

Meeting Minutes
Wurtsmith BCT Meeting
18 February 2020
Teleconference

Bay West Project No. J150073
Location: Teleconference

Meeting Date: Tuesday, 18 February 2020
Meeting Time: 0900-1115 EST

MEETING ATTENDEES VIA TELECONFERENCE:

Dave Gibson	AFCEC	Lee Major	Cherokee Nation
Mark Weegar	Cherokee Nation	Abiy Mussa	MDHHS
Charlie Bauer	EGLE- WRD – Bay City	Jeremiah Morse	AECOM
Matt Siler	EGLE- WRD – Bay City	Dale Corsi	DLZ
Amanda Armbruster	EGLE- RRD – Bay City	Beth Flynn	Wood
Marc Gesink	Bay West	Saamih Bashir	Wood
Dirk Pohlmann	Bay West	Paul Walz	Bay West
Andrea Stawowy	Bay West	Ryan Morrish	Bay West
Beth Place	EGLE-RRD – Superfund Section, Lansing		
Matt Baltusis	EGLE-RRD – Superfund Section, Lansing		
Dan Yordanich	EGLE-RRD – Compliance/Enforcement, Lansing		

The meeting was held via Skype. The meeting began at 0900 hours on 18 February 2020 and adjourned at 1115 hours. The meeting agenda is attached and posted to the Bay West Collaborative Website.

1. Opening Remarks

D. Gibson opened the meeting with a greeting and introductions. The meeting purpose was to discuss environmental restoration program work at the former Wurtsmith AFB.

2. Previous 22 January 2020 BCT Review

- a. The 22 January 2020 BCT Meeting Minutes are still under review by EGLE, they will submit comments before 20 February 2020. A. Mussa emailed his comments to A. Stawowy prior to the meeting. Once all comments are received, the final Meeting Minutes version will be posted to the Bay West Collaborative Website. {Note minutes have been posted as final and a copy has been placed in the IR at the Oscoda Library.}
- b. Action Items – EGLE
 - i. Provide comments of Wurtsmith documents – Air Force, EGLE and Bay West had a con-call to discuss the Annual Reports on 12 February 2020. EGLE will be submitting comments on the 2017 and 2018 Long Term Monitoring (LTM) and 2017 Pump and Treat Systems (PTS) Annual Reports no later than 28 February 2020. Comments on the Draft Final ESD for SS-57 should be submitted by Mid-March 2020. EGLE received the 30% design for the LF-30/31 drainage ditch last week, but the transmittal was dated November 2019. B. Place requested a new transmittal letter for the 30% design with the actual date EGLE received it. D. Gibson will follow up with FPM regarding the revised transmittal letter. EGLE should submit comments in 60-90 days. Late receipt of the 30% design by EGLE should not adversely impact project schedule.
- c. Action Items – Air Force
 - i. Provide EGLE with residential well data

1. EGLE and MDHHS to provide their agencies' guidance for sharing AFCEC reports that contain PII with public when FOIA requests are received. EGLE would like a copy of all the data from the residential well sampling. This information would not be available via FOIA. B. Place will confirm with the Attorney General that this information will not be released by EGLE. D. Gibson stated the Air Force will mail a hard copy of the report including all the data.
- ii. Weapons Storage Area (WSA) Deed Restrictive Covenant (DRC)
 1. Responses were sent to Bill Harmon on 12 February 2020. A MMRP meeting has been sent up with Oscoda Wurtsmith Airport Authority (OWAA) and EGLE, both agencies have next steps they need to perform internally, at this time there are no Air Force action items.
- d. Action Item – MDHHS
 - i. Provide Air Force with a copy of 2020 Residential Well Sampling Plan – There was a misunderstanding. A. Mussa will check with management to see if MDHHS will be providing the Air Force with the sampling plan and the data collected during the sampling. A. Mussa informed the group that the entire area will be sampled, not just around the base.
- e. Action Item – Bay West
 - i. Provide EGLE with a copy of LF-30/31 replacement well PW7R As-Built Drawing
 1. The PW7R As-Built drawing was submitted to EGLE on 28 January 2020.

3. DOCUMENT SUBMISSION SCHEDULE AND STATUS

- a. Annual Reports (Bay West) - discussed previously
- b. Draft Final SS-57 ESD (Bay West) – discussed previously
- c. Draft SS-57 RA-C Report (Bay West)
 - i. Currently under Air Force Review
- d. Draft SS-017 Site Closure Technical Memorandum (Bay West)
 - i. Currently under Air Force Review
- e. Draft SS-072 Proposed Plan (Bay West)
 - i. Currently under Air Force Review
- f. Five-Year Review (Bay West)
 - i. Will be submitted to the Air Force for review in the next 2 weeks, and Air Force should have comments within 30 days.
- g. The 4th and 5th Private/Public Drinking Water Monitoring Report (Wood)
 - i. Both under Air Force review
- h. The Final ESI Report (Wood)
 - i. Wood is Drafting Responses to Comments (RTCs) they should be completed no later than 21 February 2020. At this time, it is not known if the RTCs will be attached to the document, after D. Gibson receives the RTCs the Air Force will decide how to proceed.

4. FIELD WORK UPDATE AND SCHEDULE

- a. FT-02 Carbon Change out – The 18th GAC change out took place on 22 November 2019, 91 days since the last change out. The next change out is scheduled for 27 February 2020, this date could be pushed back, depending on analytical results from the weekly sampling events now being conducted, with a 48-hour turn-around time (TAT) for preliminary results. {Note the GAC change out took place on 5 March 2020}.
- b. Discussion of recent FT-02 treatment system results

- i. On 17 December 2019 the FT-02 effluent had a detection of 141 J ng/L for PFOS. This sample was collected less than one month after the carbon change out. A FT-02 effluent duplicate sample was also collected, and this sample had a PFOS detection of 42 J ng/L. Both the effluent sample and duplicate effluent sample were “J” flagged due to a high RPD. It is noted that the 17 December 2019 effluent PFOS results were not consistent with other PFAS data for this sampling event. For example, PFOA results in system effluent were not similarly elevated. Since the 17 December 2019 sample was collected, four additional treatment system sampling events have been conducted, with all PFOS results being Non-Detect (ND). This 17 December 2019 result is an anomaly, with the lead GAC vessel achieving a 97% PFOS removal rate and the lag GAC vessel (with the new carbon) only achieving a 45% PFOS removal rate. This is not consistent with how GAC systems operate or historical results. M. Siler said EGLE had no comment and stated that he will review the MiWaters submittal that includes these results.
- c. SS-57 RAWP Implementation- Presentation of the PowerPoint
 - i. M. Gesink presented a slideshow summarizing the biweekly sampling results associated with RAWP construction. These results were limited to various field parameters. Analytical results (VOCs) from the January 2020 groundwater monitoring event have been received but are not yet validated. M. Baltusis asked if any downgradient purge wells or the system effluent had been sampled for the daughter products. Bay West explained that the January 2020 VOC sampling event should confirm nitrate/phosphate migration. From past experience at FT-02 the nitrate/phosphate are not expected to be detected more than 100 ft from the point of injection. After quarterly data is evaluated updates will be presented at the BCT meetings and all data will be included in the annual reports.
- d. FT-02 RAWP Implementation –
 - i. D. Gibson has recommended to Air Force management that a contract modification be executed which will allow the concrete pad to be disposed of after its removal, thereby allowing RAWP construction to move forward. Decision by Air Force management is pending.
- e. Annual LTM groundwater monitoring –
 - i. The LTM is scheduled to begin in May 2020. Bay West will inform the team of the actual start dates for all monitoring well sampling events.
 - ii. Data quality objectives were discussed for any split samples that may be collected going forward. EGLE would like an agreement on the metrics that will be used for data quality assessment when split samples are collected. The use of relative percent difference (RPD) was discussed as a possible metric. EGLE would like agreement to be in place before any field samples are collected. B. Place stated EGLE will review the QAPP duplicate sampling language to determine if it will be acceptable for split sampling between the Air Force and EGLE.
- f. VI Update –
 - i. A conference call was held two weeks ago, and Data Quality Objectives were agreed upon. The Air Force is reviewing the Draft Work Plan. Field work needs to start in May 2020. Work scope includes installing VI points and four quarters of data collection. The Work Plan will need a 2-week review, or field work will be held up. EGLE committed to less than 30 days to review the Work Plan. Wood will let EGLE know the earliest they will receive the Work Plan; at this time, it is 23 March 2020. The team will be updated at the next BCT meeting.

- g. Wood Field Work Update –
 - i. On 11-12 February 2020 the last of the public and private wells were sampled. A total of 9 samples were collected. The Well Sampling Report should be finalized in three weeks, from receiving final analytical data, for the Air Force review, this is the last PFOS/PFOA monitoring deliverable under the current contract. S. Bashir confirmed that to date PFOA and PFOS concentrations remain below the criteria of 70 ng/L. The current sentinel wells are upgradient of the residential wells. The Air Force is entering the data into the EPA calculator, EPA Groundwater Statistic Tool, to see if sampling needs to continue. Wood will be providing the trend analysis to the Air Force. B. Place asked that an Action Item be added to resolve the residential well sampling frequency and to submit the 4th and 5th Quarterly Private/Public well sampling report upon Air Force approval. B. Flynn stated that concentration trends in all wells are either decreasing or stable, no well has an increasing trend. M. Weegar stated the EPA guidance is being followed for residential well sampling. For example, if a public water supply wells is out of compliance there are rules/steps to get it back into compliance.

5. AIR FORCE UPDATES

- a. RAB
 - i. The next RAB is scheduled for 18 March 2020, D. Gibson will be on-site 17 March 2020 for a site tour. The September 2019 RAB minutes have been released. At this time there are no plans for a Mission Pump and Treat System (MPTS) tour or ribbon cutting ceremony.
- b. Central Treatment System (CTS) Status
 - i. Operating as designed – no comments.
- c. Mission Pump and Treatment System (MPTS) Status
 - i. C. Bauer asked if there had been any communication between the Air Force and Oscoda Township regarding the storm sewer service fee for MPTS. The Air Force is in the process of evaluating the request to verify the discharge fee is reasonable. EGLE asked if they would review the Engineering Evaluation and Cost Analysis (EE/CA) and the Action Memorandum for MPTS. B. M. Weegar indicated that CERCLA required a public notice regarding the EE/CA Action Memorandum but was not sure that EGLE review/comment was required. The purpose of the MPTS retrofit was to meet the PFOS/PFOA discharge limitations in the SRD. B. Place would like these items added to the agenda. EGLE will be notified when documents are finalized. B. Place inquired about the MPTS operation. M. Weegar commented that the plant is being sampled per the SRD and other than the addition of the resin treatment, nothing regarding the operation of the MPTS has changed. Purge wells continue to discharge to the storm sewer just as they have since the MPTS was constructed in 1987. The purge wells continued to operate even during the resin retrofit. R. Morrish stated all the purge wells are at their target flows, with the system operating at a total flow of ~194 gpm. B. Place stated that D. Medina had indicated previously that EGLE would be reviewing the EE/CA. D. Gibson will discuss with the Air Force and confirm whether EGLE will or will not be receiving a copy of the EE/CA for review.
- d. Remedial Investigation (RI) for PFAS (topic not included on the final agenda)
 - i. D. Gibson stated the Air Force is securing funding and a contract with an award goal of September 2020. EGLE would not be involved until after the contract award. Since there is no contract in place there is not a field work or work plan schedule, or target date. The Air Force is working on a response to the EGLE Interim Action request letter. M. Weegar explained that any FT-02 system expansion as requested in the Interim Action letter will depend on the RI, more data will need to be collected to support the design and implementation of the FT-02

expansion. B. Place asked that the schedule for the RI, the schedule for the FT-02 Expansion, and a schedule with milestones of tentative scheduled PFAS related work be added to the future BCT agenda.

- e. LF-30/31 FFS Status
 - i. Discussed previously in section 2.b.i.

6. EGLE RRD – SUPERFUND SECTION UPDATES (the agenda was not followed for this section).

- a. RAB – B. Place and D. Gibson discussed various agenda items, topics and presentations. The team will meet prior to the RAB for a pre-meeting.
- b. EGLE data – EGLE is willing to share all data that has been collected via a data dump. B. Place asked if the data would be used in the RI. D. Gibson stated the ESI work plan would be reviewed.

7. EGLE RRD – BAY CITY DISTRICT UPDATES

- a. Kings Corner Road Dump – No update
- b. AuSable Township sampling
 - i. Ten locations were sampled in January 2020, data showed no exceedances of PFOA and PFOS but a few exceedances of compounds proposed for MI drinking water MCLs (i.e. PFNA, PFHxA, PFHxS, PFBS, GenX). Twenty monitoring wells were sampled around the community in an attempt to evaluate the groundwater at several of Oscoda Area PFAS sites, another quarterly sampling event is proposed in April/May 2020.

8. EGLE WRD – UPDATES

- a. SRD Update: Process to issue “replacement” SRD for CTS and MPTS
 - i. The SRDs for both CTS and MPTS need to be updated. M. Siler stated before the MPTS SRD can be updated more data needs to be collected. C. Bauer suggested the Air Force follow up with Tarek Buckmaster.
 - ii. A. Stawowy requested confirmation that M. Siler is the correct person to email the CTS PFAS full sampling list to monthly. M. Siler stated that he is the correct person, and that he will distribute the data to the proper members of his team.
- b. Other topics
 - i. B. Place gave an update for Joe Bohr in the surface water section. EGLE plans to collect fish and surface water samples in February 2020. Historic results in the water have been low. This is part of the work from the *Investigation of Perfluorinated and Polyfluorinated Compound Contamination in the Lake Huron-Au Sable River Plume, Iosco County, 2019*. Final results are pending and will be included in a report.

9. MDHHS UPDATES

- a. Residential Well sampling update
 - i. A. Mussa stated they are working on the residential sampling plan, upon completion sampling will be scheduled.

10. Next Meetings:

- a. RAB – 18 March 2020
- b. BCT – 24 March 2020 0900-1100 EST
- c. BCT – 28 April 2020 0900-1100 EST

11. ACTION ITEMS:

- a. EGLE
 - i. Provide comments on documents submitted for review in accordance with the schedule provided.
 - ii. Check with Attorney General on what is releasable via FOIA in regard to the Residential Well data report.
 - iii. Review Wurtsmith UFP-QAPP and propose metrics for assessing data quality for split samples and corrective actions if metrics are not met.
- b. Air Force
 - i. Contact FPM for new transmittal letter with actual date of when EGLE received the 30% design drawings. (Done 24 Sep 20)
 - ii. Determine the path forward for Residential Well Sampling, since current contract including sampling has been completed.
 - iii. Approve 4th and 5th Quarterly Residential Well sampling data and submit to EGLE.
 - iv. Add MPTS EE/CA and Action Memorandum to the agenda.
 - v. Confirm with AFCEC management whether the MPTS EE/CA will be submitted for EGLE review.
 - vi. Add Schedules to Agenda for: RI and tentative schedule with milestones for PFAS work.
 - vii. D. Gibson will follow up on the OWAA 10 Parcels status and the topic will be added to the agenda.
- c. MDHHS
 - i. Provide agencies' guidance for sharing AFCEC reports that contain PII with public when FOIA requests are received.
 - ii. Check with management about providing the Air Force a copy of the Residential Well sampling plan and sampling results.

1. Opening Remarks/General Business

2. Previous BCT Meeting - 22 Jan 20

- a. Meeting Minutes
- b. Action Items - EGLE
 - i. Provide comments or approval of Wurtsmith documents submitted for review in accordance with the schedule.
 - ii. Submit written request to the Air Force regarding the use of supplemental funding for the three-interim action EGLE wants implemented. EGLE sent letter dated January 31, 2020.
- c. Action Items - Air Force
 - i. Provide EGLE with residential well data with all analytes, well locations along with any other information.
 - 1. EGLE and MDHHS provide their agencies guidance for sharing AFCEC reports that contain PII/FOIA Exemption 6 data with the public.
 - ii. WSA DRC information – return answers to Bill Harmon questions.
 - 1. Responses provided to Mr. Harmon on 12 Feb 20
- d. Action Items - MDHHS
 - i. Provide Air Force a copy of the Residential Well sampling plan.
- e. Action Items - Bay West
 - i. Provide EGLE with a copy of the LF30/31-PW-7R As-Built Drawing
 - 1. Submitted to EGLE on 28 January.

3. Document Submission Schedule and Status

- a. Annual Reports (Bay West)
 - i. Draft 2017 LTM Report submitted to EGLE on 21 November 2018.
 - 1. Discussed Draft EGLE comments during a 12 February 2020 con-call.
 - ii. Draft 2017 PTS Report submitted to EGLE on 5 March 2019.
 - iii. Draft 2018 LTM Report submitted to EGLE on 4 April 2019.
 - 1. Discussed Draft EGLE comments during a 12 February 2020 con-call.
 - iv. Draft 2018 PTS Report
 - 1. Draft scheduled for submittal to Air Force in February 2020.
- b. Draft Final SS-57 ESD (Bay West)
 - i. Submitted to EGLE on 09 January 2020.
- c. Draft SS-57 RA-C Report (Bay West)
 - i. under Air Force Review.
- d. Draft SS-17 Site Closure Technical Memorandum (Bay West)
 - i. under Air Force Review.
- e. Draft SS-072 Proposed Plan (Bay West)
 - i. under Air Force Review.
- f. Draft Five-Year Review – Covers 30 May 2014 through 30 May 2019. (Bay West)
 - i. Will be submitted to the Air Force for review in February 2020.
- g. The 4th and 5th Private/Public Drinking Water Monitoring Report (Wood)
 - i. submitted to the Air Force for review on 9 January and 30 January 2020.
- h. The Final ESI report (Wood)
 - i. submitted 24 January 2020.

4. Field Work Update and Schedule

- a. FT-02 Carbon change out event was completed on 22 November 2019, the next change-out event scheduled for the week of 17 February 2020. (approximately 90 operational days since the last change out).
- b. Discussion of recent FT-02 treatment system results.
- c. SS-57 RAWP Implementation – Presentation on IAB Construction, IAB Injections, and Performance Monitoring
- d. FT-02 RAWP Implementation – Pending. Air Force evaluating options for path forward in light of a ROM for disposal of demolished concrete at a Subtitle C landfill.
- e. Annual LTM groundwater monitoring scheduled to begin May 2020.
- f. VI Update – Con-call to between Air Force, EGLE, Bay West and Wood completed to finalize DQOs. Work Plan finalization is in progress.
- g. Wood Field Work Update – Completed the 6th and final quarterly private and public well sampling event 11-12 February 2020. Event will include only wells not connected to municipal water (9 private and 2 public wells).

5. Air Force Updates

- a. RAB Updates
- b. Central GAC Treatment Plant Status
- c. Mission Street Treatment Plant Status
- d. LF-30/31 FFS Status update on RTCs for FFS and 30% design
- e. PFAS RI
- f. OWAA 10 parcels

6. EGLE RRD - Superfund Section Updates

- a. Other – RAB topics
- b. Submittal of EGLE data to Air Force

7. EGLE RRD - Bay City District Updates

- a. Kings Corner Road Dump
- b. Au Sable Township

8. EGLE WRD Updates

- a. SRD Update: Process to issue “replacement” SRD for CTS and MS TS.
- b. Other-Surface water/fish sampling in area

9. MDHHS Updates

- a. Residential Well sampling update

10. Schedule Next BCT Meeting



**Former Wurtsmith AFB
BRAC Cleanup Team Meeting
18 February 2020**

**Overview of Site SS-57 IAB Remedy
&
Startup/Post Application Performance Monitoring
of Screening Parameters**



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Synopsis of IAB Remedy Status

- **Infrastructure at Site SS-57 installed: September 2019**
- **Remedy startup/amendment delivery: October 2019**
- **1st round of quarterly performance sampling: January 2020**
- **Laboratory data from 1st round: available in March 2020**



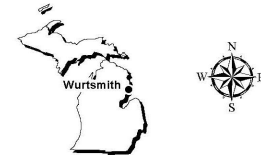
SS-57 Old Apron Hydrant Fuel System



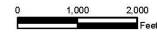
Figure 1



SS-57 Site Location Map

Wurtsmith BRAC



NAD 1983 StatePlane Michigan Central FIPS 2112 Feet Intl



-  Approximate IRP Site Location
-  Stream
-  Lake
-  Former Installation Boundary



Date Drawn/Revised: 3/7/2018 Project No. j150073



SS-57 Background/Decision Document Summary

- **COCs defined in the RAP/DD (2002) – VOCs and SVOCs**
 - Petroleum compounds from releases during former refueling operations

Soil COCs

- **VOCs** ethylbenzene, 1,2,4-TMB, 1,3,5-TMB, and total xylenes
- **SVOCs** anthracene, benzo(a)pyrene, dibenz(a,h)anthracene, and nitrobenzene

Groundwater COCs

- **VOCs** benzene, ethylbenzene, 1,2,4-TMB, 1,3,5-TMB, n-butylbenzene, sec-butylbenzene, n-propylbenzene, and total xylenes
- **SVOCs** naphthalene, bis(2-ethylhexyl)phthalate, 2-methylnaphthalene

SS-57 Background/Decision Document Summary

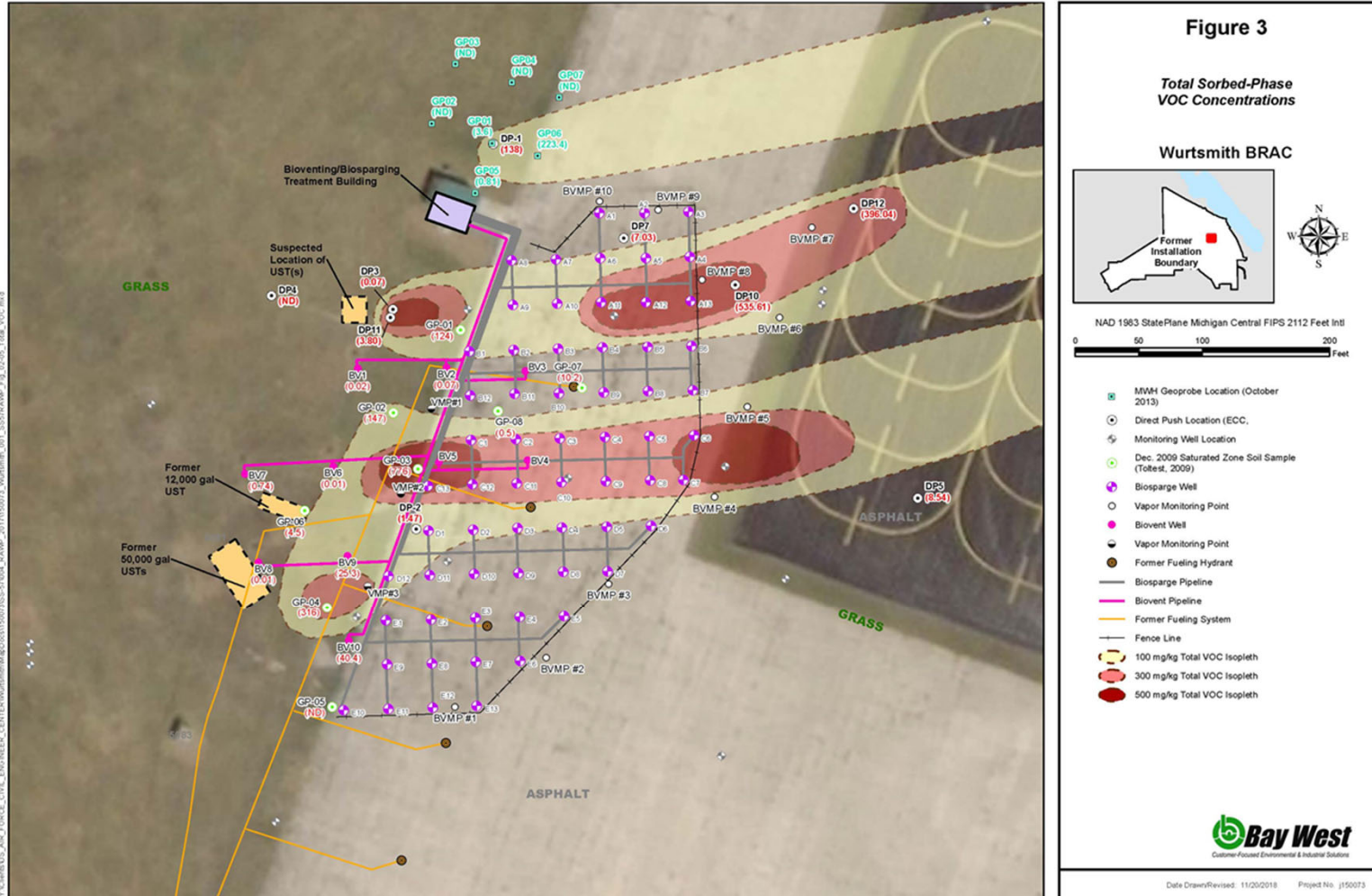
- **RAP/DD (2002) Remedial Action Objectives (RAOs)**
 - **1)** To reduce VOCs and SVOCs in soil within source area and smear zone* above the water table to meet MDEQ (i.e., EGLE) industrial criteria, and to limit further degradation of groundwater
 - **2)** To reduce VOCs and SVOCs in groundwater to meet MDEQ industrial criteria

*IAB targeted historical smear zone ~ 4 ft **below** the current water table (current water table ~ 15 ft bgs), due to rise in regional water table elevation over the last several years.

SS-57 Background

- **Approved RAP/DD (2002) Remedy (for VOCs only):** biovent, biosparge, pump & treat, institutional controls, long-term monitoring, Five-Year Review, and public education
- **Biovent and Biosparge** systems began full time operation in 2004
- **Pending ESD (2020)** adds *In situ Anaerobic Biodegradation* (IAB) - with amendments delivered via a series of infiltration trenches - to supplement existing remedy and associated optimization components
- **IAB Remedy** presented in Final RAWP (Bay West, 2019) and approved by EGLE
- **Bay West Contract Performance Objective for IAB:** RIP in POP = achieved 2019

Remedy Component: Biovent and Biosparge Systems



SS-57 IAB Remedy and Performance Monitoring

- **IAB Remedy**
 - **Purpose:** expedite achievement of RAOs
 - **Approach:**
 - **Supply nitrate** (electron acceptor) to facilitate anaerobic biodegradation to address residual fuel constituents adsorbed to subsurface soil and/or dissolved in shallow groundwater
 - **Deliver amendment** (nitrate/phosphate) to subsurface via **3 infiltration trenches** (IFs) at 3 historical source areas upgradient from biosparge and biovent systems footprint
 - **Performance Monitoring** conducted to assess effectiveness and guide frequency and duration of IAB remedy applications

SS-57 IAB Remedy and Performance Monitoring

- **IAB amendment makeup (per RAWP 2019)**
 - Amendment (i.e., IAB solution) was mixed at target concentration:
 - 1,800 mg/L NO₃

Site SS-57 IAB Solution Mixing Schedule 22-24 October 2019

Infiltration Trench	Trench Length (feet)	Solution (gallons)	NaNO ₃ (50-pound bags)	Sodium Triphosphate (50-pound bags)	Concentrate (gallons)
IF-1	40	8,400	3.2	1.6	800
IF-2	50	10,500	4	2	1,000
IF-3	50	10,500	4	2	1,000
Total	140	29,400	11.2	5.6	2,800

SS-57 IAB Remedy and Performance Monitoring

- **IAB Startup Post-Application Performance Monitoring (PM)**
 - Baseline sampling (included VOCs): 9 Oct 2019
 - Amendment applied (startup): 22-24 Oct 2019
 - Groundwater elevation monitoring: 2 pre- and 2 post-application events
 - Startup Screening PM at 16 wells: 4 biweekly events in Nov/Dec 2019
 - PM Screening Parameters (measured Nov/Dec 2019)
 - **Nitrate (NO₃)/Nitrite (NO₂)** (HACH field test strips)
 - **Phosphate (PO₄)** (HACH field test strips)
 - Groundwater quality parameters (pH, specific conductance, turbidity, temp, DO, ORP)

SS-57 IAB Startup Performance Monitoring

- **Startup Post-Application PM Metrics**
 - Confirm no groundwater mounding occurred due to amendment application
 - Confirm NO₃/PO₄ amendment delivered to targeted treatment areas (i.e., source areas), but not migrated beyond the treatment areas (laterally or deeper in aquifer below the historical smear zone)
 - Confirm NO₃ concentrations in treatment areas are < 1,800 mg/L (i.e., no inhibition of microbial processes)

SITE SS-57
SUMMARY OF WATER LEVEL MEASUREMENTS IN IAB NETWORK MONITORING WELLS
PRE- AND POST-AMENDMENT APPLICATIONS
REMEDIAL ACTION CONSTRUCTION REPORT
FORMER WURTSMITH AIR FORCE BASE, OSCODA, MICHIGAN

	Depth to Water Table (ft below TOC)			
	Baseline	Pre- Amendment Application	Post- Amendment Application	PM1
Date	See notes	10/21/2019	10/25/2019	See notes
Well ID				
A44	15.99	16.14	16.21	16.22
A48	16.47	16.51	16.61	16.58
BV6	14.31	14.39	14.46	14.45
BV8	14.13	14.20	14.27	14.28
C1	15.85	15.89	15.98	15.96
C12	15.85	15.90	15.99	15.98
D12	14.71	14.75	14.84	14.81
SS57-MW9	14.07	14.11	14.19	14.19
SS57-MW13	13.59	13.64	13.71	13.70
SS57-MW16	17.18	17.21	17.30	17.27
SS57-MW17	17.2	17.22	17.30	17.30
SS57-MW18	13.91	13.95	14.04	14.00
SS57-MW19	17.11	17.10	17.18	17.18
SS57-MW20	17.05	17.05	17.11	17.12
SS57-MW21	17.12	17.15	17.22	17.22

Notes:

Injection dates: 10-22, 10-23 and 10-24-19

Baseline dates: 10-3, 10-9, 10-14, 10-15, 10-17 and 10-18-19

PM1 dates: 11-6 and 11-7-19

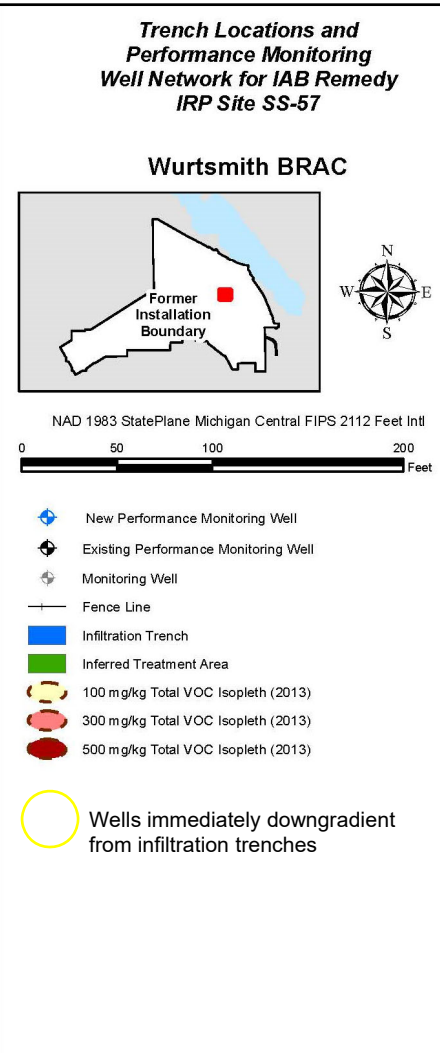
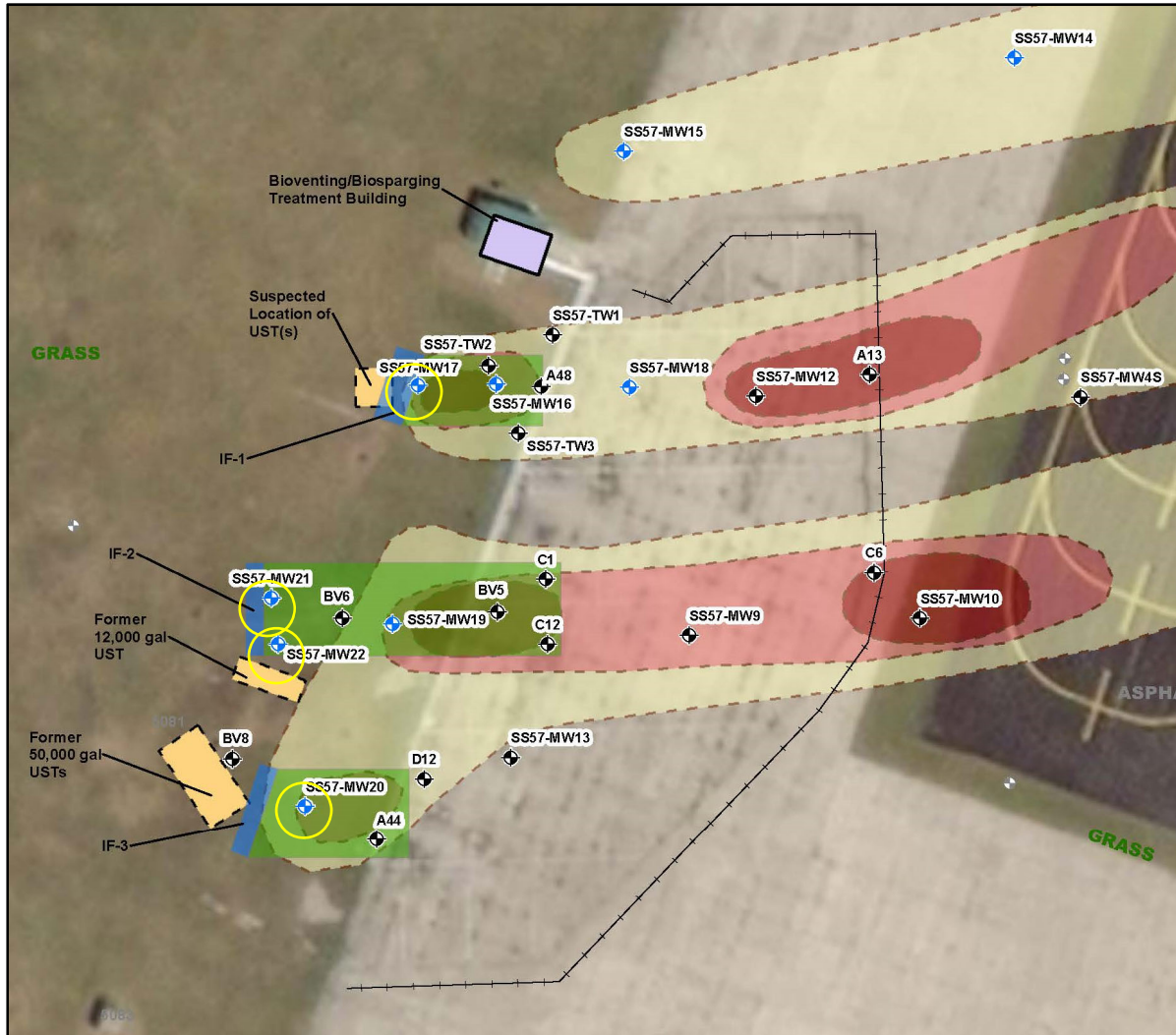
PM1 = Performance Monitoring Event #1

TOC = top of well casing

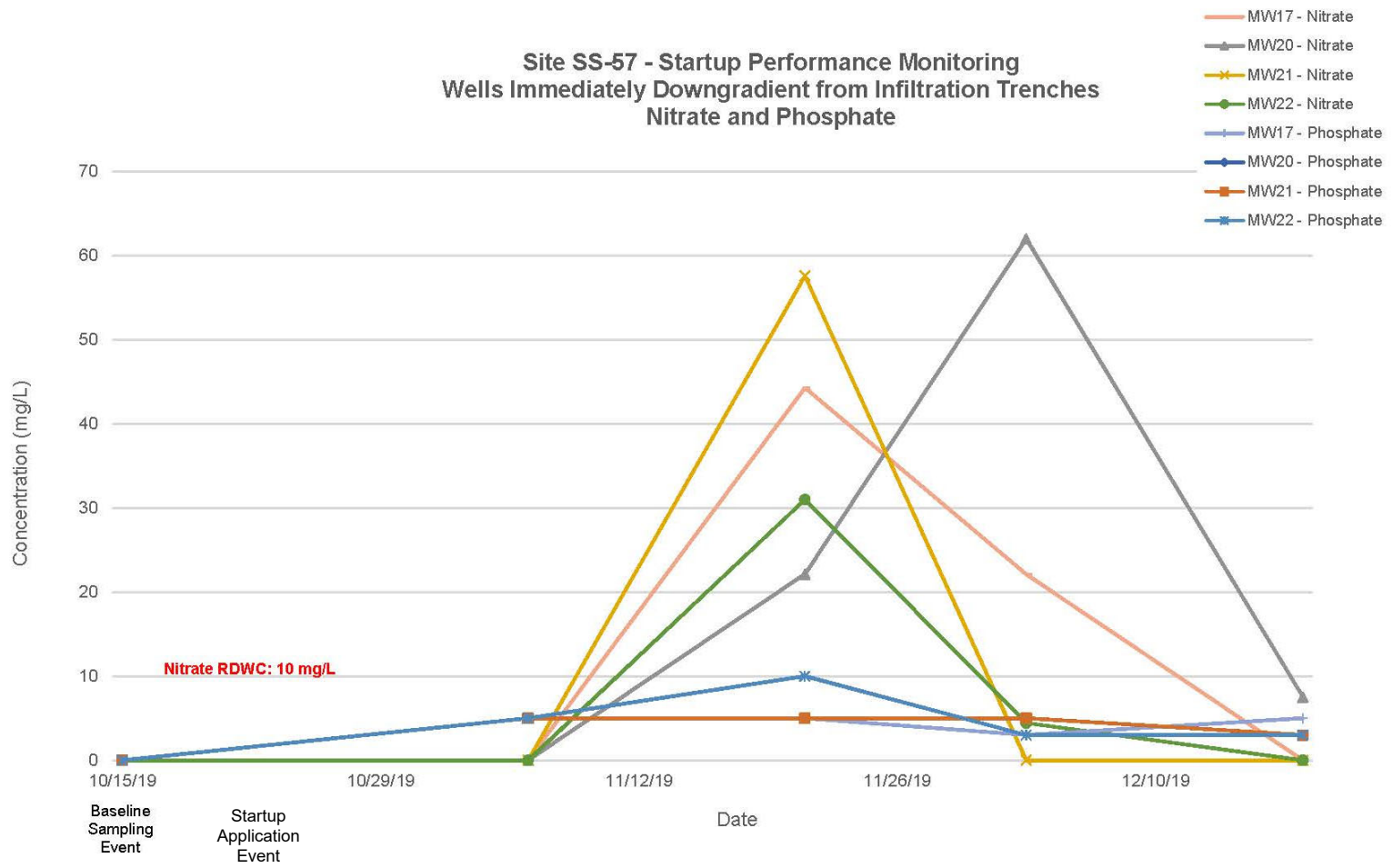
IAB = in situ anaerobic biodegradation (remedial action)



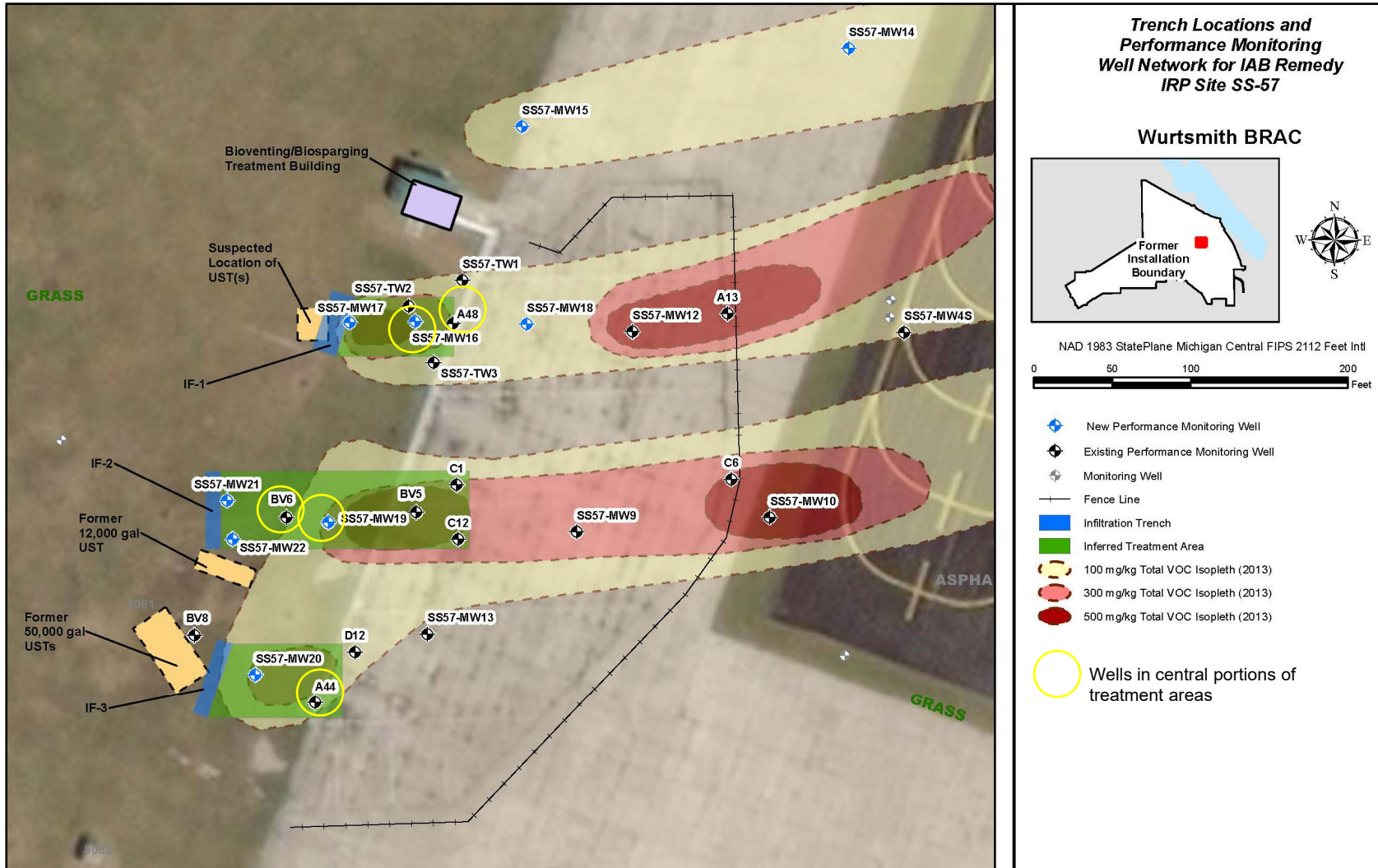
PM Wells Immediately Downgradient from IFs



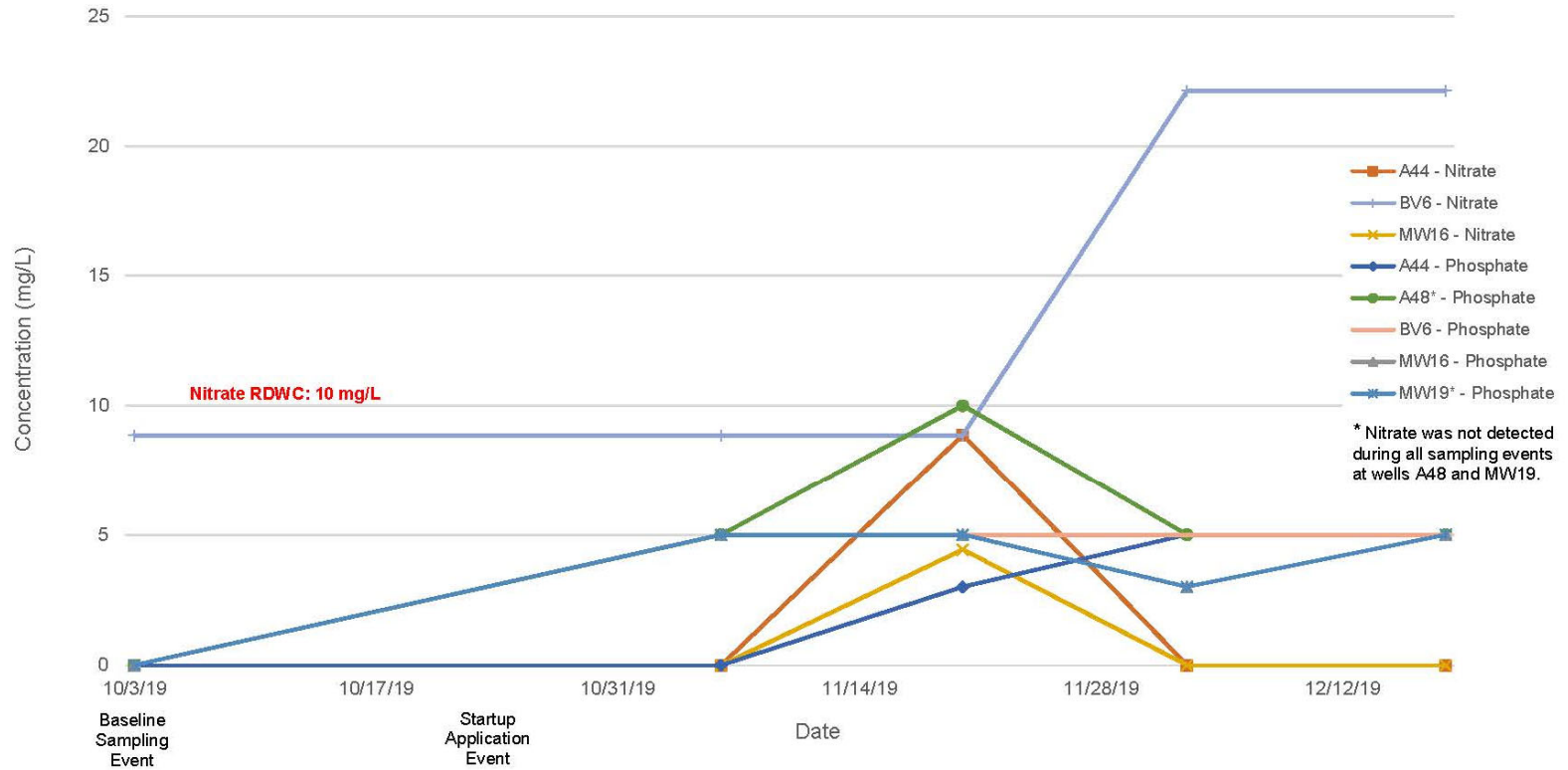
Site SS-57 - Startup Performance Monitoring
Wells Immediately Downgradient from Infiltration Trenches
Nitrate and Phosphate



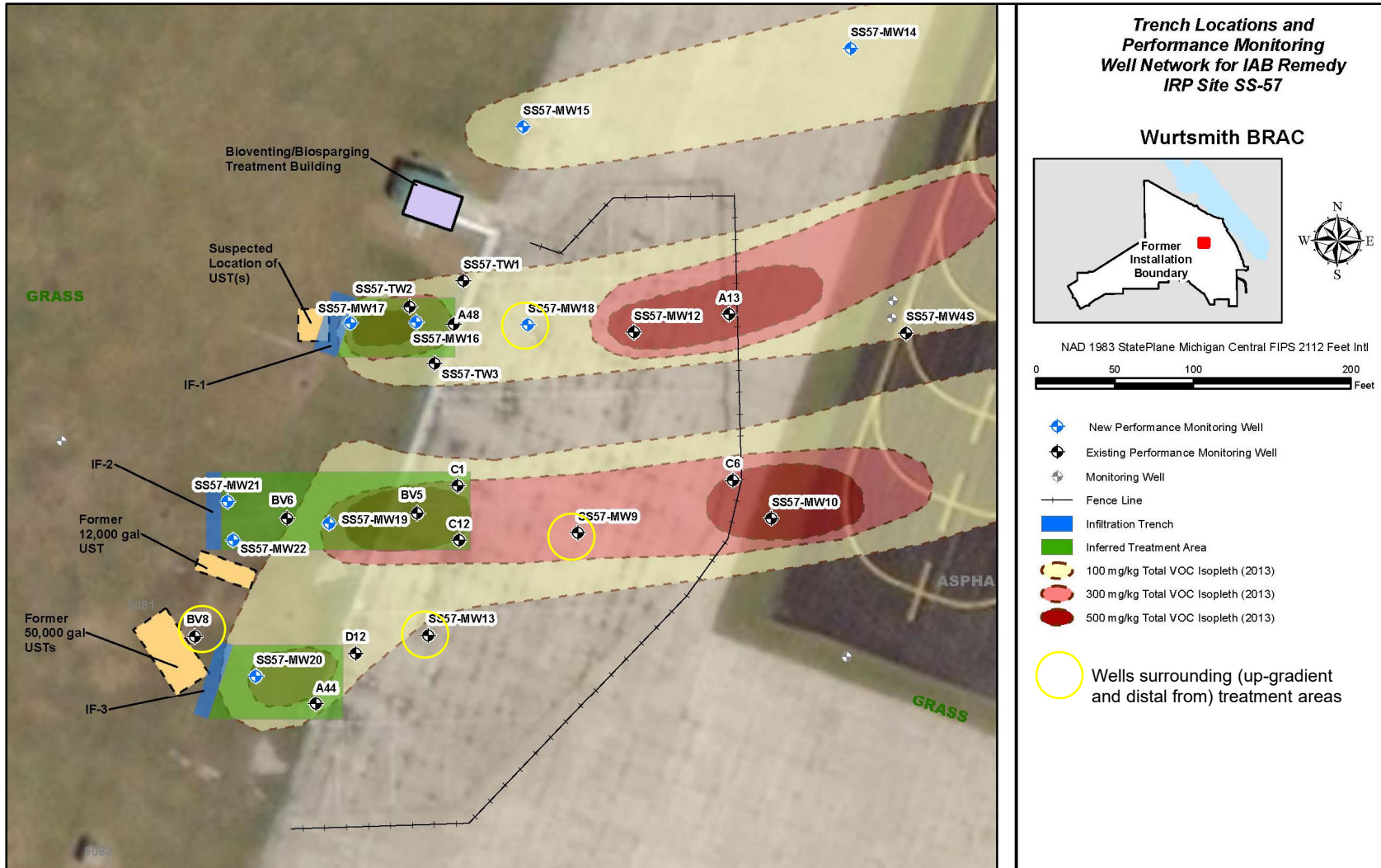
PM Wells in Central Portions of Treatment Areas



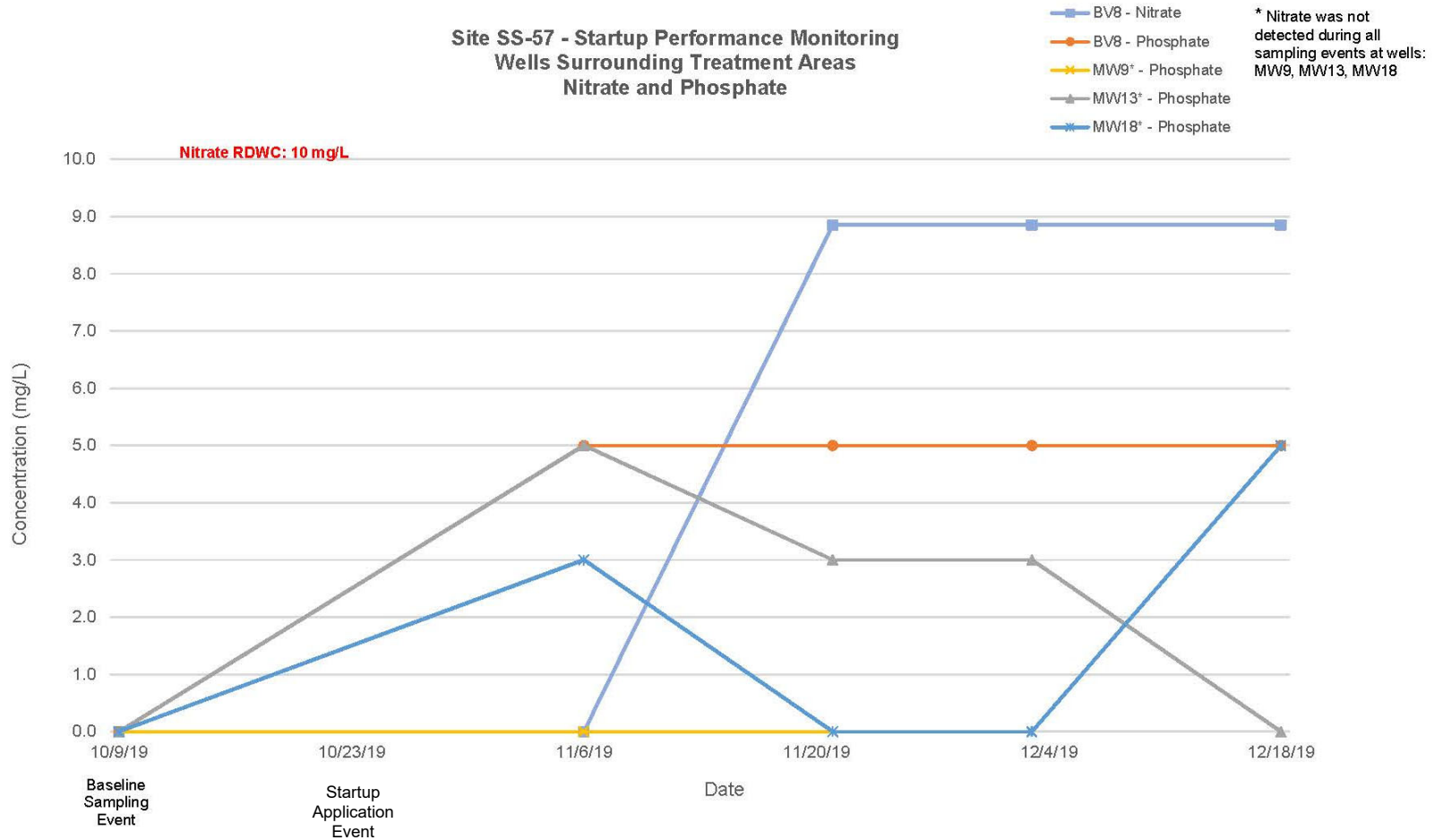
Site SS-57 - Startup Performance Monitoring
Wells in Central Portions of Treatment Areas
Nitrate and Phosphate



PM Wells Upgradient and Distal from Treatment Areas

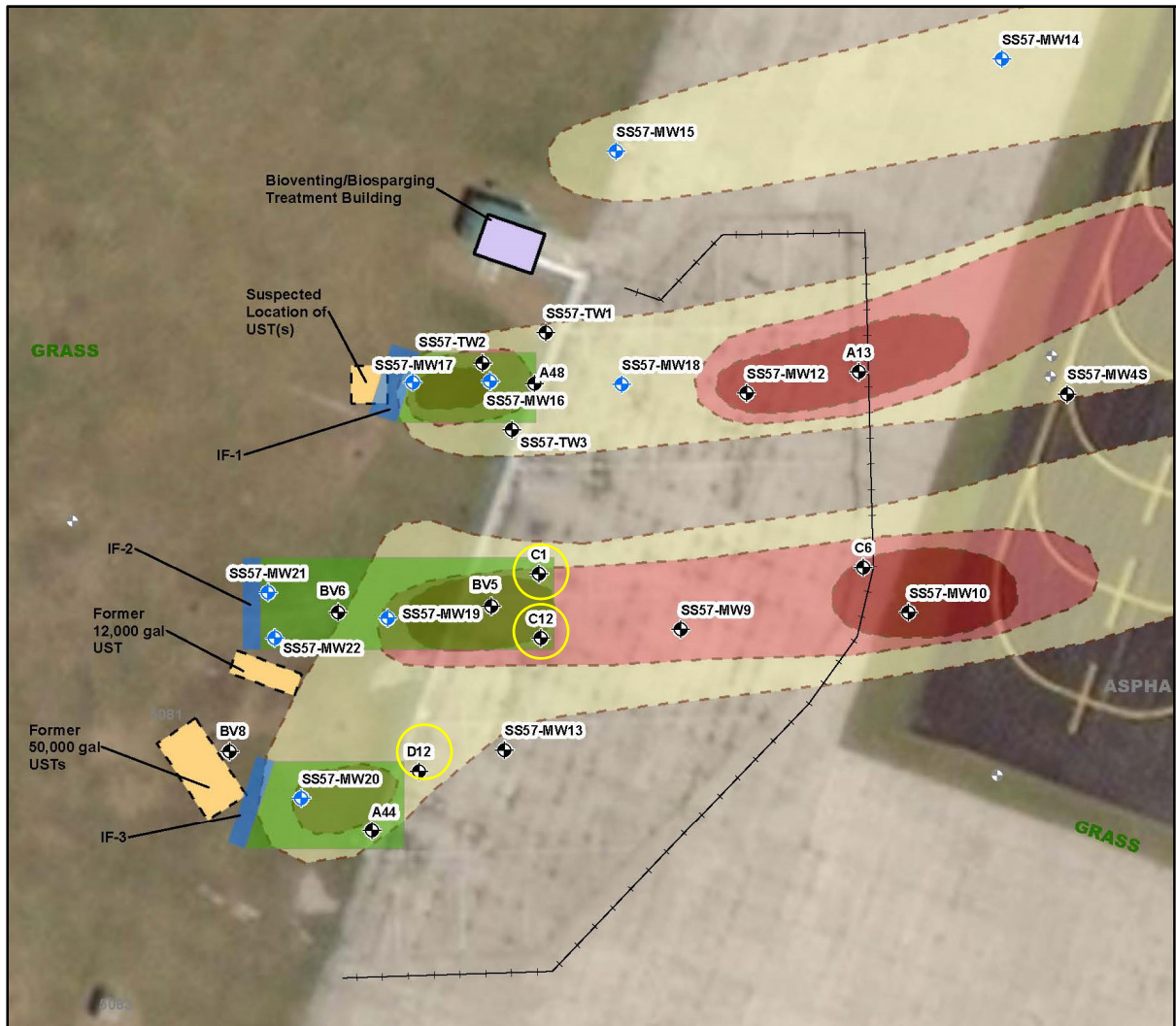


Site SS-57 - Startup Performance Monitoring
Wells Surrounding Treatment Areas
Nitrate and Phosphate



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Deep (40 ft bgs) Biosparge Wells in Treatment Areas



Trench Locations and Performance Monitoring Well Network for IAB Remedy IRP Site SS-57

Wurtsmith BRAC

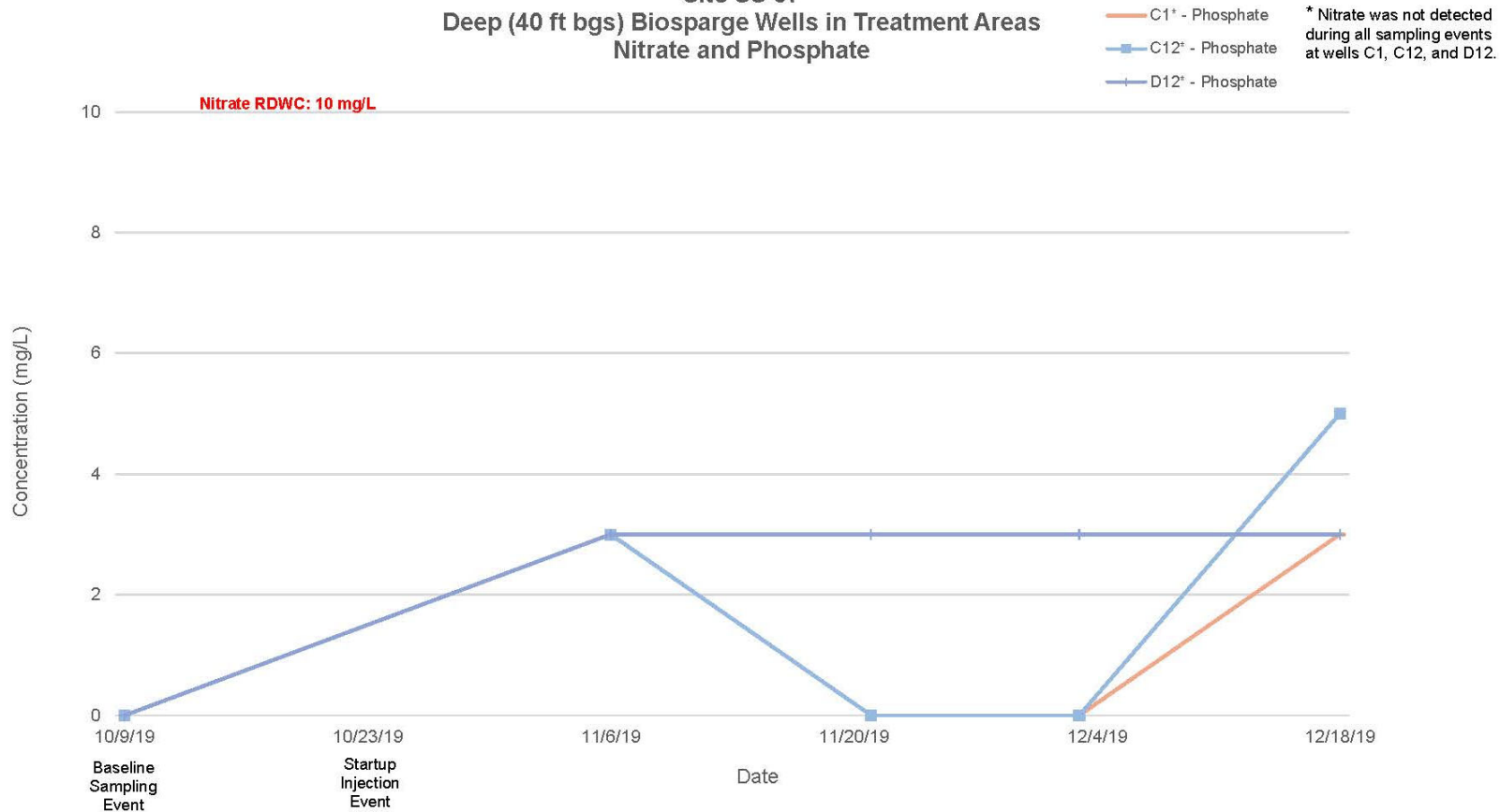
NAD 1983 StatePlane Michigan Central FIPS 2112 Feet Intl

- New Performance Monitoring Well
- Existing Performance Monitoring Well
- Monitoring Well
- Fence Line
- Infiltration Trench
- Inferred Treatment Area
- 100 mg/kg Total VOC Isoleth (2013)
- 300 mg/kg Total VOC Isoleth (2013)
- 500 mg/kg Total VOC Isoleth (2013)
- Deep wells in treatment areas



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Site SS-57
 Deep (40 ft bgs) Biosparge Wells in Treatment Areas
 Nitrate and Phosphate



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SS-57 IAB Startup Performance Monitoring Results

- **Groundwater mounding did not occur following amendment application**
 - Water table elevations actually declined slightly in the days following application, likely a result of normal seasonal fluctuations
- **The NO₃/PO₄ amendment was successfully delivered to the treatment areas**
 - NO₃ and PO₄ concentrations in treatment areas increased from baseline levels following startup amendment application, with post-startup concentration ranges:
 - NO₃: 22 to 62 mg/L
 - PO₄: 3 to 10 mg/L
 - Maximum NO₃ concentration in the treatment area was 62 mg/L (MW20) — significantly less than 1,800 mg/L inhibiting threshold
- **NO₃/PO₄ amendment did not significantly migrate laterally or vertically beyond the treatment areas**
 - NO₃ and PO₄ detected at low concentrations (<10 mg/L) in wells outside treatment areas and in deep (40 ft bgs) wells (PO₄ only) following amendment application

SS-57 IAB Performance Monitoring Next Steps

- **IAB startup PM results** indicate no changes to amendment application process are necessary
- **Quarterly PM** will be conducted to assess effectiveness of IAB remedy in reducing COC concentrations and guide amendment application schedule
- **Periodic updates** will be provided during BCT meetings, and performance data will be provided in the Annual RA-O Report

Projected Schedule for Future Quarterly PM Events and IAB Applications

Event	Projected Date
Quarterly Performance Monitoring #1	January 2020
Quarterly Performance Monitoring #2	April 2020
Amendment Application #2 to Three Infiltration Trenches	Summer 2020, estimated at May or June* after validated results from second quarterly PM event are available
Quarterly Performance Monitoring #3	July 2020
Quarterly Performance Monitoring #4	October 2020
Amendment Application #3 to Three Infiltration Trenches	Winter 2020, estimated at November or December* after validated results from fourth quarterly PM event are available

Notes:

Initial Amendment Application: 22–24 October 2019

**Date may be adjusted depending upon results acquired from quarterly performance sampling*

Questions?

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