Appendix B

START Site Logbooks

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ALL-WEATHER
JOURNAL
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Fansteel Metals/
FMRI
0001/18-173
10/25/18 — 04/12/19

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— SINCE 1916 —
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— DEFYING MOTHER NATURE —

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Project Fansteel Metals / FMRI

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Protecting people and the environment

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1110 Arrive in Muskogee, OK to meet w/ ODEQ, FMRI + NRC representatives. START M. Brown + EPA B. Cook. NRC - Greg, Linda ODEQ - Libby.

1250 Arrive at Fanshel/FMRI property. For meeting. Traing w/ James Burgess on site access. Currently leasing one building on property for storage has one employee. Bldg. 3 - one leasing on monthly basis. All sumps go into one basin, prior to treatment. Meet Jeff Getz, council w/ FMRI.

1310 EPA discusses reason for visit + possible futur sampling that will take place in Jan-Feb. timeframe.

Michael Brown

- Look @ NPDS permit + data they have from sumps. Same info. in spreadsheets have reviewed.

Training conducted discusses rad monitoring + requirement for an escort while on site.

1320 Begin tour of facility. Stack of soils under tarp According to James, they are not ~~tri~~ of contaminated + not same as secked materials. All WIP pulled out of Pond 3 + all but a few of the sacks have been removed

Outfall 1 - treated
Outfall 2 - stormwater
3 - stormwater
4 - removed in 90s

Liner taken out of Pond 3 when they

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dug it out. Currently wetlands w/in. No confirmation sys. taken after removal. Photo of hose from Sump to treatment, above ground Incepter trench cleanouts present. Photo. Trench underground. Observe washouts along fence to Arkansas River. Observe + take photos of liner patches + tears w/in Pond 9.

Sodium Reduction bldg. w/ 1-ton sacks of WIP ~~FM~~ 2 2K sacks from Ponds 5, 1S + 1N. Been in bldg. since '95. Ponds 8 + 9 have 1 leak detection sys. Pond 2 still in progress. Began digging but didn't complete.

Blue bags, WIP + ammonia ~~M20~~ blue bags + 2 WIPs 40 — Michael [illegible]

1500 Take radiation survey of hands + feet before departing NRC license area.

1510 Sintering Bldg has pit under it to catch cooling tower water 7-12' bgs Paint booths w/in bldg w/ sand blasting. According to James - dry process. Bldg. vacated ~ 2 months ago. When Fansteel had the bldg. they grided + heated metals. Fansteel would clean Tantulum here w/ solvent. Access points to pit w/in bldg. + pit concrete lined. 2 ~~m~~

Bldg. B - had large equipment that went 3 stories below slab. Filled in w/ sand + concreted over. Electron Beam Furnance.

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had another pit w/in it for cooling tower ~ 8' bgs 12' long, 5' wide. —— Bldg. 3 currently leased to company for storage of tile, ceramic tile, powder. ——

1600 START, EPA, NRC, ODEQ + FMRI attorney depart site. Several photographs taken during the tour. Photos will be documented within a seperate photo log ——

Michelle [signature]
10/25/18

04/01/19 0001/18-173

1045 STARTs Criner + Brown arrive onsite at Fansteel. Meet with James Burgess of FMRI + go through site safety training. ODEQ already onsite + performing recon.

1130 Meet with ODEQ. and begin reconning wells ODEQ, Libby, Hal, Michael, Hank + Kelsey. ODEQ taking water level measurements to see if bladder pump necessary. One well 65S found @ 25.1 ft. Three MWs, 58S, 59S + 60S could not be found. All other wells found + accessible. MW-74S is dry. MW-63S not on figure but found by building 5. ——

1250 ODEQ completed their recon + done for day. ~~Seems~~ START +

—— Michelle [signature]

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ODEQ Scan out for day. Car doesn't need to be scanned if stay on roadways since they are scanned daily. (paved or unpaved).

1310 Talk to James about missing MWs. They were removed when inceptor trench was constructed. (58,59,60).

1315 Depart site and head to Tulsa, OK. —

Late entry 1538 - each well has a dedicated boiler associated with it. Will modify sample schedule based on observations.

Michael Green

04/08/19 0001/18-173

0715 Arrive at Fansteel site. START M. Brown + S. Hettinger w/ EPA B. Cook, P. Ofusu, + L. Turner. Meet w/ ODEQ, NRC + EPA G. Fife. Go to White House + begin organizing samples for first sample collection of SS. Soil Stockpile.

~~Hettinger~~

0800 Hettinger receives site training from J. Burgess of FMRI. Continue organizing Command Post at White House.

0845 ODEQ returns from collecting SS sample. Scan personnel, samples, PPE before entering White House. Keeping a seperate logbook for scanning.

Mike Green

Rite in the Rain

04/08/19 0001/18-173

0850 Holding H+S Mtg.
Cell numbers for personnel
Libby McCaskill 405-436-5701
LaDonna Turner 214-212-1732
Sean Hettinger 609-666-9608
Brenda Coot 214-680-9776
Hal Cantwell 405-627-1170
Michael Lea 918-289-3743
Marti Poston (NRC) 713 376 1891
Philip Ufosu 214-704-6327
Greg Fife 214 789 2879
Discussed scanning. Hydration. Hospital locations.

0920 Prepare sample jars for Sintering bldg. sump sample. James Burgess shows ODEQ access point to sump location within bldg.

1045 George ~~Beroski~~ Brozowski sp? from EPA arrives on site. Call J. Wright to confirm sample

— Mike [signature]

04/08/19 0001/18-173

bottle counts for ~~a~~ 2g radionuclide analyses. 1-16 oz bottle for solids for all rad anayses. Late entry - at 0950 ODEQ collects water sample SB. No sediment could be collected at location SB.

1130 START J. Criner + S Nguyen arrive on site + S. Nguyen goes through facility H+S training.

1155 ODEQ team returns from P3 sample collection. Scan out personnel, equipment, + samples.

1230 Lunch Brezk
G Brozowski 214-755-1530

1330 Return from lunch. ODEQ at Ponds collecting additional samples. Brought 10 bags of 20lbs.

— Mike [signature]

ict. Process samples collected for day
1745 Packaged samples in coolers with ice taken to FedEx for next day shipping. — All volatiles collected during the day shipped out. Have 7 remaining coolers that we are icing + wrapping up for COC + locking up for night. —
See Scribe database for samples shipped today. —
1830 START, EPA, ODEQ and NRC depart site for day. —

Mick

0700 Arrive on site at Fansteel. Begin prepping sample containers at White House for day.
0725 H+S meeting. Hot today, take breaks + stay hydrated. Keep dust down while driving. Watch for ticks. One found on someone yesterday. Boat sampling taking place today. Will have START GW sampling seperately from ODEQ. Two sampling teams today. —
0930 STARTS Brown + Hettinger depart site to ship 8 coolers. All samples collected 4/8 have been shipped.
1030 Samples SW/SED-BKG + SW/SED-N-DRNG delivered to White House for processing. —

Mick

1130 Sample MW-64S with MS/MSD delivered to White House for processing. Scanned out at 1141.

1400 ODEQ has finished collecting + has delivered OF1 and OF2 locations. Boat operations are done.

~~1530 Omg~~ 1415 START has completed the collection of MW-53S and MW-DUP1 and delivered it for processing.

1430 Late entry - ITC tribal representatives have been on site receiving a tour from EPA Turner of the facility property and an update on site activities.

1530 ODEQ has delivered OF3 and DUP2 (SED + SW) for processing. This sample appears to have a precipitate prsent in the bottles containg Nitric Acid preservative.

1640 START begins delivery of MW-54S samples for processing.

1730 All samples collected for the day have been processed, placed on ice and sealed in coolers for shipping. ~~25~~ mg 17 coolers are sent to Fed Ex for shipping. Total of 25 coolers for day. Sample completed include SS, SB, OF1, OF2, OF3, OF5, BKG, N-DRNG, P3, P6, P7, P8, P9, MW-64S, MW-53S, MW-54S and MW-DUP1

— Michael [signature]

Rite in the Rain

0710 Arrive at Fansteel.
START, EPA, ODEQ.
0725 EPA George B. conducts H+S meeting. Windy day expected. Ticks found yesterday. Use bug spray + tuck in pants into boots. Give update on samples. Completed scheduled surface water and sediment / soil sample locations. Completed 3 MWs. Shipped total of 32 coolers to date.
0740 START + ODEQ sampling teams depart to begin sampling for day.

0950 START sample team returns w/ sample from MW-68S location. Scans out sample + themselves. ODEQ team reporting that OW8 is slow to

Michele Brown

recharge. Will allow it to recharge after purging and move to another well.

1010 Process sample MW-68S-20190410

1110 Adding sample from stormwater collection basin to collection list. Will call it SCB location. Well 51S only 100 ml/min. with slow recharge.

1330 Samples 51S, 69S, DUP2 and some of OW8 have been collected and are being processed for shipping.

1430 START returns sample 55S for processing.

1500 START Brown + EPA Cook collect a sample from the stormwater collection basin (SCB). There is a dead frog floating

Michele Brown

in the water, but water appears clear.

1522 Scan out personnel and sample SCB + begin processing sample

1615 Receive sample 75S for processing.

1420 Receive sample 56S for processing.

Late entry 75S scanned out prior to processing.

1730 Leave to deliver 9 coolers. One cooler with just volatiles, + one cooler each for samples OW8, DUP2, 69S, 75S, 51S, 68S, 56S, + SCB.

1810 ODEQ brings in more of OW8. 3 bottles remaining to be collected. one SVOC container + 2 Radioisotope containers.

1850 START returns

with sample 52S for processing.

1900 Placing 3 coolers one for OW8, one for 72S, ~~pt 7~~, and one for 52S placed on ice under COC for night + delivery tomorrow.

1915 Remaining START + EPA depart site for day.

Rite in the Rain

0705 START arrives on site.
0720 Begin H+S meeting EPA George B conducts. Winds from yesterday not occuring today. Take breaks, stay hydrated.
0750 START + ODEQ teams depart to begin sampling for day.
0920 ODEQ finished the collection of OW8 and are working on 71S.
1005 Sample OW3 returned for scanning + processing.
1220 Sample 71S returned for scanning + processing.
1340 Receive sample 70S for processing + received sample OW9 earlier at 1230. All samples scanned prior to processing.
1400 START sampling team working on MW-57S + DUP3.
1430 ODEQ sampling/

Mick

MW-63S.
1535 START returns with sample 57S + DUP3 for scanning + processing.
1615 ODEQ returns with sample 63S for scanning + processing.
1720 START returns with 62S sample for scanning + processing.
1740 START takes 12 coolers to FedEx for shipping for day. Samples OW8, 52S, ~~S~~ 72S, 71S, OW3, OW9, 57S, DUP3, 70S 63S and 62S shipped today.
1830 START sampling team collecting OW-6.
1840 ODEQ returns 67S for scanning + processing. Sample is an amber color and has an odor to it. The sample is placed on ice

Mick

Rite in the Rain.

and sealed for locked storage overnight + shipping tomorrow.

1915 START sample teams returns sample owle for scanning. Sample placed on ice and sealed for locked storage overnight + shipping tomorrow.

1930 START, EPA and ODEQ depart site for day.

0700 START arrives on site. ODEQ already on site. EPA arrives on site.

0730 H+S meeting. Remember to scan out. 3 wells left to sample. Will ensure all trash scanned + will dispose of as municiple waste. Keep a look out for ticks + continue to spray. Weather will be cool but continue to hydrate.

0800 EPA B. Cook confirmed with ODEQ Libby McCaskill + NRC Marti Puston that if all PPE trash is layed out + scans with readings < 200 c/m that it can be disposed of as municipal trash.

0815 Background reading between 45-50 c/m.

0820 Lay out visqueen & scan. Reading between 50-65 c/m. Lay out PPE & scan. Waste Includes gloves, tubing wipes, trashed visqueen & a couple of drink containers. Scans read between 50-65 c/m. Bag 1 of waste scanned out.

Note. - in addition to scanning PPE, all personnel & samples have been scanned daily & readings are kept in a seperate logbook.

0825 Bag 2 layed out for scanning. In addition to the waste listed in Bag 1, Bag 2 also includes some food trash items. Readings between 40 - 55 c/m.

0830 Lay out Bag 3 for scanning. In addition to waste listed in first 2 bags, this bag includes tyvek, additional bags & unused bottles. Reading between 35-60 c/m. The tyvek is being cut-up to make it unwareable.

0835 Scan Bag 4. Waste includes items in previous bags. Readings between 40-55 c/m. Wipe ~~cons~~ used to clean cooler reading at 100 c/m yesterday at 67 c/m & can be trashed w/ other waste in Bag 4. START Hettinger scans out at 53 c/m. EPA Cook scans out at 53 c/m as well.

0850 All 4 bags are

closed + labled + ready for municipal waste. —
0955 Sample OW5 scanned + returned for processing. —
1040 Sample 65S scanned + returned for processing.
1130 Start housekeeping while ODEQ still working on OW4 sample location
1235 Bag 5 of PPE trash from today's activities scanned by NRC Marti Pustan and deemed at background and alright to dispose of as municipal trash.
1300 EPA, START + ODEQ depart site. End of sampling event at Fansteel. START to head to Tulsa to ship samples, + empty coolers to lab + equipment to RES warehouse. 5 cooler to

be shipped today with samples OW6, 67S, OW5, OW4 + 65S. —

FedEx

dress:	2121 NORTH 85TH EAST AVENUE TULSA OK 74115
ocation:	RVSA
vice ID:	-BTC04

dEx Express Package(s) - Dropped Off
30978324315 48.7 lbs. (S)

dEx Express Package(s) - Dropped Off
30978324484 28.7 lbs. (S)

dEx Express Package(s) - Dropped Off
80978325712 47.6 lbs. (S)

FedEx Express Package(s) - Dropped Off
480978324473 49.5 lbs. (S)

FedEx Express Package(s) - Dropped Off
480978324576 48.5 lbs. (S)

Total P

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 04/12/19 0001/18-173

End of Logbook

William Dean

Rite in the Rain

Weston Groundwater
Sampling Team

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TDD 0001/18-173

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2 04/08/19 TDD 0001/18-173
Fansteel Metals / FMRI - Muskogee, OK
Michelle Brown (PL) - Weston
Jeff Criner - Weston
Stephen Nguyen - Weston
Equipment: ~~Multi~~ miniRAE PGM 732C
Ludlum - RFW 23678

1400 Testing ~~Multi~~ miniRAE with Isobutylene
PASS 95.1 ppm

1405 Loosened cap. - No readings miniRAE.
20 µR/hr reading in the area. 4in. PVC well w/ dedicated bale w/ protective cap and lock. Dust is in casing beneath protective cap.

1408 Left well. Left unlocked and loosely capped
NOTE. ~~Weston~~ EPA Ludlum background is 1-10 µR/hr
Action level is 2x amount. ~~EPA~~ Weston Ludlum is reading ~30 µR/hr background.

1417 705 well. Cap lock is broken. 30-36 µR/hr
general survey: Slip cap. No compression cap. 0.0 ppm isobutylene. Dedicated bailer. 4-in well. Debris scattered around well.

1416 555 well. By railroad tracks. In good condition. No debris nearby. 15-18 µR/hr. 0.0 ppm isobutylene. Compression cap modified to hang bailer. No compression ability. 4-in well.

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Fansteel Metals / FMRI - Muskogee, OK

[1422] 68S well. Possible prairie dog hole against slope heading up to well. 4-in well. Compression cap modified to hang bailer. Compression is not possible. Clear of debris. 12-14 μR/hr. general reading. 0.0 ppm isobutylene. Fmr. sewage lagoon b/w pond 3 berm and slope leading up to well ——— 6

[1429] 69S well. Compression cap has a hole in it, dolled-in. 11-13 μR/hr general reading. 0.0 ppm isobutylene. Site is past NE gate on ~~w~~ 6 slightly uneven ground ——— 6

[1432] MW-OW8 observation well. Compression cap was sitting loosely atop. 2-in well encased in square black casing. 18-20 μR/hr. 0.0 ppm isob.

[1436] 75 monitoring well. 20-22 μR/hr. general reading. Slip-cap only. 0.0 ppm isobutylene. Area is beside a sump station. ——— 6

[1443] MW-~~75S~~ 6 72. Marked by blue drum and piece of rebar. Area is by a sump ~~tank~~. 18-20 μR/hr general reading. Slip-cap only. Ants in well head. Area is in Former Basin 5.

[1450] MW-74S. Marked by blue drum and piece of rebar. Area slightly overgrown. Compression cap has a hole in it. 15-16 μR/hr general reading 0.0 ppm isobutylene. Smell coming off Basin 5. Late in the Rain.

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Faustel Metals / FMRI - Muskogee - O

1454 MW-71S. Marked by blue drum piece of rebar. By a debris pile. Compromised compression cap w/ a screw embedded 27-30 μR/hr general reading. 0.0 ppm isobutylen Cap is unmarked. Gauges in the ground from tires. Adjacent to power lines.

1500 Lightly rinsed down truck wheels

1505 MW-65. Located behind. Chem A' buildin Slip-cap. No debris around well. 0.0 ppm isobutylen 15-17 μR/hr generalized reading.

1512 Frisked-out

04/8/19

04/08/19 TDD 0001/18-173 — 5

Fansteel Metals / FMRI - Muskogee, OK

1528 MW-63S. 4-in. well. Screw - compromised compression cap. 14-16 μR/hr general reading. 0.0 ppm isobutylene. Built-in bailer

1532 MW-54S. Loose & saturated ground around well. 4-in well. Slip-cap. Built-in bailer. 0.0 ppm isobutylene. 15-17 μR/hr. Out by a gravel pad.

1537 MW-51S. Out in grassy area. Well casing is tilted ~30° from vertical. 11-13 μR/hr generalized reading. Base-lock ring on well is damaged. 4-in well w/ 2-in bailer. 0.0 ppm isobutylene

1543 MW-53S. Concrete around casing is fractured. Slip-cap. 4-in well. Built-in bailer 10-12 μR/hr general reading. 0.0 ppm isobutylene. Discarded metal 15 ft. away

1548 MW-OW3. By the berm of Pond 8. 2-in well. Top of well is 2 ft. below casing. Compression cap is loose. 0.0 ppm isobutylene 12-14 μR/hr general reading. No bailer.

1556 MW-56S. Cap was fand off 4-in well w/ built-in ~~bailer~~ bailer. 0.0 ppm isobutylene. Slip-cap. 10-12 μR/hr

Rite in the Rain.

04/08/19 TDD 0001/18-173

Fansteel Metals / FMRI - Muskogee, OK

~~MW-~~ [1602] MW-565. Terrain is muddy and could prove challenging to get to with vehicles. Slip-cap. 0.0 ppm isobutylene. 8-10 μR/hr general reading. Saw animal scat with rodent-sized bones. 4-in. well. Right-side of road going in appears to be more conducive to vehicle access.

[1613] MW-0W9. Locked. 15-16 μR/hr general reading. Vehicle access could be challenging. Found animal burrows.

[1619] MW-0W7. 2-in well. Compression-cap. Behind sump station. Compression cap was on tight. 0.0 ppm isobutylene. 9-11 μR/hr general reading.

[1623] MW-575. No cap on casing. 4-in well. Compression cap is compromised with screw for built-in bailer. Wasp nest inside. Water around ~~we~~ 2 4-in casing surrounded by water inside protective casing. 16-18 μR/hr general reading. 0.0 ppm isobutylene. Protective casing seems more oxidized and dented than the others encountered.

[1629] MW-625. 4-in well. Lock ring is broken off protective casing. Slip-cap. Built-in bailer. 0.0 ppm isobutylene. 14-15 μR/hr general reading

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Fansteel Metals / FMRI — Muskogee, OK
1632 MW-OW6. Located at the fence-line. 2-in. Compression-cap. 0.0ppm isobutylene. 12-13 uR/hr general reading. Large plastic sheeting adjacent to well. Arkansas River immediately in view

1636 MW-675. Located by blue drum and piece of rebar. Well near by large debris dump and wash-station. 4-in well. Slip-cap. Protective casing ~~to~~ lock ring is broken. 0.0ppm isobutylene. Built-in bailer. 18-20 uR/hr general reading.

1640 MW-OW5. Concrete around well is fractured. 2-in well. Compression-cap is on tight. Wasp nest. 0.0ppm isobutylene. Location behind sump station. River is immediately adjacent. 20-21 uR/hr general reading. Down-slope of debris dump & wash station.

1645 MW-OW4. Well concrete pad in good condition. 2-in well. Compression cap is loose and covered with ants. 0.0ppm isobutylene. 18-20 uR/hr general reading. Immediately adjacent to fence. Downslope from buildings. River is about 40yds. away.

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8 04/08/19 TDD 0001/~~19~~ 18-173 —
Fansteel Metals / FMRI - Muskogee, OK —
[1652] Vehicle washed. 2-9 μR/hr reading. —

04/09/19 TDD 0001 / 18-173 9

Fansteel Metals / FMRI - Muskogee, OK

0730 Safety meeting & gathering of supplies.

~~0800 MW-64S.~~

Personnel: Jeff Criner - Weston
Stephen Nguyen - Weston

Equipment: Geopump RFW21142
Heron Water Level Meter RFW21139
Trimble
LaMotte Turbidimeter WSH00460
YSI Professional Plus RFW23867

0800 MW-64S. Picture 0811.
MS/MSD

Casing: 4-in.

Total Depth (TD): 32.19 ft

Static Water (SW): 23.00 ft

~~Length of Water (LW)~~ 1 well vol: 5.97 ft.

Notes: - Further detail, see Field Data Sheet.
- Could only lower down 25.6 ft of tubing + water meter before loss of tension in the lines.
- YSI Calibration: DO% PASSED @ 100%
Conductivity at 1514 µs/cm @ 20.9
pH 7 PASSED @ pH 7.04

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 09/09/19 TDD 0001/18-173 —
Fansteel Metals / FMRI – Muskogee, OK.
· YSI Calibration cont'd. —
— pH 4 passed at 3.98-4.02, 4. —
— pH 10 PASSED @ 10.21 pH m —
— ORP PASSED @ 246 ORP mV —
Turbidimeter: NTU 0.0 (6/11/18) – 0.42 PASS —
— NTU 10.0 (6/11/18) – 10.62 PASS —

0937 YSI measurements have not yet stabilized. pH, temp, turbidity, SPC, and flowrate stable. Canadian Geese and local song birds nearby.

0943 Decreased flow rate to test stabilization of ORP. No success of bottom found. Decision made at 0947 to begin filling samples. —

0950 VOAs taken. ORP held steady at 12 mV for a few minutes, then jumped to 19-20 mV for a bit, then went down to -15 mV. —

0957 Sampling PCBs in 1L amber bottles. Sample 19.2°C, 1.56 DO%, 868 SPC, 6.16 pH, -22.2 ORP mV. —

1027 1 mL polys filled. —

1058 19°C, 0.42 % DO mg/L, SPC 796, 6.15 pH, -37.4 ORP mV. ORP has been ~30 mV for the past 20 minutes. —

1110 Cyanide & metals sampling begins —
Lost ~45 minutes held ~19-~20 ORP mV.

04/09/19 TDD 0001/18-173

Fanstee/ Metals / FMRI - Muskogee, OK

1202 MW-53S. Photo 1238

Casing : 4-in. + Dup

TD : 35.49 ft

StW : 26.52 ft.

1 Vol ~~LoW~~ : 5.83 ft.

Depth of Sample: 29.66 ft → 31.50 ft @ 1227 because of bubbles in the in-line

1219 Begin purge.

1250 Numbers stabilized.

1254 VOA samples taken

1258 PCB 1 L amber samples taken.

1312 RA 226/228 1 L poly. samples taken.

1320 SVOC - 1 L ambers ~~X~~ samples taken

1336 Back to RA 226/228 1L poly sampling

1405 250 mL & 60 mL TAL & Cyanide Sampling

1409 End of sampling. Final StW is 26.58 ft.

Note: ~~Sample~~ Did not encounter unstable readings this time. Sunny outside at 83°F

Rite in the Rain

04/09/19 TDD0001/18-173

Fansteel Metals/FMRI - Muskogee, OK

1535 Arrived a MW-54S.

1549 Begin purge.

Well MW-54S. 4-in. Photo 1601

TD: 31.91 ft

StW: 19.35 ft.

1 well vol: 8.16 Depth of sample intake 27.89

1555 Took water flow but realized sensor chamber was installe incorrectly. SPC sensor was not receiving well water.

1558 Flow rate: 420 mL/min Temp: 18.7°C SPC: 299.9 µS/cm

ORP: 229.4 mV ~~Redox~~ DO: 4.46 mg/L 5.48 pH

1633 Begin sampling VOAs

1635 Sampling PCB 1L Ambers

1641 Sampling SVOC 1L Ambers.

1648 Sampling RA 226/228 1L poly

1652 Break to fill TAL & Cyanide for expedited sample processing

1655 Resume sampling of RA 226/228 poly

1701 End of sampling. Final StW = 20.13 ft.

Note: Sunny @ 91°F. Temperature while purging was oscillatory.

04/09/19

04/10/19 TDD0001/18-173

Fansteel Metals / MRI - Muskogee, OK

0750 Arrived at MW-68S. Photo 0811

Well MW-68S 4-in.

TD: 29.17 ft. — YSI Calibration

SWL: 15.95 ft. — SPC: 1420 µS/cm

Low: 8.59 ft. — ORP: 244 mV

Depth of sample: 28.00 ft. pH 10: 10 ppm

pH 7: 7 ppm

Turbidimeter: 10.6/10.0 pH 4: 4 ppm

All within 0.01 ppm

0816 Begin purge.

0818 Initial flow measurements. See field data sheet for details. Temp: 17.8°C SPC: 359.7 µS/cm ORP: 240.7 mV DO mg/L: 3.02 pH: 6.86 Turb. 6/5.9 NTU

0852 All readings stabilized except ORP.

0855 Begin sampling VOAs.

0857 Begin sampling 1 L amber PCBs.

0903 Begin sampling 1 L amber SVOCs

0908 Begin sampling TAL & Cyanide

0910 Begin sampling Ra 226/228 Poly

0922 ~~Final~~ End sampling. Final SWL = 16.6 ft

Conditions: Sunny, Winds from South @ 18 mph

70°F

04/10/19

 04/10/09 TDD 0001/18-173 —

Fansteel Metals / FMRI - Muskogee, OK.

1005 **MW-51s** Arrived on site

Well casing 4-in —— Photo 1030 —

TD: 34.31 ft. ——

~~StW~~ StW: 28.09 ft. ——

~~LoW~~ 1 well vol 4.04 ft. ——

Sampling depth: 32.06 → Changed to 33.00 ft @ 1025 b/c of airbubbles in in-take tubing. —

Conditions: Sunny, 21mph winds from South, 75°F

1019 Begin purge. ——

1025 Changed depth of sampling to 33.00 ft.

1033 Initial readings on max pump rpm are Temp: 20.7

SPC: 564 µS/cm ORP: 165.9 mV DO: 6.64 mg/L pH: 6.76 Turb: 1.8

1057 Begin sampling VOAs. VERY low flow ~90 mL/min NTU

1059 Begin sampling 1L amber PCBs

1124 Begin sampling TAL & Cyanide. Spilled cyanide bottle. Switched to SVOCs 1L amber sampling and sent for another cyanide sample container. ——

126 Began sampling 1L amber SVOCs. ——

37 Paused SVOC sampling to re-sample cyanide.

41 Resumed sampling SVOC. ——

51 Began sampling 1L poly Ra 226/228 ——

veraging ~10 min/L. ——

38 End of sampling. End StW = 29.39 ft —

52 Housekeeping, sample drop off, decontamination —

04/10/09 TDD 0001/18-173 —
Fansteel / Metals / FMRI - Muskogee, OK
[1318] MW-55S. Arrived onsite. Sunny, 84°F
24 mph winds from the South. —
TD: 24.91 ft. — Well casing 4-in —
SWL: 14.42 ft. — Photo 0144 —
1 well vol: 6.89 ft. —
Depth of sampling: 21.93 ft. —
[1333] Begin purge. —
[1338] Initial readings are Temp: 16.9°C —
SPC: 111.5 ORP: 238.4 DO: 7.80 mg/L pH: 5.26
For more details see Field Data Sheet —
[1408] Begin sampling VOAS. Flow @ 342 ml/min.
[1412] Begin sampling 1L amber PCBs.
Note: Before sampling, all readings had stabilized except for turbidity. See Field Data Sheet.
[1417] Begin sampling 1L amber SVOCs —
[1423] Begin sampling 1L poly Ra 226/228 —
[1435] Begin sampling TAL & Cyanide —
~~[1435] B~~ —
[1436] End sampling. Final SWL = 14.60 ft.
[1448] Housekeeping, vehicle wash —
[1456] Sample drop off, decontamination —

04/10/09

Rite in the Rain

04/10/19 TDD 0001/18-173 —
Fansteel Metals/FMRI - Muskogee, OK
1510 Arrived at MW-56S. Sunny, 88°F
24 mph wind coming from the South.
Well casing: 4-in. — Photo 0330 —
TD: 20.17 ft.
StW: 13.99 ft.
~~Length~~ 6.02 ft.
Depth of Sampling: 19.00 ft.
~~1525 Begin purge.~~
1525 Begin purge.
1532 Initial flow readings Flowrate 284 mL/min.
Temp: 16.8°C SPC: 1253 µS/cm ORP: 250.9 mV DO: 3.19 mg/L
~~DO:~~ pH: 6.48 Turbidity: clear @ 6.19 NTU
1606 Flow rate 272 mL/min. Turbidity gradually dropping. Begin sampling VOAs.
1609 Begin sampling 1 L amber PCBs
1615 Begin sampling 1 L amber SVOCs
1621 Begin sampling 1 L poly Ra 226/228
1635 Begin sampling TAL & Cyanide.
1637 End sampling. Final StW: 15.56 ft.
Note: ORP kept drawing down. At time, -103 mV
Water was observed b/w well & protective casing
1640 Loaded the samples into Philip Ofosu (EPA) truck to expedite processing.
1646 Cleanup, load truck.
1649 Move to MW-52S

~~Stark~~ 04/10/19 TDD 0001/18-173
Fansteel Metals/FMRI - Muskogee, OK
1650 Arrive at MW-~~16~~ 52S. Sunny w/ clouds, 90°F, 25mph winds from South.
Well Casing: 4-in. — Photo 04:53
TD: 20.34 ft.
StW: 15.49 ft.
1 well vol ~~4~~ 3.15 ft
Depth of Sampling: 19.00 ft.
1706 Begin purge.
1713 Initial flow readings. Flow rate 280 mL/min Temp: 17.6°C
SPC: 420.7 µS/cm ORP: 252.1 mV DO: 699 mg/L pH: 6.7
Turbidity: 3.33 NTU ~ clear
1758 Begin sampling VOAs. Flowrate 268 mL/min
Turbidity Oscillates b/w 4-5 NTU.
1803 Begin sampling 1L amber PCBs
1809 Begin sampling 1L amber SVOCs
1818 Begin sampling 1L poly Ra 226/228
1832 End of sampling Final StW = 15.98 ft.
TAL & Cyanide samples taken at same time as VOAs. ORP Stabilized during sampling at ~70 mV
1834 Clean up. Pack-up truck.
1845 Wash truck & dispose water.
1849 Drop-off samples

Rite in the Rain

04/11/19 TDD 0001/18-173

Fansteel Metals / FMRI - Muskogee, OK

0721 Safety meeting. Weather conditions are cloudy and windy. Everyone is doing well with safety. ODEQ will continue pumping at MW-OW8. Spray for ticks and wash hands.

0740 Arrived at MW-OW3. Weather is cloudy, 54°F, 14mph winds from the West.

Calibration:	YSI	LaMotte Turbidimeter
	SPC = 1413/1480 µS/cm	NTU 0.0 (6/11/18) = 0.0/0.49
	pH 4 = 4.00/3.99	NTU 100 (6/11/18) = 100/10.57
	pH 7 = 7.00/7.02	
	pH 10 = 10.00/10.18	
	ORP = 240/250 mV	

Equipment used: YSI Professional Plus RFW 23867

LaMotte Turbidimeter WSH 00460

geopump-peristaltic RFW 21142

Heron dipper-T water level meter RFW 21139

Well casing: 2in — Photo 08:07

TD: 29.46ft — Time of purge: 0821

SWL: 20.18ft. — Personnel: Philip Ofosu (EPA)

LWL: 9.28 ft. — Jeff Cramer (Western)

1 well volume: 1.48 gal — Stephen Nguyen (Western)

Depth of sampling: 28.0ft.

04/11/19 TDD 0001/18 - 173

Forsteel Metals / FMRI - Muskogee, OK.

0822 First water up the tube had black sediment.

0826 Flow ~ 230 ml/min. Turbidity 12.32 NTU

0828 Flow has stalled. Proceed to remove tubing and water meter. Separated the two which were zipped together. Re-inserted tube & tested water level. Water level is at 20.26 ft.

0836 Restart purge. 22.01 - 22.03 ft. from protective casing. 0.03 ft drop in 30 seconds @ 280 ml/min flow.

0842 Stabilized flow. Likely a kink in the line going through peristaltic pump. Initial readings: Flowrate = 188 ml/min Temp: 17.1°C SPC = 1840 µS/cm ORP = -102.9 mV DO = 0.84 mg/L pH = 6.82 Clear - Turbidity = 11.51 NTU and water level = 20.58 ft.

0919 VOAs, TAL, Cyanide. Sampling began. ORP steadily & gradually moving into the positives. DO gradually moved up to 0.86. All other readings are steady.

0924 Began sampling 1L amber ~~PCB~~ SVOCs. Water level is steady at 20.55 ft.

0933 Began sampling 1L amber PCBs

0942 Began sampling 1L poly Ra226/228

1002 End of sampling. Final water level 20.62 ft.

Rite in the Rain.

04/11/19 TDD 0001/18-173

Fansteel Metals / FMRI - Muskogee, OK.

1014 Arrived onsite to check water levels of MW-AW9 on com. Jeff & Philip went to dump purge water.

Conditions are cloudy. 52°F. 11mph winds from West.

Well casing: 2-in. Plate: 1056

TD: 30.25 ft MiniRAE (PGM 7320)

SWL: 22.50 ft Isobutylene: 9.68 ppm.

Low: 7.75 ft.

1 well volume: 1.24 gal

Depth of sampling: 29.00 ft.

1041 Begin purge. First water is red, pink w/ sediment. Water is yellow and cloudy. Initial readings:

1056 Flow rate = 288 ml/min Temp = 16.0°C SPC = 1495 µS/cm

ORP = 155.1 mV DO = 0.39 mg/L pH = 6.56

Appearance = cloudy yellow Turbidity = 162.0 NTU.

1118 Note. Flow of water and well water level vary. 150 ft. proximity to sump stream

1122 Begin sampling VOAs, TAL & Cyanide.

1127 Begin sampling 1L amber PCBs

1137 Begin sampling 1L amber SVOCs

1147 Begin sampling 1L amber Poly Ra 226/228

1206 End of sampling. Final SWL: 23.20 ft

1214 Left site to dispose of purge water.

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Fansteel Metals/ FMRI - Muskogee, OK.

1253 Arrived at site MW-OW7.

Well: 2-in. — StW 19.62 ft.

TD: 20.33 ft

Called Michelle Brown to notify of low water level. Move on to MW-57S. May return to attempt.

1307 Arrived at site MW-57S.

Cloudy with some sun. 61°F. 14 mph winds from the west. Had trouble running tube down to sampling depth.

1325 MW-57S Purging begins.

Casing: 4-in. → Photo. 01:34

TD: 21.01 ft.

StW: 17.64 ft. — DUPLICATE TAKEN

LW: 3.37 ft.

1 Well volume: 0.54 gal.

Depth of sampling: 19.00 ft.

1327 Preliminary flow rate at 230 mL/min.

1336 Initial readings. Flow rate: 256 mL/min. Temp: 16.8°C

SPC: 2376 µS/cm ORP: 173.6 mV DO: 0.73 mg/L pH: 6.00

Appearance: clear — Turbidity: 0.64

For more details. See Field Data Sheet.

Note: Turbidimeter ~~is 100%~~ Calibration is 100% compared to this morning.

1411 Begin sampling VOAs. 1418 for duplicate purposes.

TAL & Cyanide

Rite in the Rain

 04/11/19 TDD 0001/18-173 —

Fenstee / Metals / FMRI - Muskogee, OK

1418 Begin sampling 1 L amber PCBs —

1429 Begin sampling SVOCs. 1 L amber —

1451 Begin sampling 1 L poly Ra 226/228 —

1521 ~~Begin~~ End of sampling. Final water lvl = 17.8 ft.

1528 Disposal of purge & wash water. —

Note: Philip Ofosu will not join for next sampling —

1548 Arrive at MW-625. Sunny, 70°F, 14mph winds from the West. —

Well casing: 4-in — Photo 04:05 —

TD —: 22.75 ft. —

SWL —: 17.63 ft. —

LWL —: 5.12 ft. —

1 Well Vol: 3.33 gal —

Depth of sampling: 21.00 ft. —

1602 Purge begins. Initial flow rate 304 mL/min.

1611 First flow readings. Flow rate = ~~70~~ 304 mL/min. —

Temp: 17.9°C SPC: 1396 µS/cm ORP: 91.9 mV DO: 0.29 mg/L

pH: 7.55 Appearance: clear Turbidity: 0.81 NTU.

1641 Begin sampling VOAs, TAL, & Cyanide. —

Flow rate of 294 mL/min. See Field Data Sheet for details

1644 Begin sampling 1 L Amber PCBs —

1650 Begin sampling 1 L amber SVOCs —

~~17~~ 1659 Begin sampling 1 L poly Ra 226/228

~~17~~ 1715 End sampling. Final SWL = 17.74 ft.

04/11/19 TDD 0001/18-173-G
Fansteel / Metals / FMRI - Muskogee, OK.
MW-OW6. Conditions @ 1732 are
Sunny, 61°F, 14 mph winds from the
West.

1732 Arrived at site well MW-OW6
Well casing: 2-in. — Photo: 05:53
TD —: 19.57 ft.
SWL —: 15.98 ft.
LWL —: 3.59 ft.
1 Well Vol. —: 0.57 gal.
Depth of Sampling: 18.50 ft.
1747 Begin purging. Preliminary flow are 340 to 280 mL/min
1755 Initial readings. Flow rate = 268 mL/min. Temp = 15.6°C
SPC = 1305 µS/cm ORP = 68.7 mV DO = 3.60 mg/L pH = 6.56
Appearance = clear Turbidity = 7.40 NTU Water lvl = 16.55 ft
Note: Water level is falling. ORP & DO falling.
1833 Begin sampling VOAs, TAL, Cyanide
Note: ORP gradually increasing. DO is gradually
oscillating. Water drawdown is -0.02/5-min
1837 Begin sampling 1 L amber SVOCs
1844 Begin sampling 1 L amber PCBs
1852 Begin sampling 1 L poly Ra 226/228
1859 Water level at 16.97 ft.
1904 End of sampling. 16.99 ft final water lvl.

Rite in the Rain

09/12/19 TDD 0001/18 - 173

Fansteel Metals/FMRI - Muskogee, OK

0730 Safety meeting. Discussed trash removal/disposal concerning radiation. Discussed hydration & ticks. Aim to be done by 12p.

0740 Arrived MW-65S. Begin calibration. Conditions are sunny with some clouds, 39°F, 4 mph winds coming from the northwest.

YSI Calibration		LaMotte Turbidimeter Calib.
DO Charge Value:	100.0/~~110.0~~ 100.1 NTU	0.0 6/11/18 : 0.0/0.5
DO mg/L	: 8.82/~~14.12~~ 11.55 mg NTU	10.0 6/11/18 : 10.0/11.0
SPC	: 1413/1511	
mV @ pH 4.0	4.00/9.00	
MV @ pH 7.0	7.00/7.10	
mV @ pH 10.0	10.00/10.20	
ORP mV	: 240/255.8	

Note: Temp might be a factor in calibration numbers. Changed mmHg to local 761.9 after readings. pH 7 buffer about to expire.

0855 Begin purge.

Stephen Nguyen (Weston)

Jeff Criner (Weston)

Philip Ofosu (EPA)

0908 Flow decreased. Dropped sampling depth to 28.00 ft. Initial readings @ 0903 are: Flow rate = 286 mL/min. Temp = 17.5°C SPC = 931 µS/cm ORP = 267.6 mV DO = 0.72 mg/L pH = 5.89 Appearance is clear, Turbidity = 1.82 NTU For more details see Field Data Sheet.

Well casing: 4-in — Photo 09:16 —

TD — : 33.68 ft. —

SWL — : 25.02 ft —

LOW — 8.66 ft. —

1 well vol. — : 5.63 gal —

Depth of sampling: 27.00 ft → 28.00 ft @ 0908. —

[0936] One of the FMRI site managers mentioned that one of the mower guys encountered a black snake earlier this week. We encountered a baby garter snake on Wednesday 04/10/19 near the wash station. —

Flow rate is variable. Probably at well head pressure. Temp is at max capacity w/ sampling depth at 28.00 ft. Readings stabilized. Temp creeping up.

[0942] Begin sampling VOAs, TAL, Cyanide. —

[0947] Begin sampling 1 Lamber SVOCs. —

[0957] Begin sampling 1L amber PCBs —

[1006] Begin sampling 1L poly Ra 226/228 —

[1023] End of sampling. Final well water lvl. = 25.42 ft.

[1030] Rechecked SPC & ORP calibration again. SPC = 1468 µS/cm ORP = 253 mV. PASSED.

04/12/19 TDD 0001/18-173 —

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Rite in the Rain

Sampling complete.

04/12/15