

**Travis Air Force Base
Environmental Restoration Program
Restoration Program Manager's
Meeting Minutes
15 May 2019, 0930 Hours**

Mr. Lonnie Duke of the Air Force Civil Engineer Center (AFCEC) Restoration Installation Support Section (ISS) conducted the Restoration Program Manager's (RPM) teleconference on 15 May 2019 at 0930 hours in Building 248 at Travis AFB, California. Attendees included:

Lonnie Duke	AFCEC/CZOW
Glenn Anderson	AFCEC/CZOW
Milton 'Gene' Clare	AFCEC/CZOW
Angel Santiago	AFCEC/CZOW
Haekyung Kim (via telephone)	AFCEC/CZRW
Sarah Miller (via telephone)	USACE
Paul Gedbaw (via phone)	USACE
Ben Fries (via telephone)	DTSC
Adriana Constantinescu (via telephone)	RWQCB
Nadia Hollan Burke (via telephone)	EPA
Meg Greenwald (via telephone)	CAPE
Mike Wray	CH2M/Jacobs
Leslie Royer	CH2M/Jacobs
Levi Pratt (via telephone)	CH2M/Jacobs
Jill Dunphy	CH2M/Jacobs

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

Attachment 1	Meeting Agenda
Attachment 2	Master Meeting and Document Schedule
Attachment 3	SBBGWTP Monthly Data Sheet (April 2019)
Attachment 4	CGWTP Monthly Data Sheet (April 2019)

Attachment 5	ST018 Monthly Data Sheet (April 2019)
Attachment 6	Presentation: Site SD043 Remedial Action Completion Report
Attachment 7	Presentation: Site SS046 Remedial Action Completion Report and Well Decommissioning Work Plan
Attachment 8	Presentation: Program Update

1. ADMINISTRATIVE

A. Previous Meeting Minutes

There were no comments on the Draft Meeting Minutes from April 2019.

B. Action Item Review

Action items from April 2019 were reviewed.

Action item 1 is ongoing: Ms. O’Sullivan to provide updates on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). May 2019 update: Mr. Duke noted that the Air Force has received and responded to the Water Board letter requesting an expanded site inspection. He hopes that the contract will be awarded in the next few months, but the Air Force is combining it with similar contracts for other Air Force bases, so the contract award is beyond his control. Mr. Duke reminded the team that Ms. O’Sullivan will return in June 2019.

Action Item 2 is ongoing: Mr. Duke will continue to provide design and construction information for the new KC-46 Hangar construction project. May 2019 update: The Air Force will be awarding the contract for construction in the next few months, so this ramps up the pressure to complete the amendment to the NEWIOU Record of Decision. The revised ARARs table was sent back to the Water Board. The Water Board noted they will get back to the Air Force within two weeks regarding that and the new toxicity rule. The new Air Force attorney should be addressing the comments on this document soon.

Action Item 3: The PMs for all agencies will elevate to their management any suggestions for keeping document reviews on schedule going forward. May 2019 update: Mr. Duke reminded the team that several documents are well overdue and are at risk for expiration of funds: the Amendment to the NEWIOU, the Site SS046 RACR, and potentially the 2018 GRISR if the current trend continues. Mr. Fries noted that Dom Forrester sent DTSC’s input on the ROD amendment toxicity issue, on behalf of the Human and Ecological Risk Office. Mr. Duke requested that all agencies continue to work with their legal departments to review and provide

comments in the shortest amount of time possible, in order to keep the documents on schedule.

Action Item 4: Mr. Wray recognizes that the Water Board does not concur with the Subarea LF007C Total Petroleum Hydrocarbon Chromatogram Review Technical Memorandum. Before re-starting the LF007C treatment system, it will be upgraded to treat TPH extracted from the site. May 2019 update: The vernal pools were close to being dried up until recent rains. Once they are dried up, we will restart the system and sample it, then shut it down again to see how the TPH concentrations are trending, then change out the carbon as necessary. This action item is now closed.

Action Item 5: Mr. Wray will discuss sampling the piezometer near the DP039 bioreactor with Ms. Royer, to verify that groundwater being diverted from the infiltration trench is being fully treated by the bioreactor. May 2019 update: We are already monitoring this piezometer as part of the annual GRIP sampling, and will continue to do so. The GRIP sampling is occurring now; once we get results, we will compare them to past results. If they differ significantly, we can consider increasing the monitoring frequency, but we have no reason to expect that they'll be different. This action item remains open until results are received and interpreted.

Action Item 6: When the Draft Site SS046 RACR is submitted to the agencies, Mr. Anderson will include a request to decommission the two (2) piezometers in question in the cover letter to the agencies, with reference to recommendations in past GRISR reports. May 2019 update: Mr. Anderson included the request in the cover letter to the Draft Site SS046 RACR, and requested that the agencies provide concurrence or comments on the proposed decommissioning, ideally before the end of the week. This is more time-critical than reviewing the rest of the document. Ms. Constantinescu noted that the Water Board wants to be sure there are no issues with groundwater quality. Mr. Anderson took the action to send to the Water Board the piezometer groundwater data from the WABOU RI Report later today. This action item is now closed.

Action Item 7: Before introducing isopropyl alcohol (IPA) into the subsurface, Mr. Wray will send a request to the Water Board for injecting IPA into the wells at Site ST027, and will include a description of the process, as well as the concentration of IPA proposed, the quantity of the solution to be injected into each well, and the locations of the wells planned for IPA injection. May 2019 update: CH2M/Jacobs attempted to collect a sample of the congealed oil to see if the IPA would dissolve it, but observed that there is very little congealed oil remaining and thus, no need for the IPA injection. This action item is now closed.

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

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

Travis AFB Annual Meeting and Teleconference Schedule

The next RPM meeting will be a face to face meeting held on Wednesday, 19 June 2019, at 0930.

The 2020 Meeting Schedule has been provided so that people can start planning ahead for next year.

Travis AFB Master Document Schedule

- Community Relations Plan Update (CRP): There was no change to the schedule. Other documents in the review queue are higher priority, and this document will be finished as soon as the other documents are completed.
- Amendment to the NEWIOU Soil ROD for the Travis AFB ERP Sites SS016 and SD033: There was no change to the schedule. The Air Force sent a revised and clean ARAR table showing where comments had been addressed; the Water Board has reviewed it and it is now with the Water Board attorney for review. DTSC has responded. The EPA received comments from the Air Force; these are now with the EPA attorney. Ms. Burke noted that the EPA has not received the Air Force response to comments sent in December, and offered to send a markup to the Air Force showing what EPA is requesting. **This is a super-critical document** due to site work supporting planned KC-46 hangar construction, and it has been **delayed for almost a year**.
- No Further Action ROD for Old Skeet Range (TS060 and TS060A MRA): There is no change in the schedule. **This is becoming a critical document, because it affects two site closures**.
- Site SS016 Remedial Design/Remedial Action Work Plan: There was no change in the schedule. This document won't go final until the final Amendment to the NEWIOU Soil ROD is published. This excavation project is located within the footprint of the future new KC-46 hangar, so **this document is critical and is delayed due to excessive delays on the Amendment to the NEWIOU Soil, Sediment and Surface Water ROD**.
- Site SD031 Soil Remedial Investigation/Feasibility Study: There was no change in the schedule. **This document is important and although not time-critical, must be completed during the current contract**.
- Fourth Five-Year Review Report for Multiple Groundwater, Soil, and Sediment Sites: No change was made to the schedule. Air Force responses to agency legal comments have been approved by AFLOA, they will be sent to the agencies for review and concurrence next week. **This document is very important but not critical**.

- Addendum to the Site SS016 Groundwater Remedial Design/Remedial Action Work Plan: The Response to Comment due date was changed to 12 June 2019, the rest of the schedule was updated accordingly.
- Potrero Hills Annex (FS, PP, and ROD): No change was made to the schedule; Mr. Anderson noted that the contractor has issued a proposal to close the groundwater component of the site using the Water Board Low-Threat Closure Policy. The Water Board is currently reviewing the proposal.
- Quarterly Newsletters (July 2019): There is no change in the schedule.
- 2017 Annual Groundwater Remediation Implementation Status Report (GRISR): The Response to Comments due date was changed to 20 May 2019. The rest of the schedule was changed accordingly. Mr. Anderson shared his appreciation for the reviews.
- 2018 Annual GRISR: There was no change in schedule. The Air Force is going to try to complete their review of the Predraft 2018 GRISR ahead of the schedule presented on the MMDS, in order to allow more time for agency review of the Draft. The Air Force anticipates being able to submit the draft in June. The Final document must be submitted by the end of the fiscal year (September 2019).
- Site LF006 Technology Demonstration Construction Completion Report: The Response to Comments and Final due dates were changed to 19 April 2019 based on actual submittal. This document will be moved to the History section next month.
- Site SD043 Remedial Action Completion Report: The Draft to Agencies due date was changed to 8 May 2019, based on actual submittal. The rest of the schedule was updated accordingly. There is a presentation on this document later in the meeting.
- Site SS046 Remedial Action Completion Report: The Draft to Agencies due date was changed to 9 May 2019 based on actual submittal; the rest of the schedule was updated accordingly. There is a presentation on this document later in the meeting.
- 2018 Annual Site LF007 Corrective Action Management Unit Inspection, Monitoring, and Maintenance Report: A schedule was assigned to the previously TBD dates. The Predraft to AF Service Center is 24 June 2019, all other dates were assigned accordingly.
- Site SD043 Site Closure Report: This is a new document. Levi Pratt of CH2M will be the document lead. All dates are TBD until the RACR is finalized.
- Subarea LF007C Total Petroleum Hydrocarbon Chromatogram Review Technical Memorandum: The Water Board has rejected the validity of the chromatograms; therefore, this document will not be finalized and will be removed from the MMDS.
- Site SS014 POCO Subsites 4 and 5 Closure Report. Subsite 2 has been added to the title and report. The Draft to Agencies due date was changed to 2 May 2019; all

other dates were changed accordingly. This will not close the entire SS014 site, but will provide the information necessary when the site is ready for closure of the various subsites.

MOVED TO HISTORY:

— None

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

South Base Boundary Groundwater Treatment Plant, April 2019 (see Attachment 3)

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 100% uptime, and 7.4 million gallons of groundwater were extracted and treated in April 2019. All treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 169.3 gallons per minute (gpm). Electrical power usage was 17,389 kilowatt hours (kWh), and approximately 14,468 pounds of CO₂ were created (based on DOE calculation). Approximately 1.5 pounds of volatile organic compounds (VOCs) were removed in April. The total mass of volatile organic compounds (VOCs) removed since startup of the system is 515.6 pounds.

Troubleshooting was performed on several extraction wells during the month of April. The SBBGWTP was temporarily shut down for 30 minutes on 1 April 2019 to backwash the granulated activated carbon vessel. Details can be found in Attachment 3.

No optimization activities are reported for the month of April 2019.

Central Groundwater Treatment Plant, April 2019 (see Attachment 4)

The Central Groundwater Treatment Plant (CGWTP) performed at 99.2% uptime with approximately 1,212,650 gallons of groundwater extracted and treated in April 2019. All treated water was discharged to the storm sewer system which discharges to Union Creek. The average flow rate for the CGWTP was 28.3 gpm. Electrical power usage was 1,759 kWh for all equipment connected to the Central Plant, and approximately 2,190 pounds of CO₂ were generated. Approximately 2.0 pounds of VOCs were removed from groundwater by the treatment plant in April. The total mass of VOCs removed since the startup of the system is 11,518 pounds.

The Site DP039 Bioreactor was taken offline on 15 April to modify the conveyance line between the bioreactor and infiltration trench to allow overflow to be conveyed to the SBGR. On 17 April, the CGWTP was shut down because of a high bag filter

pressure alarm. The bag filters were replaced, and the system was restarted without issue.

The detection limit for TPH listed in Table 5 of the CGWTP Monthly Data Sheet showed “160 – 180.” It should have been listed as 100 ug/L. The Air Force will look into the sample and follow up as appropriate.

Optimization Activities for CGWTP: The DP039 bioreactor continues to operate in a four-week “pulsed mode.” No other optimization activities are reported for the month of April 2019.

LF007C Groundwater Treatment Plant, April 2019

The Subarea LF007C Groundwater Treatment Plant (LF007C GWTP) has been shut down due to the presence of vernal pools above the treatment area. There is no report for April 2019.

Discussions regarding the origins of the TPH concentration exceedances continue, and a source has not yet been confirmed. Once the vernal pools dry, the system will only be restarted long enough to collect additional samples for TPH analysis. The system will not be restarted until concentrations of TPH do not exceed allowable discharge levels.

ST018 Groundwater (MTBE) Treatment Plant, April 2019 (see Attachment 5)

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 83.6% uptime with approximately 216,790 gallons of groundwater extracted in April 2019. All groundwater was discharged to the Fairfield – Suisun Sewer District. The average flow rate for the ST018 GWTP was 6.0 gpm. Electrical power usage for the month was 139 kWh for all equipment connected to the ST018 GWTP. The total CO₂ equivalent, including an estimate for the carbon change-out, equates to approximately 103 pounds. Approximately 0.02 pound of MTBE, BTEX, VOCs, and TPH was removed in April by the treatment plant, and approximately 0.02 pound of MTBE-only was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 47.1 pounds, and the total MTBE mass removed since startup of the system is 11.5 pounds.

Note: Electrical power use at the ST018 GWTP is only for the alarm system and a pump that pushes influent tank water to the Fairfield-Suisun Sanitary Sewer line. The four groundwater extraction pumps in the system are all solar powered.

On 26 April, the ST018GWTP was shut down because the treatment plant containment float switch failed. This failure resulted in a false containment area flooding alarm that shut off the system. The float switch was bypassed temporarily, and the system was restarted on May 1, 2019. The float switch will be replaced in early May 2019.

No optimization activities are reported for the month of April 2019.

3. Presentations:

A) Presentation: Site SD043 Remedial Action Completion Report (see Attachment 6)

Mr. Pratt presented an overview of the remedial action approach and objectives, field activities, and demonstration of completion of the remedial action at Site SD043. Please refer to Attachment 6 for the full briefing.

B) Presentation: Site SS046 Remedial Action Completion Report and Well Decommissioning Work Plan (see Attachment 7)

Ms. Greenwald presented an overview of the remedial action approach and objectives, field activities, and demonstration of completion of the remedial action at Site SS046. Please refer to Attachment 7 for the full briefing.

C) Program Update: Activities Completed, In Progress, and Upcoming (see Attachment 8)

Mr. Wray reported on the status of fieldwork and documents that have been completed, are in progress, or upcoming. Please refer to Attachment 8 for the full briefing.

4. New Action Item Review

1. Mr. Duke or Mr. Anderson will follow up on the TPH motor oil detection at the Central Groundwater Treatment Plant.

5. PROGRAM ISSUES/UPDATE

Ms. O'Sullivan will be returning to work in early June. She will be doing more restoration work upon her return.

Mr. Duke will not be able to attend the July teleconference.

AFLOA has hired Jason Sherman to replace Marc Trost after his retirement; Mr. Sherman is eager and motivated to begin working on the project.

6. Action Items

Item #	Responsible	Action Item Description	Due Date	Status
1.	Monika O'Sullivan	Ms. O'Sullivan to provide updates on PFOS and PFOA as she becomes aware of them.	Ongoing	Open
2.	Lonnie Duke	Mr. Duke will continue to provide design and construction information for the KC-46 Hangar for agency input ahead of the Air Force/Civil Engineering awarding the construction contract.	Ongoing	Open
3.	All	All PMs for all agencies will elevate to their management any suggestions for keeping document reviews on schedule going forward.	Ongoing	Open
3.	Mike Wray	Mr. Wray will discuss sampling the piezometer near the DP039 bioreactor with Ms. Royer, to verify that water being diverted from the infiltration trench is being fully treated by the bioreactor.	19 June 2019	Open
4.	Mr. Duke/Mr. Anderson	Mr. Duke or Mr. Anderson will follow up on the TPH motor oil detection at the Central Groundwater Treatment Plant	19 June 2019	Open

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

The RPM Teleconference is scheduled for 9:30 AM PST on 15 May 2019. **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. Site SD043 Remedial Action Completion Report
- B. Site SS046 Remedial Action Completion Report and Well Decommissioning Work Plan
- C. PROGRAM UPDATE:
DOCUMENTS & ACTIVITIES COMPLETED, IN PROGRESS AND PLANNED

4. NEW ACTION ITEM REVIEW

5. PROGRAM/ISSUES/UPDATE

- A. 2020 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.

(2019)
Annual Meeting and Teleconference Schedule

Monthly RPM Meeting ¹ (Begins at time noted)	RPM Teleconference (Begins at time noted)	Restoration Advisory Board Meeting (Begins at 7:00 p.m.) (Poster Session at 6:30 p.m.)
—	01-16-19	—
02-13-19	—	—
—	03-20-19	—
04-18-19 (Thursday 2:00 PM)	—	04-18-19
—	05-15-19	—
06-19-19	—	—
—	07-17-19	—
08-21-19	—	—
—	09-18-19	—
10-16-19	—	May through October ²
—	11-20-19	—
—	—	—

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

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

(2020)
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.)
—	01-15-20	—
02-19-20	—	—
—	03-18-20	—
04-16-20 (Thursday 2:00 PM)	—	04-16-20
—	05-20-20	—
06-17-20	—	—
—	07-15-20	—
08-19-20	—	—
—	09-16-20	—
10-21-20	—	May through October ²
—	11-18-20	—
—	—	—

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

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

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS			
Life Cycle	Community Relations Plan Update Travis AFB, Glenn Anderson CH2M, Jill Dunphy	Amendment to the NEWIOU Soil ROD for the Travis AFB ERP Sites SS016 and SD033 Travis AFB, Glenn Anderson CH2M, Latonya Coleman	No Further Action Soil ROD for Old Skeet Range (TS060 MRA) Travis AFB, Glenn Anderson
Scoping Meeting	NA	NA	NA
Predraft to AF/Service Center	08-23-16	02-28-18	05-18-18
AF/Service Center Comments Due	09-07-16	03-30-18	06-01-18
Draft to Agencies	09-28-16 (03-22-18)	06-22-18	6-25-18
Draft to RAB	09-28-16 (03-22-18)	06-22-18	6-25-18
Agency Comments Due	10-28-16 (04-27-18)	08-22-18	11-30-18
Response to Comments Meeting	TBD	09-06-18	01-16-19
Agency Concurrence with Remedy	NA	NA	NA
Public Comment Period	NA	NA	NA
Public Meeting	NA	NA	NA
Response to Comments Due	TBD	TBD	TBD
Draft Final Due	TBD	TBD	TBD
Final Due	TBD	TBD	TBD

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS		
Life Cycle	Site SS016 Remedial Design/Remedial Action Work Plan Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald	Site SD031 Soil Remedial Investigation/Feasibility Study Travis AFB, Glenn Anderson CH2M, Rick Sturm
Scoping Meeting	NA	NA
Predraft to AF/Service Center	06-04-18	05-22-19
AF/Service Center Comments Due	06-18-18	06-05-19
Draft to Agencies	07-31-18	06-20-19
Draft to RAB	07-31-18	06-20-19
Agency Comments Due	08-30-18	07-22-09
Response to Comments Meeting	09-19-18	08-21-19
Agency Concurrence with Remedy	NA	NA
Public Comment Period	NA	NA
Public Meeting	NA	NA
Response to Comments Due	10-24-18	09-05-19
Draft Final Due	10-24-18	09-05-19
Final Due	TBD	10-07-19

Travis AFB Master Meeting and Document Schedule

PRIMARY DOCUMENTS		
Life Cycle	Fourth Five-Year Review Report for Multiple Groundwater, Soil, and Sediment Sites Travis AFB, Glenn Anderson Tetra Tech, Joachim Eberharter	Addendum to the Site SS016 Groundwater Remedial Design/Remedial Action Work Plan Travis AFB, Lonnie Duke CH2M, Levi Pratt
Scoping Meeting	NA	NA
Predraft to AF/Service Center	03-14-18	12-12-18
AF/Service Center Comments Due	05-22-18	01-02-19
Draft to Agencies	06-05-18	02-22-19
Draft to RAB	06-05-18	02-22-19
Agency Comments Due	07-20-18	03-25-19
Response to Comments Meeting	TBD	04-18-19
Agency Concurrence with Remedy	NA	NA
Public Comment Period	NA	NA
Public Meeting	NA	NA
Response to Comments Due	TBD	06-12-19
Draft Final Due	TBD	06-12-19
Final Due	TBD	07-17-19

Travis AFB Master Meeting and Document Schedule

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

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS				
Life Cycle	Quarterly Newsletter (July 2019) Travis, Glenn Anderson	2017 Annual GRISR Travis AFB, Glenn Anderson CH2M, Leslie Royer	2018 Annual GRISR Travis AFB, Glenn Anderson CH2M, Leslie Royer	Site LF006 Technology Demonstration Construction Completion Report Travis AFB, Glenn Anderson CH2M HILL, Levi Pratt
Scoping Meeting	NA	NA	NA	NA
Predraft to AF/Service Center	06-18-19	05-09-18	05-06-19	12-19-18
AF/Service Center Comments Due	NA	06-11-18	05-20-19	01-09-19
Draft to Agencies	06-25-19	07-19-18	06-05-19	03-05-19
Draft to RAB	NA	07-19-18	06-05-19	03-05-19
Agency Comments Due	07-10-19	11-19-18 (01-31-19) (02-08-19)	07-08-19	04-04-19
Response to Comments Meeting	07-17-19	01-16-19 (02-13-19)	07-17-19	04-18-19
Response to Comments Due	07-17-19	05-20-19	08-14-19	05-15-19 (04-19-19)
Draft Final Due	NA	NA	NA	NA
Final Due	07-18-19	05-20-19	08-14-19	05-15-19 (04-19-19)
Public Comment Period	NA	NA	NA	NA
Public Meeting	NA	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS				
Life Cycle	Site SD043 Remedial Action Completion Report Travis AFB, Glenn Anderson CH2M, Levi Pratt	Site SS046 Remedial Action Completion Report and Well Decommissioning Work Plan Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald	2018 Annual Site LF007 Corrective Action Management Unit Inspection, Monitoring, and Maintenance Report Travis AFB, Milton Clare CH2M, Levi Pratt	Site SD043 Site Closure Report Travis AFB, Glenn Anderson CH2M, Levi Pratt
Scoping Meeting	NA	NA	NA	NA
Predraft to AF/Service Center	03-29-19	04-15-19	06-24-19	TBD
AF/Service Center Comments Due	04-12-19	04-22-19	07-09-19	TBD
Draft to Agencies	05-08-19	05-09-19	07-24-19	TBD
Draft to RAB	05-08-19	05-09-19	07-24-19	TBD
Agency Comments Due	06-07-19	06-10-19	08-23-19	TBD
Response to Comments Meeting	06-19-19	06-19-19	09-18-19	TBD
Response to Comments Due	07-09-19	07-12-19	10-02-19	TBD
Draft Final Due	NA	NA	NA	NA
Final Due	07-09-19	07-12-19	10-02-19	TBD
Public Comment Period	NA	NA	NA	TBD
Public Meeting	NA	NA	NA	NA

Travis AFB Master Meeting and Document Schedule

INFORMATIONAL DOCUMENTS		
Life Cycle	Subarea LF007C Total Petroleum Hydrocarbon Chromatogram Review Technical Memorandum Travis AFB, Glenn Anderson CH2M HILL, Leslie Royer	Site SS014 Subsites 2, 4, and 5 POCO Site Closure Evaluation Report Travis AFB, Glenn Anderson CH2M, Tony Chakurian
Scoping Meeting	NA	NA
Predraft to AF/Service Center	09-05-18	04-10-19
AF/Service Center Comments Due	09-19-18	04-24-19
Draft to Agencies	09-24-18	05-02-19
Draft to RAB	09-24-18	05-02-19
Agency Comments Due	10-24-18 (12-19-18)	06-03-19
Response to Comments Meeting	01-16-19	06-19-19
Response to Comments Due	TBD	07-11-19
Draft Final Due	NA	NA
Final Due	TBD	07-11-19
Public Comment Period	NA	NA
Public Meeting	NA	NA

South Base Boundary Groundwater Treatment Plant Monthly Data Sheet

Report Number: 222

Reporting Period: 1 April 2019 – 1 May 2019

Date Submitted: 13 May 2019

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

System Metrics

Table 1 presents operational data from the April 2019 reporting period.

Table 1 – Operations Summary – April 2019			
Initial Data Collection:	4/1/2019 9:30	Final Data Collection:	5/1/2019 14:20
Operating Time:	Percent Uptime:	Electrical Power Usage:	
SBBGWTP: 725 hours	SBBGWTP: 100%	SBBGWTP: 17,389 kWh (14,468 lbs CO₂ generated^a)	
Gallons Treated: 7.4 million gallons		Gallons Treated Since July 1998: 1,110 million gallons	
Volume Discharged to Union Creek: 7.4 million gallons		Gallons Treated from Other Sources: 0 gallons	
VOC Mass Removed: 1.5 lbs^b		VOC Mass Removed Since July 1998: 515.6 lbs	
Rolling 12-Month Cost per Pound of Mass Removed: \$13,263 ^c			
Monthly Cost per Pound of Mass Removed: \$23,350 ^c			
lbs = pounds ^a 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. ^b Calculated using April 2019 EPA Method SW8260C analytical results. ^c Costs include operations and maintenance, carbon change out, reporting, analytical laboratory, project management, and utility costs related to operation of the system.			

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

Table 2 – SBBGWTP Average Flow Rate (gpm)^a – April 2019							
FT005^b				SS029		SS030	
EW01x05	Offline	EW743x05	Offline	EW01x29	Offline ^c	EW01x30	16.6
EW02x05	Offline	EW744x05	3.3	EW02x29	Offline ^c	EW02x30	3.6
EW03x05	Offline	EW745x05	13.2	EW03x29	3.0	EW03x30	14.4
EW731x05	6.6	EW746x05	Offline	EW04x29	6.7	EW04x30	23.8
EW732x05	Offline	EW2291x05	3.5	EW05x29	8.5	EW05x30	18.5
EW733x05	Offline	EW2782x05	5.8	EW06x29	7.6	EW2174x30	8.0
EW734x05	3.0	EW2783x05	8.9	EW07x29	13.0	EW711x30	9.4
EW735x05	10.1	EW2784x05	11.4			MW269x30	0.5
EW736x05	Offline	EW2785x05	5.4				
EW737x05	Offline	EW2786x05	17.7				
EW742x05	Offline						
FT005 Total: 88.9				SS029 Total: 38.8		SS030 Total: 94.8	
SBBGWTP Average Monthly Flow^d: 169.3 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 Extraction wells taken off line because of persistent fouling of the well pumps and associated discharge piping. ^d 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	1 April 2019	10:00	1 April 2019	10:30	Backwash GAC vessels
^a Shutdown and restart times estimated based on field notes SBBGWTP = South Base Boundary Groundwater Treatment Plant					

Summary of O&M Activities

Monthly groundwater treatment samples were collected at the SBBGWTP on 2 April 2019. Sample results are presented in Table 4. The total VOC concentration (24.58 µg/L) in the influent sample decreased from the March 2019 sample results (29.29 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 23 µg/L. Cis-1,2-DCE, chloroform, and 1,2-DCA were detected in the midpoint sampling location at low concentrations. No VOCs were detected in the effluent sample.

In April 2019, troubleshooting was performed on several extraction wells. The following list presents the maintenance activities and status of several extraction wells:

- EW734x05 – Pulled the pump and cleaned the clogged screen intake. Replaced flow totalizer. Well is currently operating.
- EW735x05 – Replaced flow totalizer; however, the well has repeated flow meter fouling. Well is currently operating.
- EW744x05 – Replaced transducer. Well is currently operating.
- EW745x05 – Replaced flow totalizer. Well is currently operating.
- EW2786x05 – Replaced flow totalizer. Well is currently operating.
- EW06x29 – Replaced pump motor. Well is currently operating.

Figure 1 presents the influent 1,2-DCA and TCE concentrations since January 2017. The 1,2-DCA and TCE concentrations have been sporadic and are dependent on seasonal variation and which wells are actively being extracted during the time of sampling. TCE concentrations have generally been increasing since March 2018, and 1,2-DCA concentrations were elevated between December 2017 and June 2018 and mostly non-detect from July through November 2018. 1,2-DCA concentrations were sporadic between December 2018 and April 2019.

Figure 2 presents a plot of influent VOC concentrations and average flow at the SBBGWTP over the past twelve (12) months. An overall increasing trend was observed for the VOC influent concentrations in the past 12 months. An overall flat flow rate trend was observed in the past 12 months.

Optimization Activities

No optimization activities occurred at the SBBGWTP in April 2019.

Sustainability

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

Figure 3 presents the historical GHG production from the SBBGWTP. In April 2019, the SBBGWTP produced approximately 14,468 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 April 2019 – South Base Boundary Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	2 April 2019 (µg/L)		
				Influent	Midpoint	Effluent
Halogenated Volatile Organics						
Bromodichloromethane	NA	0.29	0	ND	ND	ND
Chloroform	1.9	0.12	0	0.28 J	0.32 J	ND
1,1-Dichloroethane	0.50	0.15	0	ND	ND	ND
1,2-Dichloroethane	0.50	0.22	0	ND	0.73 J	ND
1,1-Dichloroethene	0.50	0.14	0	ND	ND	ND
cis-1,2-Dichloroethene	0.50	0.15	0	1.3	1.3	ND
trans-1,2-Dichloroethene	0.50	0.11	0	ND	ND	ND
Tetrachloroethene	0.50	0.15	0	ND	ND	ND
1,1,1-Trichloroethane	0.50	0.19	0	ND	ND	ND
1,1,2-Trichloroethane	0.50	0.31	0	ND	ND	ND
Trichloroethene	0.65	0.13	0	23	ND	ND
Vinyl Chloride	0.90	0.22	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
Methyl Tert Butyl Alcohol	0.50	0.17	0	ND	ND	ND
Other						
Total Petroleum	50	10	0	NM	NM	ND
Hydrocarbons – Gasoline						
Total Petroleum	50	16	0	NM	NM	ND
Hydrocarbons – Diesel						
Total Petroleum Hydrocarbons – Motor Oil	100	160	0	NM	NM	ND

* In accordance with current National Pollutant Discharge Elimination System permit number CAG912002, Order number R2-2017-0048.

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

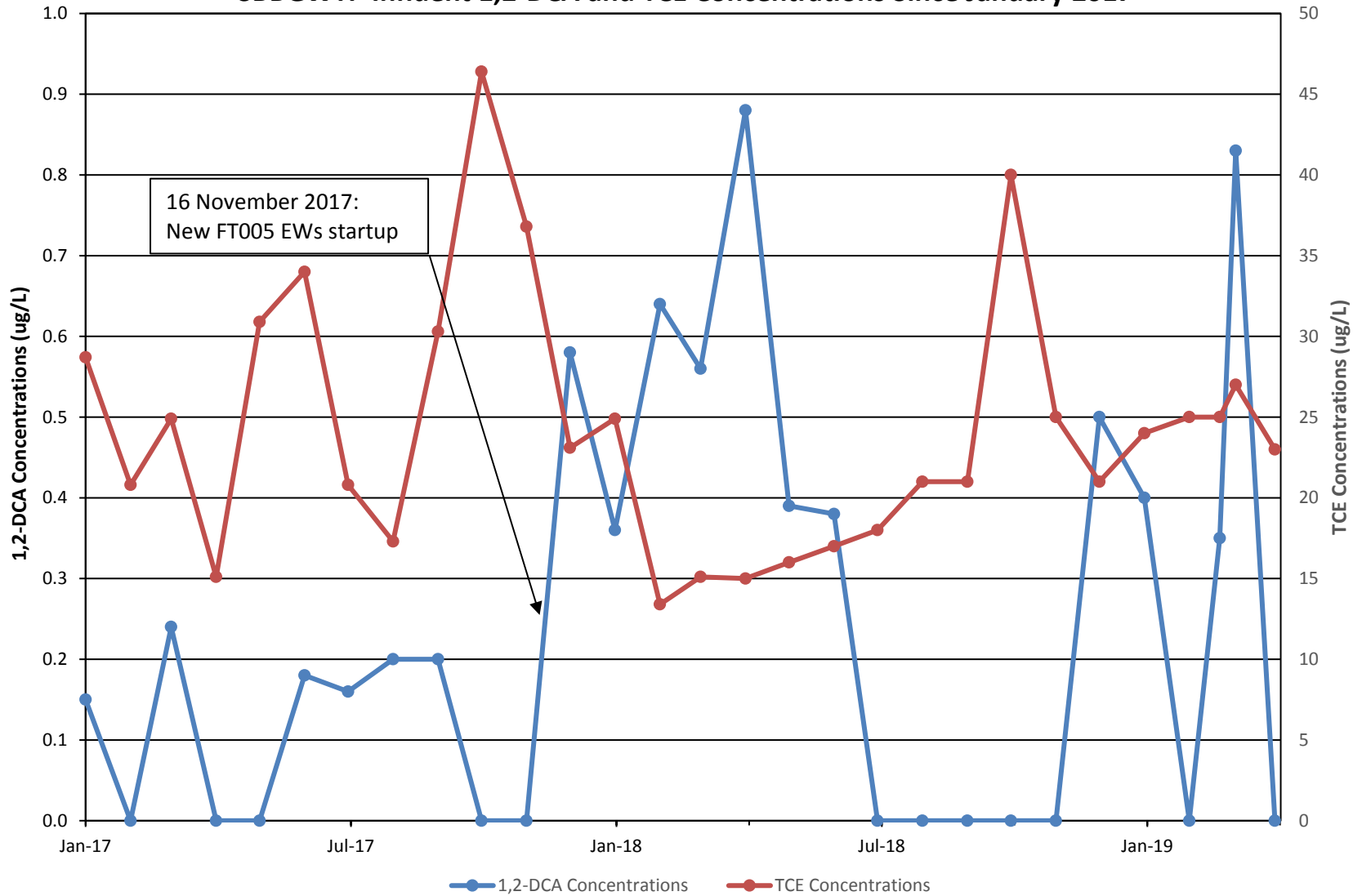


Figure 2
SBBGWTP Total VOC Influent Concentrations and Average Flowrate Twelve Month History

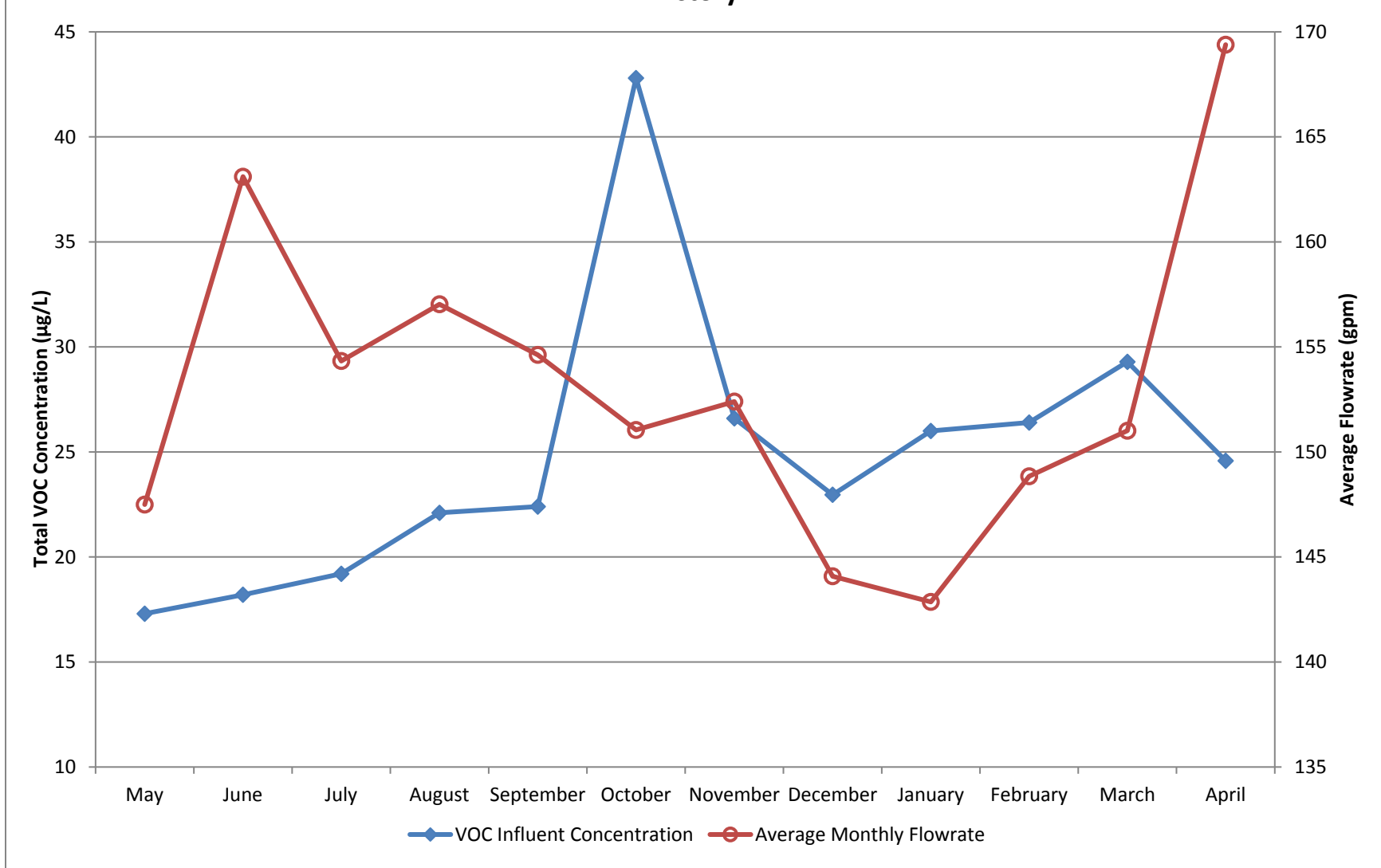
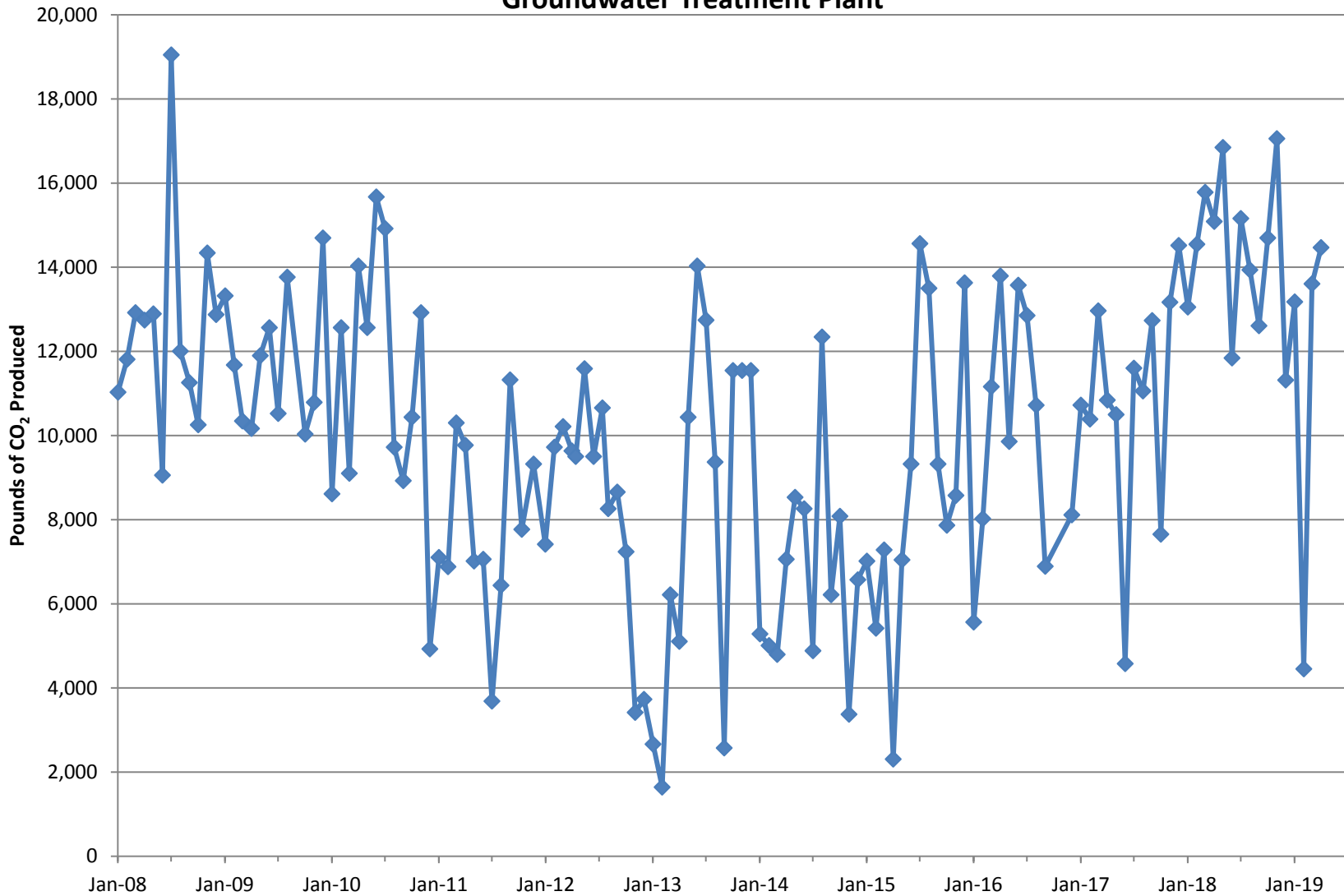


Figure 3
Equivalent Pounds of Carbon Dioxide Produced by the South Base Boundary
Groundwater Treatment Plant



Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 237

Reporting Period: 1 April 2019 – 1 May 2019

Date Submitted: 13 May 2019

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

System Metrics

Table 1 presents operational data from the April 2019 reporting period.

Table 1 – Operations Summary – April 2019			
Initial Data Collection:	4/1/2019 11:25	Final Data Collection:	5/1/2019 11:00
Operating Time:		Percent Uptime:	Electrical Power Usage:
CGWTP:	714 hours	CGWTP:	99.2%
		CGWTP:	1,759 kWh (2,190 lbs CO ₂ generated ^a)
Gallons Treated (discharge to storm sewer):		Gallons Treated Since January 1996:	568.6 million gallons
1,212,650 gallons			
VOC Mass Removed from groundwater:		VOC Mass Removed Since January 1996:	
2.0 lbs^b		2,832 lbs from groundwater	
		8,686 lbs from vapor	
Rolling 12-Month Cost per Pound of Mass Removed:	\$4,398 ^c		
Monthly Cost per Pound of Mass Removed:	\$6,148 ^c		
^a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 888 pounds of GHG from GAC change out services averaged to a per month basis. ^b Calculated using April 2019 EPA Method SW8260C analytical results. ^c Costs include operations and maintenance, carbon change out, reporting, analytical laboratory, project management, and utility costs related to operation of the system.			

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

Table 2 – CGWTP Average Flow Rates^a – April 2019	
Location	Average Flow Rate Groundwater (gpm)
EW001x16	12.7
EW002x16	6.4
EW003x16	0.2
EW605x16	5.8
EW610x16	2.5
CGWTP	28.3
^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	17 April 2019	10:25	17 April 2019	15:00	High bag filter pressure alarm.
-- = Date/Time not recorded					
^a Shutdown and restart times estimated based on field notes					
CGWTP = Central Groundwater Treatment Plant					

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

Table 4 – Summary of DP039 Bioreactor “Pulsed Mode” Operations		
Location	Pulse-on Date	Pulse-off Date
MW750x39	19 February 2018	21 March 2018
	16 April 2018	14 May 2018
	12 June 2018	9 July 2018
	7 August 2018	6 September 2018
	1 October 2018	30 October 2018
	27 November 2018	24 December 2018
	23 January 2019	26 February 2019
	18 March 2019	15 April 2019
MW = Monitoring Well		

Summary of O&M Activities

Monthly groundwater treatment samples were collected at the CGWTP on 2 April 2019. Sample results are presented in Table 5. The total VOC concentration (198.5 µg/L) in the April 2019 influent sample has decreased from the March 2019 sample (297.6 µg/L). TCE was the primary VOC detected in the influent sample at a concentration of 160 µg/L. Vinyl chloride (0.25 J µg/L) was detected in the sample after the first carbon vessel. No VOCs were detected in the sample collected after the second carbon vessel or in the effluent sample. Travis AFB will continue to monitor influent, midpoint, and effluent concentrations at the CGWTP for carbon breakthrough, though the carbon treatment remained effective in April 2019.

On 17 April, the CGWTP was shut down because of a high bag filter pressure alarm. The bag filters were 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 show a decreasing trend over the past 12 months along with a decreasing trend for the flow rate through the treatment plant.

The Site DP039 subgrade biogeochemical reactor (SBGR), also known as a bioreactor, continued to operate in a four-week “pulsed mode” to optimize distribution of total organic carbon (TOC). The bioreactor was taken off

line on 15 April 2019. In March 2019, the conveyance line between the bioreactor and the infiltration trench was modified to allow overflow from the Site DP039 infiltration trench to be conveyed to the SBGR. On 9 April, a restrictor plate was installed in the conveyance line leading to the infiltration trench to help with flow adjustment. The restrictor plate currently limits the flow to approximately 2.5 gpm to the infiltration trench.

Optimization Activities

No optimization activities occurred at the CGWTP in April 2019.

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 2,190 pounds of GHG during April 2019.

TABLE 5

Summary of Groundwater Analytical Data for April 2019 – Central Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	2 April 2019 (µg/L)			
				Influent	After Carbon 1 Effluent	After Carbon 2 Effluent	System Effluent
Halogenated Volatile Organics							
Acetone	NA	2.1 – 11	0	ND	ND	ND	ND
Chloroform	1.9	0.12 – 0.60	0	ND	ND	ND	ND
1,2-Dichlorobenzene	NA	0.15	0	0.27 J	ND	ND	ND
1,3-Dichlorobenzene	NA	0.24	0	0.39 J	ND	ND	ND
1,4-Dichlorobenzene	NA	0.13 – 0.65	0	ND	ND	ND	ND
Bromodichloromethane	NA	0.17 – 0.85	0	ND	ND	ND	ND
1,1-Dichloroethane	0.50	0.15 – 0.75	0	ND	ND	ND	ND
1,2-Dichloroethane	0.50	0.22 – 1.1	0	ND	ND	ND	ND
1,1-Dichloroethene	0.50	0.14 – 0.70	0	0.52 J	ND	ND	ND
cis-1,2-Dichloroethene	0.50	0.15 – 0.50	0	34	ND	ND	ND
trans-1,2-Dichloroethene	0.50	0.15 – 0.55	0	2.8	ND	ND	ND
Tetrachloroethene	0.50	0.15 – 0.75	0	0.37 J	ND	ND	ND
1,1,1-Trichloroethane	0.50	0.19 – 0.95	0	ND	ND	ND	ND
1,1,2-Trichloroethane	0.50	0.31 – 1.6	0	ND	ND	ND	ND
Trichloroethene	0.65	0.16 – 1.6	0	160	ND	ND	ND
Vinyl Chloride	0.90	0.22 – 1.1	0	0.18 J	0.25 J	ND	ND
Non-Halogenated Volatile Organics							
Benzene	0.50	0.13 – 0.65	0	ND	ND	ND	ND
Ethylbenzene	0.50	0.15 – 0.75	0	ND	ND	ND	ND
Toluene	0.50	0.25 – 1.3	0	ND	ND	ND	ND
Total Xylenes	0.50	0.18 – 0.90	0	ND	ND	ND	ND
Methyl Tertiary Butyl Ether	0.50	0.25 – 1.3	0	ND	ND	ND	ND
Other							
Total Petroleum Hydrocarbons – Gasoline (C6 – C10)	50	10	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Diesel (C10 – C28)	50	15 – 17	0	NM	NM	NM	ND
Total Petroleum Hydrocarbons – Motor Oil (C28 – C40)	100	160 - 180	0	NM	NM	NM	ND

* In accordance with current National Pollutant Discharge Elimination System permit number CAG912002, Order number R2-2017-0048.

Notes:

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

NA = not applicable

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

ND = not detected

NM = not measured

µg/L = micrograms per liter

mg/L = milligrams per liter

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

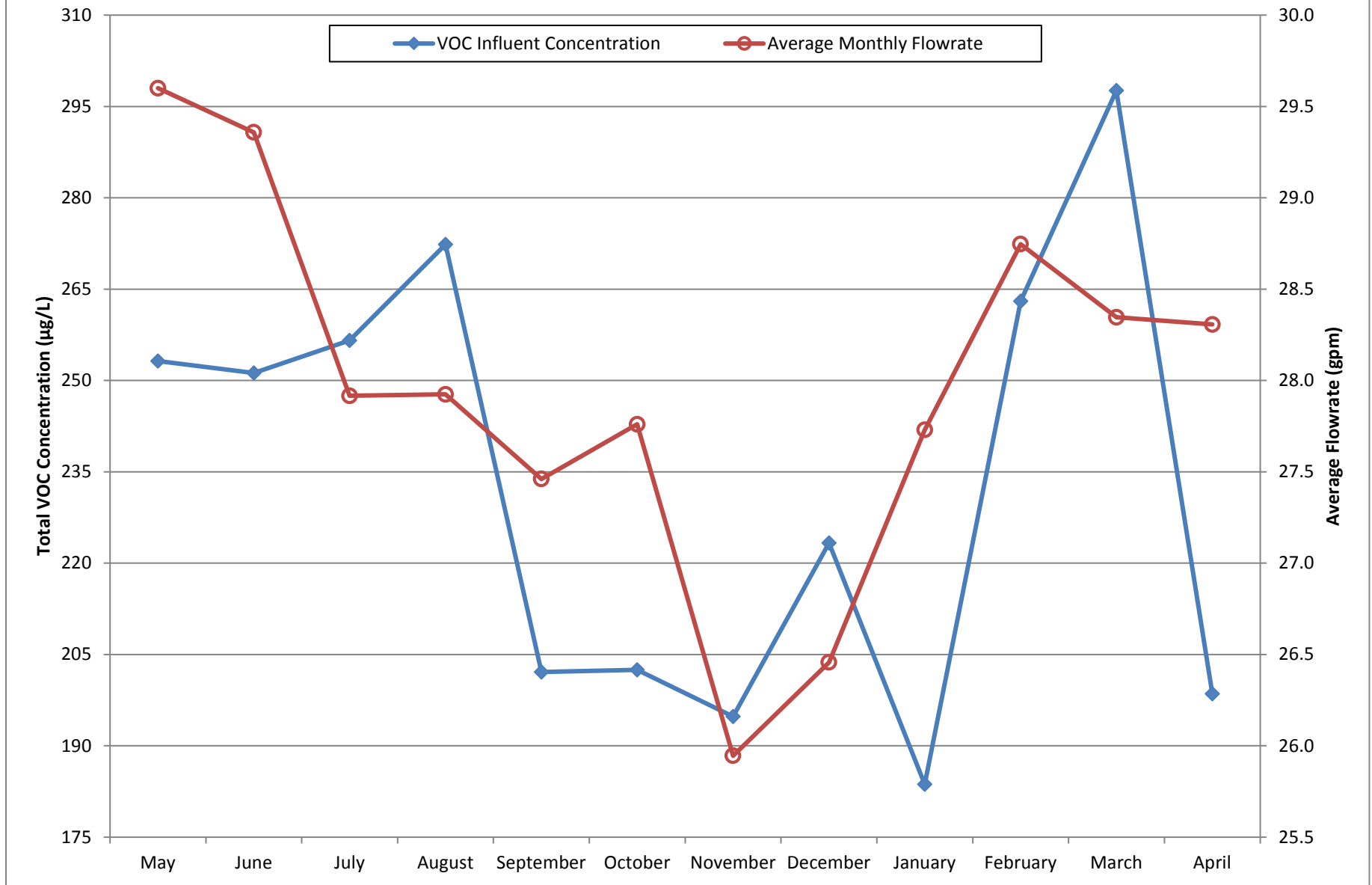
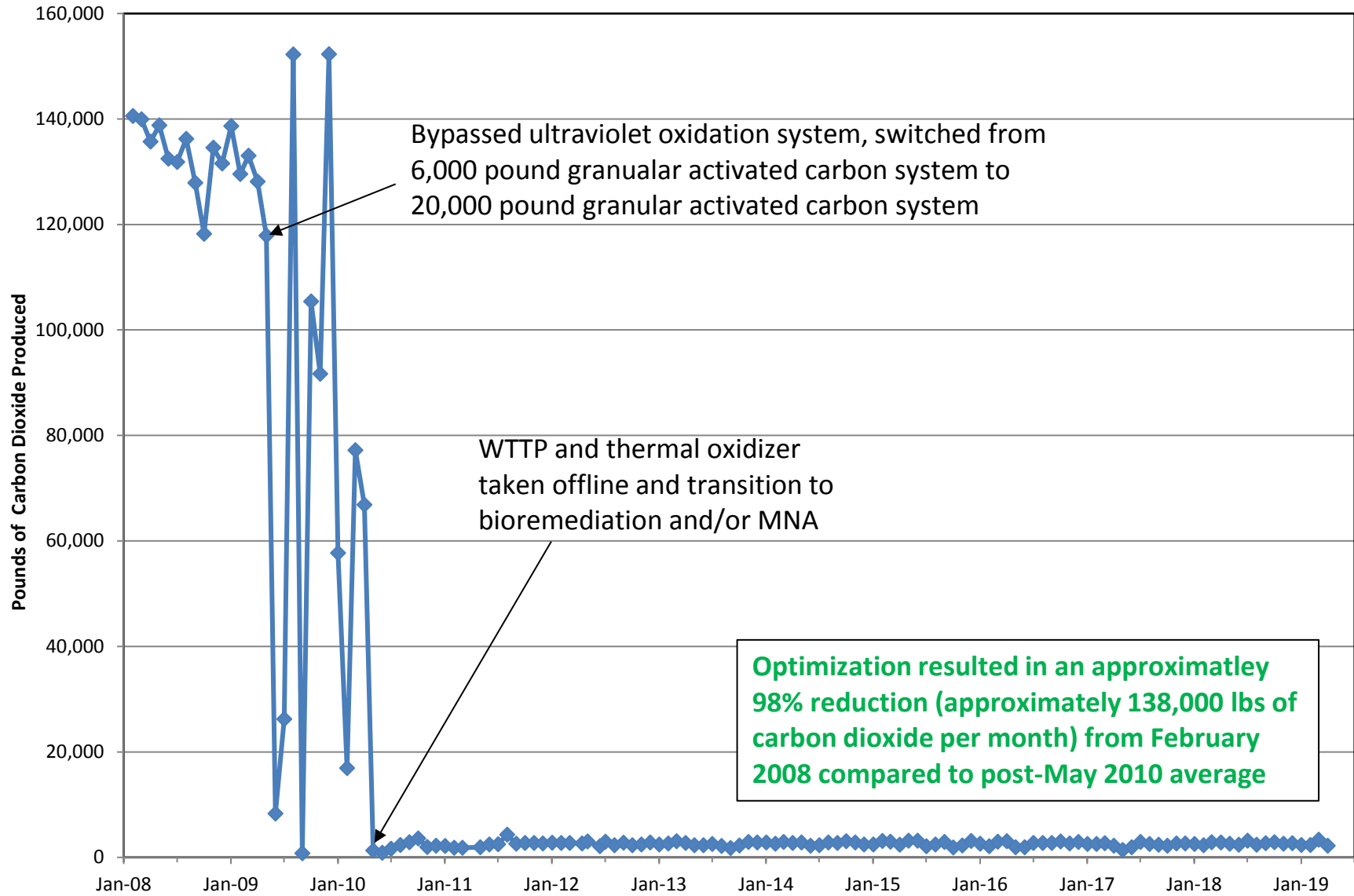


Figure 2

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



Site ST018 Groundwater Treatment Plant Monthly Data Sheet

Report Number: 098

Reporting Period: 1 April 2019 – 1 May 2019

Date Submitted: 13 May 2019

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

System Metrics

Table 1 presents operation data from the April 2019 reporting period.

Table 1 – Operations Summary – April 2019			
Initial Data Collection:	4/1/2019 14:30	Final Data Collection:	5/1/2019 12:05
Operating Time:		Percent Uptime:	Electrical Power Usage:
	ST018GWTP: 600 hours	ST018GWTP: 83.6%	ST018GWTP: 139 kWh (103 lbs CO₂ generated^a)
Gallons Extracted:	216,790 gallons	Gallons Extracted Since March 2011:	17.0 million gallons
Volume Discharged to Sanitary Sewer:	216,790 gallons	Final Totalizer Reading:	17,048,329 gallons
Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014:	10,552,155 gallons		
MTBE, BTEX, VOC, TPH Mass Removed:	0.02 lbs^b	MTBE, BTEX, VOC, TPH Mass Removed Since March 2011:	47.1 lbs
MTBE (Only) Removed:	0.02 lbs^b	MTBE (Only) Mass Removed Since March 2011:	11.5 lbs
Rolling 12-Month Cost per Total Pounds of Mass Removed:	\$19,003 ^{bc}		
Monthly Cost per Pound of Mass Removed:	\$225,763 ^{bc}		
^a SiteWise™ estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. ^b Calculated using April 2019 EPA Method SW8260C and SW8015B analytical results. ^c Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system. kWh = kilowatt hour lbs = pounds			

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

Table 2 – ST018GWTP Average Flow Rates – April 2019		
Location	Average Flow Rate Groundwater (gpm) ^a	Hours of Operation
EW2014x18	0.6	600
EW2016x18	1.0	600
EW2019x18	1.6	600
EW2333x18	1.5	600
ST018GWTP	6.0	600

^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	26 April 2019	12:20	1 May 2019	9:50	Treatment plant containment float switch failure

^a 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 April 2019. 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 April 2019 laboratory data report is available upon request. The MTBE discharge concentration during the April 2019 sampling event was 12 µg/L, which is a decrease from the March 2019 sample result of 47 µg/L. No other VOCs or TPH were detected in the system discharge sample. As a result of the small amount of contaminant mass removed (0.02 pound), the monthly cost per pound of mass removed was very high (\$225,763) for April 2019.

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 discharge contaminant concentrations to maintain compliance with the Fairfield-Suisun Sewer District discharge permit.

On 26 April, the ST018GWTP was shut down because the treatment plant containment float switch failed. This failure resulted in a false containment area flooding alarm that shut off the system. The float switch was bypassed temporarily, and the system was restarted on May 1, 2019. The float switch will be replaced in early May 2019.

Figure 1 presents plots of the average flow rate and total extracted contaminant (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 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 an increasing trend with a fairly steadily increasing trend since December 2018. The extracted MTBE concentrations and extracted total concentrations have generally been fluctuating over the past 12 months with overall increasing trend.

Optimization Activities

No optimization activities occurred at the ST018GWTP in April 2019.

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 103 pounds of GHG during April 2019 and removed 216,790 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 April 2019– Site ST018 Groundwater Treatment Plant

Constituent	Instantaneous Maximum* (µg/L)	Detection Limit (µg/L)	N/C	2 April 2019 (µg/L)
				System Discharge
Fuel Related Constituents				
Methyl tert-Butyl Ether	6,400	0.25	0	12
Benzene	25,000 ^a	0.16	0	ND
Ethylbenzene	25,000 ^a	0.16	0	ND
Toluene	25,000 ^a	0.17	0	ND
Total Xylenes	25,000 ^a	0.19 – 0.34	0	ND
Total Petroleum Hydrocarbons – Gasoline	50,000 ^b	10	0	ND
Total Petroleum Hydrocarbons – Diesel	50,000 ^b	15	0	ND
Total Petroleum Hydrocarbons – Motor Oil	100,000	160	0	ND
Other				
1,2-Dichloroethane	20	0.13	0	ND

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

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

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

µg/L = micrograms per liter

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

NA = not applicable

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

ND = not detected above method detection limit

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

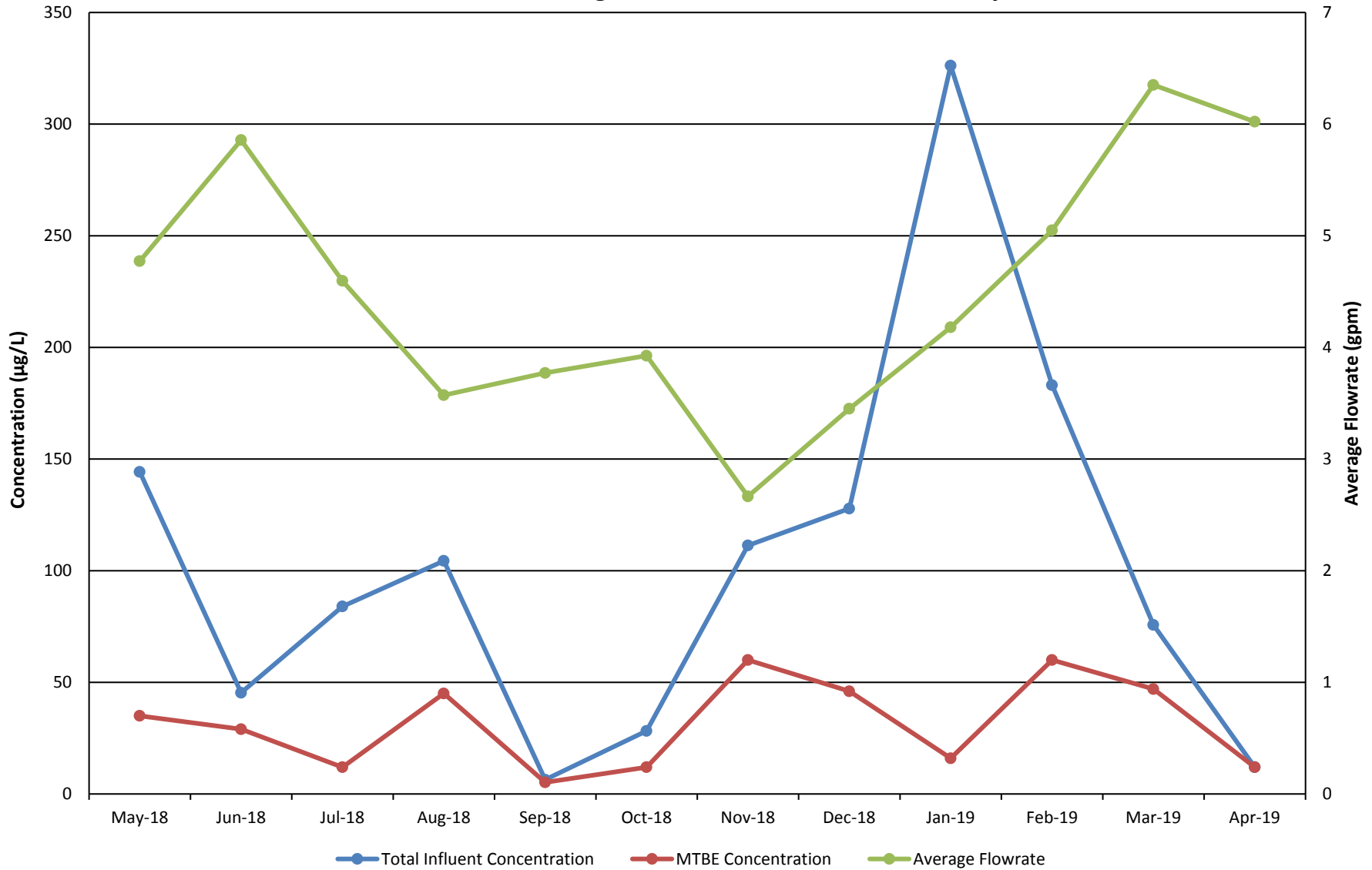
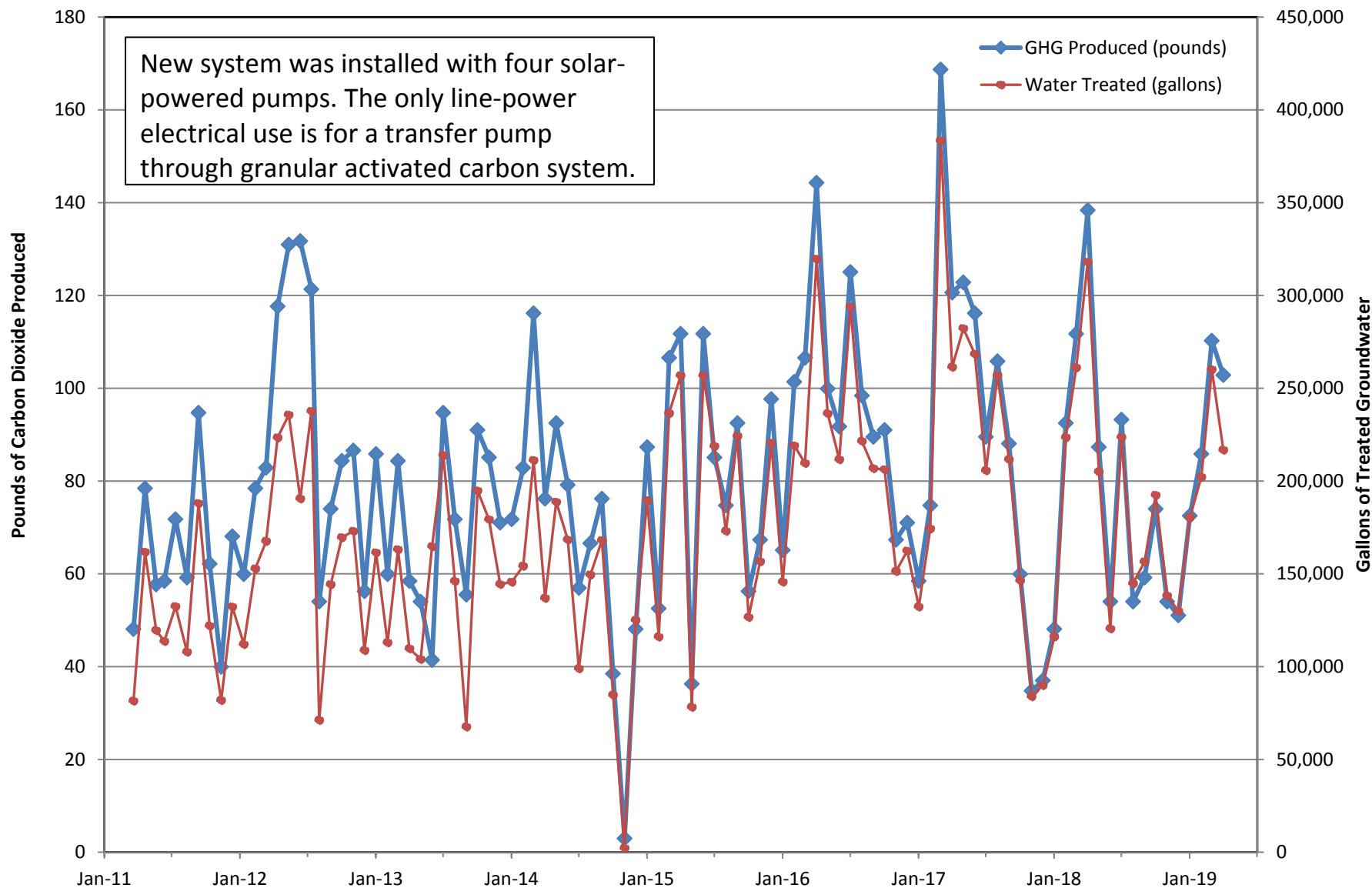


Figure 2

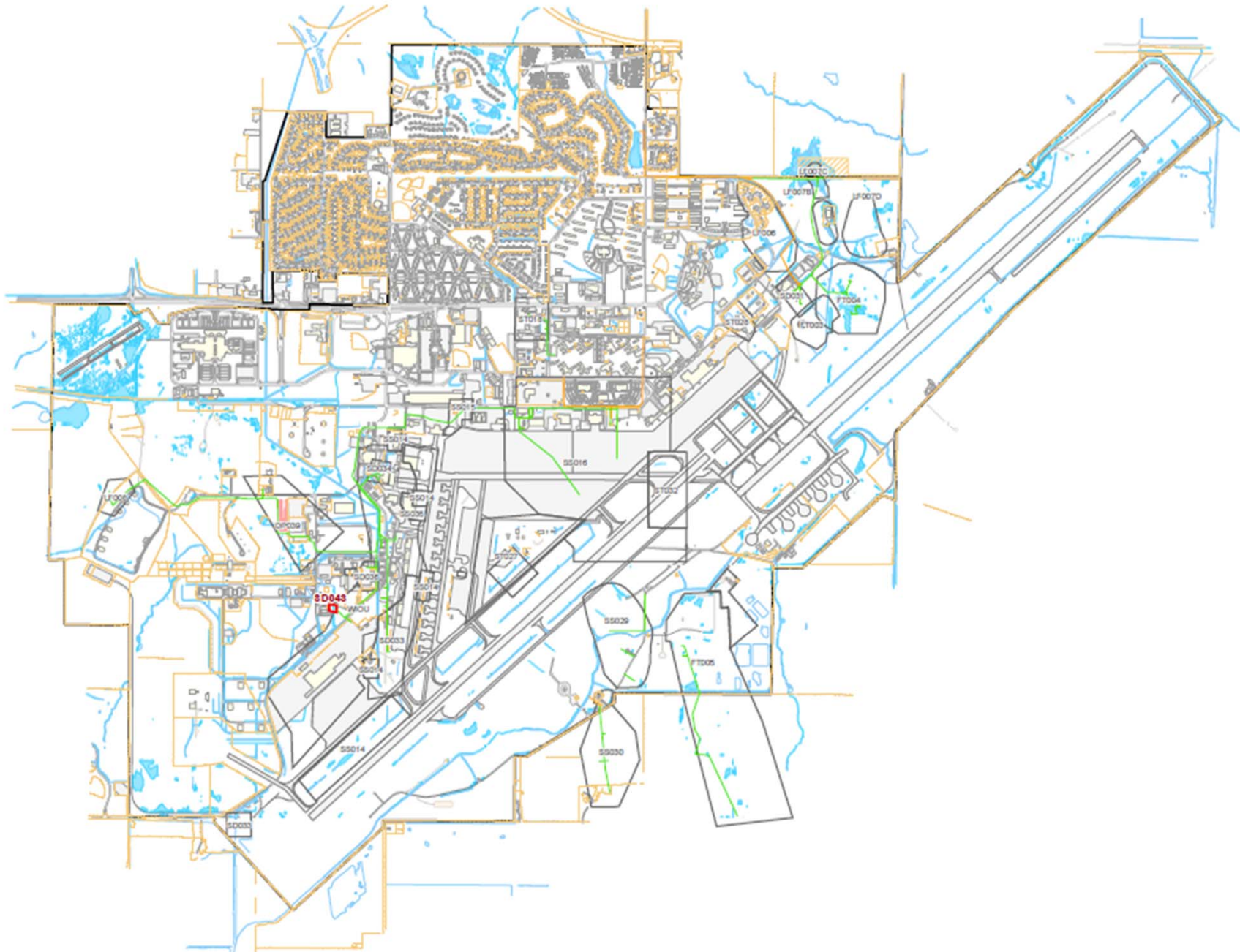
Equivalent Pounds of Carbon Dioxide Produced by the Site ST018 Groundwater Treatment Plant



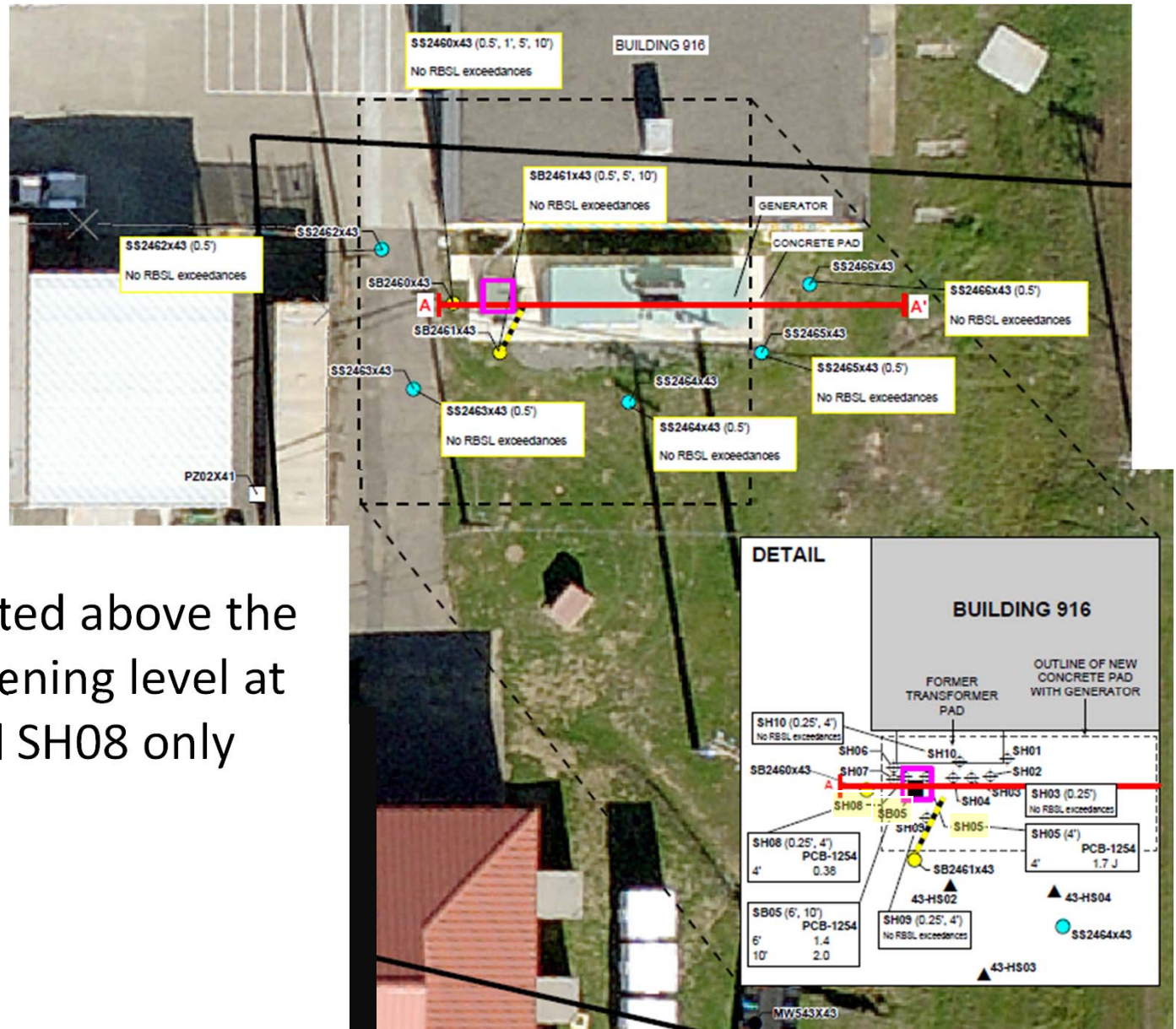
Site SD043 Remedial Action Completion Report

RPM Meeting

May 15, 2019

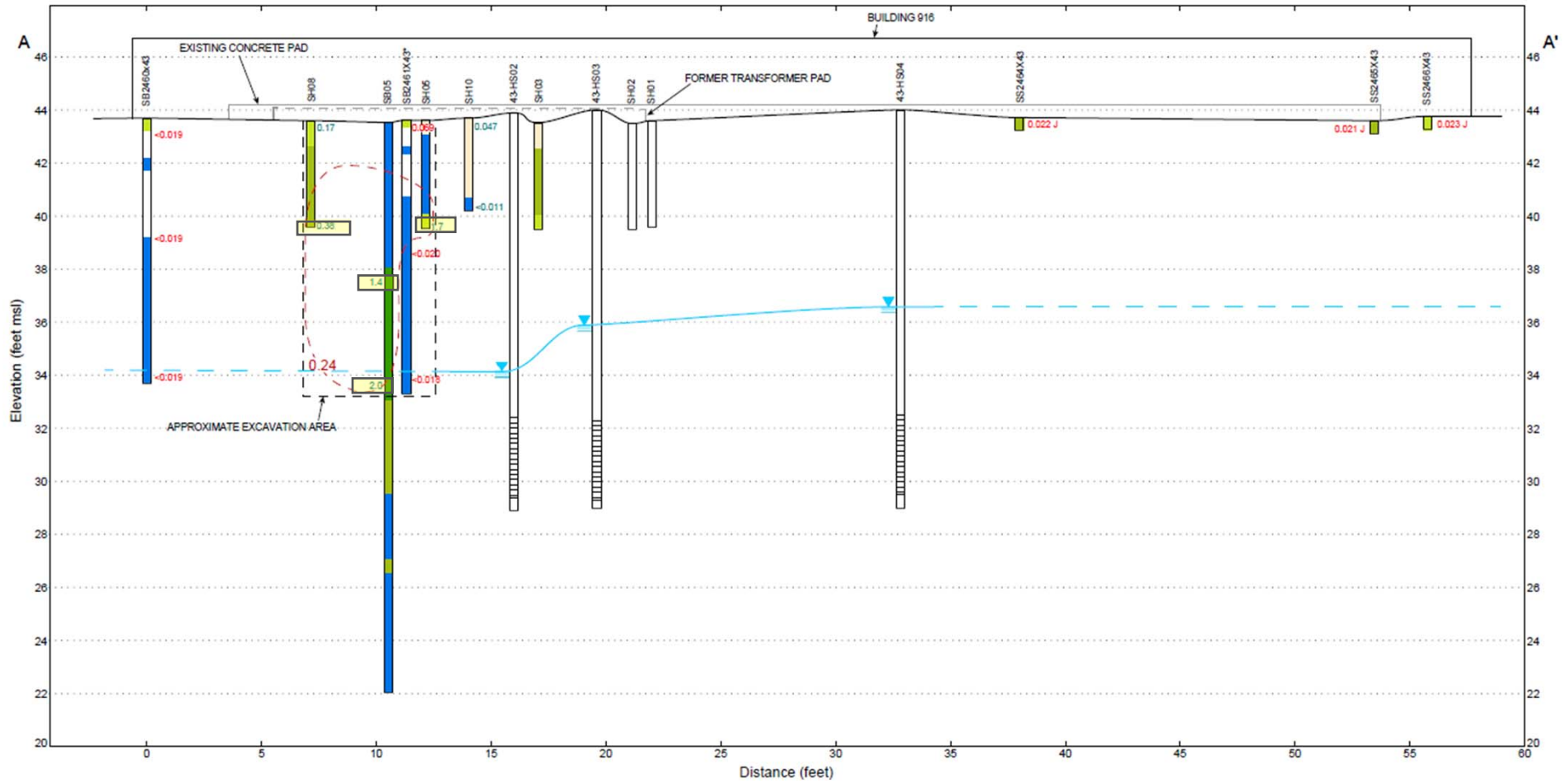


Lateral Extent of PCB-1254 in Soil



PCB-1254 detected above the Residential Screening level at SB05, SH05, and SH08 only

Vertical Extent of PCB-1254 in Soil



Remedial Action Approach

- The RA approach at Site SD043 was to remove soil containing PCB-1254 above the residential cleanup level of 0.24 mg/kg.
- Original excavation design dimension was 5 feet wide by 5 feet long by 10.5 feet deep
- It was estimated that approximately 10 cubic yards of soil would be removed.

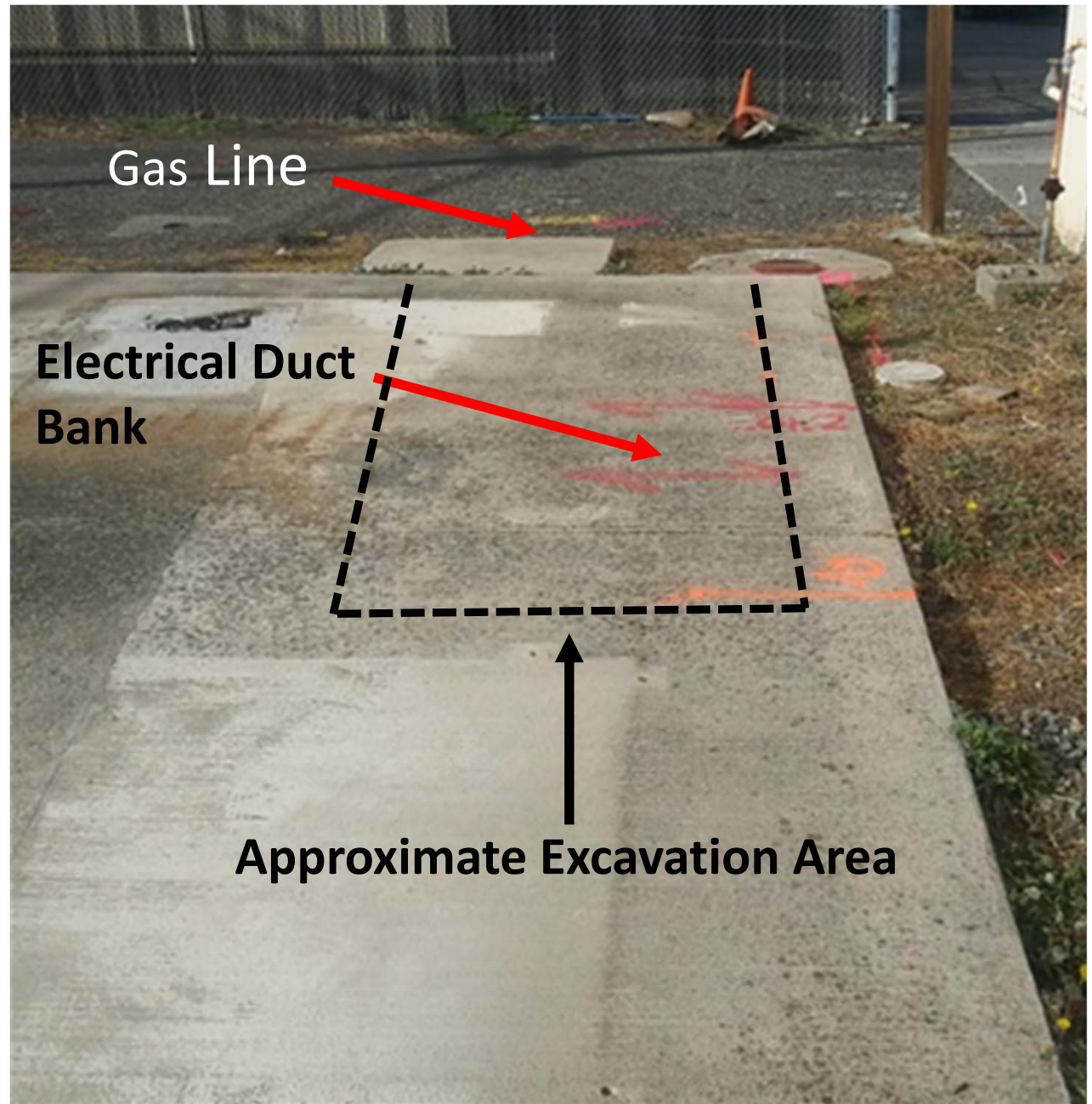
Remedial Action Objectives

- Prevent potential future residents or current Base workers from ingestion, inhalation, or coming into direct dermal contact with PCB-1254 in soil above acceptable exposure levels.
- Restore Site SD043 to achieve the residential soil cleanup level for PCB-1254 (0.24 mg/kg), which will allow for unlimited use of and unrestricted exposure to the soil, while minimizing interference with the Base military mission.

Utility Location

- A gas line and electrical duct bank were previously identified during utility locating for the 2016 data gap investigation.
- These lines were delineated on the ground surface in paint during utility location for the Site SD043 RA in 2018.

- Electrical duct bank daylighted by hand
- 5kV line de-energized
- Gas turned off



Overlying concrete pad broken up and stockpiled onsite prior to offsite recycling.





Excavation length expanded from 5 to 10 feet for safety

Soils were loaded directly to roll-off bins during excavation in lieu of onsite stockpiling for efficiency.



- Excavation completed to 5 feet wide by 10 feet long by 10.5 feet deep.
- No groundwater was encountered.
- Confirmation samples collected from sidewalls and floor.



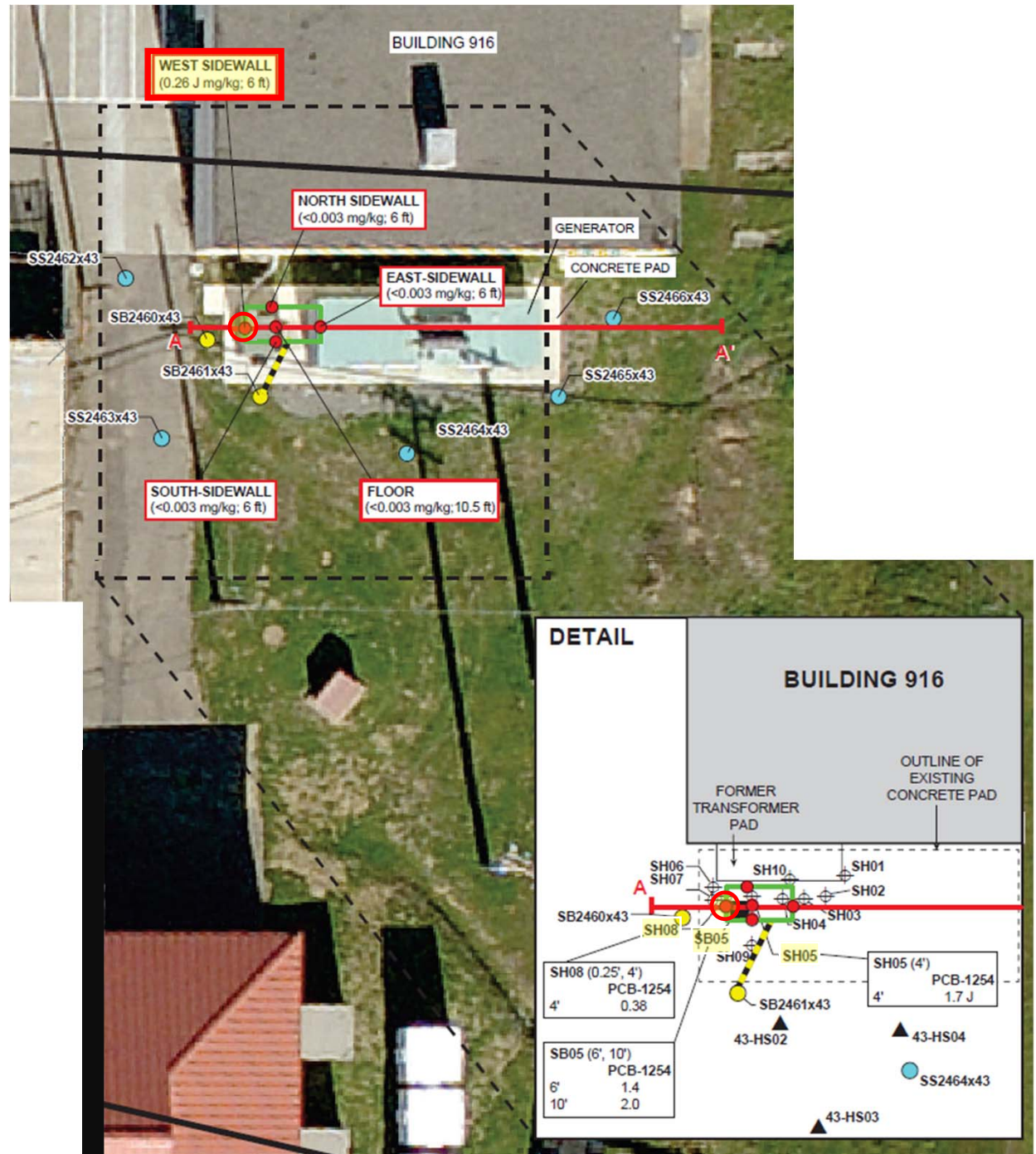
- Sidewall confirmation samples collected from 4-6 feet bgs; floor sample collected from 10.5 feet bgs.
- Backhoe bucket was decontaminated using a pressure washer prior to sample collection.
- Samples were collected from generally undisturbed soils located at the center of the bucket, where soil had not touched the bucket walls.



- Following confirmation sampling, the excavation void was backfilled with clean soils.
- Geotextile fabric was used to delineate the excavated area from the temporary backfill to allow for sidewall or floor resampling, where necessary, while eliminating the potential for cross contamination of clean and potentially impacted soils



- West Sidewall PCB-1254 concentration of 0.26 mg/kg slightly above residential cleanup level (0.24 mg/kg).
- All other confirmation samples were nondetect (<0.003 mg/kg).

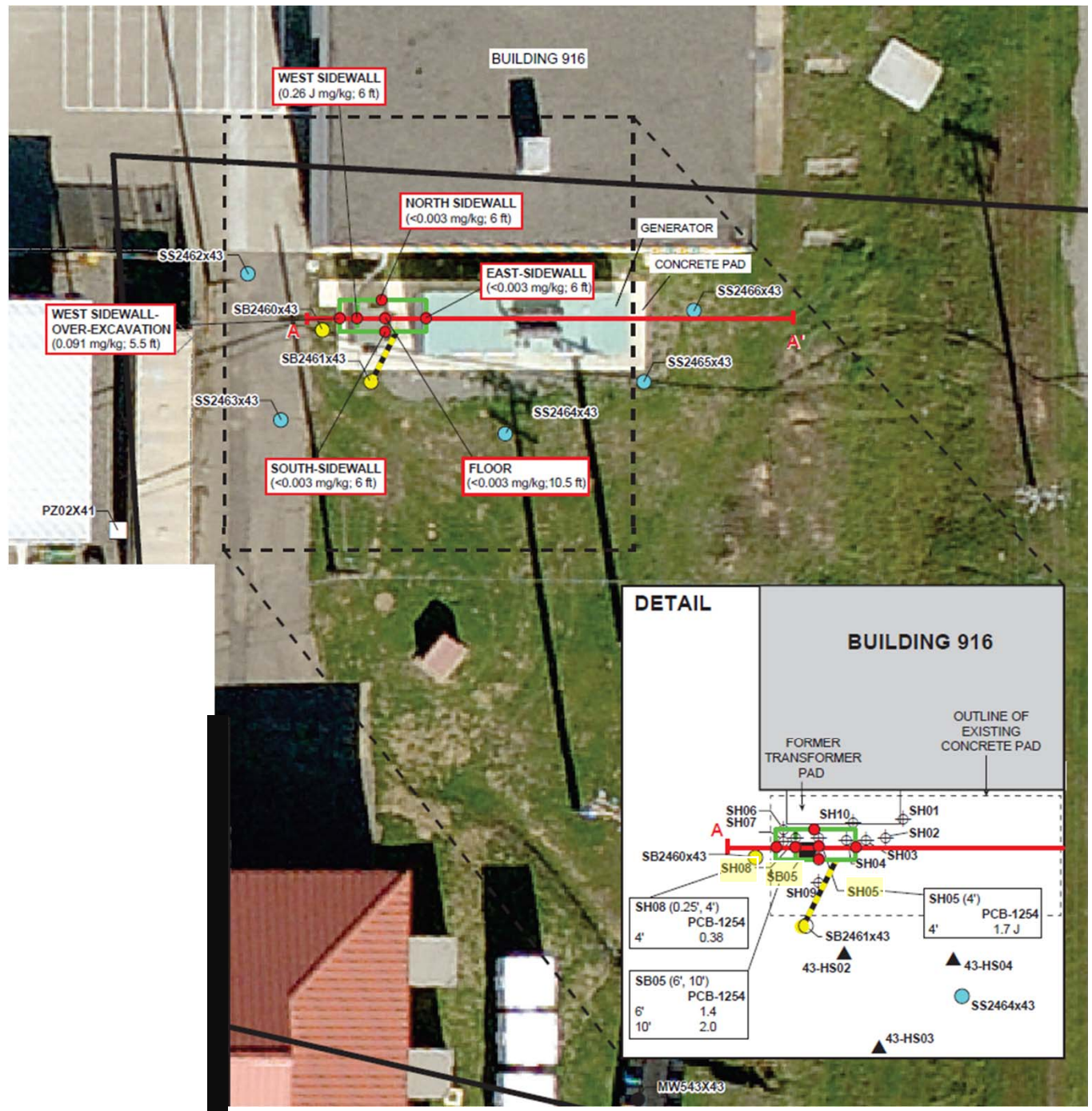


- Excavation was expanded 2 feet to the west in order to remove soils where PCB-1254 exceeded the cleanup level.
- Excavation dimension after over-excavation was 5 feet wide x 12 feet long x 10.5 feet deep.

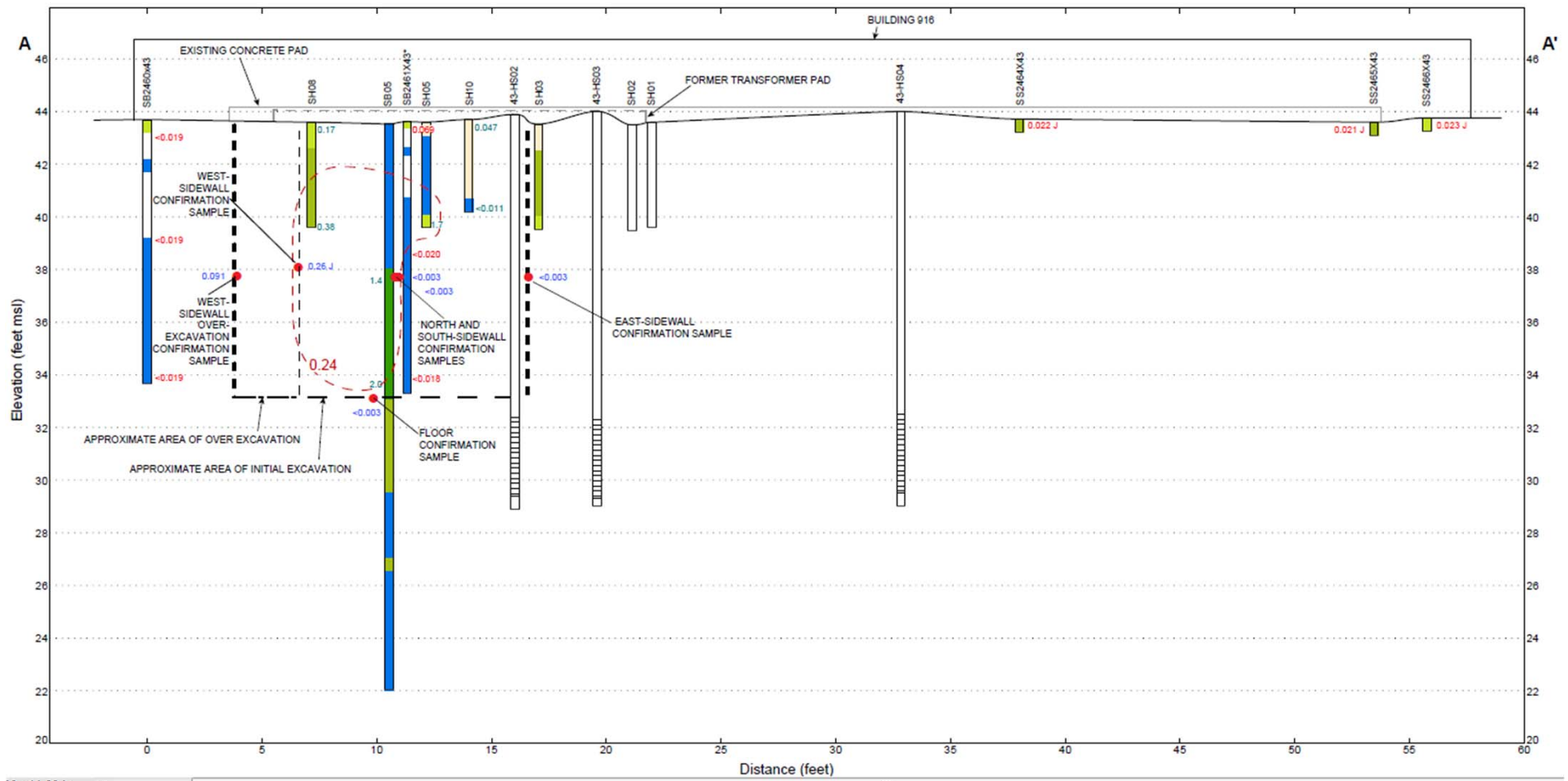


- Concentration of PCB-1254 in the West Sidewall over-excavation confirmation sample was 0.091 mg/kg; well below the cleanup level.

- Following completion of all excavation activities, 34 cubic yards of soil had been removed.



Final Excavation Profile showing confirmation sampling results



Demonstration of Completion

- Confirmation soil sampling results for PCB-1254 in subsurface soil are less than the residential cleanup level of 0.24mg/kg, indicating that soil containing PCB-1254 above the residential cleanup level was adequately removed during the RA. Since PCB-1254 concentrations in soil above the residential cleanup level have been adequately removed, the risk posed by residual concentrations in soil is acceptable under both industrial and residential exposure scenarios.
- Since PCB-1254 concentrations in soil above the residential cleanup level have been adequately removed, soil LUCs are no longer required, and the remaining site soil is available for unlimited use and unrestricted exposure.

Backfilling and Compaction

- After confirmation sampling results confirmed that all PCB impacted soils above the residential cleanup level had been removed, the void was backfilled with clean, imported fill
- Backfill was placed in 12-inch loose lifts and compacted to 90-95 %.
- Surface was mounded to promote drainage and minimize potential for ponding.





Final Site Condition

Waste Transportation & Disposal

- Concrete was recycled at ConCrush in Fairfield, CA.



- Decontamination fluids were discharged into the dry soil contained within roll-off bins.
- Soils were characterized as non-hazardous using historical in situ data for PCB-1254 and were disposed of at the Potrero Hills Landfill in Suisun City, CA.

Questions?

Presentation of the Site SS046 Remedial Action Completion Report and Well Decommissioning Work Plan

RPM Meeting

May 15, 2019

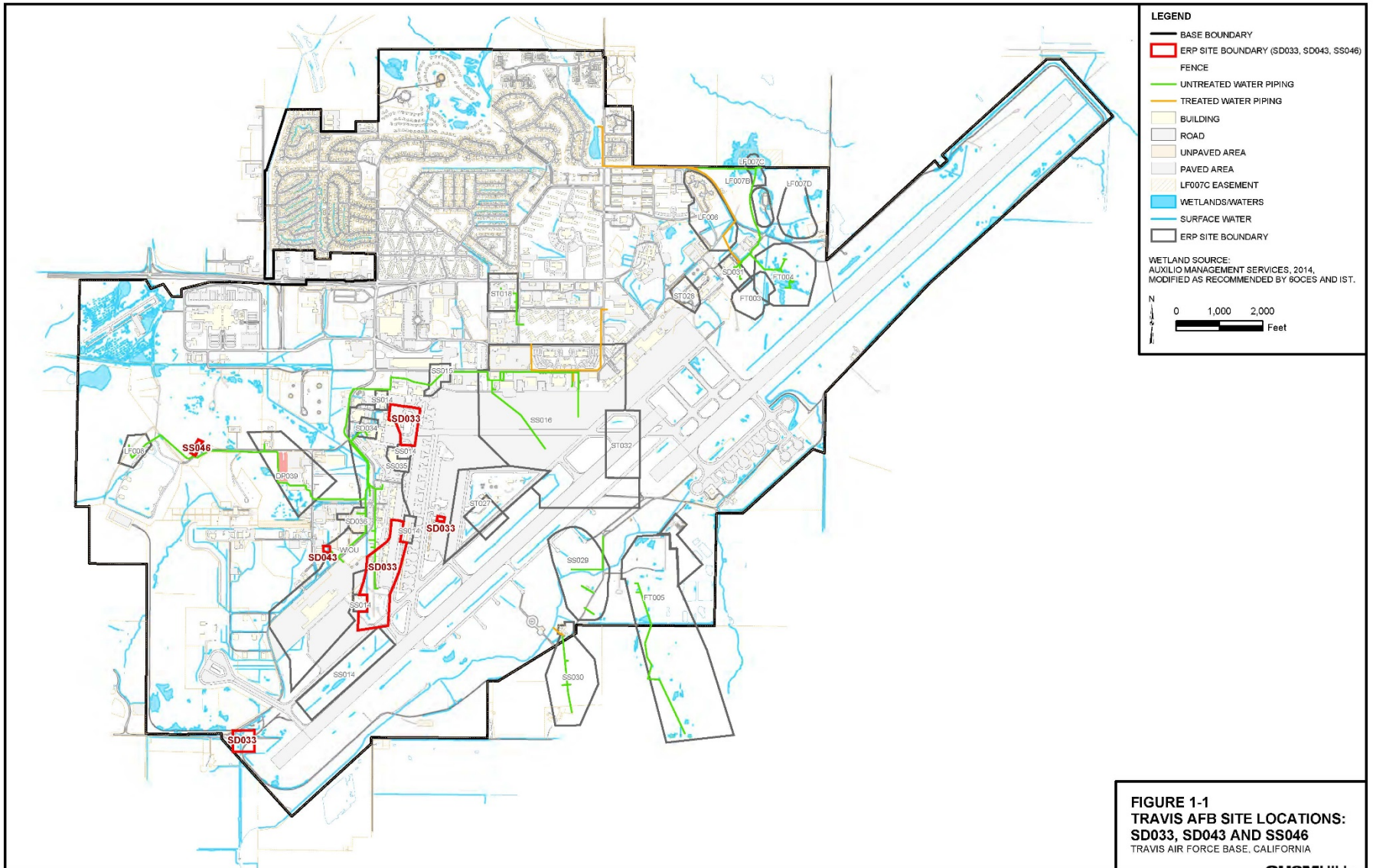


FIGURE 1-1
TRAVIS AFB SITE LOCATIONS:
SD033, SD043 AND SS046
 TRAVIS AIR FORCE BASE, CALIFORNIA

Site SS046 Background

- Site SS046, the Railhead Munitions Staging Area, is located in the north-central portion of the WABOU.
- The site formerly served as the railhead at the south terminus for a spur off the Northern Sacramento Railroad, and from 1953 to 1962 Site SS046 also served as a weapons-handling facility.
- Site investigations are documented in the Final WABOU RI Report; and selected remedial action for Site SS046 is documented in the *WABOU Soil ROD* (Travis AFB, 2002).
- The *WABOU Soil ROD Amendment* (Travis AFB, 2018) documented revised remedy for SS046, from Land Use and Access Restrictions to Excavation and Off-Base Disposal
- RD/RA Work Plan finalized in 2018.

Excavation of Contaminated Soil

- RA field activities conducted between November 2018 and February 2019.
- The RA completed excavation of soils exceeding the residential soil cleanup levels for polycyclic aromatic hydrocarbons (PAHs), pentachlorophenol, lead, and arsenic in accordance with the selected remedy for Site SS046 and the cleanup levels specified in the ROD Amendment (Travis AFB, 2018).
- Excavation of contaminated soil was conducted during the period from November 26, 2018, through January 17, 2019, and included five (5) contaminated areas.
- Approximately 75 tons of contaminated soil were excavated and disposed of as nonhazardous waste at Recology Hay Road Landfill.
- Confirmation sampling confirmed that the RA activities met the specified cleanup levels for unrestricted land use; however, data quality issues were identified with pentachlorophenol.

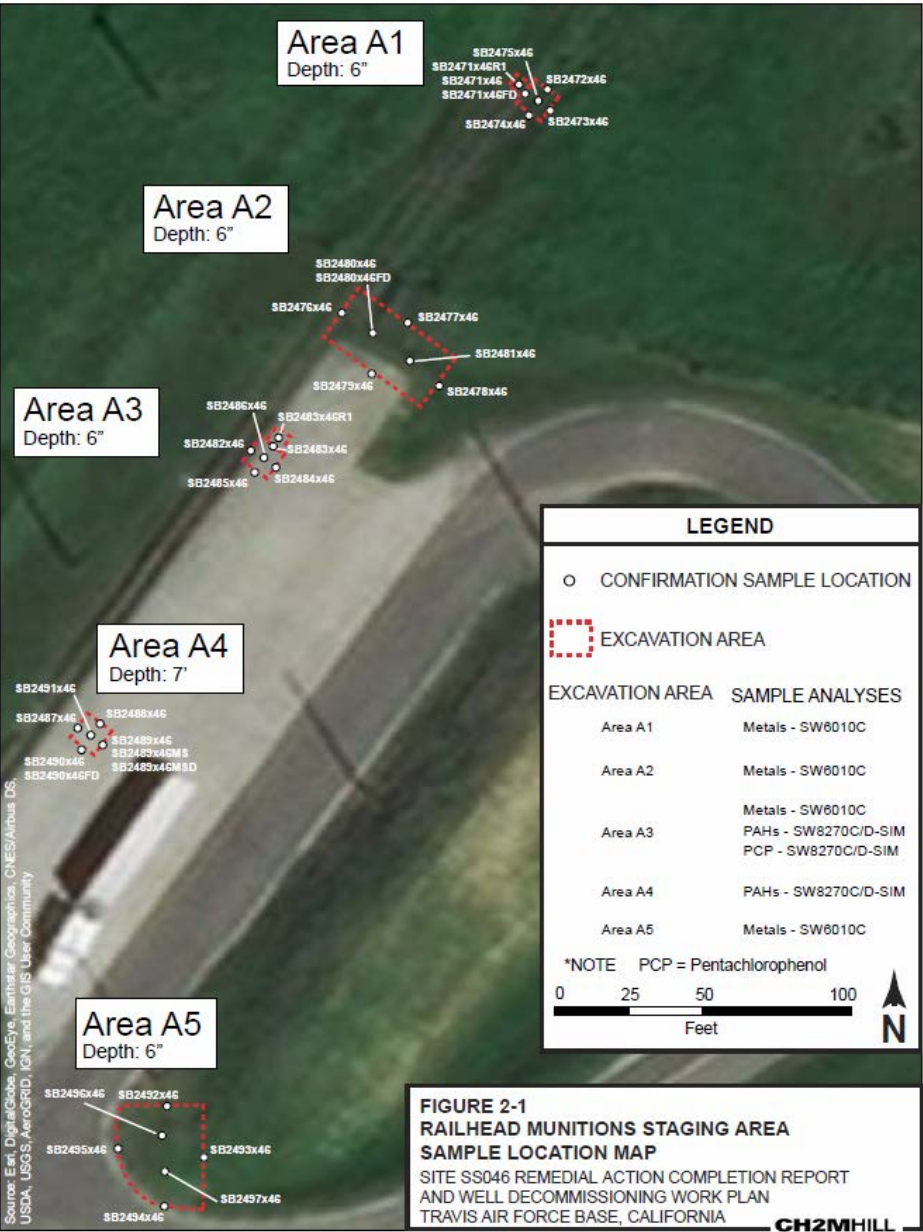


FIGURE 2-1
RAILHEAD MUNITIONS STAGING AREA
SAMPLE LOCATION MAP
SITE SS046 REMEDIAL ACTION COMPLETION REPORT
AND WELL DECOMMISSIONING WORK PLAN
TRAVIS AIR FORCE BASE, CALIFORNIA





Data Quality

- Miscommunication between the lab and project team resulted in results of one analyte, pentachlorophenol, not being reported. The error was not caught until the excavation was backfilled.
- Although hold times were exceeded, the project team decided to re-run the samples because they had been refrigerated by the lab, and because of the stability of pentachlorophenol in the environment.
- All pentachlorophenol results were below cleanup levels; however, an “R” qualifier was applied consistent with standard validation practice. Based on the EPA documentation of the long half-life of PCP degradation, the chemistry team review suggested a “UJ” qualification of all pentachlorophenol data might be appropriate for these data if all parties involved in the decision-making agreed.
- Review by USACE indicated that all reviewers did not agree; therefore the field team returned to the site on 5/8/19 to collect additional soil samples for PCP analysis.
- Five (5) confirmation samples were recollected from the interface between fill and native soil, as close to the same location as the original confirmation samples. Results are pending as of 5/15/2019.

Resampling for Pentachlorophenol



Path Forward

- Complete the regulatory review of Site SS046 RACR. Travis will send out a revised data table with updated PCP results after data validation; use updated data table to gain agency concurrence with recommendation to close the site; and submit final RACR that contains revisions based on agency comments and the revised table with updated PCP results.
- Gain concurrence on recommendation to abandon two piezometers. This recommendation is independent of resolution of pentachlorophenol data quality issues because groundwater is not a media of concern at the site and there are no groundwater COCs.
- Approval for piezometer abandonment is requested ahead of final approval of the RACR due to contractual issues regarding expiring funds.
- The two (2) piezometers have been identified in the GRISR as appropriate for decommissioning since 2011. They are not used for groundwater monitoring and remaining wells in the area (MW04x44 and MW231x19) provide sufficient groundwater elevation data for hydraulic control.

Travis AFB Restoration Program

Program Update

RPM Meeting

May 15, 2019

Completed Documents (1)

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

Completed Documents (2)

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

Completed Documents (3)

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

Completed Documents (4)

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

Completed Documents (5)

- Data Gap Investigation Results, Technical Memorandum for Soil Site SS016
- LF006, SS030, SD031 Aquifer Test Activities Technical Memorandum
- SS015 Soil Sampling Plan
- Monitoring Well Installation Tech Memo for Site DP039, Addendum to the RACCR
- FT005 Extraction System Optimization Tech Memo
- 2017 Annual CAMU Monitoring Report
- LF044 Sediment Sampling Report
- SD043 RD/RA Work Plan
- SS046 RD/RA Work Plan
- Amendment to the WABOU Soil ROD for sites DP039, SD043, and SS046
- EVO Sites FT004, SS015, SD031, & SD036 Optimization Injections Tech Memo
- LF006 Technology Demonstration Work Plan
- AOC TA500 Well Decommissioning and Site Closeout Tech Memo
- SS015 Soil Sampling Results Tech Memo
- ***LF006 Technology Demonstration Construction Completion Report***

Completed Field Work (1)

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

Completed Field Work (2)

- 2015 Annual GRIP Sampling
- SD037 EVO Injection
- SD034 Data Gaps Investigation
- SS015 EVO Injection
- FT005 Injection Well Installation
- OWS 47, 48, 49 Site Investigations
- SS030 Trench/Conveyance/Power Installation
- FT005 Trench Installation
- FT005 Well Development
- FT004 Well Installation, Well Development, Baseline Sampling
- FT005 Baseline Sampling
- DP039 Well Installation, Well Development, Baseline Sampling
- FT004 EVO Injection
- FT004 Trench/Conveyance/Power Installation
- DP039 Infiltration Trench Installation
- TA500 Groundwater Sampling
- FT005 EVO Injection
- 2016 Q2 GRIP Sampling
- Data Gap Inv. for Soil Sites (SD043, SS046)
- SD031 Remedial Investigation Step-out Sampling (2nd round)
- DP039 EVO Injection
- CG508 Well Decommissioning
- SD033 Soil Sampling
- Multi-site Bioaugmentation Well Installation
- SD034 Technology Demonstration Well Installation
- SS014 Bioreactor Installation
- ST028 & ST032 Well Decommissioning

Completed Field Work (3)

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

Completed Field Work (4)

- FT004 POCO Soil Data Gaps Investigation
- LF044 Sediment Sampling
- FT004 EVO Optimization
- DP039 Install downgradient monitoring wells (2nd round)
- FT005 – Install Extraction Wells
- DP039 Repair SBGR distribution headers
- Q4 2017 GRIP Sampling
- SD036 EVO Optimization
- SS015 EVO Optimization
- SD031 EVO Optimization
- FT005 Installation of Pumps and Controls in 5 New Extraction Wells
- Q1 2018 GRIP Sampling
- SD037 EVO reinjection
- Q2 2018 GRIP Sampling
- SS015 Soil sampling
- TA500 Well Decommissioning
- FT005 EVO injection
- FT004 POCO Soil Investigation
- 3Q 2018 GRIP Sampling
- LF006 Well Installations and Injections
- 4Q 2018 GRIP Sampling
- SD043 Soil excavation
- 1Q 2019 GRIP Sampling
- 2019 Annual LUC Inspections
- SS046 Soil excavation

Documents In-Progress

CERCLA

- Amendment to the NEWIOU Soil ROD for Sites SS016 and SD033
- Community Relations Plan Update (revised draft)
- 4th Five Year Review Report for Multiple Groundwater, Soil, and Sediment Sites
- SS016 RD/RA Work Plan
- 2017 Annual GRISR
- Addendum to the Site SS016 Groundwater RD/RA Work Plan
- ***SD043 Remedial Action Completion Report***
- ***SS046 Remedial Action Completion Report***

Documents In-Progress

MMRP

- NFA ROD for Old Skeet Range (TS060/TS060A MRA)

POCO

- Subarea LF007C TPH Chromatogram Review TM
- ***SS014 POCO Subsites 2, 4, and 5 Closure Evaluation Report***

Field Work In-Progress

CERCLA

- ***2Q 2019 GRIP Sampling Event***

POCO

- ***2Q 2019 GRIP Sampling Event***

Documents Planned

CERCLA

- 2018 Annual GRISR Jun
- SD031 Soil RI/FS Jun
- 2018 LF007 CAMU Inspection, Monitoring,
and Maintenance Report Jul

POCO

- None

Field Work Planned

CERCLA

- SD034 O₂ Enhancement Jun
- **SS016 SBGR Repairs Jun**
- **Well Re-development (13 wells) Jun**
- ST027B EVO/Bioaugmentation Reinjection Jul
- **SD036 Injection Well Installation Jul**
- **SD037 Injection Well Installation Jul**
- SS016 Soil excavation (waiting on ROD amendment) TBD
- SD036 EVO Injection (MW2032x36) TBD
- SD037 EVO Re-injection (MW 2121x37) TBD
- **SS046 Well Decommissioning TBD**

POCO

- None

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

Petroleum Technology Demonstration Projects (1)

- SS014: Recycled Drywall Subgrade Biogeochemical Reactor (SBGR)
 - Evaluate the effectiveness of sulfate (gypsum from crushed drywall) to enhance anaerobic biodegradation of petroleum in groundwater
 - Installation was completed November 2016
 - Results through first 22 months
 - TPH-G: 99% reduction in source area (1,900 to <25 mg/L [non-detect])
 - TPH-D: 99% reduction in source area (5,500 to 54 mg/L)
 - Benzene: 99% reduction in source area (90 to <0.4 mg/L [non-detect])
 - Plume as a whole continues to shrink, so this TD has been quite successful

SBGR = Subgrade Biogeochemical Reactor

Updates in Green Font

Petroleum Technology Demonstration Projects (2)

- SD034: Aerobic “Washboard” Subgrade Biogeochemical Reactor (SBGR)
 - Installed six (6) SBGR trenches in November 2016 to evaluate the effectiveness of an oxygen-enhanced aerobic SBGR on reducing TPH as diesel (TPH-D) in groundwater
 - Below SBGR trench (MW811x34/PZSSAx34) through first 2 years
 - TPH-D baseline 9,600 ug/L was reduced to 40 J ug/L after 15 months, with increase to 890 ug/L at 20 months, then decreased to 100 ug/L at 2 years. Concentration fluctuations are to be expected as higher concentration areas are flushed as part of the washboard effect. We are evaluating enhancements to the SBGR trenches to maintain treatment efficiency.)
 - TPH-MO baseline 2,300 ug/L was reduced to 89 J ug/L after 15 months, with increase to 760 ug/L at 20 months, then decreased to non-detect at 2 years
 - Plume hot spot monitoring well (MW02x34) through first 2 years
 - TPH-D baseline 8,300 ug/L was reduced to 6,800 ug/L after 15 months, with increase to 13,000 ug/L at 20 months, then decreased to 6,700 ug/L at 2 years (Concentration fluctuations are to be expected as higher concentration areas are flushed as part of the washboard effect. We are evaluating enhancements to the extraction network to help reductions in this area.)
 - TPH-MO baseline 1,500 ug/L was reduced to 660 J ug/L after 15 months, with non-detect at elevated detection limit at 20 months, then 1,100 ug/L at 2 years (Was 72% reduction after 9 months, seeing some fluctuations)
- Aerobic treatment process for this TD has been successful, but additional enhancements are warranted to maintain treatment efficiency (to be discussed in separate presentation)

Updates in Green Font

CVOC Technology Demonstration Projects (3)

- **Multisite Bioaugmentation: EVO and KB-1 Plus (No new information)**
 - Evaluate if addition of bioaugmentation substrate to an EVO injection will increase the rate of CVOC degradation
 - Initial injections were completed (Nov 2016)
 - Limited TOC dispersal at SD036, so installed additional injection wells and reinjected with nanoEVO in 2017
 - Too early to evaluate degradation rates; however:
 - ~50-70% TCE reductions at ST027B, but still too early to evaluate if bioaugmentation was beneficial
 - TCE fluctuations at SD036 bioaugmentation area and 99% decrease in the EVO-only area, reinjections and additional injection wells have supported significant reductions to the east of the site (in MW2064Ax36, TCE reduced from 6,400 to 11 ug/L), northeast (in MW2063x36, TCE reduced from 1,000 to 1.8 ug/L), and to the north (in MW2187x36, TCE reduced from 1,400 to 84 ug/L). Still too early to evaluate if bioaugmentation was beneficial
- **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. TD installation completed May 2016. Optimized the GETs in 2017
 - FT005 north area: Slightly elevated TOC and reduced COC concentrations (below MCLs);
 - FT005 central area: Limited TOC increase observed to date in most areas, as injected EVO may be adsorbed to sediments or being consumed faster than spread can be observed. However, MW2292x05 (south of Base boundary) had TOC increase from 1.2 to 20 mg/L between May and October 2018, likely the result of the newly installed extraction wells and the 2018 reinjection in this area.
 - FT005 south area: No TOC increase observed in this control area: Newly installed extraction wells are effectively capturing the remaining 1,2-DCA hot spots, with concentrations now beginning to decrease in these areas
 - New extraction wells are decreasing 1,2-DCA (e.g., 3.6 to 0.8 J, 1.4, to 0.85 J, 5.9 to 4.4, 3.0 to 1.9 ug/L)
 - We don't think distribution of TOC through the aquifer via extraction will be viable, although it is still expected to have had a benefit to remediation as a whole

CVOC Technology Demonstration Projects (4)

- FT004: Distribution of EVO via SBGR and/or Groundwater Extraction
 - Determine effectiveness of TOC distribution through two different enhanced reductive dechlorination (ERD) approaches: (1) groundwater TOC recirculation using a combination EVO injection, infiltration SBGR trenches, and groundwater extraction; and (2) EVO injection with groundwater extraction
 - Installation completed April 2016
 - COC concentrations declined through year 1
 - ~50% total molar reduction plume-wide through first year
 - Max monitoring well TCE concentration reduced from 560 to 140 $\mu\text{g/L}$
 - Limited TOC dispersal, additional EVO injection conducted with nanoEVO in 2017 to determine if this can enhance TOC dispersal (too early to evaluate results of reinjection)
 - Slight TOC increase (3.5 to 5.4 mg/L) and TCE decrease (previous max well rebounded from 140 to 330 ug/L, and then decreased to 63 ug/L following reinjection)
 - Variable TOC increase and TCE decrease in main plume area monitoring wells
 - In some extraction wells, TCE concentrations are increasing. This indicates additional TCE mass below the vernal pools that is now being pulled to the extraction wells (recirculation is working, but we are fighting additional TCE mass below the vernal pools, so it will take additional time to see concentration reductions)

Updates in Green Font

CVOC Technology Demonstration Projects (5)

- SD031: EVO distribution via Gravel Chimneys (No new information)
 - Determine if EVO injection and recirculation of groundwater through gravel chimneys can effectively distribute TOC horizontally in the subsurface to support ERD of 1,1-dichloroethene (DCE)
 - Installation completed in April 2015
 - Early indications:
 - Recirculation through chimneys has been successful relative to our design assumptions, TOC increased to >10 mg/L within majority of target area and COCs decreased to below MCLs (most wells ND, max 1,1-DCE reduced from 390 ug/L to ND)
 - 1,1-DCE (primary COC) concentrations have reduced by 99% (was 93%) (sum of key wells within TD area, excluding 2 wells to SW that increased)
 - Total molar concentration (sum of CVOCs) has reduced by 99% (was 84%) (sum of key wells within TD area, excluding 2 wells to SW that increased)
 - Four (4) new EVO wells installed to SW to enhance TOC in problem areas (plume being pulled back towards extraction well causing increasing concentrations in this cross-gradient area), conducted reinjection of EVO in 2017
 - While the demonstration has treated the originally defined groundwater plume area to below MCLs, we are waiting on 2Q19 data to evaluate effects of reinjections, since there is additional mass being pulled in from cross-gradient that we are continuing to evaluate

Updates in Green Font

Completed Documents (Historical1)

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

Completed Documents (Historical 2)

- Phytostabilization Study Report
- 2009/2010 Annual GSAP Report
- SS015 Remedy Optimization Field Implementation Plan
- Sites SS014 and ST032 Tier 1 POCO Evaluation Report
- SD036 Remedy Optimization Field Implementation Plan
- 2010 Annual CAMU Inspection Report
- Site ST018 POCO Baseline Implementation Report
- FT005 Data Gaps Investigation Report
- Comprehensive Site Evaluation Phase II Report
- 2010 Groundwater RPO Annual Report
- Focused Feasibility Study (FFS)
- Site ST027-Area B Human Health Risk Assessment
- Site ST027-Area B Ecological Risk Assessment
- Work Plan for Assessment of Aerobic Chlorinated Cometabolism Enzymes
- 2010/2011 Annual GSAP Report
- Baseline Implementation Report (Sites SS015, SS016, SD036, SD037, and DP039)
- 2011 CAMU Annual Report
- Technical and Economic Feasibility Analysis (TEFA)
- Work Plan for RPO of Sites SS016 and SS029
- Site LF007C Data Gaps Investigation Technical Memorandum
- Technical Memorandum for Assessment of Aerobic Chlorinated Cometabolism Enzymes
- Old Skeet Range Engineering Evaluation/Cost Analysis
- 2011 Groundwater Treatment RPO Annual Report
- Groundwater Proposed Plan (PP)
- FT005 Remedial Action Completion Report
- 2012 GSAP Technical Memorandum22

Completed Field Work (Historical1)

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

Completed Field Work (Historical 2)

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