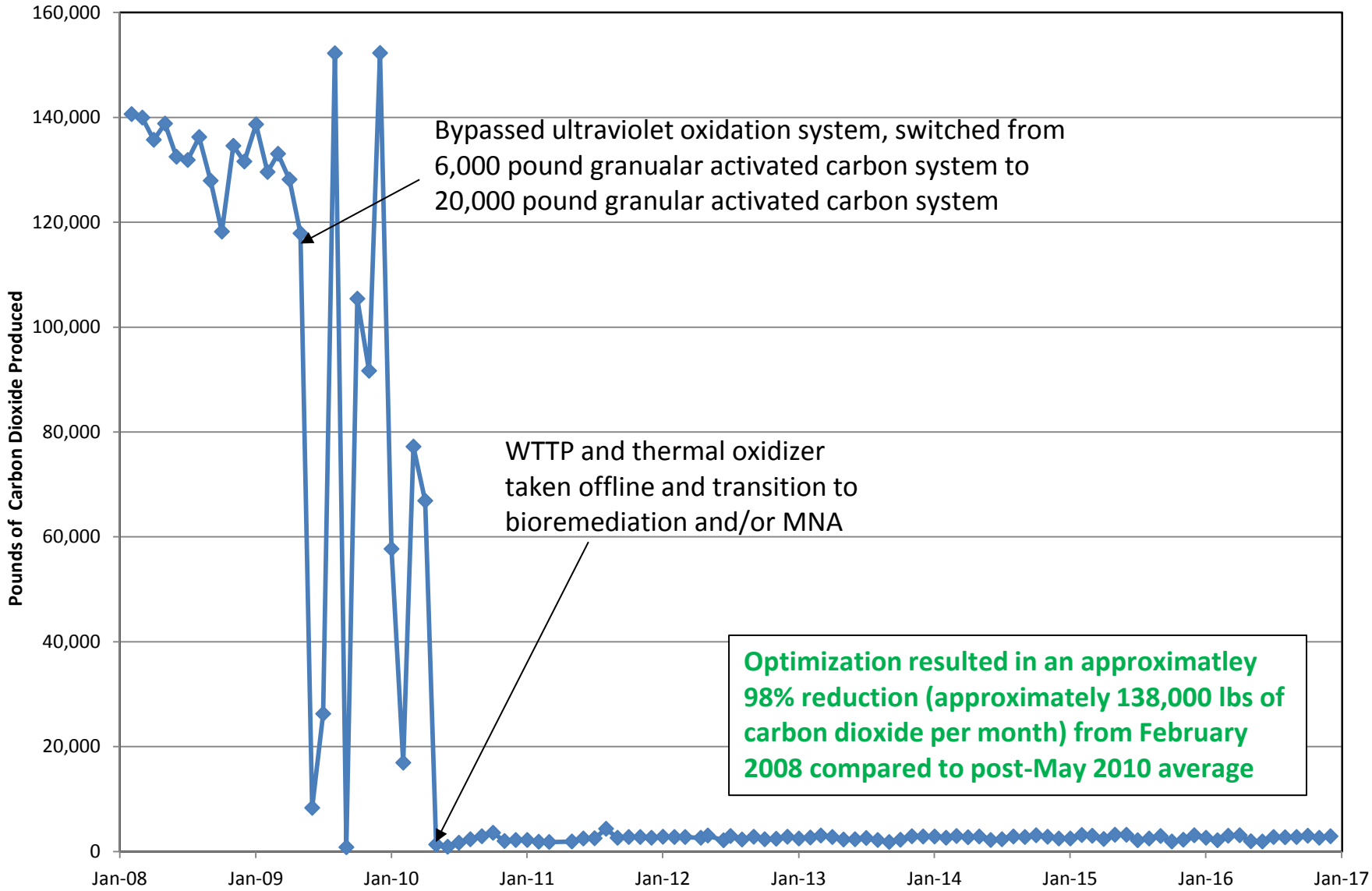


Figure 2

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



Subarea LF007C Groundwater Treatment Plant Monthly Data Sheet

Report Number: 157 **Reporting Period: 4 November 2016 – 2 December 2016** **Date Submitted: 14 December 2016**

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 November 2016 reporting period:

Table 1 – Operations Summary – November 2016

Initial Data Collection:	11/4/2016 10:45		**Final Data Collection:**	12/2/2016 13:10	
Operating Time:		Percent Uptime:		Electrical Power Usage[a]:	
LF007C GWTP:	589 hours	**LF007C GWTP**	87.33%	**LF007C GWTP:**	0 kWh
Gallons Treated: **104,895 gallons**				Gallons Treated Since March 2000: **85.8 million gallons**	
Volume Discharged to Duck Pond: **104,895 gallons**					
VOC Mass Removed: **1.16 x 10^{-3} pounds[b]**				VOC Mass Removed Since March 2000: **174.36 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 November 2016 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 – November 2016

Location	Average Flow Rate (gpm)[a]	Total Gallons Processed (gallons)
EW614x07	2.5	88,535
EW615x07	0.4	15,782
LF007C GWTP	**2.9**	**104,895**

[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	19 November 2016	12:40	22 November 2016	15:00	Treatment pad flooded with rainwater.
LF007C GWTP	28 November 2016	03:55	28 November 2016	15:15	Treatment pad flooded with rainwater.

-- = 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

Analytical data from the 7 November 2016 sampling event are presented in Table 4. TCE was detected at the influent sample location at a concentration of 1.33 µg/L. No VOCs were detected at the midpoint or effluent sampling locations. Analytical data continue to indicate effective treatment of the influent process stream.

Figure 1 presents a chart of influent concentrations (total VOCs) at the LF007C GWTP versus time for the past twelve months. VOC concentrations, primarily TCE, have generally continued to decrease over the last twelve months. The average flow rate through the LF007C GWTP in November 2016 (2.97 gpm) increased from the flow rate measured in October 2016 (1.92 gpm). However, since the system was restarted in May 2016, the overall flow rate has decreased, which may be a result of a prolonged period of dry weather, and repeated flooding of the treatment plant compound.

In November 2016, the LF007C GWTP system was shut down for a total of approximately 3.5 days because the treatment pad sump flooded with rainwater on two (2) occasions. The rainwater was pumped out of the pad and sump, and the system was restarted without issue.

Optimization Activities

No optimization activities occurred at the LF007C GWTP in November 2016.

Sustainability

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

TABLE 4
Summary of Groundwater Analytical Data For November 2016 – Subarea LF007C Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	7 November 2016 (µg/L)		
				Influent	After Carbon 1	Effluent
Halogenated Volatile Organics						
Bromodichloromethane	5.0	0.15	0	ND	ND	ND
Bromoform	5.0	0.15	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	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
2-Hexanone	NA	0.50	0	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND
Trichloroethene	5.0	0.15	0	1.33	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 Suspended Solids (mg/L)	NA	0.6	0	18.2	NM	NM
Total Petroleum Hydrocarbons – Gasoline	50	35	0	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	23.9	0	ND	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	100	23.9	0	ND	NM	ND

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

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

LF007CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

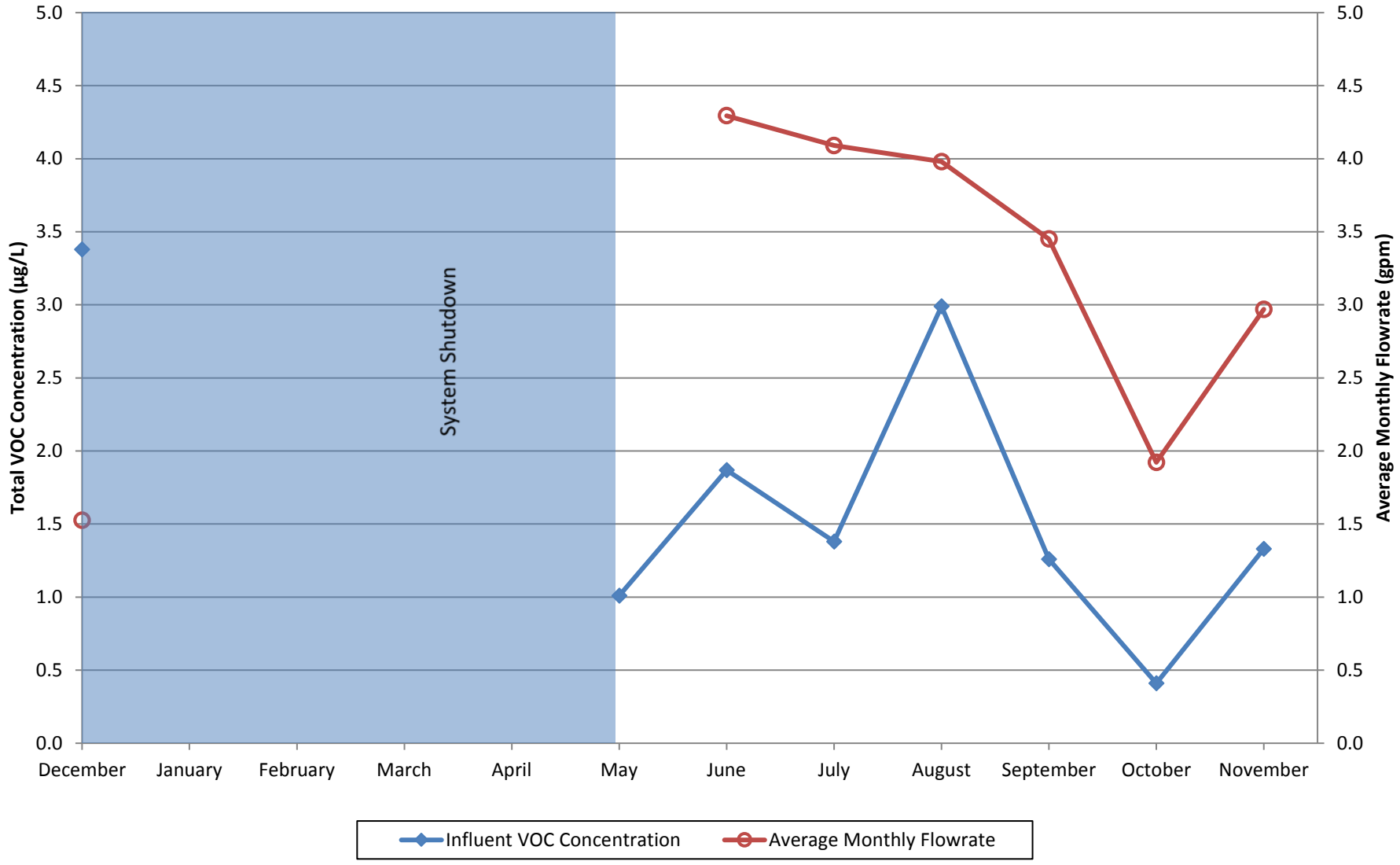
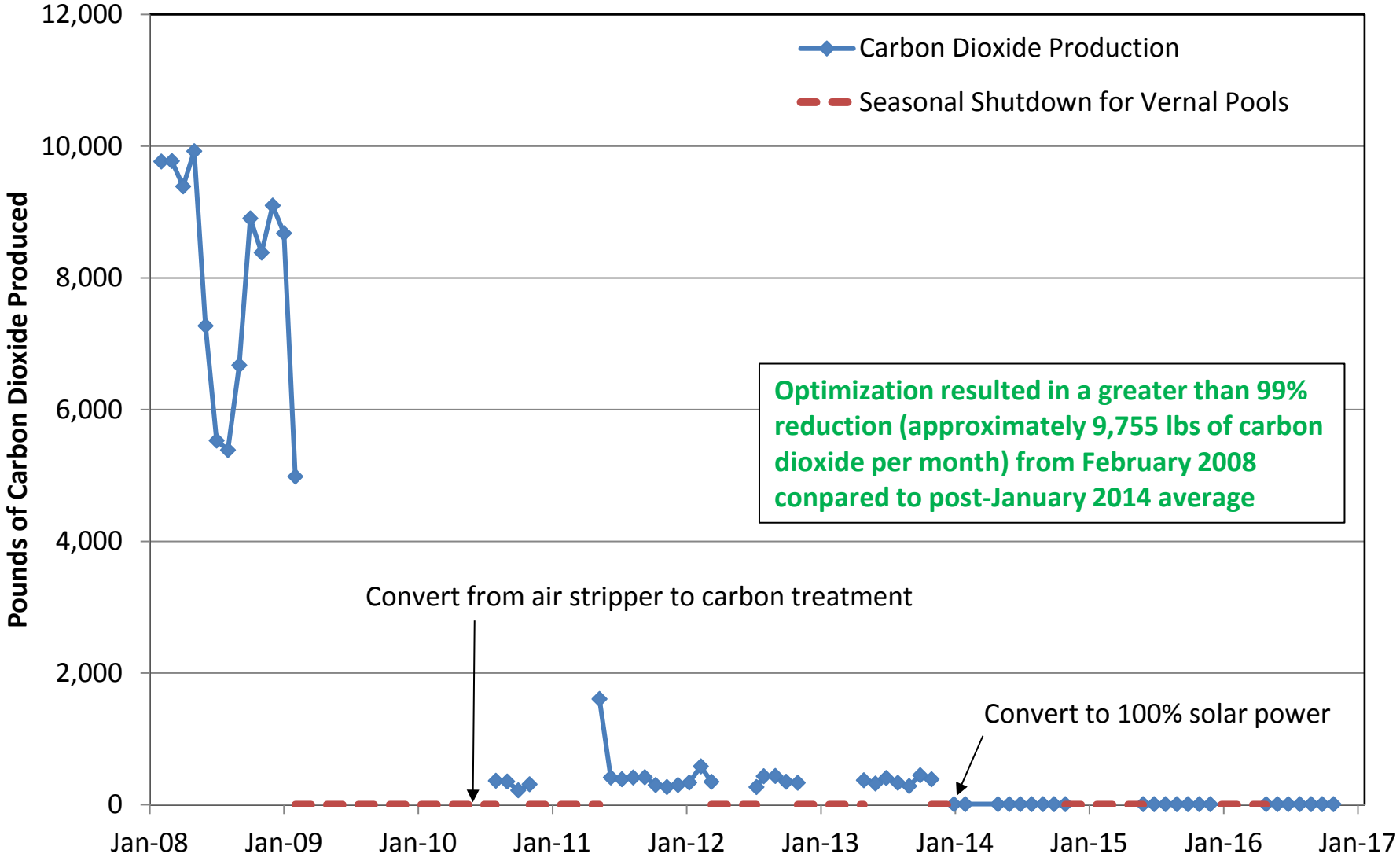


Figure 2

Equivalent Pounds of Carbon Dioxide Produced by the NGWTP/LF007C Groundwater Treatment Plant



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

Subarea LF007C Groundwater Treatment Plant Monthly Data Sheet

Report Number: 158 **Reporting Period: 2 December 2016 – 16 December 2016** **Date Submitted: 12 January 2017**

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 December 2016 reporting period:

Table 1 – Operations Summary – December 2016

Initial Data Collection:	12/2/2016 13:10			**Final Data Collection:**	12/16/2016 08:45
Operating Time:		Percent Uptime:		Electrical Power Usage[a]:	
LF007C GWTP:	207 hours	**LF007C GWTP**	62.5%[b]	**LF007C GWTP:**	0 kWh
Gallons Treated: **44,691 gallons**				Gallons Treated Since March 2000: **85.8 million gallons**	
Volume Discharged to Duck Pond: **44,691 gallons**					
VOC Mass Removed: **7.60×10^{-4} pounds**[c]				VOC Mass Removed Since March 2000: **174.36 pounds (Groundwater)**	
Rolling 12-Month Cost per Pound of Mass Removed: **Not Measured**[d]					
Monthly Cost per Pound of Mass Removed: **Not Measured**[d]					

[a] The LF007C GWTP operates on solar power only.
[b] The system ran 62.5% of the available time between 2 and 16 December (when the system was taken off line due to vernal pool formation).
[c] VOCs from December 2016 influent sample detected by EPA Method SW8260C.
[d] 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 – December 2016

Location	Average Flow Rate (gpm)[a]	Total Gallons Processed (gallons)
EW614x07	3.3	41,217
EW615x07	0.3	3,474
LF007C GWTP	**3.6**	**44,691**

[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	11 December 2016	04:10			Treatment pad flooded with rainwater. System shutdown was discovered on 16 December 2016, and the hour meter was used to back calculate the time and date of system shutdown.
LF007C GWTP	16 December 2016				The system had been off line since 11 December 2016 (see above), and was not restarted on 16 December 2016 because vernal pools had formed at Subarea LF007C.

-- = 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

Analytical data from the 7 December 2016 sampling event are presented in Table 4. TCE and cis-1,2-DCE were detected at the influent sample location at concentrations of 1.86 µg/L and 0.18 J µg/L, respectively. No VOCs were detected at the midpoint or effluent sampling locations. Analytical data continue to indicate effective treatment of the influent process stream.

Figure 1 presents a chart of influent concentrations (total VOCs) at the LF007C GWTP versus time for the past twelve months. VOC concentrations, primarily TCE, have been seasonally variable; however, over the last twelve months the trend has been flat. The average flow rate through the LF007C GWTP in December 2016 (3.59 gpm) increased from the flow rate measured in November 2016 (2.97 gpm). However, since the system was restarted in May 2016, the overall flow rate has decreased, which may be a result of a prolonged period of dry weather, and repeated flooding of the treatment plant compound.

The LF007C GWTP was shut down on 11 December 2016 because the treatment pad sump flooded with rainwater. The LF007C GWTP was taken off line on 16 December 2016 when vernal pools formed at Subarea LF007C. The system will be restarted in spring/summer 2017 once the vernal pools have dissipated.

Optimization Activities

No optimization activities occurred at the LF007C GWTP in December 2016.

Sustainability

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

TABLE 4
Summary of Groundwater Analytical Data For December 2016 – Subarea LF007C Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	7 December 2016 (µg/L)		
				Influent	After Carbon 1	Effluent
Halogenated Volatile Organics						
Bromodichloromethane	5.0	0.15	0	ND	ND	ND
Bromoform	5.0	0.15	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	0.18 J	ND	ND
trans-1,2-Dichloroethene	5.0	0.15	0	ND	ND	ND
2-Hexanone	NA	0.50	0	ND	ND	ND
Methylene Chloride	5.0	0.15	0	ND	ND	ND
Tetrachloroethene	5.0	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	5.0	0.15	0	ND	ND	ND
1,1,2-Trichloroethane	5.0	0.15	0	ND	ND	ND
Trichloroethene	5.0	0.15	0	1.86	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 Suspended Solids (mg/L)	NA	0.6	0	1.2 J	NM	NM
Total Dissolved Solids (mg/L)	NA	4.2	0	NM	NM	2,130
Total Petroleum Hydrocarbons – Gasoline	50	35	0	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	23.9	0	ND	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	100	23.9	0	ND	NM	ND

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

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

LF007CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

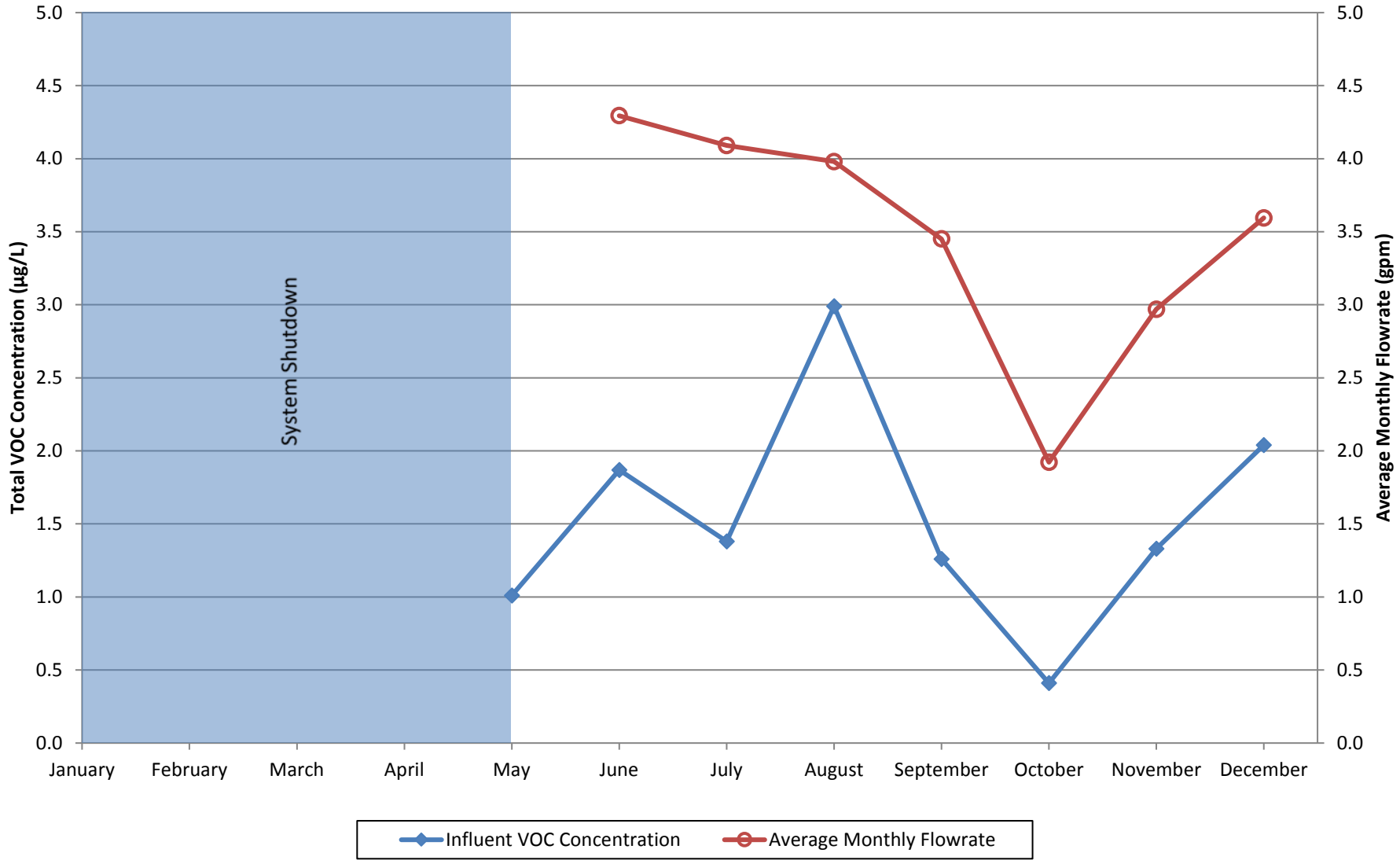
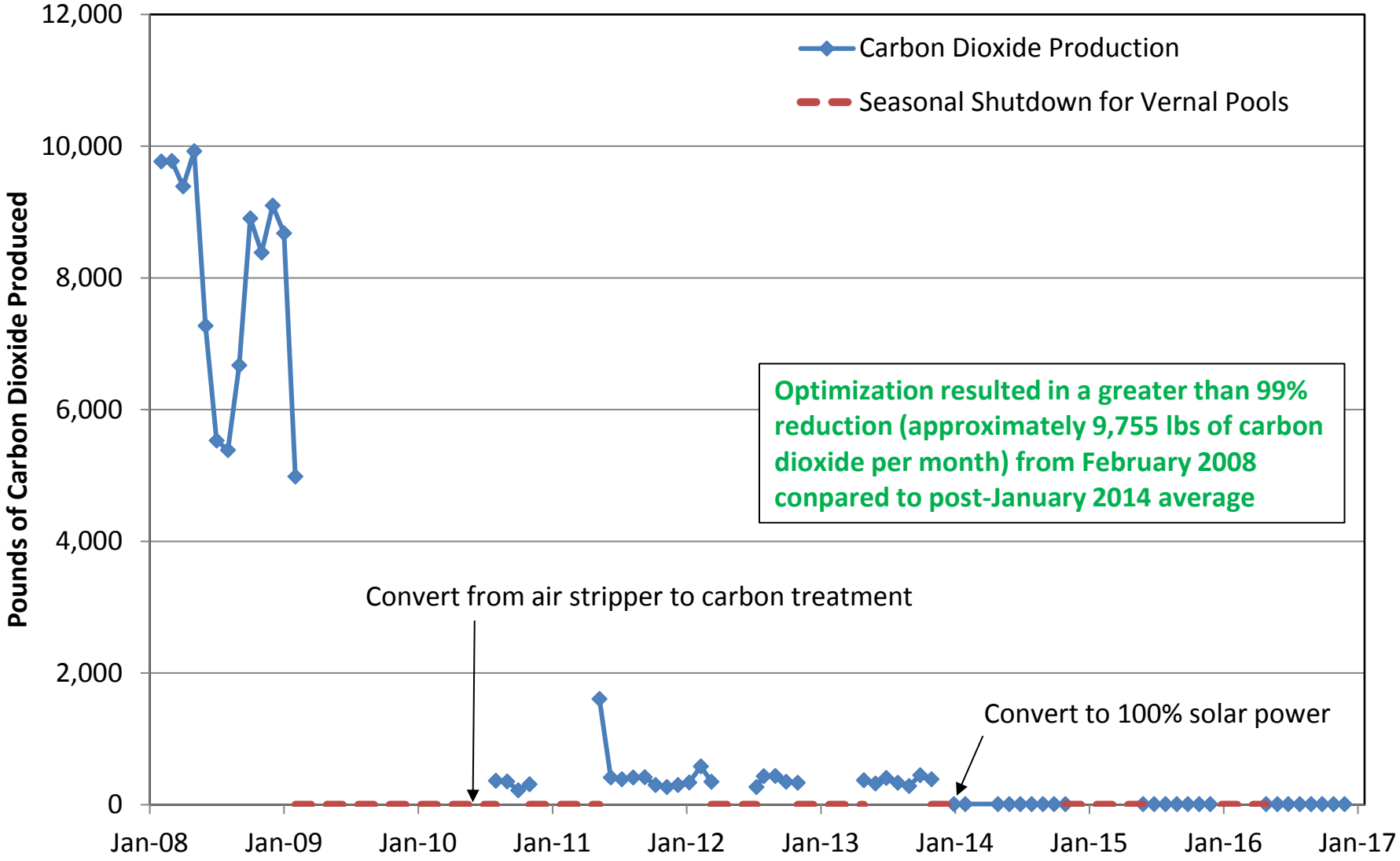


Figure 2

Equivalent Pounds of Carbon Dioxide Produced by the NGWTP/LF007C Groundwater Treatment Plant



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: 069 **Reporting Period: 4 November 2016 – 2 December 2016** **Date Submitted: 14 December 2016**

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

System Metrics

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

Table 1 – Operations Summary – November 2016

Initial Data Collection:	11/4/2016 9:20	**Final Data Collection:**	12/2/2016 13:30
Operating Time:		Percent Uptime:	Electrical Power Usage:
ST018GWTP: 677 hours		**ST018GWTP:** 100%	**ST018GWTP:** 91 kWh (467 lbs CO_2 generated[a])
Gallons Treated: **151,385 gallons**		Gallons Treated Since March 2011: **11.3 million gallons**	
Volume Discharged to Sanitary Sewer: **151,385 gallons**		Final Totalizer Reading: **11,299,599 gallons**	
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: **4,803,425 gallons**			
MTBE, BTEX, VOC, TPH Mass Removed: **0.26 lbs**[b]		MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: **40.0 lbs**	
MTBE (Only) Removed: **0.06 lbs**[b]		MTBE (Only) Mass Removed Since March 2011: **9.8 lbs**	
Rolling 12-Month Cost per Total Pounds of Mass Removed: $10,813[bc]			
Monthly Cost per Pound of Mass Removed: $15,263[bc]			

[a] SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 400 pounds of GHG from GAC change out.
[b] Calculated using November 2016 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 – November 2016

Location	Average Flow Rate Groundwater (gpm)[a]	Hours of Operation
EW2014x18	0.6	677
EW2016x18	0.8	677
EW2019x18	0.8	677
EW2333x18	1.0	677
Site ST018 GWTP	3.7	677

[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 7 November 2016. Results are presented in Table 4. The complete November 2016 laboratory data report is available upon request. The influent concentration for MTBE during the November 2016 sampling event was 47.5 µg/L, which is a decrease from the October 2016 sample result of 51.0 µg/L. TPH-g (85.0 J µg/L), TPH-d (46.8 J µg/L), TPH-mo (31.5 J µg/L), benzene (0.18 J µg/L), and 1,2-DCA (0.77 µg/L) were also detected in the influent sample. No TPH constituents were detected after the first carbon vessel sampling location. MTBE was detected after the second carbon vessel sampling location and in the system effluent sampling location at concentrations of 0.24 J µg/L and 2.03 µg/L, respectively. All detected concentrations of TPH are well below the Fairfield-Suisun Sewer District effluent limitation of 50,000 µg/L, 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 and evaluate the condition of the carbon filter beds.

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 seasonally variable with an increasing trend between January 2016 and April 2016 and a steady decreasing trend since April 2016. The total influent concentrations have varied considerably throughout the past twelve months, which is due primarily to the TPH-g

concentrations. Since May 2016, however, the total concentrations have remained relatively steady. The MTBE concentration in the system influent has generally been decreasing slightly over the past 12 months.

Optimization Activities

No optimization activities occurred at the ST018GWTP in November 2016.

Sustainability

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

Figure 2 presents the historical GHG production from the ST018GWTP. The ST018GWTP produced 467 pounds of GHG during November 2016 and treated 151,385 gallons of water, which was a decrease from October 2016 (491 pounds, treating 206,210 gallons). The GHG levels had been peaked in April 2016, which was due to the addition of a new extraction well into the groundwater extraction and treatment system. Since May 2016, GHG levels have continued to decrease to levels observed historically.

TABLE 4
Summary Of Groundwater Analytical Data for November 2016 – Site ST018 Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	7 November 2016 (µg/L)			
				Influent	After Carbon 1	After Carbon 2	System Effluent
Fuel Related Constituents							
Methyl tert-Butyl Ether	6,400	0.15	0	47.5	NM	0.24 J	2.03
Benzene	25,000[a]	0.15	0	0.18 J	NM	ND	ND
Ethylbenzene	25,000[a]	0.15	0	ND	NM	ND	ND
Toluene	25,000[a]	0.15	0	ND	NM	ND	ND
Total Xylenes	25,000[a]	0.15 – 0.30	0	ND	NM	ND	ND
Total Petroleum Hydrocarbons – Gasoline	50,000[b]	35	0	85.0 J	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50,000[b]	23.8 – 24.5	0	46.8 J	ND	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	100,000	23.8 – 24.5	0	31.5 J	ND	NM	ND
Other							
1,2-Dichloroethane	20	0.15	0	0.77	NM	ND	ND

* In accordance with the Fairfield-Suisun Sewer District Effluent Limitations

Laboratory data available on request.

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

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

µg/L = micrograms per liter
J = analyte concentration is considered an estimated value due to a detected concentration value between the reporting limit and method detection limit for the contaminant
N/C = number of samples out of compliance with discharge limits
ND = not detected above method detection limit
NM = not measured this month

Figure 1

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

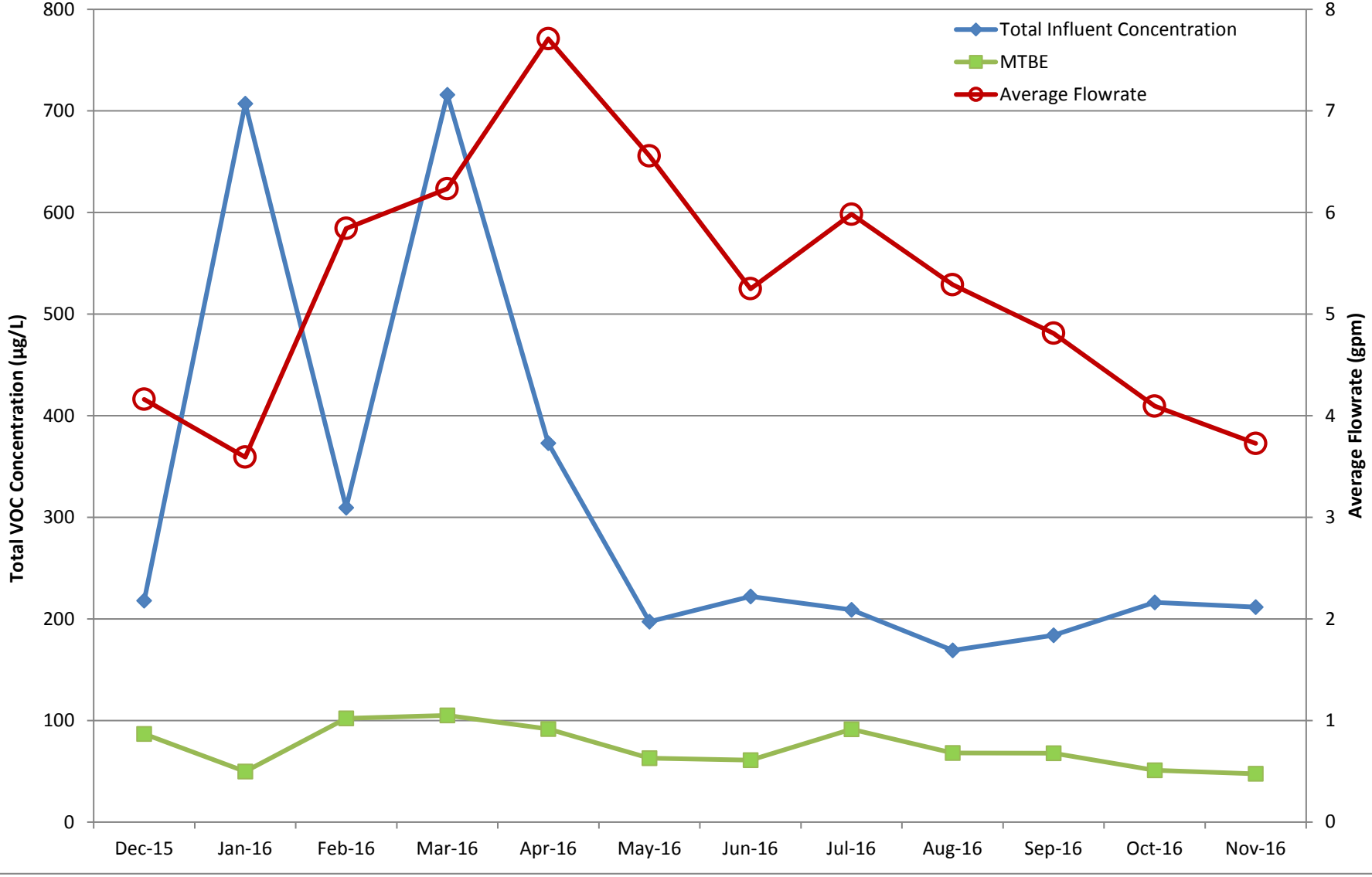
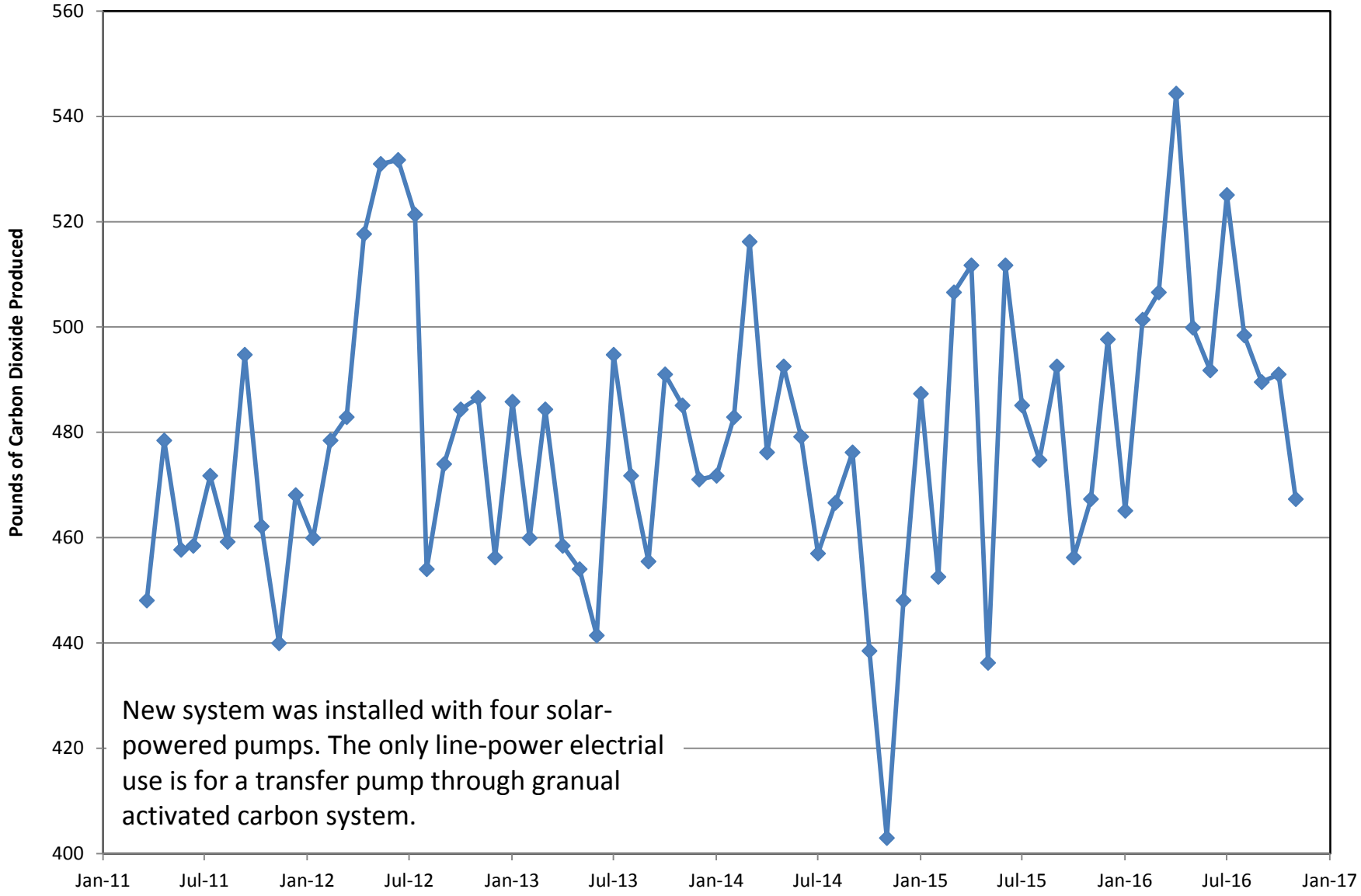


Figure 2

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



Site ST018 Groundwater Treatment Plant Monthly Data Sheet

Report Number: 070 **Reporting Period: 2 December 2016 – 4 January 2017** **Date Submitted: 12 January 2017**

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

System Metrics

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

Table 1 – Operations Summary – December 2016

Initial Data Collection:	12/2/2016 13:30	**Final Data Collection:**	1/4/2017 13:30
Operating Time:		Percent Uptime:	Electrical Power Usage:
ST018GWTP: 791 hours		**ST018GWTP:** 99.9%	**ST018GWTP:** 96 kWh (471 lbs CO_2 generated[a])
Gallons Treated: **162,380 gallons**		Gallons Treated Since March 2011: **11.5 million gallons**	
Volume Discharged to Sanitary Sewer: **162,380 gallons**		Final Totalizer Reading: **11,461,979 gallons**	
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: **4,965,805 gallons**			
MTBE, BTEX, VOC, TPH Mass Removed: **0.15 lbs**[b]		MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: **40.1 lbs**	
MTBE (Only) Removed: **0.04 lbs**[b]		MTBE (Only) Mass Removed Since March 2011: **9.8 lbs**	
Rolling 12-Month Cost per Total Pounds of Mass Removed: $11,589[bc]			
Monthly Cost per Pound of Mass Removed: $41,608[bc]			

[a] SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 400 pounds of GHG from GAC change out.
[b] Calculated using December 2016 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 – December 2016

Location	Average Flow Rate Groundwater (gpm)[a]	Hours of Operation
EW2014x18	0.5	791
EW2016x18	0.9	791
EW2019x18	1.0	791
EW2333x18	0.7	654
Site ST018 GWTP	3.4	791

[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	12 December 2016	15:00	12 December 2016	15:40	Routine maintenance. Influent bag filters were replaced.

-- = 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 7 December 2016. Results are presented in Table 4. The complete December 2016 laboratory data report is available upon request. The influent concentration for MTBE during the December 2016 sampling event was 30.1 µg/L, which is a decrease from the November 2016 sample result of 47.5 µg/L. TPH-g (44.0 J µg/L), TPH-d (34.5 J µg/L), and 1,2-DCA (0.52 µg/L) were also detected in the influent sample. No TPH constituents were detected after the first carbon vessel sampling location. MTBE was detected after the second carbon vessel sampling location and in the system effluent sampling location at concentrations of 0.26 J µg/L and 1.95 µg/L, respectively. All detected concentrations of TPH are well below the Fairfield-Suisun Sewer District effluent limitation of 50,000 µg/L, 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 and evaluate the condition of the carbon filter beds.

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 seasonally variable with an increasing trend between January 2016 and April 2016 and a steady decreasing trend since April 2016. The total influent concentrations have varied considerably throughout the past twelve months, which is due primarily to the TPH-g

concentrations. Since May 2016, however, the total concentrations have been slowly decreasing. The MTBE concentration in the system influent has generally been decreasing slightly over the past 12 months.

On 12 December 2016, the ST018GWTP was shut down for less than 1 hour to change the influent bag filters. The system was restarted without issue.

Optimization Activities

No optimization activities occurred at the ST018GWTP in December 2016.

Sustainability

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

Figure 2 presents the historical GHG production from the ST018GWTP. The ST018GWTP produced 471 pounds of GHG during December 2016 and treated 162,380 gallons of water, which was a slight increase from November 2016 (467 pounds, treating 151,385 gallons). The GHG levels had been peaked in April 2016, which was due to the addition of a new extraction well into the groundwater extraction and treatment system. Since May 2016, GHG levels have continued to decrease to levels observed historically.

TABLE 4
Summary Of Groundwater Analytical Data for December 2016 – Site ST018 Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	7 December 2016 (µg/L)			
				Influent	After Carbon 1	After Carbon 2	System Effluent
Fuel Related Constituents							
Methyl tert-Butyl Ether	6,400	0.15	0	30.1	NM	0.26 J	1.95
Benzene	25,000[a]	0.15	0	ND	NM	ND	ND
Ethylbenzene	25,000[a]	0.15	0	ND	NM	ND	ND
Toluene	25,000[a]	0.15	0	ND	NM	ND	ND
Total Xylenes	25,000[a]	0.15 – 0.30	0	ND	NM	ND	ND
Total Petroleum Hydrocarbons – Gasoline	50,000[b]	35	0	44.0 J	ND	NM	ND
Total Petroleum Hydrocarbons – Diesel	50,000[b]	23.8 – 24.5	0	34.5 J	ND	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	100,000	23.8 – 24.5	0	ND	ND	NM	ND
Other							
Chloromethane	NA	0.15	0	ND	NM	0.29 J	ND
1,2-Dichloroethane	20	0.15	0	0.52	NM	ND	ND

* In accordance with the Fairfield-Suisun Sewer District Effluent Limitations

Laboratory data available on request.

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

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

µg/L = micrograms per liter
J = analyte concentration is considered an estimated value due to a detected concentration value between the reporting limit and method detection limit for the contaminant
NA = not applicable
N/C = number of samples out of compliance with discharge limits
ND = not detected above method detection limit
NM = not measured this month

Figure 1

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

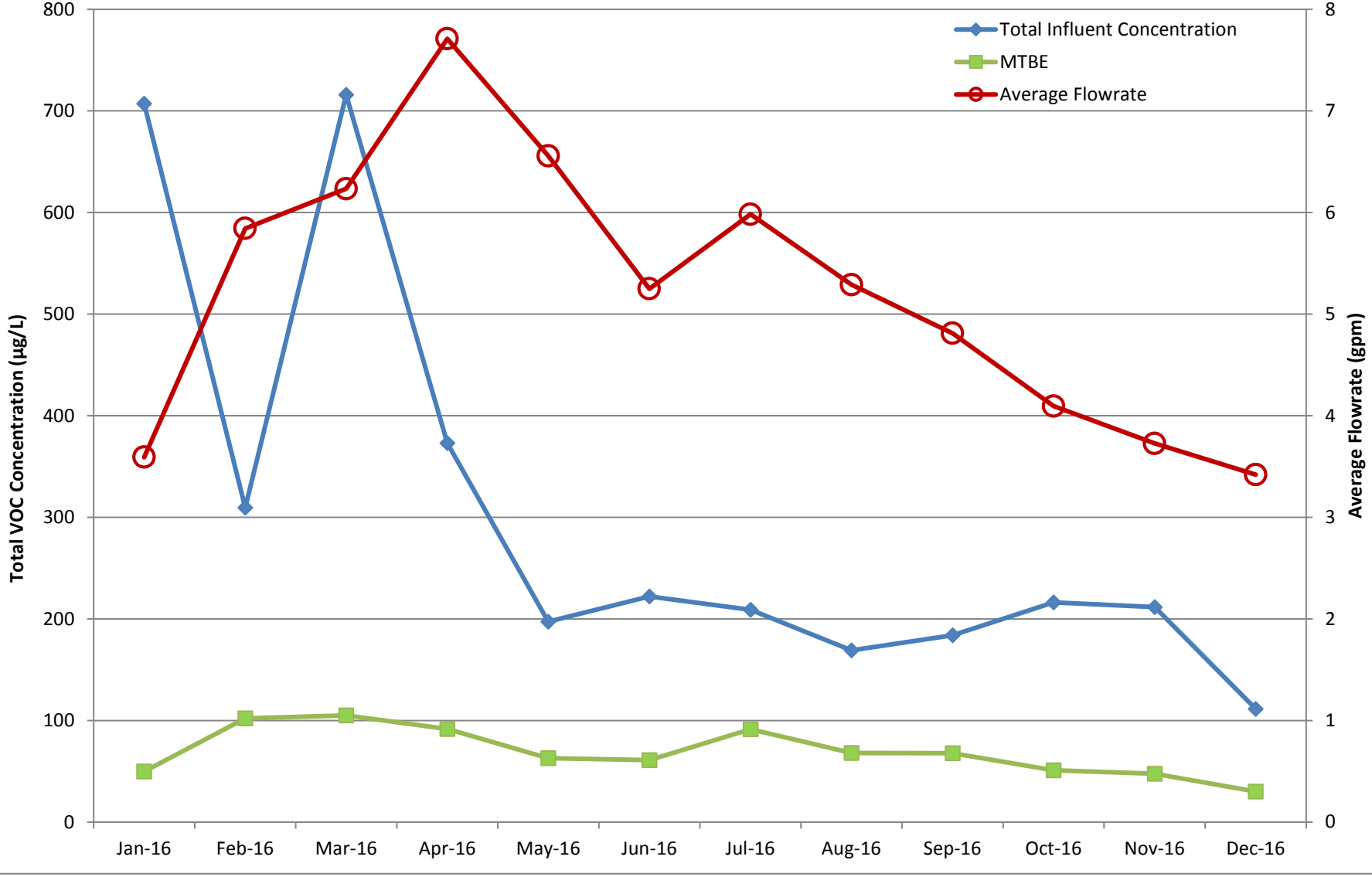
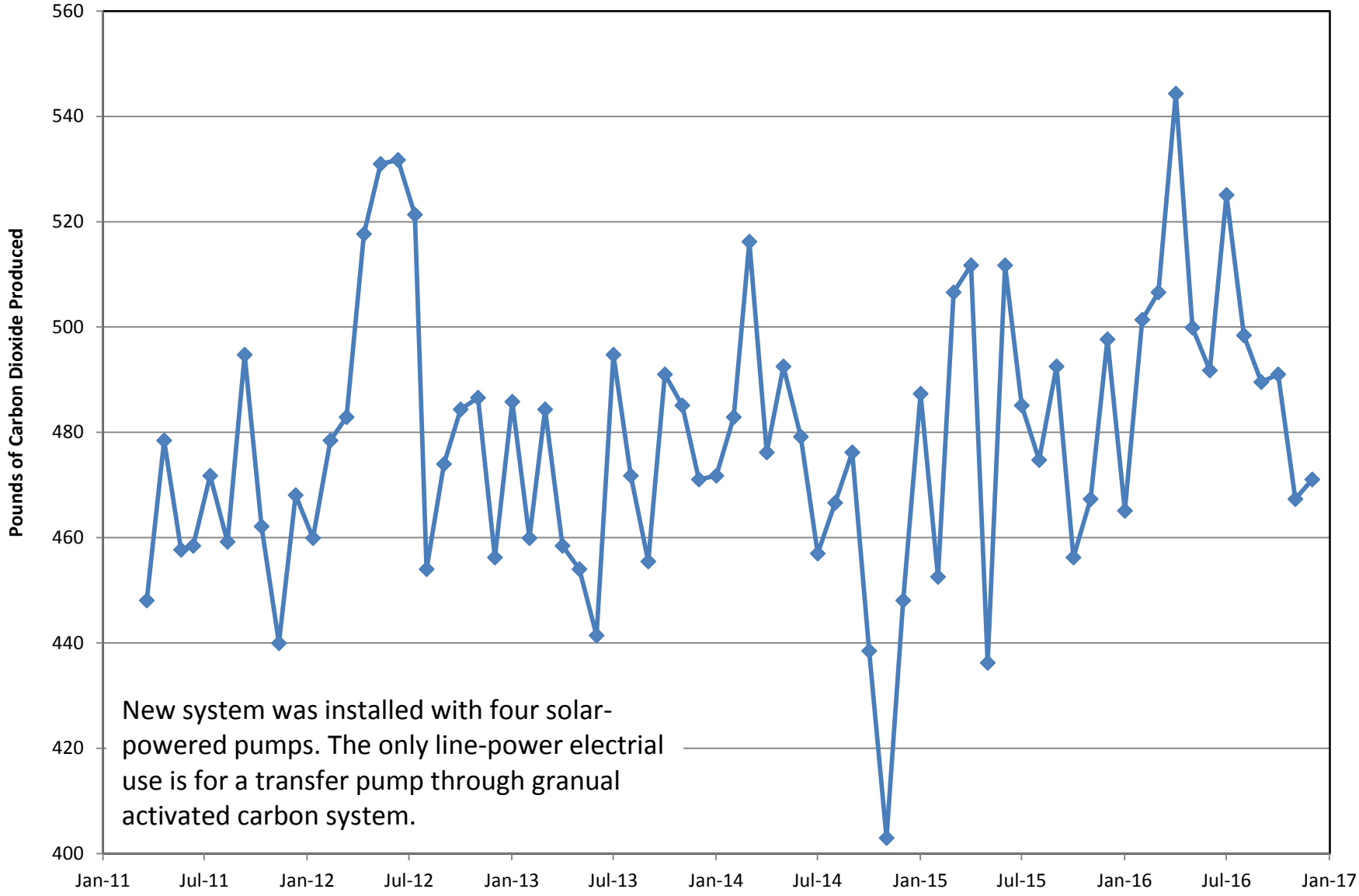


Figure 2

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



Travis AFB
Restoration Program

Program Update

RPM Teleconference
January 18, 2017

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

2

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

3

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***

4

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

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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

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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***

7

Documents In-Progress

CERCLA

- Community Involvement Plan
- Site DP039 Remedial Action Construction Completion Report
- Site TS060 Removal Action Work Plan
- Site LF044 Investigation Work Plan

8

Documents In-Progress

POCO

- Site FT004 POCO Soil Data Gap Investigation Work Plan
- ***ST028 POCO Well Decommissioning/Site Closeout Technical Memorandum***

9

Field Work In-Progress

CERCLA

- None

POCO

- None

10

Documents Planned

CERCLA

- Multisite Technology Demonstration Construction Completion Report — Jan
- ***2016 Annual CAMU Monitoring Report*** — ***Mar***
- SD034 Technology Demonstration Construction Completion Report — Apr
- SD033, SD043, SS046 Risk Assessment Tech Memo — Apr
- ***SS016 Risk Assessment Technical Memorandum*** — ***Apr***
- ***2016 Annual GRISR*** — ***TBD***
- ***SD031 Background Soil Study*** — ***TBD***

11

Documents Planned

POCO

- POCO Evaluation/Closeout Report for DERA-funded oil/water separators OW051, OW053, and OW054 — Jan
- SS014 POCO Technology Demonstration Construction Completion Report — Mar
- ***POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW055, and OW057*** — ***Mar***

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Field Work Planned

CERCLA

- LF044 Berm Sampling 2017
- TS060 Removal Action 2017
- DP039 Installation of Down-gradient Monitoring Wells 2017
- ***SD031 Background Soil Sampling*** ***2017***

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

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Field Work Planned

POCO

- FT004 POCO Soil Data Gaps Investigation 2017
- OW055 Sidewalk Repairs 2017
- OW056 Site Excavation/Closure 2017

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

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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
  - Too early to evaluate performance data
- Multisite Bioaugmentation: EVO and KB-1 Plus
  - Evaluate if addition of bioaugmentation substrate to an EVO injection will increase the rate of CVOC degradation
  - Injections were completed (Nov 2016)
  - Too early to evaluate performance data
- SD034: Washboard SBGR
  - Evaluate the effectiveness of an oxygen-enhanced aerobic SBGR on reducing TPH as diesel (TPH-D) in groundwater
  - Installation was completed November 2016
  - Installed six (6) SBGR trenches. In process of evaluating need/constructability of installing the 7th trench
  - Too early to evaluate performance data

* SBGR = Subgrade Biogeochemical Reactor

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Technology Demonstration Projects (2)

- 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
  - Too early to evaluate performance data
- 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
  - Too early to evaluate performance data

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Technology Demonstration Projects (3)

- 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
    - 1,1-DCE (primary COC) concentrations have reduced by 57% (sum of key wells within TD area)
    - Total Molar concentration (sum of CVOCs) has reduced by 49% (sum of key wells within TD area)
    - Recirculation through chimneys has been successful relative to our design assumptions

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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

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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

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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

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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

21