

**Travis Air Force Base  
Environmental Restoration Program  
Restoration Program Manager's  
Meeting Minutes  
19 January 2022, 0930 Hours**

Mr. Chet Storrs of the Air Force Civil Engineer Center (AFCEC) Restoration Installation Support Section (ISS) conducted the Restoration Program Manager's (RPM) teleconference on 19 January at 0930 hours.

The 60 AMW/CC at Travis Air Force Base (AFB) has directed Health Protection Condition (HPCON) Bravo + (changed from HPCON Bravo) in response to the evolving COVID-19 public health situation in the local area. The base continues to encourage teleworking and virtual meetings in place of in-person meetings. Essential missions will continue, and visitors are permitted with an approved base pass.

**All attendees participated via telephone or Microsoft TEAMS due to increased teleworking measures meant to reduce the number of employees on the base at one time. Attendees included:**

- Chet Storrs AFCEC/CZOW
- Mobashir Ahmad AFCEC/CZOW
- Tom Potter AFCEC/CZOW
- Angel Santiago AFCEC/CZOW
- Kurt Grunawalt Travis AFB 60 AMW/JA
- Lou Briscese Travis AFB 60 AMW/PA
- Dave Leeson AFCEC
- Kim Rasmussen 60 CES/CEIE
- Jessica Faragalli USACE-Sacramento
- Ryan Sinnott USACE-Sacramento
- Julie Higgins USACE-Sacramento
- Alan Soicher USACE-Omaha
- Nadia Burke EPA
- Dominique Forrester DTSC
- Kimiye Touchi DTSC
- Kerry Rasmussen DTSC
- Dave Kremer DTSC
- Li Wang DTSC
- Adriana Constantinescu RWQCB
- Megan Duley SRS
- Diane Escobedo SRS
- Matt Mayry SRS
- Gaby Atik FPM
- Chris Coonfare FPM
- Lynette Mockry FPM
- Colton Ranson FPM
- Leslie Royer Jacobs
- Mike Perlmutter Jacobs
- Doug Berwick Jacobs
- Jill Dunphy Jacobs

Handouts distributed prior to the meeting included:

- Attachment 1: Meeting Agenda
- Attachment 2: Master Meeting and Document Schedule
- Attachment 3: Travis AFB LUC Sites Update (January 2022)
- Attachment 4: Travis AFB PFAS Update (January 2022)
- Attachment 5: Groundwater Treatment System Updates (November 2021 and December 2021)
- Attachment 6: ORC Program Update (January 2022)
- Attachment 7: Presentation: Offline Recirculation Systems (January 2022)
- Attachment 8: Presentation: Phase 1 Remedial Investigation of AFFF Areas (November 2021)
- Attachment 9: Groundwater Treatment System Monthly Data Sheets (November 2021)
- Attachment 10: Groundwater Treatment System Monthly Data Sheets (December 2021)

## **I. TRAVIS AFB UPDATES**

### **A. ADMINISTRATIVE**

#### **1. Agenda and Introductions**

Mr. Storrs announced that he is now officially serving in the role of RPM, taking over for Lonnie Duke. In this new role, one of his first priorities was to reorganize the agenda for RPM meetings. He reviewed the agenda and pointed out the changes, indicating that the order of discussion items can change if needed. The most significant changes to note are that the Travis AFB team updates will be presented first, prior to the ORC and PFAS contract updates; and that the Monthly O&M Reports will no longer be reviewed in detail; only notable information will be presented.

#### **2. Previous Meeting Minutes**

The Regional Water Quality Control Board (RWQCB) and the Department of Toxic Substances Control (DTSC) indicated they would be sending comments via email. These items will be addressed in the Final meeting minutes. The Environmental Protection Agency (EPA) had no comments.

#### **3. Action Item Review**

There were no ongoing or new action items to report on.

#### **4. 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**

Mr. Storrs proposed that RPM meetings be held quarterly rather than monthly (January, April, July, and November). The team agreed, with the stipulation that the others remain on the schedule, and everyone leaves that time blocked off in case something must be discussed with the RPM team sooner. Any member of the RPM team may request to keep

scheduled meetings. A final decision to cancel or discuss a particular topic will be announced a week ahead of each of the scheduled meetings. Draft meeting minutes will still be provided for review within 30 days of the meeting, as per the current schedule.

All RPM meetings planned for 2022 will be held via MTeams until all three regulatory agencies are permitted to attend in person. At that time, the schedule will resume to alternating in-person meetings and teleconferences.

The next RAB meeting is scheduled for April 2022. Mr. Storrs solicited opinions regarding whether the meeting should be held in-person or virtually, noting that he wanted to decide at this meeting so the team could coordinate accordingly. The team agreed to hold the April RAB virtually via MTeams. The RAB meeting announcement will request RSVPs and offer a one-time troubleshooting session approximately a week ahead of the meeting. Ms. Dunphy has a process she has been using for Beale AFB virtual RAB meetings and will follow a similar process for Travis AFB.

Upon decision to hold the April RAB virtually, the April RPM meeting was moved to 20 April 2022 and will start at 0930.

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

- Universal Federal Program Quality Assurance Program Plan (UFP-QAPP): The Predraft to AF/Service Center due date was changed to 6 January 2022; the rest of the schedule changed accordingly.
- Site SD031 Data Gaps Investigation Work Plan: This is now a primary document. Predraft to AF/Service Center due date was changed to 20 January 2022; the rest of the schedule changed accordingly.
- Community Relations Plan (CRP) Update: There was no change to the schedule. Now that the ORC has been awarded, this document will be re-prioritized; the first step in the update will be a community survey. Dates will be assigned once the survey results are available.
- Potrero Hills Annex (FS, PP, and ROD): There were no updates to the schedule.

#### **Moved to history:**

- Travis AFB AFFF Remedial Investigation Work Plan
- Travis AFB AFFF Remedial Investigation Quality Assurance Program Plan (QAPP)

## **B. CURRENT PROJECTS**

### **1. Land Use Control Sites Update (Attachment 3)**

Mr. Storrs reported on the status of the LUC sites at Travis AFB. Please refer to Attachment 3 for the full briefing. Highlights of the discussion are as follows:

- Two monitoring wells that fell within the footprint of the new hangar were decommissioned.
- These wells were replaced with newly constructed monitoring wells MW2871Ax16 and MW2871Bx16.
- Ms. Constantinescu would like to be notified 3 days prior to the pump test at horizontal well EW003Ax16. Mr. Storrs and Ms. Royer noted that it can't be

scheduled yet due to Jacobs not having been awarded the contract yet. Once awarded, field work will need to begin within 60 days and finish within a year. They will keep Ms. Constantinescu in the loop.

- Ms. Constantinescu asked if confirmation samples will be collected in the sidewalls of the excavation at Site SD037 for Building 977, citing vapor intrusion as her concern. Mr. Storrs replied that the facility is not an enclosed office building; it is open on one side. Additionally, the goal of the work is to replace facility equipment, not to define nature and extent of contamination to support site remediation. The LUCs are the remedy; and the work will be carried out in accordance with the LUCs. Mr. Storrs took the action to go to the site and make a video of the facility so the team could better understand why vapor intrusion is not a concern at this facility.
- Mr. Storrs noted that they are removing concrete rubble from the runway replacement project and said it may be contaminated with PFOS, but is not sure of testing procedures. Ms. Burke replied that this was her agency's comment and took the action item to check with her team regarding suggested methods for testing concrete demolition debris.

## **2. PFAS Updates (Attachment 4)**

Mr. Storrs reported on the PFAS updates for Travis AFB. Please refer to Attachment 4 for the full briefing. Highlights of the discussion are as follows:

- During the discussion, the Agencies expressed concern about current potential human health exposures to PFAS off-Base. The two pathways discussed were the effluent from groundwater treatment systems to Union Creek (surface water exposures) and potential groundwater from off Base migration. The Agencies expressed the need for a more robust conceptual site model (CSM) needed as part of the remedial investigation (RI) to better understand migration of potential PFAS off-Base.
- The Agencies discussed off-base sampling conducted in 2020 and 2021, as part of the expanded SI, at privately owned wells down gradient (south-southeast) of the base. The subject document reporting off-Base PFAS sampling results contains personally identifiable information (PII) and therefore has contents that have been redacted from the publicly available document. AFCEC requests EPA provide a letter requesting an unredacted version of this document stating how PII will be protected by EPA. The EPA stated their position is that the document falls under the FFA as either a primary or secondary document and that a letter is not required for provision of an unredacted version of the document. The AF will discuss internally with AFCEC attorneys and arrange a meeting with EPA at a later date.
- Mr. Storrs expressed that the AF has performed due diligence by contacting off-Base landowners within four miles to request access for well sampling and that of the eleven owners contacted for permission to sample, only six well owners agreed to allow sampling. Mr. Storrs noted that of the sampled wells, three had levels of PFOS/PFOA that exceeded EPA health advisory levels (HALs). Point-of-entry-treatment (POET) systems were installed at each well exceeding the HALs and are currently in operation to reduce PFAS concentrations below action levels. The Agencies expressed that more immediate action needs to be taken to determine whether groundwater quality is protective of human health in the unsampled drinking water wells located off-base.
- The Agencies stated that the AF needs to be proactive with educating property owners to potential PFAS risks and continued to inquire if the AF is tracking any changes

in property ownership that may allow future sampling at off-Base wells. The AF expressed that it may consider future efforts to inquire about sampling at off-Base wells.

#### C. PROGRAM ISSUES/UPDATE

None.

#### D. ACTION ITEMS

Item #	Responsible	Action Item Description	Due Date	Status
1	Chet Storrs	Mr. Storrs will send an invitation to the regulators for the upcoming LUC inspections	31 Jan 2022	Closed
2	Chet Storrs	Mr. Storrs will create a small video of the Site SD037 for Building 977 for the regulators to understand the site conditions and planned work	16 Feb 2022	Open
3	Chet Storrs	Mr. Storrs will send the POETs installation summary reports to the regulatory agencies.	16 Feb 2022	Closed
4	Chet Storrs	Mr. Storrs will inquire with POETs property owners regarding disclosure of data	16 Feb 2022	Open
5	Chet Storrs, Adriana Constantinescu, Kimiye Touchi, Nadia Burke	Mr. Storrs will inquire with AFLOA regarding release of Expanded Site Inspection data to regulatory agencies per the clause in the Porter-Cologne Act, and to which agency he is able to release data if the property owners provide permission. The regulatory agency representatives will check with their management and legal teams regarding protection of the PII included therein.	16 Feb 2022	Closed
6	Chet Storrs, Adriana Constantinescu, Kimiye Touchi, Nadia Burke	Mr. Storrs will coordinate a meeting with AFLOA and the regulatory agencies (and their respective legal departments) about release of private well data and protection of PII. The regulatory agencies will coordinate availability with their respective legal departments for this meeting.	16 Feb 2022	Closed

7	Nadia Burke	Ms. Burke will inquire with her agency SMEs about testing for PFAS in concrete rubble	16 Feb 2022	Closed
8	Adriana Constantinescu	Ms. Constantinescu will email her comments on the November 2021 meeting minutes	21 Jan 2022	Open
9	Kimiye Touchi	Ms. Touchi will provide a date by which the DTSC will provide comments on the Expanded Site Inspection	16 Feb 2022	Closed

## II. OPTIMIZED REMEDIATION CONTRACT UPDATES

### A. Administrative

All administrative topics were discussed earlier in the RPM meeting.

### B. CURRENT PROJECTS

#### 1. Groundwater Treatment Plant Reports (Attachment 5)

Mr. Berwick reported on the status of the groundwater treatment plants at Travis AFB. Please refer to Attachment 5 for the full briefing. Highlights of the discussion are as follows:

- Ms. Burke inquired if the sampling plan for the SBBGWTP includes additional sampling when the system is shut down. Mr. Berwick replied that treatment plant shutdowns do not trigger additional sampling requirements. Semiannual sampling conducted through the GRIP is used to evaluate system effectiveness; that samples planned for collection in April 2022 will be used to evaluate impacts on remedial progress due to the recent down time. Ms. Royer added that groundwater moves very slowly at Travis AFB so minimal impacts are anticipated during the down time, noting that the system had been shut down for several months on occasion without issue.
- The Agencies inquired about PFAS sampling from the effluent at the SBBGWTP and timing of such sampling relative to granular activated carbon (GAC) change-outs. The RWQCB expressed concern about the 2017 results more so than the results of samples collected in 2021. The EPA expressed the need for more frequent sampling of the effluent to characterize what PFAS concentrations, if any, could be or have discharged into Union Creek.
- The new vendor receiving the spent carbon from the granulated activated carbon (GAC) changeouts is requesting a new analytical profile to account for potential PFAS in the spent carbon. Jacobs will provide the analytical profile data to the Air Force when it is available.
- DTSC discussed that April 2022 would be too early to collect PFAS samples following GAC change-out at the treatment system. DTSC noted that they may have the capacity and capability to perform sampling services to collect additional samples

from the SBBGWTP and other treatment plants on Base. In order to execute, additional agreements with the AF would need to occur. The RWQCB also expressed concern regarding effluent discharge from the Central Groundwater Treatment Plant and the need for additional sampling.

## **2. Program Update (Attachment 6)**

Ms. Royer reported on the status of the Optimized Remediation Contract at Travis AFB. Please see Attachment 6 for the full briefing.

## **C. PRESENTATIONS**

### **1. Update on Offline Recirculation Systems (Attachment 7)**

Ms. Royer reported on the status of the Offline Recirculation Systems at Travis AFB. Please see Attachment 7 for the full briefing. Ms. Royer noted that the DP039 recirculation system resumed operation on 18 January 2022.

## **D. PROGRAM ISSUES/UPDATE**

None.

## **E. ACTION ITEMS**

<b>Item #</b>	<b>Responsible</b>	<b>Action Item Description</b>	<b>Due Date</b>	<b>Status</b>
10	Leslie Royer/ Doug Berwick	Ms. Royer and Mr. Berwick will look into details of the last shutdown at the SBBGWTP to see what impact the previous shutdown had on remediation progress.	16 Feb 2022	Open
11	Doug Berwick	Mr. Berwick will verify, and correct if necessary, apparent typos noted on the SBBGWTP November 2021 monthly data sheets.	16 Feb 2022	Closed
12	Chet Storrs	Mr. Storrs will inquire with JEPP and AFLOA regarding the possibility of DTSC sampling for PFAS at GWTPs when Jacobs conducts a sampling event. He will also inquire about modifying the ORC to collect samples for PFAS analysis at the GWTPs during monthly O&M sampling.	16 Feb 2022	Open
13	Kimiye Touchi	Ms. Touchi will check with her management about the possibility of DTSC collecting samples for PFAS	16 Feb 2022	Open

		analysis at the GWTPs when Jacobs is collecting for other parameters		
14	Adriana Constantinescu	Ms. Constantinescu will inquire with management about potential ways to conduct additional sampling for PFAS south of TAFB and will coordinate a meeting with the AF.	16 Feb 2022	Open

### III. SRS PFAS CONTRACT

#### A. ADMINISTRATIVE

All administrative topics were discussed earlier in the RPM meeting.

#### B. PRESENTATIONS

##### 1. Travis AFB Phase I RI of AFFF Sites (Attachment 10)

Ms. Duley presented slides providing an update on the Phase I RI of AFFF sites. Please refer to Attachment 10 for the full briefing.

##### Phase 1 Remedial Investigation Data-Driven Process

Matt Mayry (Oneida) provided an update on the Phase I RI. Currently, a preliminary data set is being reviewed by the Oneida team. As indicated on the data-driven process graphic, the Oneida Team will hold Stakeholder Meeting #1 with the Agencies to discuss the results from the initial sampling event and the recommendations for Field Event 2. DTSC requested that data be available to review prior to the meeting. The EPA stated that they envision two separate meetings; the first to be held to review the new preliminary data, followed by a second meeting to review recommended locations and rationale for future sampling. The Team agreed the first meeting would be held on 16 February 2022. The second meeting will be scheduled on 2 or 3 March 2022. Matt Mayry and Megan Duley (Oneida) discussed a potential submittal date for UFP-QAPP Amendment #1 to follow approximately two weeks after, depending on amount of revisions required following the two planned stakeholder meetings. Megan noted to the Teams that the provided data tables and figures would be preliminary and would be caveated as such and were not for distribution. Megan also noted that Oneida would work to use the GIS in the meetings to provide full access to project data and relevant layers for planning consideration.

#### C. PROGRAM ISSUES/UPDATE

None



**D. ACTION ITEMS**

<b>Item #</b>	<b>Responsible</b>	<b>Action Item Description</b>	<b>Due Date</b>	<b>Status</b>
1	Megan Duley/ Diane Escobedo	Send meeting minutes to Travis AFB.	26 January 2022	Closed
2	Megan Duley/ Chet Storrs	Coordinate time for meetings with agencies.	28 January 2022	Open
3	Megan Duley/ Oneida Team	Preliminary data package (tables/figures) providing data from Field Event 1 to be distributed prior to 16 February meeting with the agencies.	9 February 2022	Open

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

The RPM Teleconference is scheduled for 9:30 AM PST on 19 Jan 2022. The call-in number will be provided in the MS Teams meeting invite and also in the same email that the meeting materials are provided in. If you are able to participate via MS Teams meeting, you will see the shared documents that will be viewable by all participants.

**A. TRAVIS INSTALLATION SUPPORT SECTION**

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1. ADMINISTRATIVE
  - a. Introductions
  - b. Previous Meeting Minutes
  - c. Action Item Review
  - d. Master Meeting and Document Schedule Review
  - e. Proposal for Quarterly Rpm Meetings
2. UPDATES
  - a. Land Use Controls
  - b. PFAS

**B. JACOBS OPTIMIZED REMEDIAL CONTRACT (ORC)**

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1. ADMINISTRATIVE
2. CURRENT PROJECTS
  - a. Treatment Plant Operation and Maintenance Update (New Format)
3. PROGRAM UPDATE
  - a. Documents & Activities Completed, In Progress & Planned
4. PRESENTATIONS
  - a. Off-Line Recirculation Systems

**C. ONIEDA AFFF REMEDIAL INVESTIGATION**

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1. ADMINISTRATIVE
2. CURRENT PROJECTS
3. PROGRAM UPDATE
  - a. Documents & Activities Completed, In Progress & Planned
  - b. Discussion of preliminary sampling data
4. PRESENTATIONS
  - a. NA

# 2022

## Annual Meeting and Teleconference Schedule

Monthly RPM Meeting	Restoration Advisory Board Meeting
19 Jan (Wed) 0930 PST	—
16 Feb (Wed) 0930 PST	—
16 Mar (Wed) 0930 PST	—
21 Apr (Thu) 1400 PST	21 Apr (Thu) 1900 PST
18 May (Wed) 0930 PST	—
15 Jun (Wed) 0930 PST	—
20 Jul (Wed) 0930 PST	—
17 Aug (Wed) 0930 PST	—
21 Sep (Wed) 0930 PST	—
20 Oct (Thu) 1400 PST	20 Oct (Thu) 1900 PST
16 Nov (Wed) 0930 PST	—
—	—

## Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
Life Cycle	UFP-QAPP Travis AFB, Mobashir N. Ahmad FPM, Chris Coonfare	Site SD031 Data Gaps Investigation Work Plan Travis AFB, Mobashir N. Ahmad Jacobs, Levi Pratt	Community Relations Plan Update Travis AFB,TBD Jacobs, Jill Dunphy
<b>Scoping Meeting</b>	NA	NA	NA
Predraft to AF/Service Center	01-06-22	01-20-21	08-23-16
AF/Service Center Comments Due	02-07-22	02-22-22	09-07-16
Draft to Agencies / RAB	03-10-22	03-24-22	09-28-16 (03-22-18)
<b>Agency Comments Due</b>	05-09-22	05-23-22	10-28-16 (04-27-18)
<b>Response to Comments Meeting</b>	05-18-22	06-06-22	TBD
Agency Concurrence with Remedy	NA	NA	NA
Public Comment Period	NA	NA	NA
<b>Public Meeting</b>	NA	NA	NA
Response to Comments Due	06-01-22	06-20-22	TBD
Draft Final Due	06-01-22	06-20-22	TBD
Final Due	07-01-22	07-21-22	TBD

## Travis AFB Master Meeting and Document Schedule

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

[https://geotracker.waterboards.ca.gov/profile\\_report.asp?global\\_id=SL20299915](https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL20299915)

## Travis AFB Master Meeting and Document Schedule

HISTORY - PRIMARY DOCUMENTS		
Life Cycle	Travis AFB AFFF RI Work Plan <sup>2</sup> Travis AFB, Chet Storrs SRS, Megan Duley	Travis AFB AFFF RI QAPP <sup>2</sup> Travis AFB, Chet Storrs SRS, Megan Duley
<b>Scoping Meeting</b>	NA	NA
Predraft to AF/Service Center	10-27-20	10-27-20
AF/Service Center Comments Due	12-08-20	12-08-20
Draft to Agencies / RAB	03-26-21	03-26-21
<b>Agency Comments Due</b>	05-26-21	05-26-21
<b>Response to Comments Meeting</b>	<b>06-16-21</b>	<b>06-16-21</b>
Agency Concurrence with Remedy	NA	NA
Public Comment Period	NA	NA
<b>Public Meeting</b>	<b>NA</b>	<b>NA</b>
Response to Comments Due	06-30-21	06-30-21
Draft Final Due	06-30-21	06-30-21
Final Due	07-30-21 (10-27-21)	07-30-21 (10-27-21)

# Land Use Control Sites Status/Update



- 8 Feb Annual LUC inspection scheduled.
- SS016-KC-46 Hangar Project
  - SCADA currently not receiving flow data for EW605x16 and EW610x16; broken electrical connection suspected.
  - Well startup and pump test of horizontal EW003Ax16 will be conducted Jacobs.
  - Two new monitoring wells installed on 12 Jan: MW2871Ax16 (shallow well), MW2871Bx16 (deep well).
- SD037-Bldg. 977
  - Material Handling System; contract was awarded and design is in progress.
  - 18 Jan Meeting schedule with 60 CE to discuss.
- LF044
  - Concrete batch plant construction; NSTR.
- SS016/SS029/ST032
  - Runway replacement-Air Force working to finalize EA, still waiting for USFWS Consultation.





# PFOS/PFOA Updates



# Point-Of-Entry-Treatment-Systems

- All systems are effectively operating.
- Delivery of bottled water terminated in Dec 2021.
- A pre-treatment UV system was placed at Property 1 to alleviate potential bio-contamination issues.
  - During the POETS installation, it was noted the well was infiltrated with roots from nearby trees.



# Expanded Site Inspection

- 30 Dec 2021 comments received from the EPA to the final *Site Inspection Addendum Aqueous Film Forming Foam (AFFF) Release Areas Off-Base Drinking Water*.
- 3 Jan 2022 EPA comments submitted to AFCEC & USACE for RTC.
  - RTC currently under development.
- EPA and DTSC requested supporting document containing CUI/PP.
  - AF can/will release the document to the EPA (federal agency).
  - Can/will release to state agencies if approval is received from property owners and state agencies agree to protect CUI/PII.



# FY22 NDAA

- Subtitle D—Treatment of Perfluoroalkyl and Polyfluoroalkyl Substances (10 pages)
  - The Sec Def shall establish a task force to address the effects of the release of Pperfluoroalkyl substances and polyfluoroalkyl substances from DoD activities.
  - Not later than two years after enactment of FY22 NDAA, DoD shall complete PA/SI of all military Installations.
  - Temporary Moratorium.—Beginning not later than 120 days after enactment of FY22 NDAA , the Sec Def shall prohibit the incineration PFAS substances and AFFF until...
    - interim guidance on the destruction and disposal of PFAS and materials containing PFAS is published by the EPA.
  - *The Sec Def may not publicly disclose the results of testing for perfluoroalkyl or polyfluoroalkyl substances conducted on private property without the consent of the property owner.*

\* National Defense Authorization Act



# Groundwater Treatment Systems Updates November and December 2021



# LF007C GWTP

- The LF007C GWTP was taken offline on 25 October 2021 when vernal pools formed at Subarea LF007C. System off line for all of November and December 2021 (0% uptime).
- The system will be restarted once the vernal pools have dissipated.
- No system sampling will be conducted until the system comes back on line.



# ST018 GWTP

- System experienced 81% (November) and 100% (December) uptime.
- Noted increase in MTBE concentration from October 2021 (14 µg/L) to November 2021 (54 µg/L), and December 2021 (51 µg/L). One contributing factor is that only two of the four extraction wells remain on line (dilution reduction).



# CGWTP

- System experienced 99.5% (November) and 100% (December) uptime.
- Small amount of downtime in November to repair a cracked fitting on the system transfer pump.
- No VOC concentrations detected in November or December 2021 in the midpoint or effluent samples.





# SBBGWTP

- SBBGWTP taken off line on 11 November 2021 after confirmation samples confirmed exceedance of 1,2-DCA in the effluent sample. Approximately 30% uptime in November, 0% for December 2021.
- In November 2021, a freshwater toxicity test was performed on the SBBGWTP system effluent. No observed adverse effects were reported on the rainbow trout, and the survival rate was 100 percent.
- The system remains off line until a carbon change of the primary vessel can be performed.
  - Carbon vendors concerned with PFAS liability
  - Carbon will go to a different regeneration facility; which will require a new carbon profile and EPA Region 3 CERCLA Off-site Rules (OSR) approval
  - Carbon change-out anticipated by the end of February 2022





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**Jacobs**



# Travis AFB Restoration Program ORC Program Update

*RPM Meeting January 19, 2022*

# Documents Planned

## CERCLA

- UFP- QAPP March
- Site SD031 Data Gaps Investigation WP March

## POCO

None

# Completed Field Work

- 4Q21 GRIP Event

# Field Work Planned

## CERCLA

- 2Q GRIP Event April-May '22
- Site SD031 Data Gaps Investigation August '22

## POCO

None



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Travis AFB

# Update on Offline Recirculation Systems

*RPM Meeting January 19, 2022*

# Affected Recirculation Systems

- Site FT004
  - Bioreactor trench recirculation system
  - Technology demonstration (planned for future incorporation into the groundwater remedy)
  - Shutdown on December 16, 2021
- Site DP039
  - Bioreactor and phytoremediation trench
  - Part of the groundwater remedy
  - Shutdown on December 16, 2021

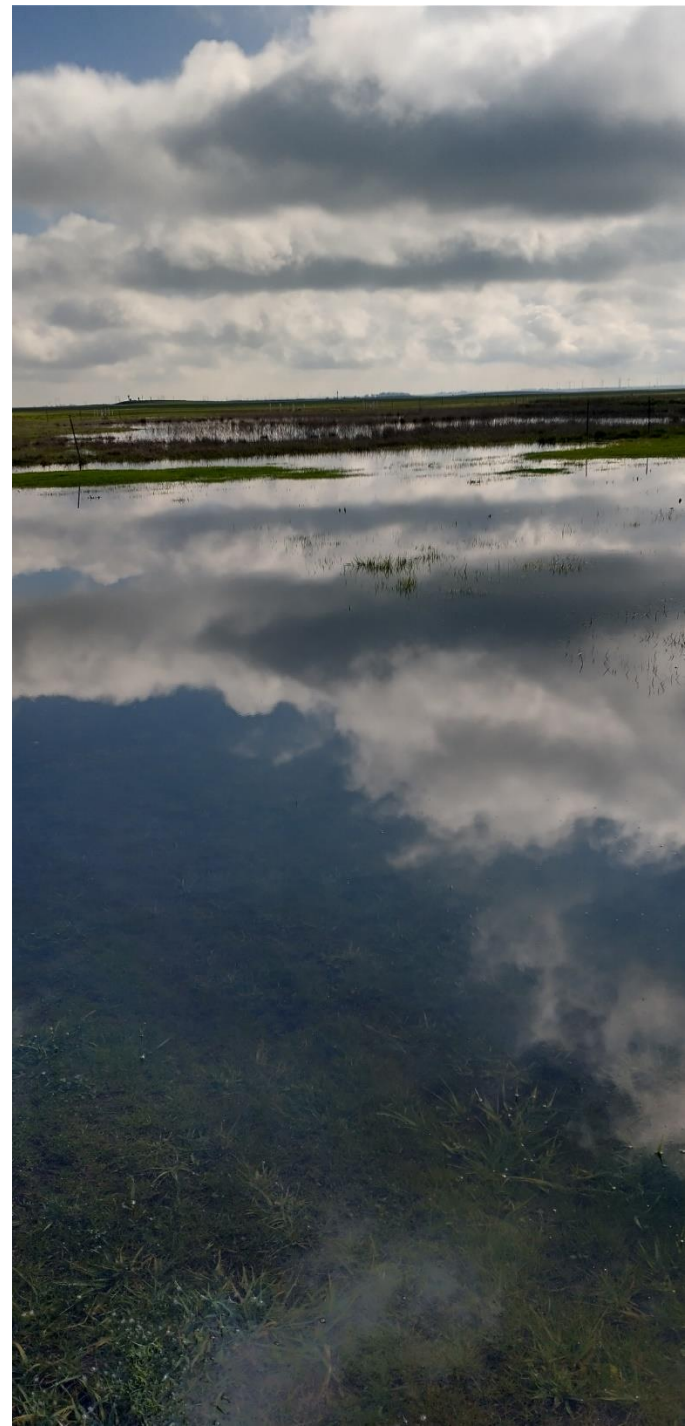
# Reasons for Shutdown

- Large amounts of precipitation led to saturated ground conditions and standing surface water around the bioreactor and trenches.
- Site FT004 was the most impacted, the seasonal vernal pools have formed, making the system inaccessible for monitoring system performance

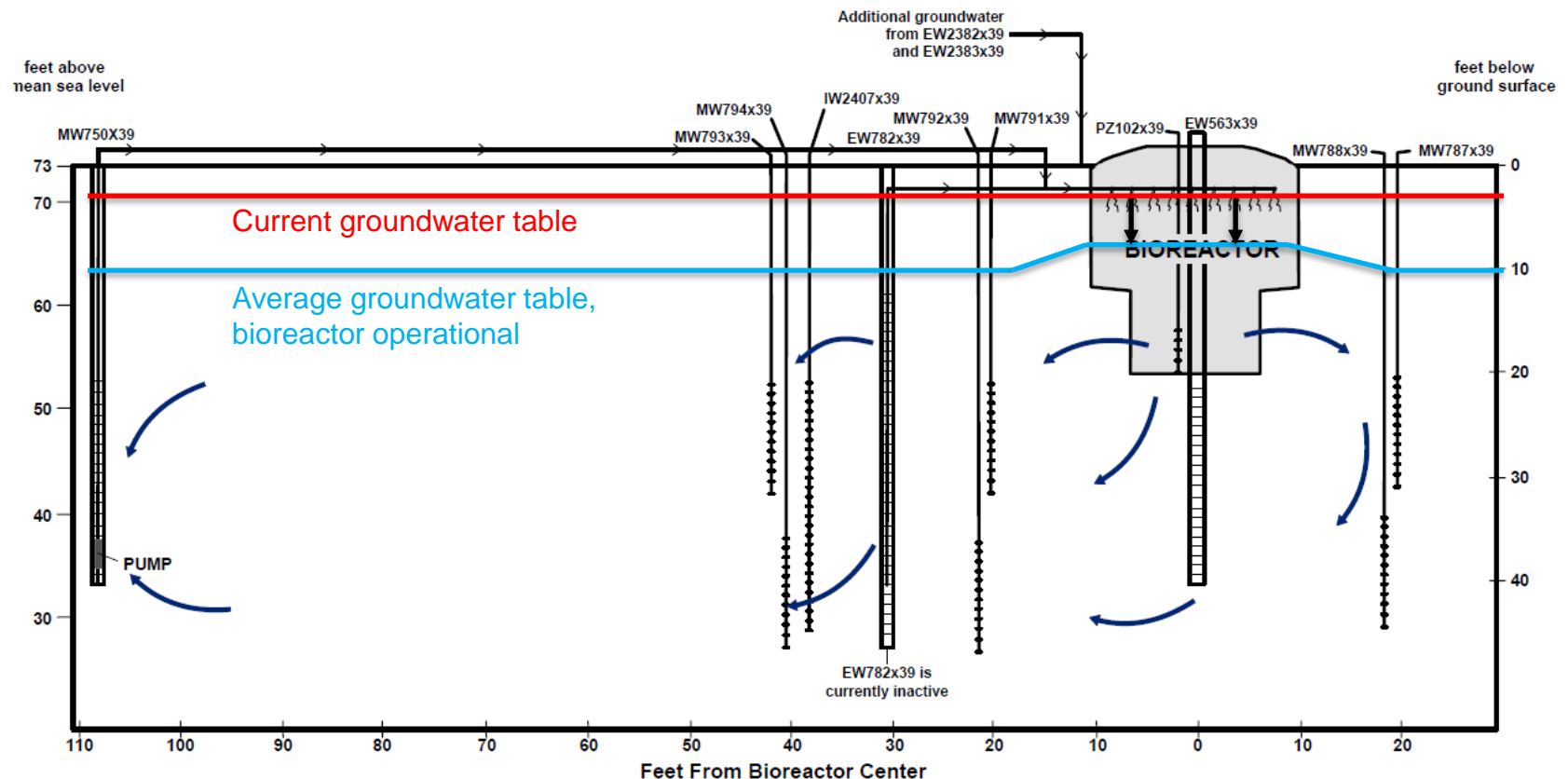


# Site FT004, December 2021 Vernal Pools

Bioreactor trench recirculation  
system is inaccessible for  
monitoring



# Bioreactor Cross-Sectional View



Note: Site DP039 bioreactor used as an example, the concept is also applicable to the Site FT004 bioreactor trenches

# Bioreactor/Trench Operating Parameters

- Groundwater added to trench/bioreactor cannot exceed the infiltration rate
- Under normal operating conditions, this is not an issue, and can be verified by measuring the depth to water in the bioreactor/trench (piezometers)
- When the ground is saturated and the water table rises, the infiltration rate is reduced (less void space), and the water level in the bioreactor/trench may reach the ground surface if groundwater continues to be added to the system

# Bioreactor/Trench Operating Parameters

- Recirculation systems are shut down as a precautionary measure when a reduction in infiltration capacity is anticipated and/or the system cannot be adequately monitored.
- The systems will be restarted when conditions dry out and they can be monitored
- DP039 is expected to be back online soon (barring unforeseen weather events)
- FT004 will likely be offline until spring; which, when vernal pools form, is typical for the system

# Questions?

# Air Force Civil Engineer Center

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## Travis Air Force Base Phase I Remedial Investigation of AFFF Areas



Presented by  
Matt Mayry, Alt. PM



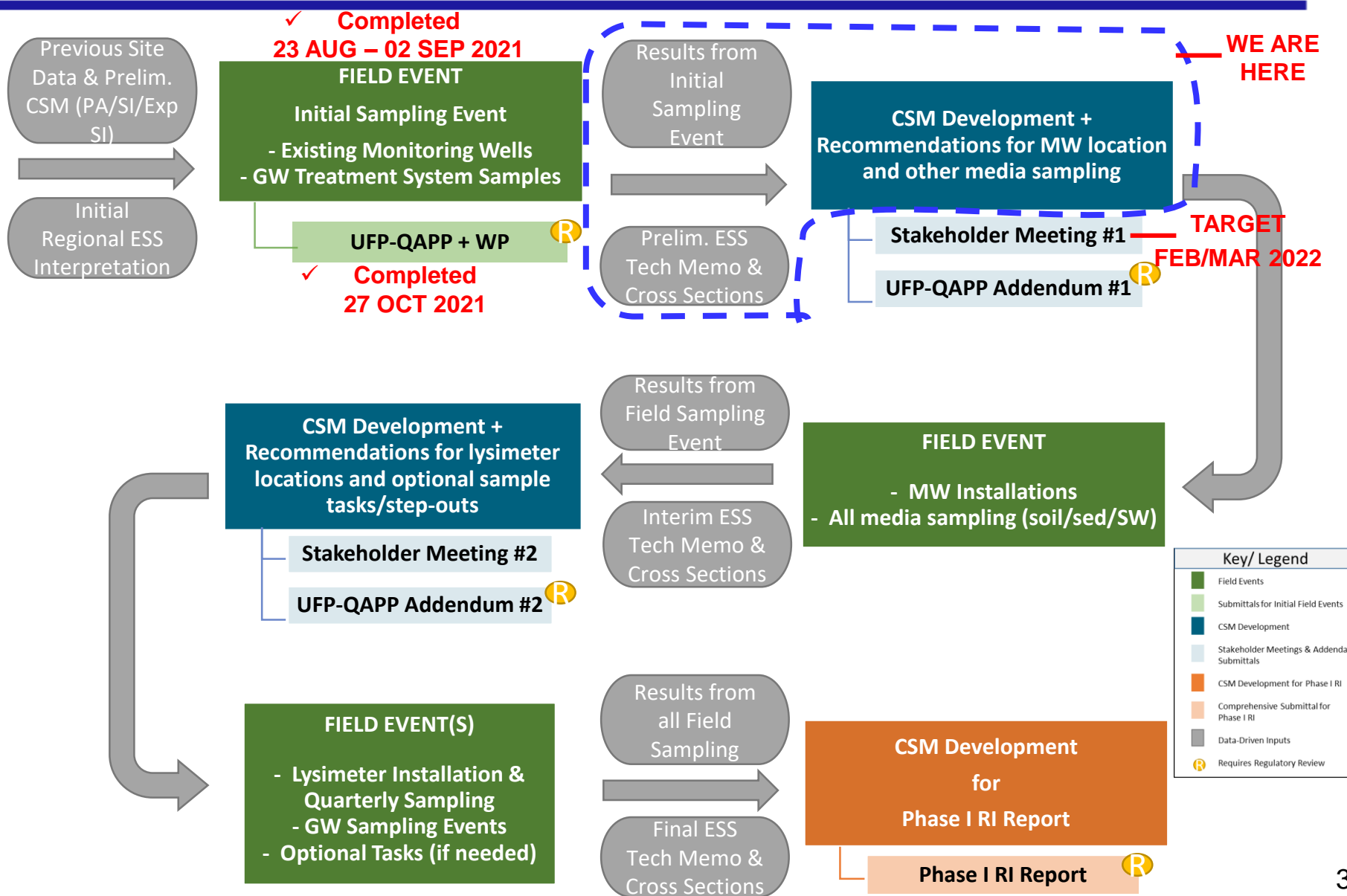
19 January 2022

# Planning Document Update

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- *27 October 2021.* Final WP and Final UPF-QAPP docs posted to Oneida SharePoint.
- *3 January 2022.* Revised Field Change Request Form sent via email to project team.
- *January – May 2022.* CSM Development and UFP-QAPP Addendum #1 Process.

# Phase I Remedial Investigation Data-Driven Process



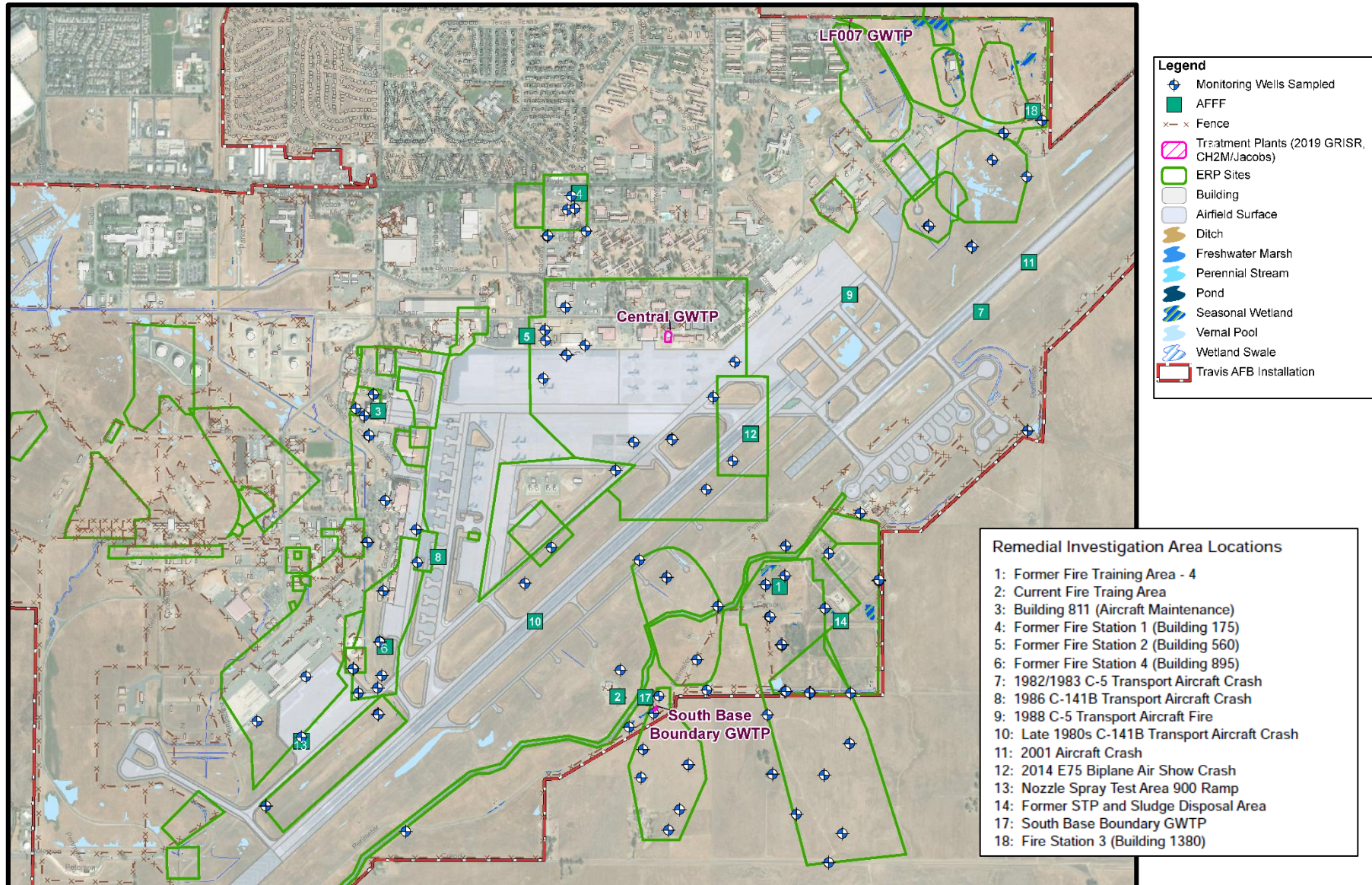


# Initial Sampling Event and Next Steps

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- *23 Aug – 2 Sep 2021.* Sampled 96 monitoring wells and collected influent and effluent samples at the SBBGWTP, CGWTP, and LF007 treatment systems.
- *25 October 2021.* Preliminary ESS Tech Memo and Cross Sections shared with Team.
- *Oct/Nov 2021.* Receipt of remaining (unvalidated) laboratory data packages.
- *Dec 2021/Jan 2022.* Data Validation.
- *Jan/Feb 2022.* Generate data tables and figures.
- *Target Feb/Mar 2022.* Stakeholder Meeting #1 and UFP-QAPP Addendum #1.

# AFFF and Remedial Investigation Areas





# South Base Boundary Groundwater Treatment Plant

## Monthly Data Sheet

Report Number: 253

Reporting Period: 4 November 2021 – 1 December 2021

Date Submitted: 14 December 2021

This monthly data sheet presents information regarding the South Base Boundary Groundwater Treatment Plant (SBBGWTP).

## System Metrics

Table 1 presents operational data from the November 2021 reporting period.

Table 1 – Operations Summary – November 2021				
Initial Data Collection:		11/4/2021 12:00	Final Data Collection:	12/1/2021 12:00
Operating Time:		Percent Uptime:		Electrical Power Usage:
SBBGWTP:	196 hours	SBBGWTP:	30.3%	SBBGWTP: 4,318 kWh (4,795 lbs CO <sub>2</sub> generated <sup>a</sup> )
Gallons Treated: 1.411 million gallons		Gallons Treated Since July 1998: 1.290 billion gallons		
Volume Discharged to Union Creek: 1.411 million gallons		Gallons Treated from Other Sources: 0 gallons		
VOC Mass Removed: 0.36 lbs <sup>b</sup>		VOC Mass Removed Since July 1998: 544.6 lbs		
Rolling 12-Month Cost per Pound of Mass Removed: \$20,078 <sup>c</sup>				
Monthly Cost per Pound of Mass Removed: \$46,221 <sup>c</sup>				
lbs = pounds				
<sup>a</sup> SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 1,600 pounds of GHG from GAC change out services averaged to a per month basis.				
<sup>b</sup> Calculated using November 2021 EPA Method SW8260C analytical results.				
<sup>c</sup> Costs include operations and maintenance, carbon change out, reporting, analytical laboratory, project management, and utility costs related to operation of the system.				



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

Table 2 – SBBGWTP Average Flow Rate (gpm) – November 2021							
FT005				SS029		SS030	
EW01x05	Offline <sup>a</sup>	EW743x05	Offline <sup>a</sup>	EW01x29	Offline <sup>c</sup>	EW01x30	6.4
EW02x05	Offline <sup>a</sup>	EW744x05	4.4	EW02x29	7.4	EW02x30	3.7
EW03x05	Offline <sup>a</sup>	EW745x05	13.1	EW03x29	20.0	EW03x30	15.6
EW731x05	Offline <sup>b</sup>	EW746x05	Offline <sup>a</sup>	EW04x29	6.1	EW04x30	8.1
EW732x05	Offline <sup>a</sup>	EW2291x05	Offline <sup>b</sup>	EW05x29	4.2	EW05x30	6.4
EW733x05	Offline <sup>a</sup>	EW2782x05	Offline <sup>d</sup>	EW06x29	14.1	EW2174x30	4.5
EW734x05	5.5	EW2783x05	3.7	EW07x29	7.1	EW711x30	5.1
EW735x05	8.3	EW2784x05	11.0				
EW736x05	Offline <sup>a</sup>	EW2785x05	10.5				
EW737x05	Offline <sup>a</sup>	EW2786x05	12.8				
EW742x05	Offline <sup>a</sup>						
FT005 Total: 69.3				SS029 Total: 58.9		SS030 Total: 49.8	
SBBGWTP Average Monthly Flow <sup>e</sup> : 120.0 gpm							
<sup>a</sup> 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.							
<sup>b</sup> Extraction well was taken offline because the Site FT005 TD has concluded and COCs no longer exceed cleanup goals in this extraction area.							
<sup>c</sup> Extraction well taken offline because of persistent fouling of the well pump and associated discharge piping.							
<sup>d</sup> Extraction well was offline for repair							
<sup>e</sup> 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							
The South Plant was taken off line 11 November 2021 due to an effluent exceedance. Individual well flow rates were not recorded prior to this shutdown, so October 2021 values are reported here as an estimate of well performance prior to shutdown.							

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

Table 3 – Summary of System Shutdowns					
Location	Shutdown <sup>a</sup>		Restart <sup>a</sup>		Cause
	Date	Time	Date	Time	
SBBGWTP	11 November 2021	16:00			Precautionary measure due to contaminant detection after carbon treatment.
<sup>a</sup> Shutdown and restart times estimated based on field notes SBBGWTP = South Base Boundary Groundwater Treatment Plant					

## Summary of O&M Activities

Monthly groundwater treatment samples were collected at the SBBGWTP on 2 November 2021. Sample results are presented in Table 4. The total VOC concentration (30.8 µg/L) in the influent sample decreased from the October 2021 sample results (31.9 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 29 µg/L. TCE, cis-1,2-DCE, and chloroform were detected in the midpoint sampling location. Cis-1,2-DCE and chloroform were detected in the effluent sampling location, and the cis-1,2-DCE concentration (1.2 µg/L) exceeded the discharge limits of 0.5 µg/L.

The effluent sample was also analyzed for TPH-g, TPH-d, and TPH-mo, and no TPH was detected.

On 4 November, confirmation samples were collected from the effluent sample location and upstream and downstream of the discharge point in Union Creek. Sample results are presented in Table 5. Cis-1,2-DCE (1.0 µg/L) and 1,2-DCA (0.29 µg/L) were detected in the system effluent, and the cis-1,2-DCE concentration exceeded the discharge limit. Acetone (2.7 J µg/L) and 2-butanone (0.42 J µg/L) were detected upstream of the discharge point, and cis-1,2-DCE (0.25 J µg/L) was detected downstream of the discharge point.

On 11 November, the SBBGWTP was shut down as a precautionary measure due to contaminant breakthrough following carbon treatment.

In November 2021, a freshwater toxicity test was performed on the SBBGWTP system effluent. No observed adverse effects were reported on the rainbow trout, and the survival rate was 100 percent.

Figure 1 presents a plot of influent VOC concentrations and average flow at the SBBGWTP over the past twelve (12) months. VOC concentrations have been seasonally variable; however, over the last 12 months the trend has increased. An overall decreasing flow rate trend was also observed in the past 12 months.

In November 2021 troubleshooting was performed on three extraction wells. The following list presents the maintenance activities and status of those extraction wells:

- EW2782x05 –Rodent-damaged power wiring were replaced. The well will be returned to service once the treatment plant is back on line.
- EW06x29 – The control panel fuse block (power disconnect) was replaced with a circuit breaker.
- EW2174x30 – The transducer was replaced. The well will be returned to service once the treatment plant is back on line.

## Optimization Activities

No optimization activities occurred at the SBBGWTP in November 2021.

## 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 offline that are no longer necessary for contaminant plume capture.

Figure 2 presents the historical GHG production from the SBBGWTP. In November 2021, the SBBGWTP produced approximately 4,795 pounds of GHG, which includes approximately 1,600 pounds of GHG generated from GAC change out services averaged to a per month basis.

TABLE 4

Summary of Groundwater Analytical Data for November 2021 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum <sup>a</sup> (µg/L)	Detection Limit (µg/L)	N/C	2 November 2021 (µg/L)		
				Influent	Midpoint	Effluent <sup>b</sup>
Halogenated Volatile Organics						
Acetone	NA	1.9	0	ND	ND	ND
Bromodichloromethane	NA	0.17	0	ND	ND	ND
Chloroform	1.9	0.16	0	ND	ND	0.18 J
Chloromethane	NA	0.30	0	ND	ND	ND
1,1-Dichloroethane	0.50	0.22	0	ND	ND	ND
1,2-Dichloroethane	0.50	0.13	0	ND	0.16 J	ND
1,1-Dichloroethene	0.50	0.23	0	ND	ND	ND
cis-1,2-Dichloroethene	0.50	0.15	1	1.8	2.2	1.2
trans-1,2-Dichloroethene	0.50	0.11	0	ND	ND	ND
Dichlorodifluoromethane	NA	0.31	0	ND	ND	ND
Tetrachloroethene	0.50	0.20	0	ND	ND	ND
1,1,1-Trichloroethane	0.50	0.16	0	ND	ND	ND
1,1,2-Trichloroethane	0.50	0.27	0	ND	ND	ND
Trichloroethene	0.65	0.16	0	29	8.8	ND
Vinyl Chloride	0.90	0.10	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	0.50	0.13	0	ND	ND	ND
Ethylbenzene	0.50	0.15	0	ND	ND	ND
Toluene	0.50	0.25	0	ND	ND	ND
Xylenes	0.50	0.10 – 0.18	0	ND	ND	ND
Other						
Total Petroleum Hydrocarbons – Gasoline	50	10	0	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel	50	25	0	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil	100	32	0	NM	NM	ND

<sup>a</sup> In accordance with current National Pollutant Discharge Elimination System permit number CAG912002, Order number R2-2017-0048.

<sup>b</sup> Concentrations in **bold** exceeded discharge limits.

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

TABLE 5

Summary of Groundwater Analytical Data for November 2021 Confirmation Sampling – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum <sup>a</sup> (µg/L)	Detection Limit (µg/L)	N/C	4 November 2021 (µg/L)		
				Effluent <sup>b</sup>	Upstream	Downstream
Halogenated Volatile Organics						
Acetone	NA	1.9	0	ND	2.7 J	ND
Bromodichloromethane	NA	0.17	0	ND	ND	ND
Chloroform	1.9	0.16	0	ND	ND	ND
Chloromethane	NA	0.30	0	ND	ND	ND
1,1-Dichloroethane	0.50	0.22	0	ND	ND	ND
1,2-Dichloroethane	0.50	0.13	0	0.29 J	ND	ND
1,1-Dichloroethene	0.50	0.23	0	ND	ND	ND
cis-1,2-Dichloroethene	0.50	0.15	1	1.0	ND	0.25
trans-1,2-Dichloroethene	0.50	0.11	0	ND	ND	ND
Dichlorodifluoromethane	NA	0.31	0	ND	ND	ND
Tetrachloroethene	0.50	0.20	0	ND	ND	ND
1,1,1-Trichloroethane	0.50	0.16	0	ND	ND	ND
1,1,2-Trichloroethane	0.50	0.27	0	ND	ND	ND
Trichloroethene	0.65	0.16	0	ND	ND	ND
Vinyl Chloride	0.90	0.10	0	ND	ND	ND
Non-Halogenated Volatile Organics						
Benzene	0.50	0.13	0	ND	ND	ND
Ethylbenzene	0.50	0.15	0	ND	ND	ND
Toluene	0.50	0.25	0	ND	ND	ND
Xylenes	0.50	0.10 – 0.18	0	ND	ND	ND
Others						
2-Butanone	NA	0.35	0	ND	0.42 J	ND

<sup>a</sup> In accordance with current National Pollutant Discharge Elimination System permit number CAG912002, Order number R2-2017-0048.

<sup>b</sup> Concentrations in **bold** exceeded discharge limits.

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.

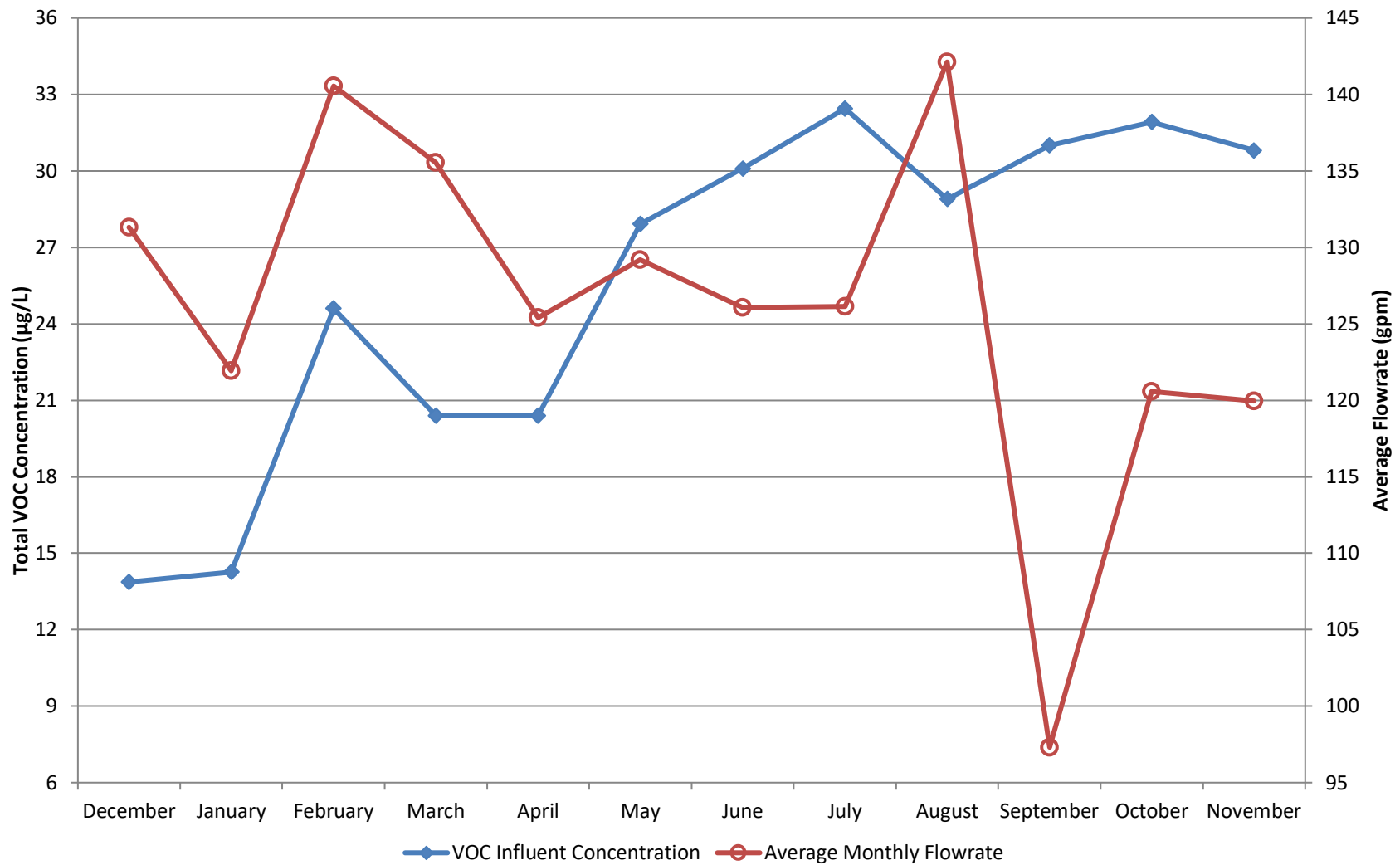
ND = not detected

NM = not measured

µg/L = micrograms per liter

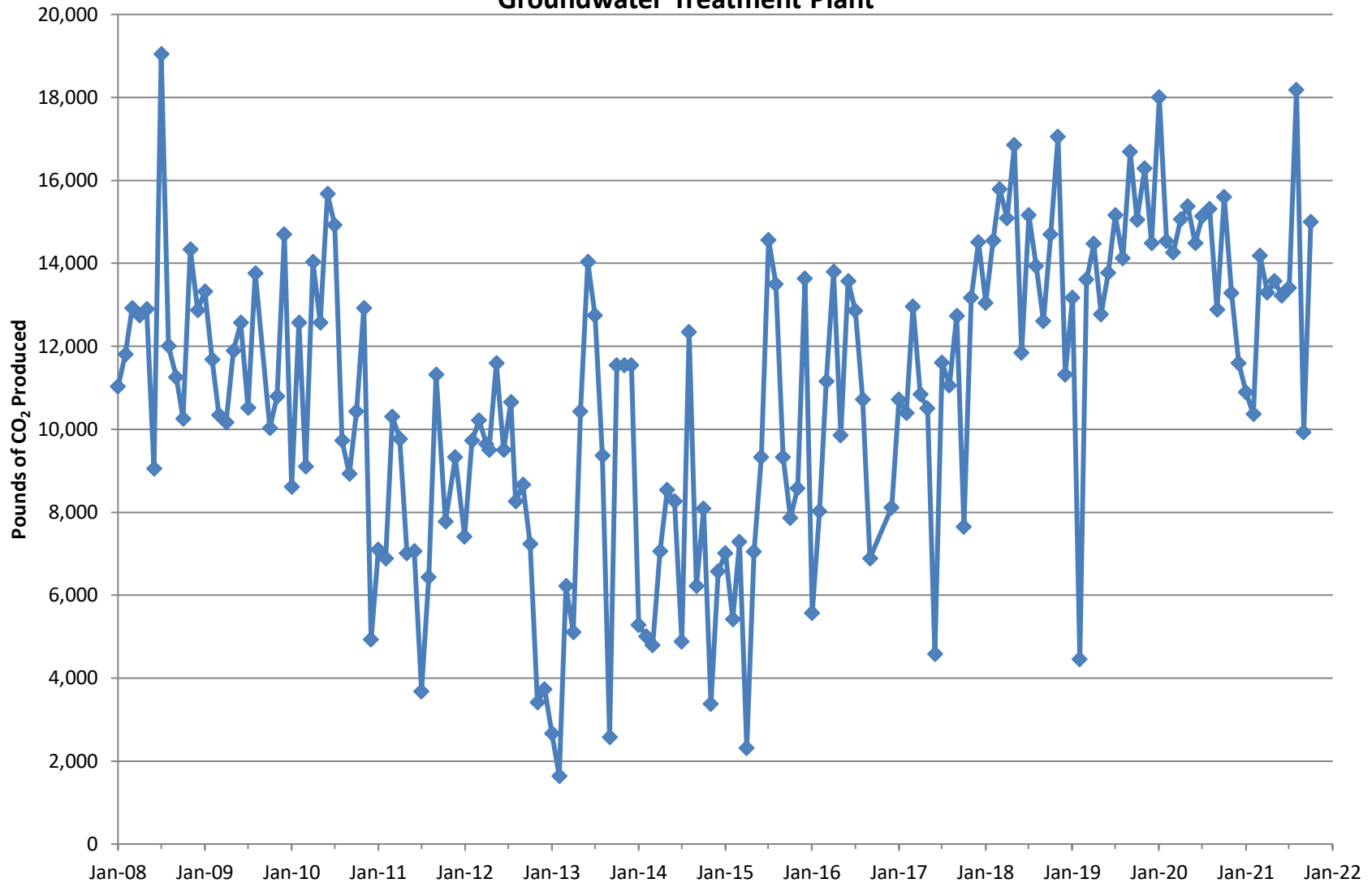


**Figure 1**  
**SBBGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History**



**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: 268

Reporting Period: 1 November 2021 – 1 December 2021

Date Submitted: 14 December 2021

This monthly data sheet presents information regarding the Central Groundwater Treatment Plant (CGWTP) and its associated bioreactors (Sites DP039 and SS016).

## System Metrics

Table 1 presents operational data from the November 2021 reporting period.

Table 1 – Operations Summary – November 2021				
Initial Data Collection:		11/1/2021 13:00	Final Data Collection:	12/1/2021 10:00
Operating Time:		Percent Uptime:		Electrical Power Usage:
CGWTP:	713.5 hours	CGWTP:	99.5%	CGWTP: 1,290 kWh (1,842 lbs CO <sub>2</sub> generated <sup>a</sup> )
Gallons Treated (discharge to storm sewer):		Gallons Treated Since January 1996: <b>598.8 million gallons</b>		
<b>794,472 gallons</b>				
VOC Mass Removed from groundwater:		VOC Mass Removed Since January 1996:		
<b>1.10 lbs<sup>b</sup></b>		<b>2,891 lbs from groundwater</b>		
		<b>8,686 lbs from vapor</b>		
Rolling 12-Month Cost per Pound of Mass Removed: \$3,357 <sup>c</sup>				
Monthly Cost per Pound of Mass Removed: \$4,158 <sup>c</sup>				
<sup>a</sup> SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 888 pounds of GHG from GAC change out services averaged to a per month basis.				
<sup>b</sup> Calculated using November 2021 EPA Method SW8260C analytical results.				
<sup>c</sup> Costs include operations and maintenance, carbon change out, reporting, analytical laboratory, project management, and utility costs related to operation of the system.				

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

Table 2 – CGWTP Average Flow Rates <sup>a</sup> – November 2021	
Location	Average Flow Rate Groundwater (gpm)
EW001x16	10.6
EW002x16	6.3
EW003x16 <sup>b</sup>	0.0
EW605x16	NM <sup>c</sup>
EW610x16	NM <sup>c</sup>
CGWTP	18.6
<sup>a</sup> Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the instantaneous readings.	
<sup>b</sup> Extracted groundwater from EW003x16 had been treated in Site SS016 bioreactor until November 2020 when it was taken offline and decommissioned. The well replacing EW003x16 (EW003Ax16) has been installed but is not yet online.	
<sup>c</sup> No current access available to the wellhead totalizers because of construction activities	
gpm = gallons per minute	
NM = not measured	

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

<b>Table 3 – Summary of System Shutdowns</b>					
<b>Location</b>	<b>Shutdown<sup>a</sup></b>		<b>Restart</b>		<b>Cause</b>
	<b>Date</b>	<b>Time</b>	<b>Date</b>	<b>Time</b>	
CGWTP	29 November 2021	9:00	29 November 2021	12:30	Repair cracked fitting on transfer pump
-- = Date/Time not recorded					
<sup>a</sup> Shutdown and restart times estimated based on field notes					
CGWTP = Central Groundwater Treatment Plant					

## Summary of O&M Activities

Monthly groundwater treatment samples were collected at the CGWTP on 2 November 2021. Sample results are presented in Table 4. The total VOC concentration (166.1 µg/L) in the November 2021 influent sample has increased slightly from the October 2021 sample (163.1 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 120 µg/L. No VOCs were detected in the samples collected after the first and second carbon vessels and the system effluent sample. The effluent sample was also analyzed for TPH-g, TPH-d, and TPH-mo, and no TPH was detected.

In November 2021, a freshwater toxicity test was performed on the CGWTP system effluent. No observed adverse effects were reported on the rainbow trout, and the survival rate was 100 percent.

On 29 November, the system was temporarily shut down for approximately 3.5 hours to repair a leak on a pump within the containment area. A cracked PVC fitting was replaced, and the system was restarted without issue.

Figure 1 presents a plot of influent concentrations (total VOCs) and the influent flow rate at the CGWTP versus time for the past twelve (12) months. The influent concentrations have been seasonally variable; however, over the last 12 months the trend has decreased. An overall decreasing flow rate trend was observed in the past 12 months.

The Site SS016 subgrade biogeochemical reactor (SBGR), also known as the bioreactor, and the Site DP039 bioreactor both continued operating in November 2021.

A 3-bay aircraft hangar is being constructed over much of the Oil Spill Area (OSA) source area (former Buildings 16 and 18 area). Construction activities are expected to continue through 2022. Every attempt will be made to keep all extraction wells and the Site SS016 bioreactor in operation. However, there may be times when extraction needs to be shutdown to facilitate construction activities. Both wells (EW605x16 and EW610x16) are currently operational.

## Optimization Activities

No optimization activities occurred at the CGWTP in November 2021.

## 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 1,842 pounds of GHG during November 2021.

TABLE 4

Summary of Groundwater Analytical Data for November 2021 – Central Groundwater Treatment Plant

				2 November 2021 (µg/L)			
Constituent	Instantaneous Maximum <sup>a</sup> (µg/L)	Detection Limit (µg/L)	N/C	Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent <sup>b</sup>
Halogenated Volatile Organics							
Acetone	NA	1.9 – 3.8	0	ND	ND	ND	ND
Bromomethane	NA	0.21 – 0.42	0	ND	ND	ND	ND
Carbon disulfide	NA	0.17	0	ND	ND	ND	ND
Chloroform	1.9	0.16 – 0.32	0	ND	ND	ND	ND
Chloromethane	NA	0.30 – 0.60	0	ND	ND	ND	ND
1,2-Dichlorobenzene	NA	0.15 – 0.30	0	0.35 J	ND	ND	ND
1,3-Dichlorobenzene	NA	0.13 – 0.26	0	0.38 J	ND	ND	ND
1,4-Dichlorobenzene	NA	0.16 – 0.32	0	0.27 J	ND	ND	ND
1,1-Dichloroethane	0.50	0.22 – 0.44	0	ND	ND	ND	ND
1,2-Dichloroethane	0.50	0.13 – 0.26	0	ND	ND	ND	ND
1,1-Dichloroethene	0.50	0.23 – 0.46	0	0.53 J	ND	ND	ND
cis-1,2-Dichloroethene	0.50	0.15 – 0.30	0	41	ND	ND	ND
trans-1,2-Dichloroethene	0.50	0.15 – 0.30	0	3.0	ND	ND	ND
Tetrachloroethene	0.50	0.20 – 0.40	0	0.57 J	ND	ND	ND
1,1,1-Trichloroethane	0.50	0.16 – 0.32	0	ND	ND	ND	ND
1,1,2-Trichloroethane	0.50	0.27 – 0.54	0	ND	ND	ND	ND
Trichloroethene	0.65	0.16 – 0.32	0	120	ND	ND	ND
Vinyl Chloride	0.90	0.10 – 0.20	0	ND	ND	ND	ND
Non-Halogenated Volatile Organics							
Benzene	0.50	0.16 – 0.32	0	ND	ND	ND	ND
Ethylbenzene	0.50	0.16 – 0.32	0	ND	ND	ND	ND
Toluene	0.50	0.17 – 0.34	0	ND	ND	ND	ND
Total Xylenes	0.50	0.15 – 0.38	0	ND	ND	ND	ND
Other							
Total Petroleum Hydrocarbons – Gasoline (C6 – C10)	50	10	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel (C10 – C28)	50	24 – 27	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil (C28 – C40)	100	24 – 27	0	NM	NM	NM	ND

<sup>a</sup> In accordance with current National Pollutant Discharge Elimination System permit number CAG912002, Order number R2-2017-0048.

<sup>b</sup> Concentrations in **bold** exceeded discharge limits

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.

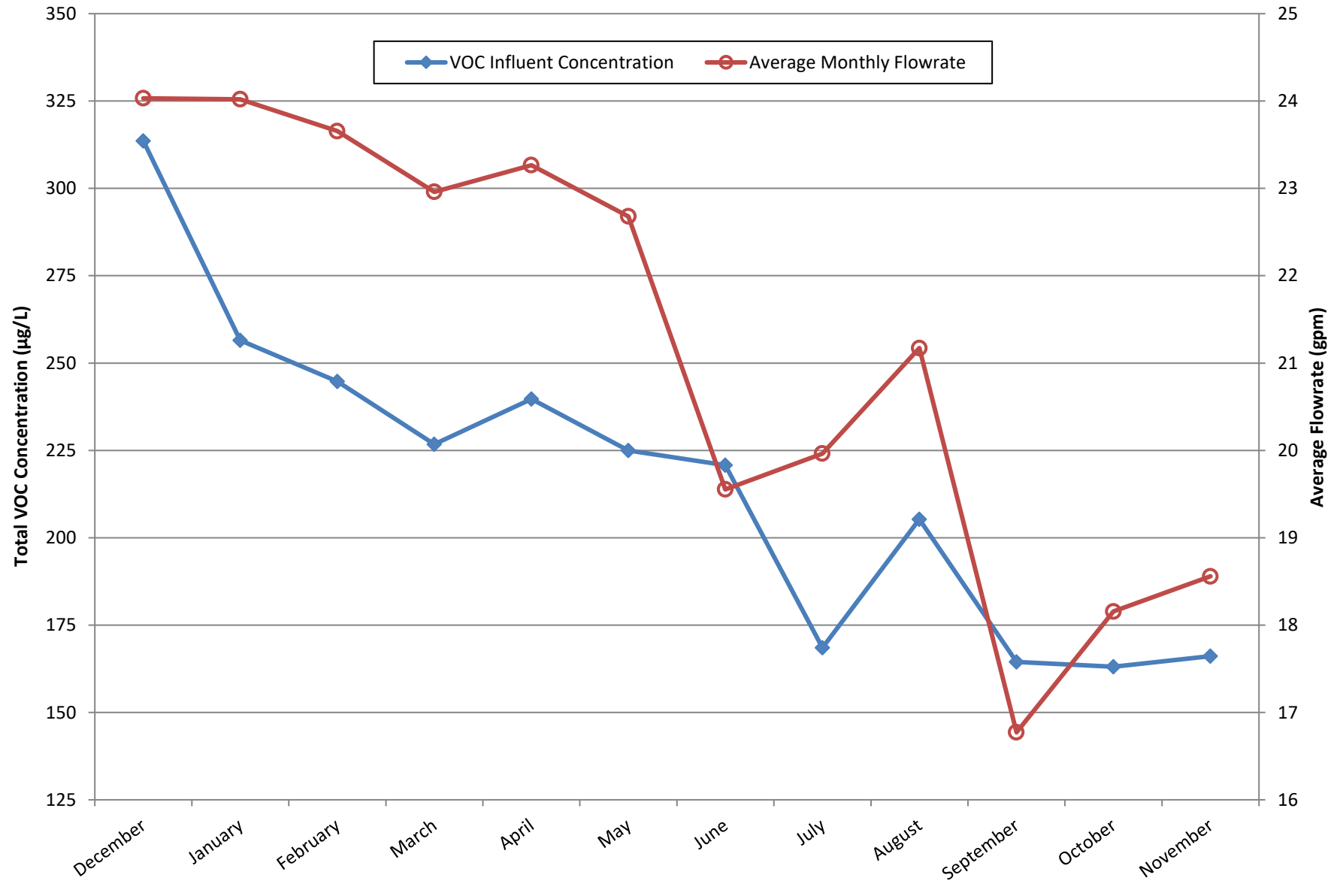
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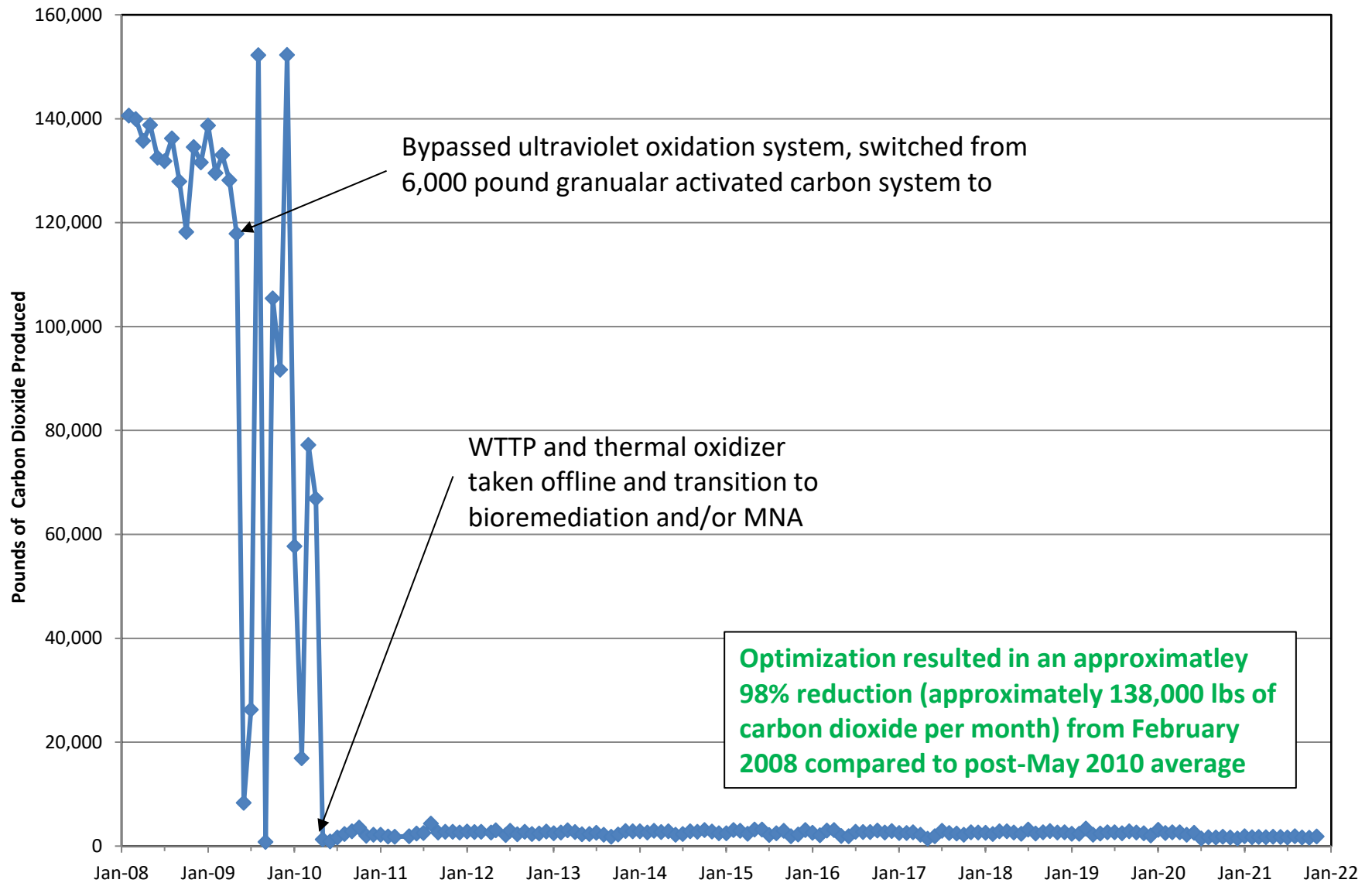
**Figure 1**

**CGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History**



**Figure 2**

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





# Site ST018 Groundwater Treatment Plant

## Monthly Data Sheet

Report Number: 129

Reporting Period: 1 November 2021 – 1 December 2021

Date Submitted: 14 November 2021

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

### System Metrics

Table 1 presents operation data from the November 2021 reporting period.

Table 1 – Operations Summary – November 2021			
Initial Data Collection: 11/1/2021 12:30		Final Data Collection: 12/1/2021 11:00	
Operating Time:		Percent Uptime:	
ST018GWTP: 583 hours		ST018GWTP: 81.1%	
		Electrical Power Usage: ST018GWTP: 25 kWh (19 lbs CO <sub>2</sub> generated <sup>a</sup> )	
Gallons Extracted: 40,421 gallons		Gallons Extracted Since March 2011: 20.6 million gallons	
Volume Discharged to Sanitary Sewer: 40,421 gallons		Final Totalizer Reading: 20,646,789 gallons	
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: 14.2 million gallons			
MTBE, BTEX, VOC, TPH Mass Removed: 0.03 lbs <sup>b</sup>		MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: 50.2 lbs	
MTBE (Only) Removed: 0.02 lbs <sup>b</sup>		MTBE (Only) Mass Removed Since March 2011: 12.3 lbs	
Rolling 12-Month Cost per Total Pounds of Mass Removed: \$90,735 <sup>bc</sup>			
Monthly Cost per Pound of Mass Removed: \$131,792 <sup>bc</sup>			
<sup>a</sup> SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG.			
<sup>b</sup> Calculated using November 2021 EPA Method SW8260C and SW8015B analytical results.			
<sup>c</sup> Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system.			
kWh = kilowatt hour			
lbs = pounds			

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

<b>Table 2 – ST018GWTP Average Flow Rates – November 2021</b>		
<b>Location</b>	<b>Average Flow Rate Groundwater (gpm)<sup>a</sup></b>	<b>Hours of Operation</b>
EW2014x18	0.0	Offline <sup>b</sup>
EW2016x18	0.6	583
EW2019x18	0.0	Offline <sup>b</sup>
EW2333x18	1.3	583
ST018GWTP	1.2	583
<sup>a</sup> Flow rates calculated by dividing total gallons processed by amount of operating time of the pump/system. The extraction pumps take in air from the subsurface, which alters the flow and totalizer. <sup>b</sup> Extraction well was turned off with regulatory approval because of low MTBE concentrations.  gpm = gallons per minute ST018GWTP = Site ST018 Groundwater Treatment Plant		

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

<b>Table 3 – Summary of System Shutdowns</b>					
<b>Location</b>	<b>Shutdown<sup>a</sup></b>		<b>Restart<sup>a</sup></b>		<b>Cause</b>
	<b>Date</b>	<b>Time</b>	<b>Date</b>	<b>Time</b>	
ST018GWTP	1 November 2021	15:00	9 November	9:00	Faulty pressure switch. System operated in hand mode between 0900 and 1500 on business days only during this period.
-- = Time not recorded <sup>a</sup> Shutdown and restart times estimated based on field notes ST018GWTP = Site ST018 Groundwater Treatment Plant					

## Summary of O&M Activities

Monthly groundwater discharge samples were collected at the ST018GWTP on 2 November 2021. Because the extracted groundwater is no longer treated with carbon prior to discharge to the sanitary sewer, only discharge samples are now collected, rather than influent and effluent samples. Results are presented in Table 4. The complete November 2021 laboratory data report is available upon request. The MTBE discharge concentration during the November 2021 sampling event was 54 µg/L, which is an increase from the October 2021 sample result of 14 µg/L. TPH-d and TPH-g were also detected in the system discharge sample and are listed in Table 4.

The Fairfield-Suisun Sewer District does not currently have a discharge 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 discharge contaminant concentrations to maintain compliance with the Fairfield-Suisun Sewer District discharge permit.

As discussed in the October 2021 Monthly Data Sheet, as a precaution, the Site ST018 GWTP was left off line beginning on 28 October 2021 and operated during business hours only (approximately 0900 to 1500). On 9 November, the pressure switch for EW2333x18 was calibrated so it would turn off the system during a fault.

The system was fully restarted after this calibration and operated under normal conditions for the rest of the reporting period.

Figure 1 presents plots of the average flow rate and total extracted contaminants (MTBE, TPH-g, TPH-d, TPH-mo, BTEX, and VOCs) and extracted MTBE concentrations at the ST018GWTP over the past twelve (12) months. The average flow rate through the ST018GWTP has been cyclical with typical flow rates decreasing during the dry season (summer and fall) and increasing during the rainy season (winter and spring). The overall average flow rates in the past 12 months show a decreasing trend. The extracted MTBE concentrations and extracted total concentrations have exhibited overall increasing and decreasing trends, respectively, over the past 12 months.

## Optimization Activities

No optimization activities occurred at the ST018GWTP in November 2021.

## 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 a majority of the ST018GWTP system.

Figure 2 presents the historical GHG production from the ST018GWTP. The ST018GWTP produced 19 pounds of GHG during November 2021 and removed 40,421 gallons of water. The amount of GHG produced is directly attributed to the amount of water removed through the system because the only line-power electrical use is for a transfer pump to push the water from the system to the sanitary sewer.

TABLE 4

Summary of Groundwater Analytical Data for November 2021 – Site ST018 Groundwater Treatment Plant

Summary of Groundwater Analytical Data for November 2021 - Site C1010 Groundwater Monitoring Point				
Constituent	Instantaneous Maximum <sup>a</sup> (µg/L)	Detection Limit (µg/L)	N/C	2 November 2021 (µg/L)
				System Discharge <sup>b</sup>
Fuel Related Constituents				
Methyl tert-Butyl Ether	6,400	0.25	0	54
Benzene	25,000 <sup>c</sup>	0.16	0	ND
Ethylbenzene	25,000 <sup>c</sup>	0.16	0	ND
Toluene	25,000 <sup>c</sup>	0.17	0	ND
Total Xylenes	25,000 <sup>c</sup>	0.19 – 0.34	0	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 <sup>d</sup>	10	0	17 J
Total Petroleum Hydrocarbons – Diesel	50,000 <sup>d</sup>	15	0	30 J
Total Petroleum Hydrocarbons – Motor Oil	100,000	160	0	ND
Other				
Acetone	NA	1.9	0	ND
Bromomethane	NA	0.21	0	ND
2-Butanone (MEK)	NA	2.0	0	ND
1,2-Dichloroethane	20	0.13	0	ND
Isopropylbenzene	NA	0.19	0	ND
Naphthalene	NA	0.22	0	ND
N-Propylbenzene	NA	0.16	0	ND

<sup>a</sup> In accordance with the Fairfield-Suisun Sewer District Discharge Limitations<sup>b</sup> Concentrations in **bold** exceeded discharge limits<sup>c</sup> The limit of 25,000 µg/L is a combined limit for BTEX.<sup>d</sup> The limit of 50,000 µg/L is a combined limit for TPH-g and TPH-d.

µg/L = micrograms per liter

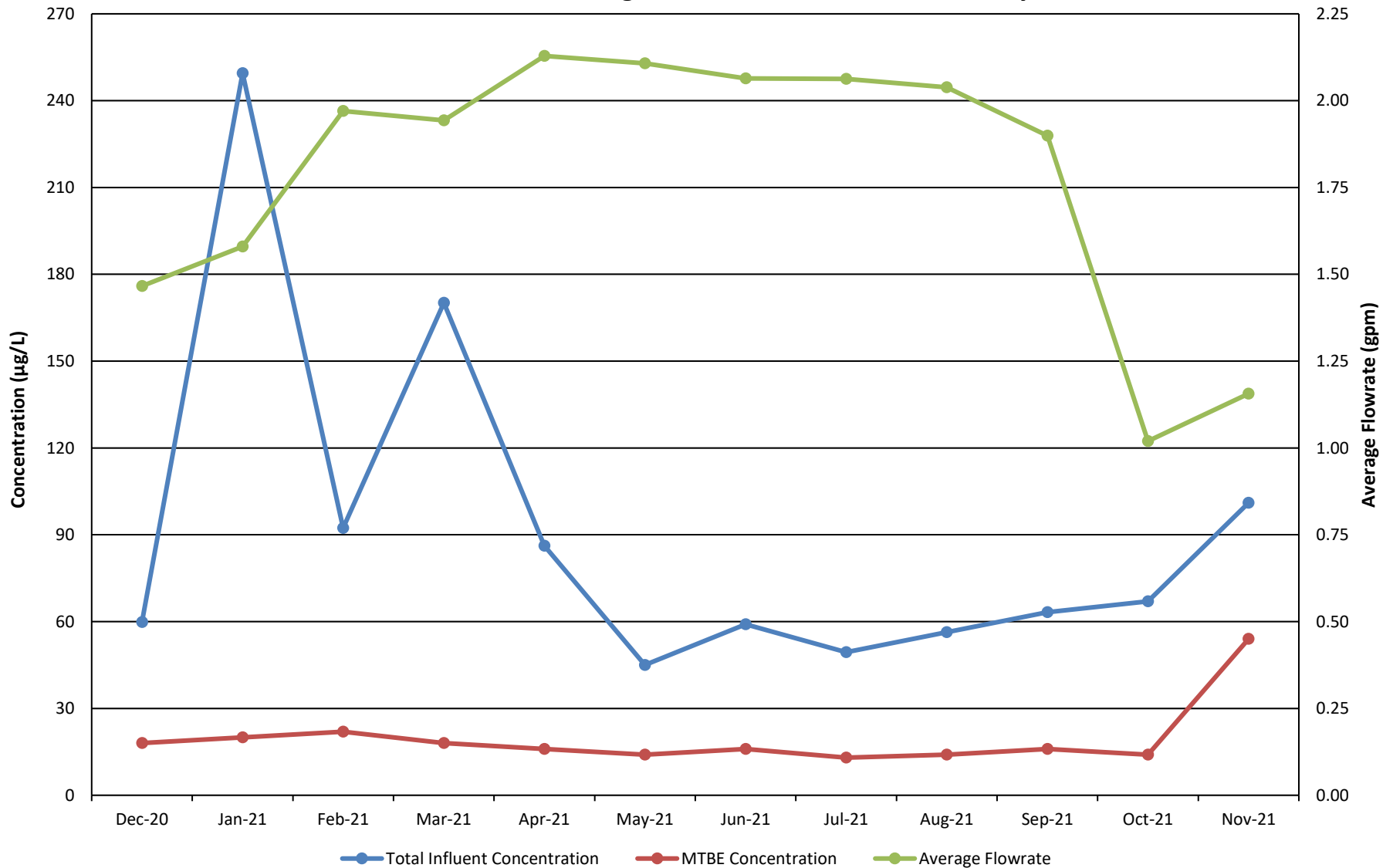
J = analyte concentration is considered an estimated value due to a detected concentration value between the reporting limit and method detection limit for the contaminant.

NA = not applicable

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

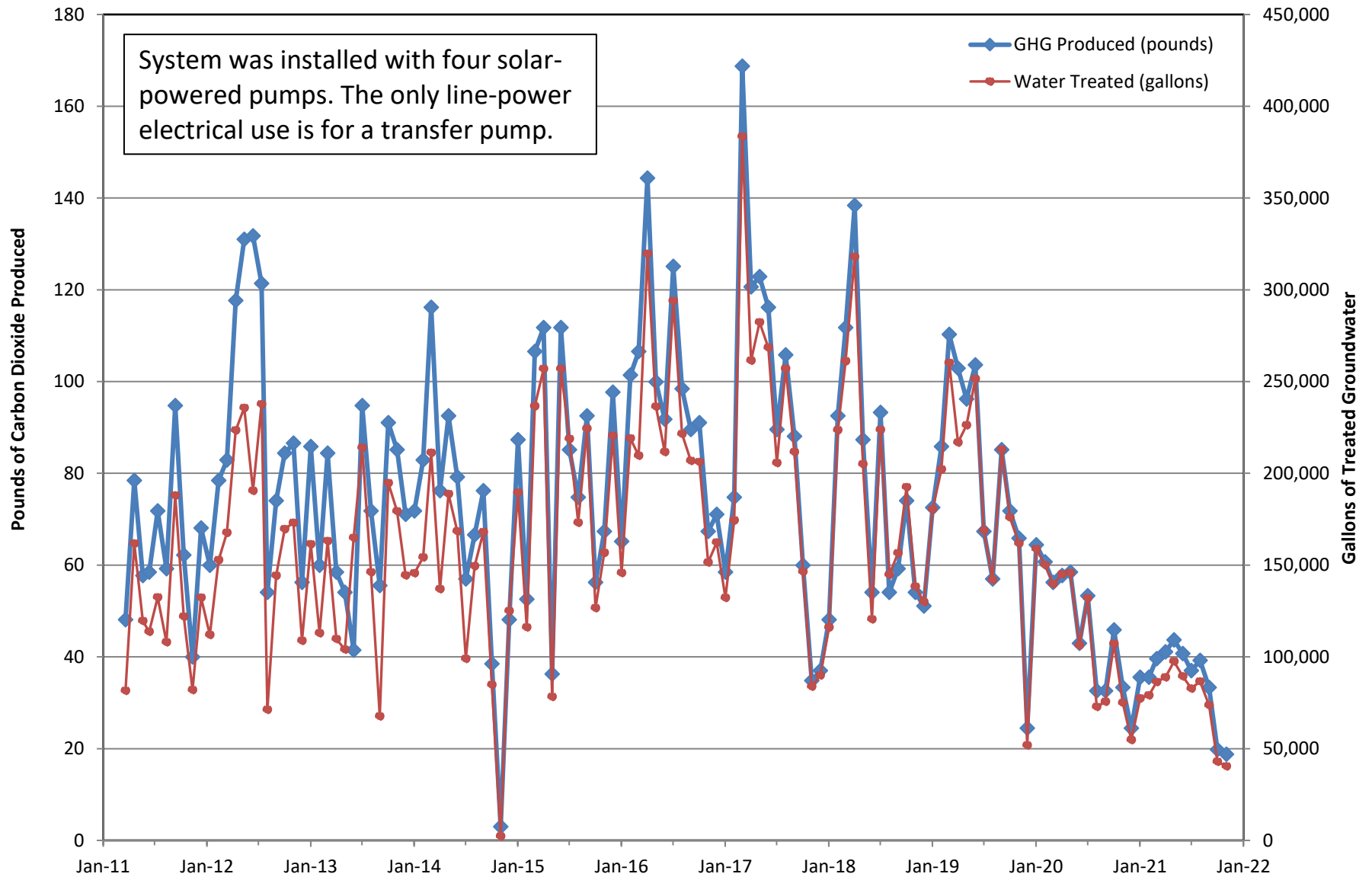
ND = not detected above method detection limit.

**Figure 1**  
**ST018GWTP Total Influent and MTBE 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: 130

Reporting Period: 1 December 2021 – 3 January 2022

Date Submitted: 12 January 2022

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

### System Metrics

Table 1 presents operation data from the December 2021 reporting period.

Table 1 – Operations Summary – December 2021			
<b>Initial Data Collection:</b>	12/1/2021 11:00	<b>Final Data Collection:</b>	1/3/2022 11:00
Operating Time:		Percent Uptime:	Electrical Power Usage:
<b>ST018GWTP:</b> 792 hours		<b>ST018GWTP:</b> 100%	<b>ST018GWTP:</b> 33 kWh (24 lbs CO <sub>2</sub> generated <sup>a</sup> )
Gallons Extracted: <b>50,533 gallons</b>		Gallons Extracted Since March 2011: <b>20.7 million gallons</b>	
Volume Discharged to Sanitary Sewer: <b>50,533 gallons</b>		Final Totalizer Reading: <b>20,697,322 gallons</b>	
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: <b>14.2 million gallons</b>			
MTBE, BTEX, VOC, TPH Mass Removed: <b>0.04 lbs<sup>b</sup></b>		MTBE, BTEX, VOC, TPH Mass Removed Since March 2011: <b>50.3 lbs</b>	
MTBE (Only) Removed: <b>0.02 lbs<sup>b</sup></b>		MTBE (Only) Mass Removed Since March 2011: <b>12.3 lbs</b>	
Rolling 12-Month Cost per Total Pounds of Mass Removed: <b>\$82,084<sup>bc</sup></b>			
Monthly Cost per Pound of Mass Removed: <b>\$44,066<sup>bc</sup></b>			
<sup>a</sup> SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. <sup>b</sup> Calculated using December 2021 EPA Method SW8260C and SW8015B analytical results. <sup>c</sup> Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system. kWh = kilowatt hour lbs = pounds			

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

<b>Table 2 – ST018GWTP Average Flow Rates – December 2021</b>		
<b>Location</b>	<b>Average Flow Rate Groundwater (gpm)<sup>a</sup></b>	<b>Hours of Operation</b>
EW2014x18	0.0	Offline <sup>b</sup>
EW2016x18	0.7	792
EW2019x18	0.0	Offline <sup>b</sup>
EW2333x18	1.5	792
ST018GWTP	1.1	792
<sup>a</sup> Flow rates calculated by dividing total gallons processed by amount of operating time of the pump/system. The extraction pumps take in air from the subsurface, which alters the flow and totalizer. <sup>b</sup> Extraction well was turned off with regulatory approval because of low MTBE concentrations.  gpm = gallons per minute ST018GWTP = Site ST018 Groundwater Treatment Plant		

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

<b>Table 3 – Summary of System Shutdowns</b>					
<b>Location</b>	<b>Shutdown<sup>a</sup></b>		<b>Restart<sup>a</sup></b>		<b>Cause</b>
	<b>Date</b>	<b>Time</b>	<b>Date</b>	<b>Time</b>	
ST018GWTP	None	--	--	--	
-- = Time not recorded <sup>a</sup> Shutdown and restart times estimated based on field notes ST018GWTP = Site ST018 Groundwater Treatment Plant					

## Summary of O&M Activities

Monthly groundwater discharge samples were collected at the ST018GWTP on 1 December 2021. Because the extracted groundwater is no longer treated with carbon prior to discharge to the sanitary sewer, only discharge samples are now collected, rather than influent and effluent samples. Results are presented in Table 4. The complete December 2021 laboratory data report is available upon request. The MTBE discharge concentration during the December 2021 sampling event was 51 µg/L, which is a slight decrease from the November 2021 sample result of 54 µg/L. TPH-g was also detected in the system discharge sample and are listed in Table 4.

The Fairfield-Suisun Sewer District does not currently have a discharge 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 discharge contaminant concentrations to maintain compliance with the Fairfield-Suisun Sewer District discharge permit.

Figure 1 presents plots of the average flow rate and total extracted contaminants (MTBE, TPH-g, TPH-d, TPH-mo, BTEX, and VOCs) and extracted MTBE concentrations at the ST018GWTP over the past twelve (12) months. The average flow rate through the ST018GWTP has been cyclical with typical flow rates decreasing during the dry season (summer and fall) and increasing during the rainy season (winter and spring). The overall average flow rates in the past 12 months show a decreasing trend. The reason for the decreased flow rate during the rainy season is a result of shutting down two extraction wells (EW2014x18 and EW2019x18)



due to low MTBE concentrations. The extracted MTBE concentrations and extracted total concentrations have exhibited overall increasing and decreasing trends, respectively, over the past 12 months.

## Optimization Activities

No optimization activities occurred at the ST018GWTP in December 2021.

## 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 a majority of the ST018GWTP system.

Figure 2 presents the historical GHG production from the ST018GWTP. The ST018GWTP produced 24 pounds of GHG during December 2021 and removed 50,533 gallons of water. The amount of GHG produced is directly attributed to the amount of water removed through the system because the only line-power electrical use is for a transfer pump to push the water from the system to the sanitary sewer.

TABLE 4

Summary of Groundwater Analytical Data for December 2021 – Site ST018 Groundwater Treatment Plant

Summary of Groundwater Analytical Data for December 2021 - Site C-176 Groundwater Monitoring Point				
Constituent	Instantaneous Maximum <sup>a</sup> (µg/L)	Detection Limit (µg/L)	N/C	1 December 2021 (µg/L)
				System Discharge <sup>b</sup>
<b>Fuel Related Constituents</b>				
Methyl tert-Butyl Ether	6,400	0.25	0	51
Benzene	25,000 <sup>c</sup>	0.16	0	ND
Ethylbenzene	25,000 <sup>c</sup>	0.16	0	ND
Toluene	25,000 <sup>c</sup>	0.17	0	ND
Total Xylenes	25,000 <sup>c</sup>	0.19 – 0.34	0	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 <sup>d</sup>	10	0	38
Total Petroleum Hydrocarbons – Diesel	50,000 <sup>d</sup>	15	0	ND
Total Petroleum Hydrocarbons – Motor Oil	100,000	160	0	ND
<b>Other</b>				
Acetone	NA	1.9	0	ND
Bromomethane	NA	0.21	0	ND
2-Butanone (MEK)	NA	2.0	0	ND
1,2-Dichloroethane	20	0.13	0	ND
Isopropylbenzene	NA	0.19	0	ND
Naphthalene	NA	0.22	0	ND
N-Propylbenzene	NA	0.16	0	ND

<sup>a</sup> In accordance with the Fairfield-Suisun Sewer District Discharge Limitations<sup>b</sup> Concentrations in **bold** exceeded discharge limits<sup>c</sup> The limit of 25,000 µg/L is a combined limit for BTEX.<sup>d</sup> The limit of 50,000 µg/L is a combined limit for TPH-g and TPH-d.

µg/L = micrograms per liter

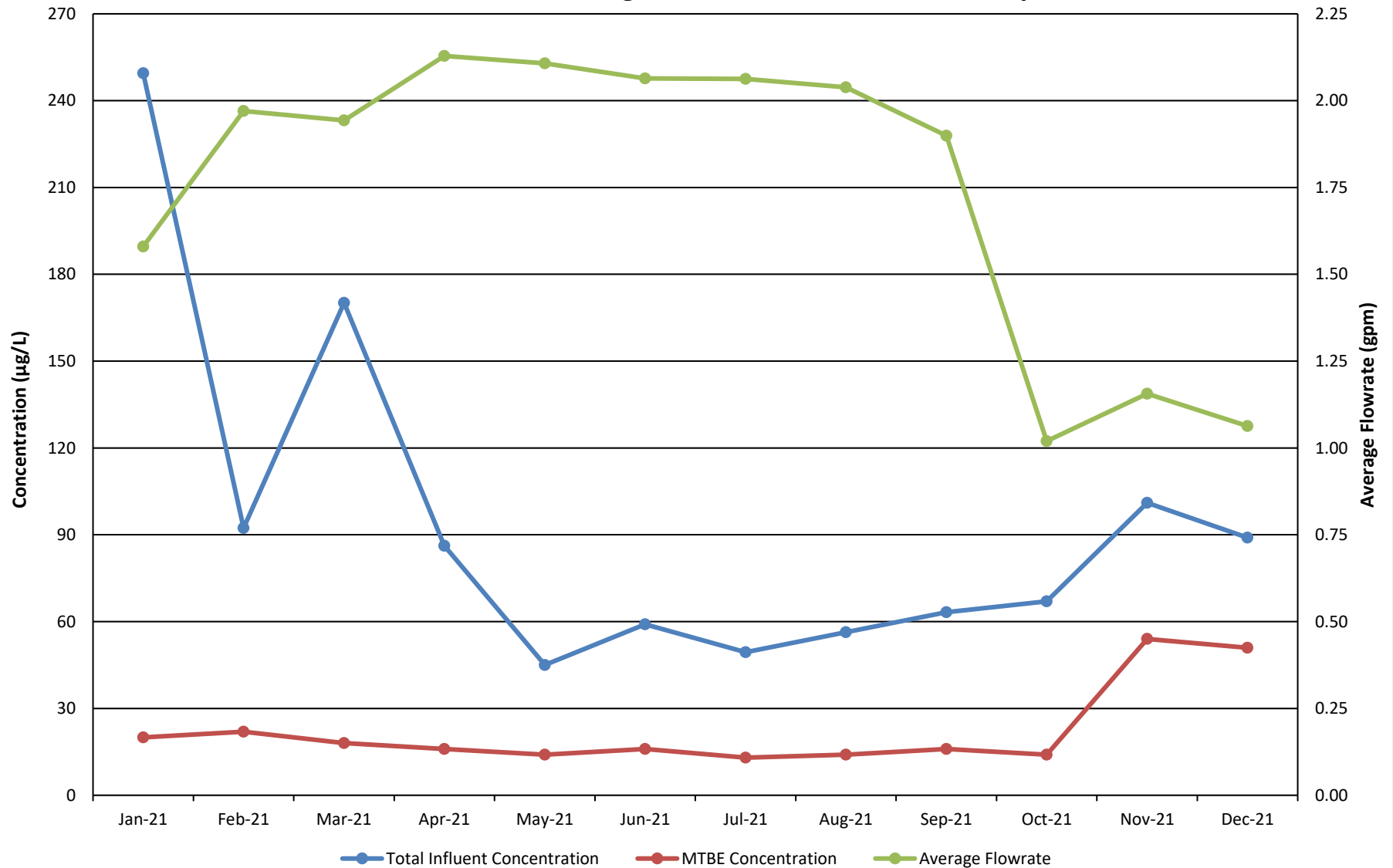
J = analyte concentration is considered an estimated value due to a detected concentration value between the reporting limit and method detection limit for the contaminant.

NA = not applicable

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

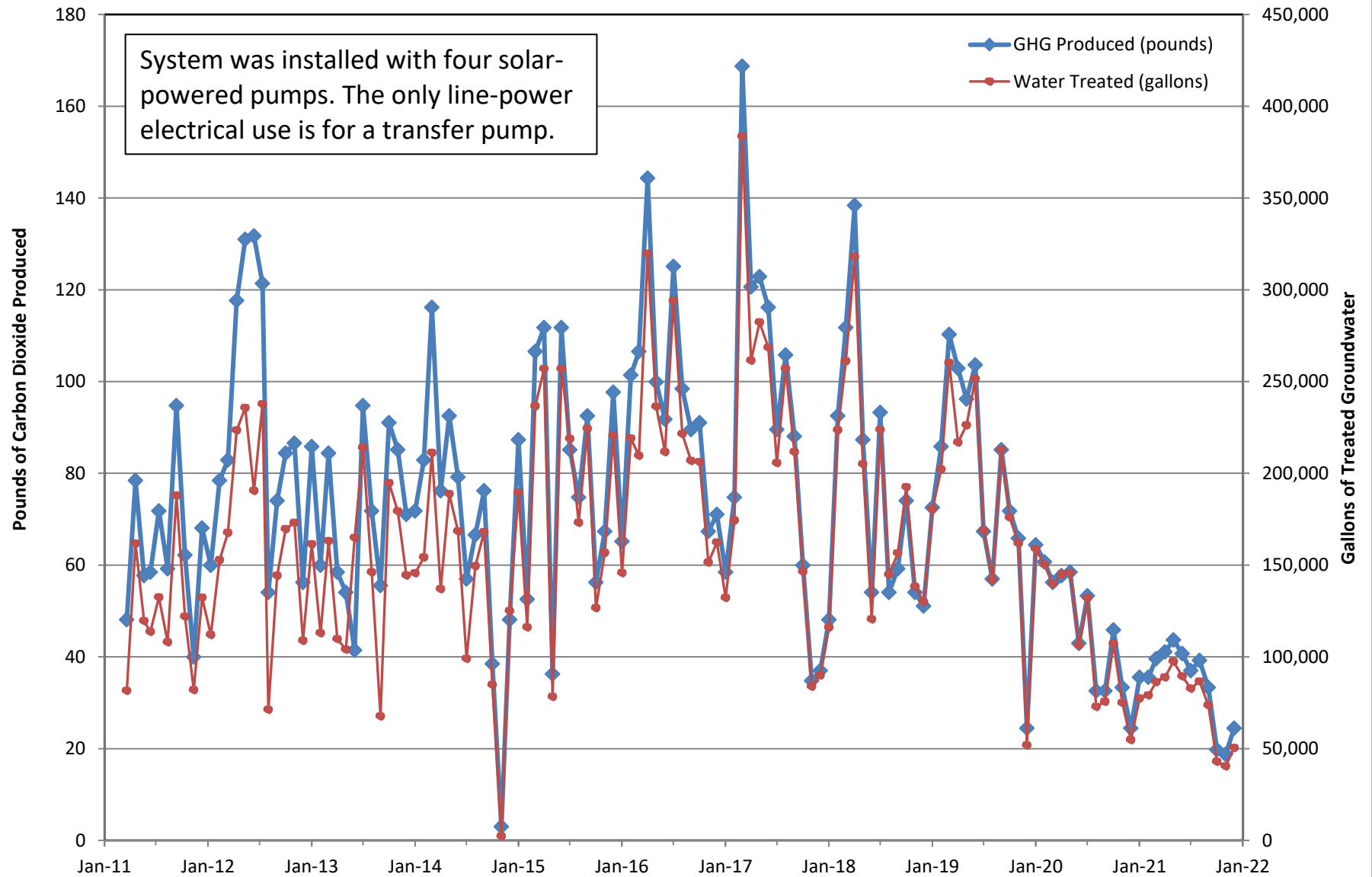
ND = not detected above method detection limit.

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



**Figure 2**

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



# Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 269

Reporting Period: 1 December 2021 – 3 January 2022

Date Submitted: 12 January 2022

This monthly data sheet presents information regarding the Central Groundwater Treatment Plant (CGWTP) and its associated bioreactors (Sites DP039 and SS016).

## System Metrics

Table 1 presents operational data from the December 2021 reporting period.

Table 1 – Operations Summary – December 2021				
Initial Data Collection:		12/1/2021 10:00	Final Data Collection:	1/3/2022 10:30
Operating Time:		Percent Uptime:		Electrical Power Usage:
CGWTP:	792.5 hours	CGWTP:	100%	CGWTP: 1,340 kWh (1,880 lbs CO <sub>2</sub> generated <sup>a</sup> )
Gallons Treated (discharge to storm sewer):		Gallons Treated Since January 1996: <b>599.6 million gallons</b>		
<b>758,355 gallons</b>				
VOC Mass Removed from groundwater:		VOC Mass Removed Since January 1996:		
<b>1.05 lbs<sup>b</sup></b>		<b>2,892 lbs from groundwater</b>		
		<b>8,686 lbs from vapor</b>		
Rolling 12-Month Cost per Pound of Mass Removed: \$3,173 <sup>c</sup>				
Monthly Cost per Pound of Mass Removed: \$1,660 <sup>c</sup>				
<sup>a</sup> SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 888 pounds of GHG from GAC change out services averaged to a per month basis.				
<sup>b</sup> Calculated using December 2021 EPA Method SW8260C analytical results.				
<sup>c</sup> Costs include operations and maintenance, carbon change out, reporting, analytical laboratory, project management, and utility costs related to operation of the system.				

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

Table 2 – CGWTP Average Flow Rates <sup>a</sup> – December 2021	
Location	Average Flow Rate Groundwater (gpm)
EW001x16	9.0
EW002x16	5.6
EW003x16 <sup>b</sup>	0.0
EW605x16	NM <sup>c</sup>
EW610x16	NM <sup>c</sup>
CGWTP	16.0
<sup>a</sup> Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the instantaneous readings.	
<sup>b</sup> Extracted groundwater from EW003x16 had been treated in Site SS016 bioreactor until November 2020 when it was taken offline and decommissioned. The well replacing EW003x16 (EW003Ax16) has been installed but is not yet online.	
<sup>c</sup> No current access available to the wellhead totalizers because of construction activities	
gpm = gallons per minute	
NM = not measured	

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

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

## Summary of O&M Activities

Monthly groundwater treatment samples were collected at the CGWTP on 1 December 2021. Sample results are presented in Table 4. The total VOC concentration (166.2 µg/L) in the December 2021 influent sample is nearly the same as the November 2021 sample (166.1 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 120 µg/L. No VOCs were detected in the samples collected after the first and second carbon vessels and the system effluent sample. The influent and effluent samples were also analyzed for TPH-g, TPH-d, and TPH-mo, and no TPH was detected.

Figure 1 presents a plot of influent concentrations (total VOCs) and the influent flow rate at the CGWTP versus time for the past twelve (12) months. The influent concentrations have been seasonally variable; however, over the last 12 months the trend has decreased. An overall decreasing flow rate trend was observed in the past 12 months.

The Site SS016 subgrade biogeochemical reactor (SBGR), also known as the bioreactor, and the Site DP039 bioreactor both continued operating in December 2021. The Site DP039 bioreactor was taken offline on 16 December 2021 following heavy rains at Travis AFB. Once the standing water around the bioreactor has sufficiently dissipated, it will be brought back online.

A 3-bay aircraft hangar is being constructed over much of the Oil Spill Area (OSA) source area (former Buildings 16 and 18 area). Construction activities are expected to continue through 2022. Every attempt will be made to keep all extraction wells and the Site SS016 bioreactor in operation. However, there may be times when extraction needs to be shutdown to facilitate construction activities. Both wells (EW605x16 and EW610x16) are currently operational.

## Optimization Activities

No optimization activities occurred at the CGWTP in December 2021.

## 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 1,880 pounds of GHG during December 2021.

TABLE 4

Summary of Groundwater Analytical Data for December 2021 – Central Groundwater Treatment Plant

				1 December 2021 (µg/L)			
Constituent	Instantaneous Maximum <sup>a</sup> (µg/L)	Detection Limit (µg/L)	N/C	Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent <sup>b</sup>
Halogenated Volatile Organics							
Acetone	NA	1.9 – 3.8	0	ND	ND	ND	ND
Bromomethane	NA	0.21 – 0.42	0	ND	ND	ND	ND
Carbon disulfide	NA	0.17	0	ND	ND	ND	ND
Chloroform	1.9	0.16 – 0.32	0	ND	ND	ND	ND
Chloromethane	NA	0.30 – 0.60	0	ND	ND	ND	ND
1,2-Dichlorobenzene	NA	0.15 – 0.30	0	ND	ND	ND	ND
1,3-Dichlorobenzene	NA	0.13 – 0.26	0	ND	ND	ND	ND
1,4-Dichlorobenzene	NA	0.16 – 0.32	0	ND	ND	ND	ND
1,1-Dichloroethane	0.50	0.22 – 0.44	0	ND	ND	ND	ND
1,2-Dichloroethane	0.50	0.13 – 0.26	0	ND	ND	ND	ND
1,1-Dichloroethene	0.50	0.23 – 0.46	0	ND	ND	ND	ND
cis-1,2-Dichloroethene	0.50	0.15 – 0.30	0	43	ND	ND	ND
trans-1,2-Dichloroethene	0.50	0.15 – 0.30	0	3.2	ND	ND	ND
Tetrachloroethene	0.50	0.20 – 0.40	0	ND	ND	ND	ND
1,1,1-Trichloroethane	0.50	0.16 – 0.32	0	ND	ND	ND	ND
1,1,2-Trichloroethane	0.50	0.27 – 0.54	0	ND	ND	ND	ND
Trichloroethene	0.65	0.16 – 0.32	0	120	ND	ND	ND
Vinyl Chloride	0.90	0.10 – 0.20	0	ND	ND	ND	ND
Non-Halogenated Volatile Organics							
Benzene	0.50	0.16 – 0.32	0	ND	ND	ND	ND
Ethylbenzene	0.50	0.16 – 0.32	0	ND	ND	ND	ND
Toluene	0.50	0.17 – 0.34	0	ND	ND	ND	ND
Total Xylenes	0.50	0.15 – 0.38	0	ND	ND	ND	ND
Other							
Total Petroleum Hydrocarbons – Gasoline (C6 – C10)	50	10	0	ND	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel (C10 – C28)	50	24 – 27	0	ND	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil (C28 – C40)	100	24 – 27	0	ND	NM	NM	ND

<sup>a</sup> In accordance with current National Pollutant Discharge Elimination System permit number CAG912002, Order number R2-2017-0048.

<sup>b</sup> Concentrations in **bold** exceeded discharge limits

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.

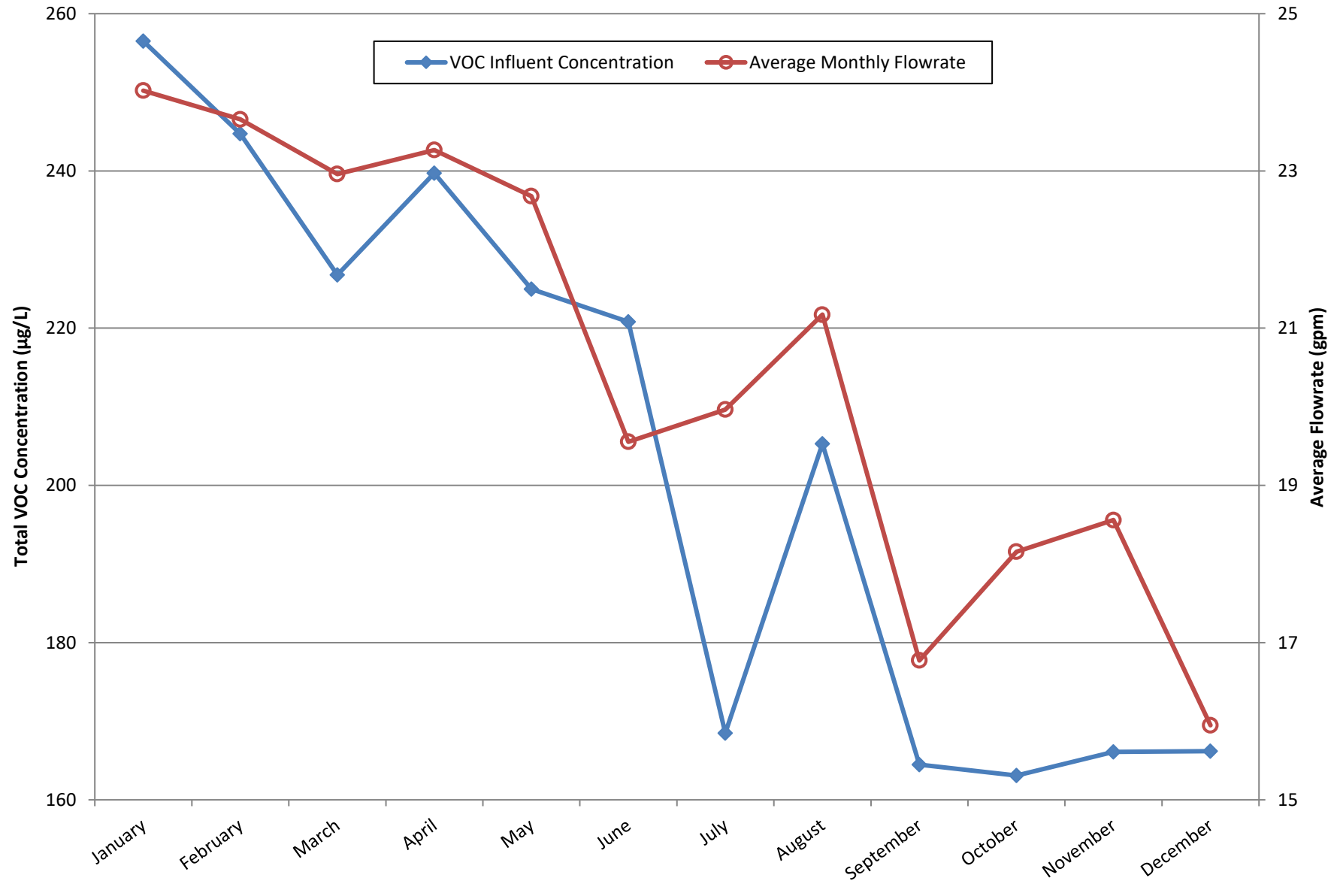
ND = not detected

NM = not measured

µg/L = micrograms per liter

**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**

