Travis Air Force Base Environmental Restoration Program Restoration Program Manager's Meeting Minutes 19 October 2017, 1400 Hours

Mr. Lonnie Duke of the Air Force Civil Engineer Center (AFCEC) Restoration Installation Support Section (ISS) conducted the Restoration Program Manager's (RPM) meeting on 19 October 2017 at 1400 hours in Building 248 at Travis AFB, California. Attendees included:

| Lonnie Duke | AFCEC/CZOW |
|------------------------|----------------|
| Glenn Anderson | AFCEC/CZOW |
| Milton 'Gene' Clare | AFCEC/CZOW |
| Angel Santiago Jr. | AFCEC/CZOW |
| Merrie Schilter-Lowe | Travis AFB/PAO |
| Dr. Haekyung Kim | AFCEC/CZRW |
| Rafael Vazquez | AFCEC/CZRW |
| Dezso Linbrunner | USACE-Omaha |
| Adriana Constantinescu | RWQCB |
| Ben Fries | DTSC |
| Nadia Hollan Burke | USEPA |
| Indira Balkissoon | Techlaw, Inc |
| (via telephone) | |
| Jeff Gamlin | CH2M |
| David Bennett | CH2M |
| Mike Wray | CH2M |
| | |

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 (September 2017) |
| Attachment 4 | CGWTP Monthly Data Sheet (September 2017) |
| Attachment 5 | LF007C GWTP Monthly Data Sheet (September 2017) |
| Attachment 6 | ST018 Monthly Data Sheet (September 2017) |
| Attachment 7 | Presentation: Triad Discussion: Site TA500 Site Closure |
| Attachment 8 | Presentation: 2017 Field Work Review |

1. ADMINISTRATIVE

A. Previous Meeting Minutes

The 20 September 2017 RPM meeting minutes were approved and finalized as written.

B. Action Item Review.

Action items from August 2017 were reviewed.

Action item 1 is ongoing: Ms. O'Sullivan to provide updates on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). 19 October 2017 update: Mr. Duke provided an update in Ms. O'Sullivan's absence. The last four (4) samples will be collected on 23 October 2017, on the flightline during closure for rubber removal, as part of the Site Inspection (SI).

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 teleconference held on Wednesday 15 November, at 0930 hours.

Travis AFB Master Document Schedule

- Community Relations Plan (CRP): No change was made to the schedule. Travis will send the document to AFCEC Public Affairs for review before submitting the draft to the regulators.
- Work Plan for the Fourth Five-year Review: No change was made to the schedule. Travis AFB emailed RTCs to EPA on 18 October 2017.
- Amendment to the WABOU Soil ROD for Travis AFB ERP Sites DP039, SD043, and SS046: No change was made to the schedule.

- Potrero Hills Annex (FS, PP, and ROD): No change was made to the schedule. Mr. Anderson said the contractor is conducting additional sampling, installing four (4) new monitoring wells, and drilling one (1) borehole for soil sample analyses.
- Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046: No change was made to the schedule, although EPA requested additional time for review.
- Data Gap Investigation Results Technical Memorandum for Soil Site SS016: Predraft to AF/Service Center date changed to 4 October 2017, to reflect the actual date; the rest of the dates were changed accordingly.
- Quarterly Newsletters (October 2017): No change was made to the schedule.
- 2016 Annual GRISR: No change was made to the schedule.
- 2016 Annual CAMU Monitoring Report: The Response to Comments, and Final due date was changed to 6 October 2017, to reflect the actual date.
- Site TS060 Removal Action Completion Report: No change was made to the schedule.
- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW051, OW053, and OW054: Response to Comments and Final Due dates were changed to 3 October 2017.
- POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW052, OW050, OW052, OW055, OW056, and OW057. Draft to Agencies Due date was changed to 10 November 2017; the rest of the dates were changed accordingly.
- Site ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum: Response to Comments and Final Due date changed to 27 September 2017 to reflect the actual date.

2. CURRENT PROJECTS

Treatment Plant Operation and Maintenance Update

South Base Boundary Groundwater Treatment Plant, September 2017 (see Attachment 3)

The South Base Boundary Groundwater Treatment Plant (SBBGWTP) performed at 99.8% uptime, and 5.8 million gallons of groundwater were extracted and treated in September 2017. All treated water was discharged to Union Creek. The average flow rate for the SBBGWTP was 127.0 gallons per minute (gpm). Electrical power usage was 16,127 kWh, and approximately 12,734 pounds of CO₂ were created (based on DOE calculation). Approximately 1.58 pounds of volatile organic compounds (VOCs)

were removed in September. The total mass of VOCs removed since startup of the system is 490.9 pounds.

Optimization Activities for SBBGWTP: Based on two aquifer tests conducted in June 2017, it was determined that five (5) new extraction wells would be needed to optimize removal of residual 1,2-DCA at Site FT005. The well installations were started in September and will be completed in October 2017.

Central Groundwater Treatment Plant, September 2017 (see Attachment 4)

The Central Groundwater Treatment Plant (CGWTP) performed at 79.7% uptime with approximately 1,249,160 gallons of groundwater extracted and treated in September 2017. All treated water was discharged to the storm sewer system which discharges to Union Creek. The average flow rate for the CGWTP was 34.1 gpm. Electrical power usage was 2,058 kWh for all equipment connected to the Central Plant, and approximately 2,411 pounds of CO_2 were generated. Approximately 2.59 pounds of VOCs were removed from groundwater by the treatment plant in September. The total mass of VOCs removed since the startup of the system is 11,473 pounds.

Optimization Activities for CGWTP: No optimization activities are reported for the month of September 2017.

LF007C Groundwater Treatment Plant, September 2017 (see Attachment 5)

The Subarea LF007C Groundwater Treatment Plant (LF007C GWTP) performed at 18.8% uptime with approximately 38,772 gallons of groundwater extracted and treated in September 2017. All treated water was discharged to the Duck Pond for beneficial reuse. The average flow rate was 4.5 gpm. This plant operates on solar power only. Approximately 3.46 x 10^{-4} pound of VOCs were removed from groundwater by the treatment plant in September. The total mass of VOCs removed since the startup of the system is 174.38 pounds.

Optimization Activities for LF007C GWTP: No optimization activities are reported for the month of September 2017.

Note: On 6 September, the LF007C GWTP was shut down because of high pressures; the shutdown was not identified until 13 September when the system was planned to be shut down because of the potentially false-positive TPH exceedances. On 14 September, the system was restarted for 2 hours prior to collecting the additional confirmation samples. The system was shut down after the samples were collected, and remained off line for the remainder of the reporting period.

Mr. Wray followed up regarding the TPH exceedances saying that we collected samples for VOCs and SVOCs, and there was no fuel components reported, which

suggests there isn't a fuel problem. Ms. Constantinescu stated that the RWQCB recommendation is to verify groundwater quality to confirm if there is discharge from the groundwater to the creek. The RWQCB recommends collecting TPHD/MO from a background well where we know we do not have TPHD/MO as chemicals of concern (COC). Test for TPHD/MO with Silica Gel Cleanup (SGC) and without, and to include other monitoring wells in the area closer to the creek. Mr. Wray said that it will be difficult to find a background well to sample, because they are all downgradient from the landfill. Ms. Constantinescu countered that Title 27 states that there needs to be a background well near the landfill to check groundwater quality. Mr. Gamlin added that TPH analyses includes a lot of components that aren't petroleum, it could be bacteria or many other things. We analyzed for VOCs and SVOCs, looking for TPH components and got non-detects for BTEX and napthalene, the chemicals you would normally find associated with petroleum. This suggests that it makes more sense to analyze for VOCs and SVOCs for the risk components associated with petroleum. Mr. Gamlin added that he looked at the chromatograms, and because the concentrations are so low, the curves look like some kind of natural biogenic material, but the curves aren't strong enough to conclusively confirm this.

ST018 Groundwater (MTBE) Treatment Plant, September 2017 (see Attachment 6)

Site ST018 (MTBE) Treatment Plant (ST018 GWTP) performed at 84.8% uptime with approximately 211,650 gallons of groundwater extracted and treated in September 2017. All treated water was discharged to the Fairfield – Suisun Sewer District. The average flow rate for the ST018 GWTP was 5.4 gpm. Electrical power usage for the month was 119 kWh for all equipment connected to the ST018 GWTP. The total CO₂ equivalent, including an estimate for the carbon change-out, equates to approximately 88 pounds. Approximately 0.50 pound of BTEX, MTBE and TPH was removed in September by the treatment plant, and approximately 0.13 pound of MTBE was removed from groundwater. The total BTEX, MTBE and TPH mass removed since the startup of the system is 42.7 pounds, and the total MTBE mass removed since startup of the system is 10.6 pounds.

Note: Electrical power use at the ST018 GWTP is only for the alarm system and a pump that pushes water through the GAC vessels for treatment. The four groundwater extraction pumps in the system are all solar powered.

Optimization Activities for ST018 GWTP: No optimization activities to report for the month of September 2017.

Mr. Gamlin said that the pulsed mode study at ST018 GWTP has begun. All extraction wells, except for the one most downgradient extraction well (EW2019x18), were turned off for two weeks. The wells were then all turned back on and samples were collected on Monday, 16 October 2017. The pulsed mode is being conducted to determine if it captures more MTBE.

3. **Presentations**:

A) Triad Discussion: Site TA500 Data Gap Investigation (See Attachment 7)

Mr. Gamlin provided a Triad update on the Site TA500 Data Gap Investigation Update. See Attachment 7 for details. Highlights of the presentation include:

Note: This is a Compliance site, and therefore is not in the CERCLA program. In 1996 when the WABOU Remedial Investigation (RI) was completed, the conclusion in the RI was that this site was going to be addressed in the Compliance Program. This site is still in the RI phase.

This site is located off base, just outside the north gate.

TA500 Background, Drinking Water Storage and Treatment Site:

- Hydrofluorosilicic acid is used to fluoridate drinking water.
- Two hydrofluorosilicic acid spills occurred at this site: A pinhole leak in the 4,000 gallon above ground storage tank (AST) in 1989, and 53 gallons released from a drum that was punctured by a forklift in 1992.
- The AST was removed in 1992 and approximately 47 cubic yards of soil was excavated (DTSC issued a no further action (NFA) determination for the drum spill soil cleanup).

Fluoride Fate and Transport:

- The fluorosilicate anion is not expected to persist in the environment. It naturally attenuates over time.
- Readily dissociates to hydrogen gas, fluoride ions, and hydrated silica.
- Fluoride adsorbs to aluminum and iron oxides.
- Fluoride has low mobility due to adsorption and natural attenuation.

Fluoride Groundwater Concentration Considerations:

- USEPA MCL = 4 mg/L. Health risk: pain and tenderness of major joints.
- CA MCL = 2 mg/L. Cosmetic risk; tooth discoloration in children. Travis AFB is using CA MCL (2 mg/L) as a standard.
- Optimal drinking water level to prevent tooth decay is 1.2 mg/L. It was lowered in 2015 to 0.7 mg/L by the U.S. Department of Health and Human Services.

TA Investigation History:

• Investigated as part of the WABOU RI in 1996. Soil Fluoride concentrations 552 to 4,470 mg/kg outside of the excavation area.

- 2009 DPT Investigation. Maximum groundwater concentrations of 109 J and 547 J mg/L, in one spot, on north side of the building near historical releases.
- Non-detect or low J-flagged values up gradient and cross gradient.
- Immediately downgradient from the release the detection was 1.1 mg/L. Indicating that Fluorosilicate is not mobile.

TA500 Data Gaps Investigations 2015 – 2017:

- Refine vertical and horizontal extent of contamination.
- Drilled nine (9) soil borings.
- Installed six (6) monitoring wells.
- Analyzed for fluoride and pH (pH as indicator, because it was an acid release).
- All the soil samples from the data gap investigation were below the RSL of 3,100 mg/kg. The highest fluoride concentration was 280 mg/kg. The initial groundwater results were all below California MCL of 2 mg/L. We planned to sample during a wet season to confirm the low detections, and then we proceeded into a period with one of the wettest winters in the past century.
- Quarterly sampling completed through 2016-2017. Monitoring wells MW2226x500 and MW2229x500 had minor exceedances, all other wells were non-detect. In January 2017, the groundwater elevation increased by 6 ft. in the saturated vadose zone. See all fluoride dataset results in Attachment 7.

TA500 Aquifer Conditions:

Note: An aquifer test was conducted in well MW2229x500 to get a better idea of aquifer properties at the site. After the pumping test was completed, the last sample collected was below the MCL 2.0 mg/L.

- Shallow bedrock (outcrops at the northern end of this site).
- Thin alluvial zone above the water table.
- Residual fluoride is within bedrock adjacent to the historical releases with minimal migration potential.
- Low hydraulic conductivity and minimal groundwater production capacity.

TA500 Aquifer Test at MW2229x500:

- Minimal groundwater production capacity (~0.25-0.35 gallons per minute).
- Low hydraulic conductivity (2 ft. per day) limits potential for migration of residual fluoride.
- Decreasing concentrations during test. Fluoride concentrations was 1.8 mg/L at the end of this test. If there was a hotspot of concentration, the fluoride concentration would be expected to go up, not down. We ended up with a lower concentration than we started with, and it was below the California MCL of 2.0 mg/L.

TA500 95% UCL Evaluation:

- The site is very small with six (6) monitoring wells in close proximity to each other. It is appropriate to evaluate the data set using 95% upper confidence limit (UCL) methods.
- The calculated 95% UCL concentration is 1.623 mg/L, which is below the CA MCL of 2 mg/L.
- Based on multiple lines of evidence using available data and the conceptual site model, the results of the investigation lead to the conclusions that NFA is required and TA500 should be closed.
- Mr. Fries asked if there is a domestic well nearby, and if so, how close is it to TA500? Mr. Anderson said there is one private well across the street, across the groundwater gradient, and fairly far away. The resident uses it for cooking, showers, etc.
- Mr. Gamlin said we are still technically in the RI phase with this site. So we would need to submit a Final RI Report. He asked the following questions: Based on what you've seen, is this enough data? Do we need to do another wet season? Mr. Fries asked how many gallons were released. Mr. Gamlin answered 53 gallons total. Ms. Constantinescu asked if pH levels were collected, stating that the RWQCB goal is in range of 6.5 to 8.0. Mr. Gamlin said he didn't know the value off the top of his head, but it was in that range, high 6's.
- Ms. Burke stated she was not sure if it was taken out of CERCLA or just if the remedy deferred for further investigation. If it was taken out of CERCLA, then it would be RWQCB decision. Mr. Gamlin said the 1996 WABOU RI states that it will be removed from CERCLA and placed into Compliance. Ms. Constantinescu said we do have 8 quarters of data, samples were collected during the draught and during a very wet season, and she thinks this should be a sufficient number of sample data-points. She added that she will consider what was presented, and be ready to discuss this topic next month. Right now, it looks like it is ready for NFA.

B) 2017 Field Work Review (See Attachment 8)

Mr. Wray reported on the Field Work conducted during the 2017 field season. Please refer to Attachment 8 for details.

C) Program Update: Activities Completed, In Progress, and Upcoming (see Attachment 9)

Mr. Wray reported on the status of fieldwork and documents which are completed, in progress, and upcoming. Please refer to Attachment 9 for the full briefing.

4. New Action Item Review

No new action items were identified during the October RPM meeting.

5. PROGRAM/ISSUES/UPDATE

Mr. Fries reported that he is being trained on the Department of Defense - State Memorandum of Agreement (DSMOA), which was supposed to be completed by 28 September 2017. He noted that he will be responsible for multiple sites of varying complexity, Travis AFB will be the last one he does, because it is the most complex.

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 |

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

The RPM face-to-face meeting is scheduled for 2:00 PM PST on 19 October, 2017.

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. TRIAD DISCUSSION:
 - SITE TA500 SITE CLOSURE
- B. 2017 FIELD WORK REVIEW
- C. PROGRAM UPDATE: DOCUMENTS & ACTIVITIES COMPLETED, IN PROGRESS AND PLANNED

4. NEW ACTION ITEM REVIEW

5. PROGRAM/ISSUES/UPDATE

MEETING SCHEDULE

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

(2017) Annual Meeting and Teleconference Schedule

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

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

² Note: RAB tour will start at 10:00 AM in front of the Delta Breeze Club.

(2018) Annual Meeting and Teleconference Schedule

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

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

² Note: Tentative RAB tour date in lieu of RAB meeting.

| PRIMARY DOCUMENTS | | | |
|--------------------------------|---|--|---|
| Life Cycle | Community Relations Plan Travis AFB, Glenn Anderson CH2M, Jill Dunphy | Work Plan for the Fourth Five-year Review Travis AFB, Glenn Anderson Tetratech, Joachim Eberharter | Amendment to the WABOU Soil ROD for the Travis AFB ERP Sites DP039, SD043, and SS046 Travis AFB, Glenn Anderson CH2M, Latonya Coleman |
| Scoping Meeting | NA | 06-02-17 | NA |
| Predraft to AF/Service Center | 08-23-16 | 08-01-17 | 10-09-17 |
| AF/Service Center Comments Due | 09-07-16 | 08-15-17 | <mark>11-08-17</mark> |
| Draft to Agencies | 09-28-16 | 08-23-17 | 11-22-17 |
| Draft to RAB | 09-28-16 | 08-23-17 | 11-22-17 |
| Agency Comments Due | 10-28-16 (11-28-16) | 09-28-17 | <mark>01-26-18</mark> |
| Response to Comments Meeting | TBD | 10-18-17 | <mark>02-21-18</mark> |
| Agency Concurrence with Remedy | NA | NA | NA |
| Public Comment Period | NA | NA | NA |
| Public Meeting | NA | NA | NA |
| Response to Comments Due | TBD | 10-31-17 | <mark>03-07-18</mark> |
| Draft Final Due | TBD | 10-31-17 | 03-07-18 |
| Final Due | TBD | 11-30-17 | <mark>04-06-18</mark> |

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

| SECONDARY DOCUMENTS | | | |
|--------------------------------|--|---|--|
| Life Cycle | Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046 Travis AFB, Glenn Anderson CH2M, Leslie Royer | Data Gap Investigation Results Technical Memorandum for Soil Site SS016 Travis AFB, Glenn Anderson CH2M, Doug Berwick CAPE, Meg Greenwald | |
| Scoping Meeting | NA | NA | |
| Predraft to AF/Service Center | 07-26-17 | 10-04-17 | |
| AF/Service Center Comments Due | 08-09-17 | <mark>10-18-17</mark> | |
| Draft to Agencies | 09-19-17 | <mark>11-01-17</mark> | |
| Draft to RAB | 09-19-17 | 11-01-17 | |
| Agency Comments Due | 10-19-17 | <mark>12-01-17</mark> | |
| Response to Comments Meeting | 11-15-17 | 01-17-18 | |
| Response to Comments Due | 12-05-17 | 02-02-18 | |
| Draft Final Due | NA | NA | |
| Final Due | 12-05-17 | 02-02-18 | |
| Public Comment Period | NA | NA | |
| Public Meeting | NA | NA | |

| INFORMATIONAL DOCUMENTS | | | |
|--------------------------------|---|---|--|
| Life Cycle | Quarterly Newsletters (October 2017) Travis, Glenn Anderson | 2016 Annual GRISR Travis AFB, Glenn Anderson CH2M, Leslie Royer | |
| Scoping Meeting | NA | NA | |
| Predraft to AF/Service Center | NA | 04-21-17 | |
| AF/Service Center Comments Due | NA | 05-22-17 | |
| Draft to Agencies | 09-22-17 | 06-07-17 | |
| Draft to RAB | NA | 06-07-17 | |
| Agency Comments Due | 10-06-17 | 08-10-17 (08-24-17) | |
| Response to Comments Meeting | TBD | 08-16-17 (09-20-17) | |
| Response to Comments Due | 10-10-17 | 09-01-17 (10-06-17) | |
| Draft Final Due | NA | NA | |
| Final Due | 10-12-17 | 09-01-17 (10-06-17) | |
| Public Comment Period | NA | NA | |
| Public Meeting | NA | NA | |

| INFORMATIONAL DOCUMENTS | | | |
|--|------------------------------------|----------------------------|--|
| Site TS060 Removal Action Co Report | | | |
| | 2016 Annual CAMU Monitoring Report | Travis AFB, Glenn Anderson | |
| | Travis AFB, Glenn Anderson | CH2M, Doug Berwick | |
| Life Cycle | CH2M, Levi Pratt | CAPE, Meg Greenwald | |
| Scoping Meeting | NA | NA | |
| Predraft to AF/Service Center | 02-09-17 | 10-27-17 | |
| AF/Service Center Comments Due | 02-24-17 | 11-10-17 | |
| Draft to Agencies | 06-30-17 | 11-29-17 | |
| Draft to RAB | 06-30-17 | 11-29-17 | |
| Agency Comments Due | 07-31-17 | 01-03-18 | |
| Response to Comments Meeting | 08-16-17 | 01-17-18 | |
| Response to Comments Due | 09-20-17 <mark>(10-06-17)</mark> | 02-05-18 | |
| Draft Final Due | NA | NA | |
| Final Due | 09-20-17 <mark>(10-06-17)</mark> | 02-05-18 | |
| Public Comment Period | NA | NA | |
| Public Meeting | NA | NA | |

| INFORMATIONAL POCO DOCUMENTS | | | |
|--------------------------------|---|---|---|
| | POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW051, OW053, and OW054 | POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW052, OW055, OW056, and OW057 | Site ST032 POCO Well Decommissioning and Site Closeout Technical Memorandum Travis AFB, Glenn Anderson |
| | Travis AFB, Glenn Anderson | Travis AFB, Glenn Anderson | CH2M, Doug Berwick |
| Life Cycle | CH2M, Doug Berwick | CH2M, Doug Berwick | CAPE, Meg Greenwald |
| Scoping Meeting | NA | NA | NA |
| Predraft to AF/Service Center | 11-07-16 | 02-01-17 | 04-25-17 |
| AF/Service Center Comments Due | 11-21-16 | 02-15-17 | 05-09-17 |
| Draft to Agencies | 01-19-17 | <mark>11-10-17</mark> | 08-30-17 |
| Draft to RAB | 01-19-17 | <mark>11-10-17</mark> | 08-30-17 |
| Agency Comments Due | 02-21-17 | 12-12-17 | 10-02-17 |
| Response to Comments Meeting | 03-15-17 | <mark>01-17-18</mark> | 10-19-17 |
| Response to Comments Due | 09-29-17 <mark>(10-03-17)</mark> | 01-31-18 | 11-08-17 <mark>(09-27-17)</mark> |
| Draft Final Due | NA | NA | NA |
| Final Due | 09-29-17 <mark>(10-03-17)</mark> | <mark>01-31-18</mark> | 11-08-17 <mark>(09-27-17)</mark> |
| Public Comment Period | NA | NA | NA |
| Public Meeting | NA | NA | NA |

South Base Boundary Groundwater Treatment Plant Monthly Data Sheet

Report Number: 203 Reporting Period: 31 August 2017 – 2 October 2017 Date Submitted: 16 October 2017

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

System Metrics

system.

Table 1 presents operational data from the September 2017 reporting period.

| Table 1 – Operations Summary – September 2017 | | | |
|--|--|--|--|
| Initial Data Collection: | 8/31/2017 14:00 | Final Data Collection: 10/2/2017 14:00 | |
| Operating Time: | Percent Uptime: | Electrical Power Usage: | |
| SBBGWTP: 767 | hours SBBGWTP: 99.8% | SBBGWTP: 16,127 kWh (12,734 lbs CO ₂ generated ^a) | |
| Gallons Treated: 5.8 mi | llion gallons | Gallons Treated Since July 1998: 993 million gallons | |
| Volume Discharged to L | Jnion Creek: 5.8 million gallons | Gallons Treated From Other Sources: 0 gallons | |
| VOC Mass Removed: 1 | .58 lbs⁵ | VOC Mass Removed Since July 1998: 490.9 lbs | |
| Rolling 12-Month Cost p | Rolling 12-Month Cost per Pound of Mass Removed [:] \$14,517° | | |
| Monthly Cost per Pound of Mass Removed: \$8,205° | | | |
| Ibs = pounds ^a SiteWise [™] estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 800 pounds of GHG from GAC change out. ^b Calculated using September 2017 EPA Method SW8260C analytical results. ^c Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the | | | |

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 – September 2017 | | | | | | | | |
|--|---|--------------------------|----------------------|---------------------|----------------|---------------------|-----------|--|
| FT005 ^b | | | SS0 | SS029 | | 30 | | |
| EW01x05 | Offline | EW736x05 | Offline | EW01x29 | 1.5 | EW01x30 | 14.3 | |
| EW02x05 | Offline | EW737x05 | Offline | EW02x29 | 5.1 | EW02x30 | 6.2 | |
| EW03x05 | Offline | EW742x05 | Offline | EW03x29 | 3.0 | EW03x30 | 15.2 | |
| EW731x05 | Offline ^c | EW743x05 | Offline ^c | EW04x29 | 8.0 | EW04x30 | 23.6 | |
| EW732x05 | Offline | EW744x05 | Offline ^c | EW05x29 | 5.9 | EW05x30 | 16.5 | |
| EW733x05 | Offline | EW745x05 | Offline ^c | EW06x29 | 6.8 | EW2174x30 | 9.6 | |
| EW734x05 | Offline ^c | EW746x05 | Offline | EW07x29 | 12.9 | EW711x30 | 8.3 | |
| EW735x05 | Offline ^c | EW2291x05 | Offline ^c | | | | | |
| | FT005 Tota | al: Offline ^c | | SS029 Tota | l: 43.2 | SS030 Tota | l: 93.7 | |
| SBBGWTP Ave | SBBGWTP Average Monthly Flow ^d : 127.0 gpm | | | | | | | |
| ^a Flow rates presented are instantaneous measurements taken at the end of the reporting period. | | | | | | | | |
| ^b Most extraction wells at FT005 were taken offline in accordance with the 2008 Annual Remedial Process Optimization Report for the | | | | | | | | |
| Central Groundv | vater Treatment P | lant, North Ground | water Treatment | Plant, and South Ba | ase Boundary G | Groundwater Treatme | nt Plant. | |
| ° FT005 taken of | f line for site const | truction. | | | | | | |
| ^d The average S ^r | ¹ The average SBBGWTP groundwater flow rate was calculated using the Union Creek Discharge Totalizer and dividing it by the total time | | | | | | | |

ıy 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 | | | | | | | |
|---|-------------------|--|-------------------|-------|--|--|--|
| | Shutdown | Shutdown ^a Restart ^a | | | | | |
| Location | Date | Time | Date | Time | Cause | | |
| SBBGWTP | 13 September 2017 | 9:59 | 13 September 2017 | 11:26 | System shut down for arc flash survey. | | |
| = Time not recorded a Shutdown and restart times estimated based on field notes SBBGWTP = South Base Boundary Groundwater Treatment Plant | | | | | | | |

Summary of O&M Activities

Monthly groundwater samples were collected at the SBBGWTP on 6 September 2017. Sample results are presented in Table 4. The total VOC concentration ($32.41 \mu g/L$) in the influent sample has increased from the August 2017 sample results ($18.78 \mu g/L$). TCE was the primary VOC detected in the influent sample at a concentration of $30.3 J \mu g/L$. Several VOCs were detected in the midpoint sampling location at low concentrations, including cis-1,2-DCE, 1,2-DCA, and chloroform. No VOCs were detected at the effluent sampling location.

Figure 1 presents a plot of influent concentrations and average flow at the SBBGWTP over the past twelve (12) months. An overall decrease in the VOC influent concentration has been observed in the past 12 months along with an increasing flow rate trend.

On 13 September, the SBBGWTP was shut down for approximately 1.5 hours to conduct an arc flash survey of the motor control centers and groundwater extraction well control panels. The Site SS030 extraction wells were restarted first, while the Site SS029 and FT005 extraction wells remained off line for several additional hours.

On 27 September, the FT005 extraction wells were shut down for site construction. Five (5) additional extraction wells will be installed and tied into the existing conveyance line. The FT005 extraction wells remained off line for the remainder of the reporting period.

In September 2017, troubleshooting was performed on several Site FT005 and SS029 extraction wells. The following list presents the maintenance activities and status of several extraction wells:

- EW735x05 Pump shuts off because of low flow. Additional troubleshooting required. Well is currently off line and will be brought back on line in October 2017.
- EW745x05 Replaced flow meter. Pump shuts off because of low flow. Additional troubleshooting required. Well is currently off line and will be brought back on line in October 2017.
- EW02x29 Pump was removed and inspected. The clogged pump was cleaned and re-installed. Well is currently operating.
- EW04x29 Pump motor was replaced. Well is currently operating.
- EW06x29 Paddle wheel housing and sensor housing were cleaned. Well is currently on line.

Optimization Activities

Based on two aquifer tests conducted in June 2017, it was determined that five (5) new extraction wells would be needed to optimize removal of residual 1,2-DCA at Site FT005. The well installations were started in September and will be completed in October 2017.

Sustainability

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

Figure 2 presents the historical GHG production from the SBBGWTP. In September 2017, the SBBGWTP produced approximately 12,734 pounds of GHG, which includes approximately 800 pounds of GHG generated from changing out the GAC.

TABLE 4

Summary of Groundwater Analytical Data For September 2017 – South Base Boundary Groundwater Treatment Plant

| | Instantaneous Maximum* | Detection | | 6 | September 20 (μg/L) | 17 |
|---|---------------------------|-------------|-----|----------|------------------------|----------|
| Constituent | (μg/L) | (μg/L) | N/C | Influent | Midpoint | Effluent |
| Halogenated Volatile Organics | | | | | | |
| Acetone | NA | 1.0 | 0 | ND | ND | ND |
| Bromodichloromethane | NA | 0.15 | 0 | ND | ND | ND |
| Carbon Tetrachloride | 0.5 | 0.15 | 0 | ND | ND | ND |
| Chloroform | 5.0 | 0.15 | 0 | 0.22 J | 0.32 J | ND |
| Chloromethane | NA | 0.15 | 0 | ND | ND | ND |
| 1,1-Dichloroethane | 5.0 | 0.15 | 0 | ND | ND | ND |
| 1,2-Dichloroethane | 0.5 | 0.15 | 0 | 0.20 J | 0.22 J | ND |
| 1,1-Dichloroethene | 5.0 | 0.15 | 0 | ND | ND | ND |
| cis-1,2-Dichloroethene | 5.0 | 0.15 | 0 | 1.69 J | 1.33 | ND |
| trans-1,2-Dichloroethene | 5.0 | 0.15 | 0 | ND | ND | ND |
| Methylene Chloride | 5.0 | 0.15 | 0 | ND | ND | ND |
| Tetrachloroethene | 5.0 | 0.15 | 0 | ND | ND | ND |
| 1,1,1-Trichloroethane | 5.0 | 0.15 | 0 | ND | ND | ND |
| 1,1,2-Trichloroethane | 5.0 | 0.15 | 0 | ND | ND | ND |
| Trichloroethene | 5.0 | 0.15 | 0 | 30.3 J | ND | ND |
| Vinyl Chloride | 0.5 | 0.15 | 0 | ND | ND | ND |
| Non-Halogenated Volatile Organ | lics | | | | | |
| Benzene | 1.0 | 0.15 | 0 | ND | ND | ND |
| Ethylbenzene | 5.0 | 0.15 | 0 | ND | ND | ND |
| Toluene | 5.0 | 0.15 | 0 | ND | ND | ND |
| Xylenes | 5.0 | 0.15 – 0.30 | 0 | ND | ND | ND |
| Other | | | | | | |
| Total Petroleum | 50 | 35 | 0 | ND | NM | ND |
| Hydrocarbons – Gasoline | | | | | | |
| Total Petroleum | 50 | 24 | 0 | ND | NM | ND |
| Hydrocarbons – Diesel | | | | | | |
| Total Petroleum Hydrocarbons – Motor Oil | 50 (trigger) | 24 | 0 | ND | NM | ND |

^{*} In accordance with Appendix B of the Travis AFB South Base Boundary Groundwater Treatment Plant Operations and Maintenance Manual (CH2M HILL, 2004).

Notes:

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

mg/L = milligrams per liter

NA = not applicable

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

ND = not detected

NM = not measured

 μ g/L = micrograms per liter





South Base Boundary Groundwater Treatment Plant Monthly Data Sheet SBBGWTP_September2017.docx

Central Groundwater Treatment Plant Monthly Data Sheet

Report Number: 218

Reporting Period: 31 August 2017 – 2 October 2017

Date Submitted: 16 October 2017

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

System Metrics

Table 1 presents operational data from the September 2017 reporting period.

| Table 1 – Operations Summary – September 2017 | | | | | | |
|--|-----------------|--------------------------------------|----------------|--|--|--|
| Initial Data Collection: | 8/31/2017 12:10 | Final Data Collection: | | 2017 10:00 | | |
| Operating Time: | Percent I | Uptime: | Electrical Pov | wer Usage: | | |
| CGWTP: 610 hours | CGWTP | 5 79.7% | CGWTP: | 2,058 kWh (2,411 lbs CO_2 generated ^a) | | |
| Gallons Treated (discharge to storm sewer):Gallons Treated Since January 1996: 545.6 million gallons1,249,160 gallons | | | | | | |
| VOC Mass Removed from gro | undwater: | VOC Mass Removed Since January 1996: | | | | |
| 2.59 lbs ^b | | 2,787 lbs from groundwater | | | | |
| | | 8,686 lbs from vapor | | | | |
| Rolling 12-Month Cost per Pound of Mass Removed [:] \$2,225° Monthly Cost per Pound of Mass Removed: \$2,340° | | | | | | |
| ^a SiteWise[™] estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. Value also includes approximately 888 pounds of GHG from GAC change out. ^b Calculated using September 2017 EPA Method SW8260C analytical results. ^c Costs include operations and maintenance, reporting, analytical laboratory, project management, and utility costs related to operation of the system. | | | | | | |

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

| Table 2 – CGWTP Average Flow Rates ^a – September 2017 | | | | | | | | |
|---|--------------------------|--|--|--|--|--|--|--|
| Location Average Flow Rate Groundwater (gpm) | | | | | | | | |
| EW001x16 | 14.4 | | | | | | | |
| EW002x16 | 11.3 | | | | | | | |
| EW003x16 | 0.1 | | | | | | | |
| EW605x16 | 6.4 | | | | | | | |
| EW610x16 | 2.8 | | | | | | | |
| CGWTP | 34.1 | | | | | | | |
| ^a Flow rates calculated by dividing total gallons processed by system operating time for the month or the average of the | | | | | | | | |
| instantaneous readings. | | | | | | | | |
| gpm = gallons per minute | gpm = gallons per minute | | | | | | | |

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

| Table 3 – Summary of System Shutdowns | | | | | | | |
|---|-------------------------------|-------|-------------------|-------|-------------------------------------|--|--|
| | Shutdown ^a Restart | | | | | | |
| Location | Date | Time | Date | Time | Cause | | |
| CGWTP | 8 September 2017 | 23:00 | 15 September 2017 | 11:00 | Influent transfer pump malfunction. | | |
| = Date/Time not recorded ^a Shutdown and restart times estimated based on field notes CGWTP = Central Groundwater Treatment Plant | | | | | | | |

Summary of O&M Activities

Monthly groundwater samples were collected at the CGWTP on 6 September 2017. Sample results are presented in Table 4. The total VOC concentration (248.37 μ g/L) in the September 2017 influent sample has increased from the August 2017 sample (198.75 μ g/L). TCE was the primary VOC detected in the influent sample at a concentration of 198 J μ g/L. Cis-1,2-DCE (15.9 μ g/L) and vinyl chloride (0.24 J μ g/L) were detected in the sample collected after the first carbon vessel, and only vinyl chloride (0.28 J μ g/L) was detected in the sample collected after the second carbon vessel. No VOC constituents were detected 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 September 2017.

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. The overall flow rate through the treatment plant has increased slightly over the past 12 months.

On 8 September, the CGWTP was shut down because the influent transfer pump malfunctioned. On 15 September, the transfer pump was rewired and programmed. The system was restarted without issue.

On 20 September, the pump from EW003x16 was replaced and the pump was restarted without issue.

The Site DP039 subgrade biogeochemical reactor (SBGR), also known as a bioreactor, continued to operate in a four-week "pulsed mode" to optimize distribution of total organic carbon (TOC). The bioreactor was brought on line on 7 September and taken off line on 2 October.

Optimization Activities

No optimization activities occurred at the CGWTP in September 2017.

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 2,411 pounds of GHG during September 2017, which is a decrease from the August 2017 amount of 2,525 pounds.

TABLE 4

Summary of Groundwater Analytical Data for September 2017 – Central Groundwater Treatment Plant

| | | | | 6 September 2017 | | | |
|---|---------------|-------------|-----|------------------|-------------------|-------------------|----------|
| | Instantancous | Detection | | | () | ιg/L) | |
| | Maximum* | Limit | | | After Carbon 1 | After Carbon 2 | System |
| Constituent | (μg/L) | (μg/L) | N/C | Influent | Effluent | Effluent | Effluent |
| Halogenated Volatile Organics | | | | | | | |
| Acetone | NA | 1.0 | 0 | ND | ND | ND | ND |
| Carbon Tetrachloride | 0.5 | 0.15 | 0 | ND | ND | ND | ND |
| Chloroform | 5.0 | 0.15 | 0 | ND | ND | ND | ND |
| Chloromethane | NA | 0.15 | 0 | ND | ND | ND | ND |
| cis-1,2-Dichloroethene | 5.0 | 0.15 | 0 | 44.4 | 15.9 | ND | ND |
| 1,2-Dichlorobenzene | 5.0 | 0.15 | 0 | 0.62 | ND | ND | ND |
| 1,3-Dichlorobenzene | 5.0 | 0.15 | 0 | 0.83 | ND | ND | ND |
| 1,4-Dichlorobenzene | 5.0 | 0.15 | 0 | 0.41 J | ND | ND | ND |
| 1,1-Dichloroethane | 5.0 | 0.15 | 0 | ND | ND | ND | ND |
| 1,2-Dichloroethane | 0.5 | 0.15 | 0 | ND | ND | ND | ND |
| 1,1-Dichloroethene | 5.0 | 0.15 | 0 | 0.51 | ND | ND | ND |
| Methylene Chloride | 5.0 | 0.15 | 0 | ND | ND | ND | ND |
| Methyl tert-Butyl Ether | 1.0 | 0.15 | 0 | ND | ND | ND | ND |
| Tetrachloroethene | 5.0 | 0.15 | 0 | 0.57 | ND | ND | ND |
| 1,1,1-Trichloroethane | 5.0 | 0.15 | 0 | ND | ND | ND | ND |
| 1,1,2-Trichloroethane | 5.0 | 0.15 | 0 | ND | ND | ND | ND |
| trans-1,2-Dichloroethene | 5.0 | 0.15 | 0 | 2.69 | ND | ND | ND |
| Trichloroethene | 5.0 | 0.15 – 1.5 | 0 | 198 J | ND | ND | ND |
| Vinyl Chloride | 0.5 | 0.15 | 0 | 0.34 J | 0.24 J | 0.28 J | ND |
| Non-Halogenated Volatile Orga | inics | | | | | | |
| Benzene | 1.0 | 0.15 | 0 | ND | ND | ND | ND |
| Ethylbenzene | 5.0 | 0.15 | 0 | ND | ND | ND | ND |
| Toluene | 5.0 | 0.15 | 0 | ND | ND | ND | ND |
| Total Xylenes | 5.0 | 0.15 – 0.30 | 0 | ND | ND | ND | ND |
| Other | | | | | | | |
| Total Petroleum Hydrocarbons – Gasoline | 50 | 35 | 0 | 54.1 J | NM | NM | ND |
| Total Petroleum Hydrocarbons – Diesel | 50 | 24 | 0 | ND | NM | NM | ND |
| Total Petroleum Hydrocarbons – Motor Oil | 50 (trigger) | 24 | 0 | ND | NM | NM | ND |

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

Notes:

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

NA = not applicable

N/C = number of samples out of compliance with discharge limits ND = not detected

NM = not measured $\mu g/L = micrograms per liter$ mg/L = milligrams per liter Table 5 presents a twelve-month summary of the Site DP039 bioreactor recirculation well pulsing dates.

| Table 5 – Summary of DP039 Bioreactor "Pulsed Mode" Operations | | | | | |
|--|------------------|------------------|--|--|--|
| Location | Pulse-on Date | Pulse-off Date | | | |
| | 10 October 2016 | 17 October 2016 | | | |
| Í | 25 October 2016 | 2 November 2016 | | | |
| | 29 November 2016 | 13 December 2016 | | | |
| | 27 December 2016 | 10 January 2017 | | | |
| 10100730239 | 7 February 2017 | 7 March 2017 | | | |
| | 5 April 2017 | 7 August 2017 | | | |
| | 7 September 2017 | 2 October 2017 | | | |
| | | | | | |
| MW = Monitoring W | /ell | | | | |





Subarea LF007C Groundwater Treatment Plant Monthly Data Sheet

Report Number: 162 Reporting Period: 31 August 2017 – 2 October 2017 D

Date Submitted: 16 October 2017

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

System Metrics

Table 1 presents operational data from the September 2017 reporting period:

| Table 1 – Operations Summary – September 2017 | | | | | | | |
|--|--|--|--|--|--|--|--|
| Initial Data Collection: | 8/31/2017 11:40 | Final Data Collection: 10/2/2017 12:00 | | | | | |
| Operating Time: | Percent Uptime: | Electrical Power Usage ^a : | | | | | |
| LF007C GWTP: 145 hours | LF007C GWTP 18.8% | LF007C GWTP: 0 kWh | | | | | |
| Gallons Treated: 38,772 gallons | | Gallons Treated Since March 2000: 86.4 million gallons | | | | | |
| Volume Discharged to Duck Ponc | : 38,772 gallons | | | | | | |
| VOC Mass Removed: 3.46 x 10 ⁻⁴ | pounds ^b | VOC Mass Removed Since March 2000: 174.38 pounds (Groundwater) | | | | | |
| Rolling 12-Month Cost per Pound | of Mass Removed: Not Measured ^c | | | | | | |
| Monthly Cost per Pound of Mass Removed: Not Measured ^c | | | | | | | |
| ^a The LF007C GWTP operates on solar power only. ^b VOCs from September 2017 influent sample detected by EPA Method SW8260C. ^c Value not calculated since measurement does not accurately represent the cost effectiveness of the system. | | | | | | | |

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

| Table 2 – LF007C GWTP Average and Total Flow Rates – September 2017 | | | | | | | |
|---|--------------------------------------|-----------------------------------|--|--|--|--|--|
| Location | Average Flow Rate (gpm) ^a | Total Gallons Processed (gallons) | | | | | |
| EW614x07 | 3.9 | 33,638 | | | | | |
| EW615x07 | 0.5 | 4,715 | | | | | |
| LF007C GWTP | 4.5 | 38,772 | | | | | |
| ^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 | | | | | | | |
|--|-----------------------|-----------|----------------------|------|--|--|--|
| | Shutdown ^a | | Restart ^a | | | | |
| Location | Date | Time | Date | Time | Cause | | |
| LF007C GWTP | 6 September 2017 | 12:00 | | | System shut down due to TPH detection in the system effluent sample. The system remained off line for the remainder of the reporting period. | | |
| = Time not recorded | | | | | | | |
| ^a Shutdown and restart times estimated based on field notes | | | | | | | |
| LF007C GWTP = | Subarea LF007C Groun | dwater Tr | eatment Plant | | | | |
| IPH – total petrole | eum hydrocarbons | | | | | | |

Summary of O&M Activities

The September 2017 analytical data are presented in Tables 4 and 5. On 6 September, TCE (1.07 μ g/L) was detected at the influent sample location. No VOC contaminants were detected at the midpoint and effluent sampling locations.

The August 2017 monthly O&M samples collected on 1 August 2017 identified TPH-D at a concentration (98.9 $\mu g/L$) in excess of the effluent limitation of 50 $\mu g/L$. TPH-MO was also detected at a concentration (62.9 $\mu g/L$) in excess of its trigger value of 50 $\mu g/L$. An additional effluent sample was collected on 24 August 2017, and this sample contained TPH-D at a concentration of 302 $\mu g/L$, and TPH-MO at a concentration of 580 $\mu g/L$. Upon receipt of these analytical results, confirmation samples from the LF007C GWTP were collected on 6 September 2017. The confirmation samples included influent, effluent, and receiving water samples in accordance with the General Fuels NPDES permit. Following sample collection on 6 September 2017, the LF007C GWTP was taken off line.

Confirmation samples identified TPH-D in the influent (109 μ g/L) and effluent (41.9 J μ g/L) samples. Likewise, TPH-MO was detected in both the influent (49.2 J μ g/L) and effluent (24.5 μ g/L), though these concentrations are both below the trigger value of 50 μ g/L for TPH-MO.

The receiving water samples collected 50 feet upstream and downstream of the outfall locations also contained TPH-D (141 μ g/L upstream, 140 μ g/L downstream) and TPH-MO (137 μ g/L upstream, 178 μ g/L downstream).

During confirmation sampling, the influent and effluent sampling locations were also analyzed for VOCs and SVOCs to determine if any fuel-related constituents are present in the extracted groundwater. No fuel-related constituents, including benzene, toluene, ethylbenzene, xylene, and naphthalene, were detected, suggesting that the TPH detections are not related to fuels contamination. In addition, the receiving water samples were analyzed for dissolved oxygen. The dissolved oxygen concentrations ranged from 12.5 mg/L (upstream) to 7.4 mg/L (downstream), both of which are in excess of both warm water (5.0 mg/L) and cold water (7.0 mg/L) habitats.

Figure 1 presents a chart of influent concentrations (total VOCs) at the LF007C GWTP versus time for the past twelve (12) months. VOC concentrations, primarily TCE, have been seasonally variable; however, over the last 12 months the trend has been increasing slightly. The average flow rate through the LF007C GWTP has increased since the low of 1.92 gpm in October 2016. The increase may be a result of the above average rainy season in 2016/2017.

On 6 September, the LF007C GWTP was shut down because of high pressures; however, the shutdown was not identified until 13 September when the system was planned to be shut down because of the TPH exceedances. On 14 September, the system was restarted for 2 hours prior to collecting the additional confirmation samples. Following the sampling, the system was shut down and remained off line for the remainder of the reporting period.

Optimization Activities

No optimization activities occurred at the LF007C GWTP in September 2017.

Sustainability

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

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

TABLE 4

Summary of Groundwater Analytical Data For September 2017 – Subarea LF007C Groundwater Treatment Plant

| | Instantaneous Maximum* | Detection | | 6 September 2017 (μg/L) | | |
|---|---------------------------|-------------|-----|----------------------------|----------------|----------|
| Constituent | (μg/L) | (μg/L) | N/C | Influent | After Carbon 1 | Effluent |
| Halogenated Volatile Organics | | | | | | |
| Acetone | NA | 0.50 | 0 | ND | ND | ND |
| Bromodichloromethane | 5.0 | 0.15 | 0 | ND | ND | ND |
| Bromoform | 5.0 | 0.15 | 0 | ND | ND | ND |
| 2-Butanone | 5.0 | 2.0 | 0 | ND | ND | ND |
| Carbon Tetrachloride | 0.5 | 0.15 | 0 | ND | ND | ND |
| Chloroform | 5.0 | 0.15 | 0 | ND | ND | ND |
| Dibromochloromethane | 5.0 | 0.15 | 0 | ND | ND | ND |
| 1,3-Dichlorobenzene | 5.0 | 0.15 | 0 | ND | ND | ND |
| 1,4-Dichlorobenzene | 5.0 | 0.15 | 0 | ND | ND | ND |
| 1,1-Dichloroethane | 5.0 | 0.15 | 0 | ND | ND | ND |
| 1,2-Dichloroethane | 0.5 | 0.15 | 0 | ND | ND | ND |
| 1,1-Dichloroethene | 5.0 | 0.15 | 0 | ND | ND | ND |
| cis-1,2-Dichloroethene | 5.0 | 0.15 | 0 | ND | ND | ND |
| trans-1,2-Dichloroethene | 5.0 | 0.15 | 0 | ND | ND | ND |
| Methylene Chloride | 5.0 | 0.15 | 0 | ND | ND | ND |
| Tetrachloroethene | 5.0 | 0.15 | 0 | ND | ND | ND |
| 1,1,1-Trichloroethane | 5.0 | 0.15 | 0 | ND | ND | ND |
| 1,1,2-Trichloroethane | 5.0 | 0.15 | 0 | ND | ND | ND |
| Trichloroethene | 5.0 | 0.15 | 0 | 1.07 | ND | ND |
| Vinyl Chloride | 0.5 | 0.15 | 0 | ND | ND | ND |
| Non-Halogenated Volatile Organ | lics | | | | | |
| Benzene | 1.0 | 0.15 | 0 | ND | ND | ND |
| Ethylbenzene | 5.0 | 0.15 | 0 | ND | ND | ND |
| Toluene | 5.0 | 0.15 | 0 | ND | ND | ND |
| Xylenes | 5.0 | 0.15 – 0.30 | 0 | ND | ND | ND |
| Other | | | | | | |
| Total Petroleum Hydrocarbons – Gasoline | 50 | 35 | 0 | ND | NM | ND |
| Total Petroleum Hydrocarbons – Diesel | 50 | 24 | 1 | 87.6 J | NM | 80.7 J |
| Total Petroleum Hydrocarbons – Motor Oil | 100 | 24 | 1 | 182 | NM | 67.6 J |

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

Notes:

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

NA = not applicable

N/C = number of samples out of compliance with discharge limits ND = not detected

NM = not measured µg/L = micrograms per liter

TABLE 5

Summary of Groundwater Analytical Data For September 2017 – Subarea LF007C Groundwater Treatment Plant

| | Instantaneous Maximum* | Detection Limit | | 14 September 2017 (μg/L) | | | |
|---|---------------------------|--------------------|-----|-----------------------------|----------|----------|------------|
| Constituent | (μg/L) | (μg/L) | N/C | Influent | Effluent | Upstream | Downstream |
| Halogenated Volatile Organics | | | | | | | |
| Acetone | NA | 0.50 | 0 | ND | ND | NM | NM |
| Bromodichloromethane | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| Bromoform | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| 2-Butanone | 5.0 | 2.0 | 0 | ND | ND | NM | NM |
| Carbon Tetrachloride | 0.5 | 0.15 | 0 | ND | ND | NM | NM |
| Chloroform | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| Dibromochloromethane | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| 1,3-Dichlorobenzene | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| 1,4-Dichlorobenzene | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| 1,1-Dichloroethane | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| 1,2-Dichloroethane | 0.5 | 0.15 | 0 | ND | ND | NM | NM |
| 1,1-Dichloroethene | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| cis-1,2-Dichloroethene | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| trans-1,2-Dichloroethene | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| Methylene Chloride | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| Tetrachloroethene | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| 1,1,1-Trichloroethane | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| 1,1,2-Trichloroethane | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| Trichloroethene | 5.0 | 0.15 | 0 | 1.10 | ND | NM | NM |
| Vinyl Chloride | 0.5 | 0.15 | 0 | ND | ND | NM | NM |
| Non-Halogenated Volatile Organ | ics | | | | | | |
| Benzene | 1.0 | 0.15 | 0 | ND | ND | NM | NM |
| Ethylbenzene | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| Toluene | 5.0 | 0.15 | 0 | ND | ND | NM | NM |
| Xylenes | 5.0 | 0.15 – 0.30 | 0 | ND | ND | NM | NM |
| Other | | | | | | | |
| Total Petroleum Hydrocarbons – Gasoline | 50 | 35 | 0 | ND | ND | NM | NM |
| Total Petroleum Hydrocarbons – Diesel | 50 | 24 | 1 | 109 | 41.9 J | 141 | 140 |
| Total Petroleum Hydrocarbons – Motor Oil | 100 | 24 | 1 | 49.2 J | 24.5 J | 137 | 178 |
| Semivolatile Organic Compounds | NA | 1.92 | 0 | ND | ND | NM | NM |

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

Notes:

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

NA = not applicable

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

ND = not detected

NM = not measured $\mu g/L = micrograms per liter$




Site ST018 Groundwater Treatment Plant Monthly Data Sheet

Report Number: 079 Reporting Period: 31 August 2017 – 2 October 2017 Date Submitted: 16 October 2017

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

System Metrics

Table 1 presents operation data from the September 2017 reporting period.

| Table 1 – Operations Summary – September 2017 | | | | |
|---|--|--|--|--|
| Initial Data Collection: 8/31/2017 14:20 | Final Data Collection: | 10/2/2017 11:50 | | |
| Operating Time: | Percent Uptime: | Electrical Power Usage: | | |
| ST018GWTP: 649 hours | ST018GWTP: 84.8% | ST018GWTP: 119 kWh (88 lbs CO ₂ generated ^a) | | |
| Gallons Treated: 211,650 gallons | Gallons Treated Since March 2011: 13.6 million gallons | | | |
| Volume Discharged to Sanitary Sewer: 211,650 gallons | Final Totalizer Reading: 13,638,539 gallons | | | |
| Cumulative Volume Discharged to Sanitary Sewer since 1 November 2014: 7,142,365 gallons | | | | |
| MTBE, BTEX, VOC, TPH Mass Removed: 0.50 lbs ^b | MTBE, BTEX, VOC, TPH Mass R | emoved Since March 2011: 42.7 Ibs | | |
| MTBE (Only) Removed: 0.13 lbs ^b | MTBE (Only) Mass Removed Since March 2011: 10.6 lbs | | | |
| Rolling 12-Month Cost per Total Pounds of Mass Removed: \$16,363 ^{bc} | | | | |
| Monthly Cost per Pound of Mass Removed: \$7,348 ^{bc} | | | | |
| ^a SiteWise[™] estimate that 1 kilowatt hour generated produces 0.74 pounds of GHG. ^b Calculated using September 2017 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 – September 2017 | | | | |
|--|---|--------------------|--|--|
| Location | Average Flow Rate Groundwater (gpm) ^a | Hours of Operation | | |
| EW2014x18 | 1.8 | 649 | | |
| EW2016x18 | 1.0 | 649 | | |
| EW2019x18 | 1.7 | 649 | | |
| EW2333x18 | 1.6 | 649 | | |
| Site ST018 GWTP | 5.4 | 649 | | |
| ^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 | | | | | |
|---|-----------------------|--|------------------|-------|---|
| | Shutdown ^a | Shutdown ^a Restart ^a | | | |
| Location | Date | Time | Date | Time | Cause |
| ST018GWTP | 1 September 2017 | 17:30 | 6 September 2017 | 12:00 | System was shut down because of high pressures. |
| = Time not recorded ^a Shutdown and restart times estimated based on field notes | | | | | |
| ST018GWTP = Site ST018 Groundwater Treatment Plant | | | | | |

Summary of O&M Activities

Monthly groundwater treatment samples were collected at the ST018GWTP on 6 September 2017. Results are presented in Table 4. The complete September 2017 laboratory data report is available upon request. The influent concentration for MTBE during the September 2017 sampling event was 74.0 μ g/L, which is a slight increase from the August 2017 sample result of 71.2 μ g/L. TPH-g, TPH-d, benzene, ethylbenzene, and 1,2-DCA were also detected in the influent sample. No MTBE, TPH, or VOCs were detected in the system effluent sampling location.

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

The ST018GWTP system was shut down on 1 September due to a high-pressure alarm related to the bag filters between the influent equalization tank, and the carbon vessels. The bag filters were replaced, and the system was turned back on 6 September without issue.

Figure 1 presents plots of the average flow rate and influent total contaminant (MTBE, TPH-g, TPH-d, TPH-mo, BTEX, and VOCs) and MTBE concentrations at the ST018GWTP over the past twelve (12) months.

The average flow rate through the ST018GWTP has been cyclical with flow rates decreasing following the wet rainy 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. The total influent concentrations have generally been fluctuating over the past 12 months with an overall flat trend. Similarly, the influent MTBE concentration has also fluctuated over the past 12 months with an overall flat trend.

Optimization Activities

No optimization activities occurred at the ST018GWTP in September 2017.

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 88 pounds of GHG during September 2017 and treated 211,650 gallons of water, which was a decrease from August 2017 (106 pounds, treating 257,020 gallons). The amount of GHG produced is directly attributed to the amount of water treated through the system because the only line-power electrical use is for a transfer pump through the GAC system.

| TABLE 4 | | | | |
|-----------------------------|---------------------------|----------------------|----------------------|---------|
| Summary Of Groundwater Anal | lytical Data for Septembe | r 2017– Site ST018 G | Froundwater Treatmen | t Plant |

| | Instantaneous Maximum* | Detection | | 6 Septe (μ | mber 2017 ıg/L) |
|---|---------------------------|-------------|-----|---------------|--------------------|
| Constituent | (µg/L) | (μg/L) | N/C | Influent | System Effluent |
| Fuel Related Constituents | | | | | |
| Methyl tert-Butyl Ether | 6,400 | 0.15 | 0 | 74.0 | ND |
| Benzene | 25,000 ^a | 0.15 | 0 | 1.1 | ND |
| Ethylbenzene | 25,000 ^a | 0.15 | 0 | 0.44 J | ND |
| Toluene | 25,000ª | 0.15 | 0 | ND | ND |
| Total Xylenes | 25,000 ^a | 0.15 – 0.30 | 0 | ND | ND |
| Total Petroleum Hydrocarbons – Gasoline | 50,000 ^b | 35 | 0 | 143 | ND |
| Total Petroleum Hydrocarbons – Diesel | 50,000 ^b | 24 | 0 | 66.0 J | ND |
| Total Petroleum Hydrocarbons – Motor Oil | 100,000 | 24 | 0 | ND | ND |
| Other | | | | | |
| Acetone | NA | 1.0 | 0 | ND | ND |
| 1,2-Dichloroethane | 20 | 0.15 | 0 | 0.90 | ND |

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

Laboratory data available on request.

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

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

 μ g/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





Site TA500 Data Gap Investigation Update Travis AFB, California



October 19, 2017



TA500 Background

- Drinking Water Storage & Treatment Site
 - Hydrofluorosilicic acid used to fluoridate water
- Two hydrofluorosilicic acid spills
 - Pinhole leak in 4,000-gallon AST in 1989 and 53 gallons released from drum puncture in 1992
 - AST removed in 1992 and soil was excavated
 - 28 x 15 feet wide by 3 feet deep excavation near drum spill (DTSC issued no further action for drum spill soil cleanup)

TA500 Site Layout



Fluoride Fate and Transport

- Fluorosilicate anion is not expected to persist in the environment
 - Readily dissociates to hydrogen gas, fluoride ions, and hydrated silica
 - Fluoride adsorbs to aluminum and iron oxides
 - Fluoride has low mobility due to adsorption and natural attenuation

Fluoride Groundwater Concentration Considerations

- USEPA MCL = 4 mg/L
 - Health Risk: Pain and tenderness of major joints
- CA MCL = 2 mg/L
 - Cosmetic Risk: Tooth discoloration in children
- Optimal drinking water levels to prevent tooth decay
 - Historically 1.2 mg/L, currently 0.7 mg/L (U.S. Department of Health and Human Services, 2015)

TA500 Investigation History

- Investigated as part of WABOU RI in 1996
 - Soil fluoride concentrations 552 to 4,470 mg/kg outside of excavation area (RSL of 3,100 mg/kg)
- 2009 DPT Investigation
 - Max groundwater concentrations of 109 J & 547 J mg/L on north side of building near historical releases (CA MCL 2 mg/L, EPA MCL 4 mg/L)
 - Non-detect or low J-flagged values up-/cross-gradient
 - 1.1 mg/L at downgradient location

TA500 Data Gaps Investigation (2015-2017)

- Refine vertical/horizontal extent of contamination
 - Nine (9) soil boring locations
 - Six (6) monitoring well locations
 - Work Plan called for five (5) MWs, but we installed one (1) extra well near the former spill area
 - Analyzed for fluoride and pH (as indicator)

TA500 Data Gap Investigation Locations



Soil Results



All soil samples from data gap investigation were below RSL of 3,100 mg/kg

Highest fluoride concentration was 280 mg/kg

- From boring SB2226 at 2.5 ft bgs (immediately outside of historical source area excavation extent)
- Soil concentrations have attenuated from 1996 maximum of 4,470 mg/kg

Initial Groundwater Results



Boring/Well ID and Fluoride Concentration (mg/L) SB2223x500 (source area) 0.16 J MW2224x500 (upgradient) 0.17 J MW2226x500 (source area) 0.19 J MW2227x500 (downgradient) 0.69 J MW2228x500 (downgradient) 0.16 J MW2229x500 (downgradient) 0.45 J

All below CA MCL of 2 mg/L

We planned to sample during wet season – we proceeded into a period with wettest winter in a century

TA500 Water Level Trends



Worst Case Wet Season Sampling (100-year precipitation event)

- Quarterly sampling completed through 2016-2017
- MW2226x500 & MW2229x500 (minor exceedances)









Groundwater Fluoride Results

(all other wells were ND or low, J-flagged results)

MW2229x500



6/29/2015 2/10/2016 3/31/2016 5/9/2016 8/16/2016 10/18/2016 1/12/2017 5/9/2017 8/9/2017 8/28/2017 8/28/2017 8/29/2017 8/30/2017 8/31/2017 0.45 J mg/L 2.6 mg/L 2.3 mg/L 2.5 mg/L 2.5 mg/L 2.0 mg/L 3.2 mg/L 3.2 mg/L 2.9 mg/L 2.7 mg/L 2.8 mg/L 2.3 mg/L 1.8 mg/L

MW2226x500

6/29/2015 2/10/2016 5/6/2016 8/16/2016 10/14/2016 1/12/2017 5/9/2017 8/9/2017 0.19 J mg/L 0.10 U mg/L 0.84 J mg/L 0.25 J mg/L 0.20 J mg/L 7.6 mg/L 2.4 mg/L 0.91 J mg/L

Groundwater Fluoride Results

(all other wells were ND or low, J-flagged results)

MW2224x500 MW2227x500 MW2228x500 MW2230x500

| 6/29/2015 | 0.16J mg/L |
|------------|--------------|
| 6/29/2015 | 0.17 J mg/L |
| 2/10/2016 | 0.1 U mg/L |
| 5/6/2016 | 0.1 U mg/L |
| 5/6/2016 | 0.1 U mg/L |
| 8/16/2016 | 0.07 J mg/L |
| 10/14/2016 | 0.1 U mg/L |
| 1/12/2017 | 0.067 J mg/L |
| 5/9/2017 | 0.1 U mg/L |
| 5/9/2017 | 0.1 U mg/L |
| 8/9/2017 | 0.1 U mg/L |
| | |

7/8/2015 0.69J mg/L 2/10/2016 0.35J mg/L 2/10/2016 0.4 J mg/L 5/9/2016 0.19J mg/L 8/16/2016 0.29J mg/L 8/16/2016 0.29J mg/L 10/18/2016 0.35J mg/L 1/12/2017 0.34J mg/L 0.34 J mg/L 1/12/2017 5/9/2017 0.092U mg/L 8/9/2017 0.11J mg/L 8/9/2017 0.11J mg/L

| 7/8/2015 | 1U mg/L |
|-----------|------------|
| 2/10/2016 | 0.13J mg/L |
| 5/9/2016 | 0.11J mg/L |
| 8/16/2016 | 0.12J mg/L |
| 0/14/2016 | 0.14J mg/L |
| 1/12/2017 | 0.14J mg/L |
| 5/9/2017 | 0.11U mg/L |
| 8/9/2017 | 0.13J mg/L |

| 6/29/2015 | 0.1 U mg/L |
|-----------|-------------|
| 2/10/2016 | 0.082J mg/L |
| 5/9/2016 | 0.1U mg/L |
| 8/16/2016 | 0.06J mg/L |
|)/14/2016 | 0.1 U mg/L |
| /12/2017 | 0.1U mg/L |

5/9/2017 0.087 U mg/L 8/9/2017 0.1 U mg/L

TA500 Aquifer Conditions

- Shallow bedrock (outcrops at north end of site)
- Thin alluvial zone (~5-8 ft thick), above water table
- Residual fluoride is within bedrock adjacent to historical releases with minimal migration potential
- Low hydraulic conductivity and minimal groundwater production capacity (see aquifer test discussion)

TA500 Cross-Section Lines



TA500 Cross Section A-A' (North to South)



CAUSERSILPRATTIDESKTOP/GINT_GRISP/2016_GRISP/TRAVIS_2016.GPJ;

17

TA500 Cross Section B-B' (East to West)



CAUSERSLPRATTIDESKTOPIGINT_GRISR/2016_GRISR/TRAVIS_2016.GPJ;

TA500 Aquifer Test at MW2229x500

- Minimal groundwater production capacity (~0.25-0.35 gallons per minute)
- Low hydraulic conductivity (2 feet/day) limits potential for migration of residual fluoride
- Decreasing concentrations during test
 - Data from analysis of samples collected during this pumping test are more representative of a drinking water scenario than the data from low-flow discrete samples
 - Fluoride concentration was 1.8 mg/L at end of test

TA500 95% UCL Evaluation

- Site is very small, with six (6) monitoring wells in close proximity to one another
 - It is appropriate to evaluate the data set using 95% UCL methods
- 95% UCL concentration of 1.623 mg/L, which is below the CA MCL of 2 mg/L

TA500 Investigation Summary

- Soil concentrations have attenuated from historical high, with all 2015 samples significantly below RSLs
- Groundwater has low production capacity
 - Fluoride attenuated from:
 - High of 109 J & 547 J mg/L in 2009
 - Below CA MCL prior to 2016-2017 100-year precipitation event
 - Slightly exceeded ~25 ft area after intense wet season and most recent samples are below CA MCL
 - 95% UCL evaluation (1.623 mg/L) results in concentration below CA MCL (2 mg/L)

TA500 Path Forward

- Based on multiple lines of evidence using available data and the conceptual site model
 - Investigation conclusions indicate no further action required and TA500 should be closed

Travis AFB 2017 Completed Field Work

RPM Meeting October 19, 2016

2017 Field Work

- Soil Sampling
- Sediment Sampling
- Hydropunch Groundwater Sampling
- Well Installation
- EVO Injection
- Aquifer Tests
- Optimization of FT005 GETS
- Excavations

Soil Sampling

Soil samples were collected from four Sites (FT004, SD031, SD033, OW050).

- Soil samples were collected from 45 borings at Site FT004 to evaluate the presence of petroleum hydrocarbons.
- Soil samples were collected at Site SD031 from 14 borings to reevaluate thallium and hexavalent chromium concentrations from previous sampling in 2016 and three step-out borings to evaluate dioxin concentrations.
- Soil samples were collected from two borings at Site SD033 to re-evaluate thallium concentrations from previous sampling in 2016.
- Soil samples were collected from five borings at Site OW050 to evaluate the impacts of petroleum hydrocarbons from the former OWS.

Sediment Sampling

Sediment samples were collected from one Site (LF044)

 Five samples were collected from Site LF044 to determine if contaminants are present in sediments in the northern portion of the Site.

Hydropunch Groundwater Sampling

Hydropunch groundwater samples were collected from two Sites (FT005 and DP039)

- Groundwater samples were collected from three hydropunch borings at Site FT005 to determine where to place extraction wells for the optimization of the groundwater extraction and treatment system (GETS).
- A groundwater sample was also collected at Site DP039 from one hydropunch boring to assisting in delineating the extent of the groundwater plume.

Well Installation

Installed monitoring wells, injection wells, or extraction wells at five Sites (FT005, SS015, SD031, SD036, and DP039).

- Five extraction wells were installed at Site FT005 to optimize the GETS.
- Six injection wells were installed at Site SS015 to optimize the enhanced attenuation (EA).
- Four injection wells were installed at Site SD031 to optimize the technology demonstration.
- Three injection wells were installed at Site SD036 to optimize the EA.
- Seven monitoring wells were installed at Site DP039 to delineate the groundwater plume to help establish an EA network.

EVO Injection

EVO was injected in wells at four Sites (FT004, SS015, SD031, and SD036).

- 20 wells were injected with 5,624 gallons of nanoEVO at Site FT004.
- 2,838 gallons of nanoEVO was injected in 11 wells at Site SS015.
- Four wells and six gravel chimneys are being injected with 1,440 gallons of nanoEVO at Site SD031.
- 1,626 gallons of nanoEVO are being injected in six wells at Site SD036.
Aquifer Tests

Performed 72-hour aquifer tests at five Sites (FT005, LF006, SS030, SD031, and TA500).

- Aquifer tests were performed at two monitoring wells at Site FT005 (MW765x05 and MW766x05).
- An aquifer test was performed at one monitoring well at Site LF006 (MW258Dx06).
- Aquifer tests were conducted at two monitoring wells at Site SS030 (MW05x30 and MW269x30).
- An aquifer test was conducted at one monitoring well at Site SD031 (MW134x31).
- An aquifer was also performed at one monitoring well at Site TA500 (MW2229x500).

Optimization of FT005 GETS

Five new extraction wells were installed to optimize the Site FT005 GETS to capture warm spots in the offbase portion of the groundwater plume.

- Three of the new extraction wells (EW2782x05, EW2783x05, and EW2784x05) were installed in the northern portion of the offbase plume.
- Two of the new extraction wells (EW2785x05 and EW2786x05) were installed in the southern portion of the offbase plume.
- New conveyance lines to connect these new extraction wells to the existing conveyance system were also installed as part of the field activities.
- All power and controls wiring in the off-base portion of the GETS is being replaced.

Excavations

- The oil/water separator (OWS) at Site OW056 was excavated, removed, and properly disposed of.
- The concrete sidewalk overlying the former OWS at Site OW055 was removed and replaced.
- Approximately 7,775 cubic yards of soil at Site TS060 was excavated, removed, and properly disposed of to remove lead and polynuclear aromatic hydrocarbons (PAHs). Approximately 5,943 cubic yards were removed from the PAH area, and 1,832 cubic yards were removed from the lead area.

Questions

Travis AFB Restoration Program

Program Update

RPM Meeting October 19, 2017

Completed Documents (1)

- Vapor Intrusion Assessment Update
 Technical Memorandum
- 2012 CAMU Annual Report
- Old Skeet Range Action Memorandum
- 3rd Five-Year Review
- 2012 Annual Groundwater Remediation Implementation Status Report (GRISR)
- Subarea LF007C and Site SS030 Remedial Process Optimization Work Plan
- Pre-Design Site Characterization of SS029 Report
- Old Skeet Range Removal Action Work Plan
- 2013 CAMU Inspection Annual Report

- Groundwater Record of Decision (ROD)
- CG508 POCO Work Plan
- 2013 Annual GRISR
- FT004 Technology Demonstration Work Plan
- Kinder Morgan LF044 Land Use
 Control Report
- SD031 Technology Demonstration Work Plan
- TA500 Data Gap Investigation Work Plan
- ST018 POCO Work Plan Addendum
- SD037 GW RD/RA Work Plan
- Travis AFB UFP-QAPP
- DP039 Lead Excavation Technical Memo

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

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 Stepout 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 (3)

- FT004 POCO Soil Data Gaps Investigation
- LF044 Sediment Sampling
- FT004 EVO Optimization
- DP039 Install downgradient monitoring wells (2nd round)
- FT005 Install Extraction Wells

Documents In-Progress

CERCLA

- Community Relations Plan
- 2016 Annual GRISR
- Data Gap Investigation Results, Technical Memorandum for Soil, Sites SD033, SD043, SS046
- Work Plan for Fourth Five-year Review

POCO

• None

Field Work In-Progress

CERCLA

- SS015 EVO Optimization
- SD036 EVO Optimization
- SD031 EVO Optimization

POCO

• None

Documents Planned

CERCLA

| • | Data Gap Investigation Results, Technical Memorandum for Site SS016 | Nov |
|---|--|-----|
| • | Amendment to the Soil ROD for WABOU sites | |

DP039, SD043, and SS046 NovTS060 Removal Action Completion Report Nov

POCO

 POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW052, OW055, OW056, and OW057

Nov

Field Work Planned

CERCLA

| • | SD034 Install bollards around SBGR | Oct |
|---|--|-----|
| • | DP039 Repair SBGR distribution headers | Oct |
| • | Q4 GRIP Sampling | Oct |

POCO

• None

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

Technology Demonstration Projects (1)

- SS014: Recycled Drywall SBGR
 - Evaluate the effectiveness of sulfate (gypsum from crushed drywall) to enhance anaerobic biodegradation of petroleum in groundwater
 - Installation was completed November 2016
 - First quarter performance results
 - TPH-G: 99% reduction in source area (1,900 to 14 J $\mu\text{g/L}),$ 18% for remaining 7 site wells
 - TPH-D: 98% reduction in source area (5,500 to 130 J $\mu\text{g/L}),$ 33% for remaining 7 site wells
 - Benzene: 98% reduction (22 to <0.4 μ g/L), 49% for remaining 7 site wells
- Multisite Bioaugmentation: EVO and KB-1 Plus
 - Evaluate if addition of bioaugmentation substrate to an EVO injection will increase the rate of CVOC degradation
 - Initial injections were completed (Nov 2016)
 - Limited TOC dispersal at SD036, so installed additional injection wells and reinjecting with nanoEVO in 2017
 - Too early to evaluate performance data

Technology Demonstration Projects (2)

- SD034: Washboard SBGR
 - Evaluate the effectiveness of an oxygen-enhanced aerobic SBGR on reducing TPH as diesel (TPH-D) in groundwater
 - Installation was completed November 2016
 - Installed six (6) SBGR trenches.
 - Too early to evaluate performance data
- FT005: Distribution of EVO and KB-1 Plus
 - Evaluate total organic carbon (TOC) dispersion distances and rates for optimizing the remediation of 1,2-dichloroethane (DCA) in groundwater
 - Installation completed May 2016
 - Slightly elevated TOC and reduced COC concentrations in the north, but too early to evaluate performance data
 - In the process of optimization of GETs in southern portion of site, which may help accelerate TOC dispersal to support this TD

Technology Demonstration Projects (3)

- FT004: Distribution of EVO via SBGR and/or Groundwater Extraction
 - Determine effectiveness of TOC distribution through two different enhanced reductive dechlorination (ERD) approaches: (1) groundwater TOC recirculation using a combination EVO injection, infiltration SBGR trenches, and groundwater extraction; and (2) EVO injection with groundwater extraction
 - Installation completed April 2016
 - Limited TOC dispersal, additional EVO injection underway with nanoEVO to determine if this can enhance TOC dispersal
 - COC concentrations have declined
 - ~50% total molar reduction plume-wide through first year
 - Max monitoring well TCE concentration reduced from 560 to 140 μ g/L

Technology Demonstration Projects (4)

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

Completed Documents (Historical1)

- Basewide Health & Safety Plan (HSP)
- Action Plan
- 2007/2008 GSAP Annual Report
- LF007C RPO Work Plan
- LF008 Rebound Study Work Plan
- SS014 Tier 1 POCO Evaluation Work
 Plan
- ST027B Site Characterization Work
 Plan
- SS030 RPO Work Plan
- ST032 POCO Technical Memo
- DP039 Bioreactor Work Plan
- 2008 Annual GWTP RPO Report
- Passive Diffusion Bag (PDB) Technical Memo
- RD/RA QAPP Update
- ST032 Tier 1 POCO Evaluation Work
 Plan
- Phytostabilization Demonstration Technical Memo
- Model QAPP

- LF008 Rebound Test Technical Memo
- Comprehensive Site Evaluation Phase II Work Plan
- Field Sampling Plan (FSP)
- SS016 RPO Work Plan
- ST018 POCO RA Work Plan
- Vapor Intrusion Assessment Report
- GSAP 2008/2009 Annual Report
- FT005 Data Gap Work Plan
- First, Second, & Third Site DP039 Sustainable Bioreactor Demonstration Progress Reports
- DP039 RPO Work Plan
- SD036/SD037 RPO Work Plan
- ST027B Site Characterization Report
- 2009 GWTP RPO Annual Report Natural Attenuation Assessment Report (NAAR)
- Union Creek Sites SD001 & SD033 Remedial Action Report
- CAMU 2008-2009 Monitoring Annual Report

Completed Documents (Historical 2)

- Phytostabilization Study Report
- 2009/2010 Annual GSAP Report
- SS015 Remedy Optimization Field
 Implementation Plan
- Sites SS014 and ST032 Tier 1 POCO Evaluation Report
- SD036 Remedy Optimization Field
 Implementation Plan
- 2010 Annual CAMU Inspection Report
- Site ST018 POCO Baseline Implementation Report
- FT005 Data Gaps Investigation Report
- Comprehensive Site Evaluation Phase
 II Report
- 2010 Groundwater RPO Annual Report
- Focused Feasibility Study (FFS)
- Site ST027-Area B Human Health Risk Assessment
- Site ST027-Area B Ecological Risk
 Assessment
- Work Plan for Assessment of Aerobic Chlorinated Cometabolism Enzymes

- 2010/2011 Annual GSAP Report
- Baseline Implementation Report (Sites SS015, SS016, SD036, SD037, and DP039)
- 2011 CAMU Annual Report
- Technical and Economic Feasibility Analysis (TEFA)
- Work Plan for RPO of Sites SS016 and SS029
- Site LF007C Data Gaps Investigation Technical Memorandum
- Technical Memorandum for Assessment of Aerobic Chlorinated Cometabolism Enzymes
- Old Skeet Range Engineering Evaluation/Cost Analysis
- 2011 Groundwater Treatment RPO Annual Report
- Groundwater Proposed Plan (PP)
- FT005 Remedial Action Completion Report
- 2012 GSAP Technical Memorandum 19

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