FMC Corporation
2929 Walnut Street
Philadelphia, PA 19104
USA

215.299.6000
fmc.com

Transmitted via Email

July 31, 2020

Mr. Jeffrey Thomas
Remedial Project Manager
U.S. Environmental Protection Agency
Hazardous Site Cleanup Division, 3HS23
1650 Arch Street
Philadelphia, PA 19103

RE: QUARTERLY PROGRESS REPORT FOR THE AVTEX FIBERS SUPERFUND SITE FOR THE PERIOD APRIL 1 THROUGH JUNE 30, 2020 (SECOND QUARTER)

Dear Mr. Thomas,

This Quarterly progress report addresses the reporting requirements in 1999 Consent Decree between the United States of America and FMC Corporation to conduct removal and remedial actions. In accordance with Section XI, Paragraph 45 of the Consent Decree, FMC has prepared this progress report to describe actions taken pursuant to the Consent Decree during the second quarter of 2020.

If you have any questions or comments, please call me at 215-299-6047.

Sincerely,

Brian McGinnis
Senior Remediation Manager

Enclosure (1)
cc: C. Marquette, B. Kiracofe, VADEQ
H. Philip, Parsons
M. Robinson, Parsons

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1.0 INTRODUCTION

FMC Corporation (FMC) has conducted removal and remedial activities at the Avtex Fibers Superfund Site, Front Royal, Virginia (Site). The removal action, remedial design, and remedial action activities were performed pursuant to the 1999 Consent Decree between the United States of America and FMC Corporation (effective 21 October 1999).

Upon completion of the Groundwater Leachate Treatment Plant (GLTP) in 2014 following Site remediation activities, the Site transitioned into the Operations and Maintenance (O&M) phase. This report documents the O&M and monitoring activities and findings for the second quarter reporting period April 1 through June 30, 2020. Daily operations and maintenance activities are ongoing and meet the requirements in the *Site-Wide O&M Plan* (FMC, May 2015).

In accordance with Section XI of the Consent Decree, this quarterly progress report contains the following:

- Description of actions taken, reports prepared, and a summary of data generated by FMC during the second quarter (April, May, and June 2020).
- Actions scheduled for the next quarter (July, August, and September 2020).
- Description of the problems encountered this quarter and actions taken to mitigate these problems.
- Update on the schedule of actions and percent completion of tasks.
- Modification to work plans or other schedules.
- Activities undertaken in support of the U.S. Environmental Protection Agency (USEPA) Community Relations Plan.

Attachment 1 lists correspondence and deliverables transmitted from FMC or FMC contractors to USEPA and the Virginia Department of Environmental Quality (VADEQ), and from USEPA, USEPA contractors or VADEQ to FMC during the second quarter of 2020.

2.0 OU-7, OU-10, and NON-TIME CRITICAL REMOVAL AND REMEDIAL ACTIONS

2.1 ACTIONS TAKEN AND REPORTS PREPARED (SECOND QUARTER 2020)

Completed quarterly inspection as described in Section 6 of Part 1 of the *Site-Wide O&M Plan*. The results are presented in **Attachment 2**.

Quarterly monitoring of gas vents was completed as described in Section 3.0 of Part 1 of the *Site-Wide O&M Plan* and as amended by the February 28, 2018 letter from USEPA with the subject "Proposed Modification to the Passive Gas Vent and Gas Vent Filter System Inspection, Monitoring and Maintenance Section of the Site-Wide Post-Closure Care Operations and Maintenance Plan (May 2015)." These results are also presented in **Attachment 2**.

Quarterly post-closure OU-7 and site perimeter real-time air monitoring was completed as required by Section 2.2 of the *Air Monitoring Plan Operable Unit 7, Avtex Fibers Superfund Site, Front Royal, Virginia* (October 2011). The results are presented in **Attachment 3**.

A memorandum was submitted to the EPA (Ecological Assessment, Avtex Fibers Superfund Site, Front Royal, VA, May 19,2020). The memo presented the results of the habitat evaluation and ecological assessment to evaluate current habitat at the former manufacturing area of the site and its potential for unacceptable ecological risks from exposure to contaminated soil at the former manufacturing facility.

On behalf of FMC, Environmental Resources Management submitted the *Draft Versions of the Off-Site Environmental Covenants* to the USEPA (April 14, 2020), as outlined in the *Revised Version of the Institutional Control Implementation and Assurance Plan* (May 2019).

2.2 DATA GENERATED (SECOND QUARTER 2020)

As required by the *Air Monitoring Plan* (2011), post-construction quarterly air monitoring for hydrogen sulfide and organic vapors was completed in June 2020. The results and a map showing the sample locations are provided in **Attachment 3**.

- Hydrogen sulfide was not detected at any OU-7 or Site perimeter sample locations in June 2020.
- No volatile organic compounds (VOCs) were detected at any of the monitoring locations.

The following instruments were utilized to collect the real-time readings:

- Hydrogen sulfide: Jerome 613X
- Organic vapor: MiniRAE 3000

2.3 ACTIONS TO BE COMPLETED NEXT PERIOD (THIRD QUARTER 2020)

- Complete quarterly inspection as described in Section 6 of Part 1 of the *Site-Wide O&M Plan*.
- Complete quarterly monitoring of gas vents as described in Section 3.0 of Part 1 of the *Site-Wide O&M Plan* and as amended by the February 28, 2018 letter from USEPA with the subject "Proposed Modification to the Passive Gas Vent and Gas Vent Filter System Inspection, Monitoring and Maintenance Section of the Site-Wide Post-Closure Care Operations and Maintenance Plan (May 2015)."
- Complete quarterly post-closure OU-7 and site perimeter real-time air monitoring as required by Section 2.2 of the *Air Monitoring Plan Operable Unit 7, Avtex Fibers Superfund Site, Front Royal, Virginia* (October 2011).
- Submit the 2019 *Annual Groundwater Report* (July 2020).
- Complete the annual groundwater monitoring event (July 2020).
- Collect annual river surface water and sediment samples (July 2020).
- Collect annual sump samples (July 2020).
- The annual wetland survey is scheduled for September 2020.

2.4 PROBLEMS ENCOUNTERED AND REMEDIES (SECOND QUARTER 2020)

No problems were encountered during the reporting period.

3.0 GROUNDWATER AND LEACHATE TREATMENT PLANT (GLTP)

3.1 ACTIONS TAKEN AND REPORTS PREPARED (SECOND QUARTER 2020)

The GLTP operated and discharged to the South Fork Shenandoah River (River) for 91 days, from April 1 to June 30, 2020.

Discharge monitoring was completed as required by the July 24, 2014, VADEQ Final Fact Sheet and Applicable or Relevant and Appropriate Requirements (ARARs) for the discharge of effluent from the GLTP. Monthly discharge monitoring included: flow, pH, total suspended solids (TSS), five-day biological oxygen demand (BOD_5), and carbon disulfide (CS_2). The daily maximum and monthly average flow and constituents of concern data are listed in the Discharge Monitoring Reports (DMRs), which were submitted during the second quarter of 2020 and are summarized in Table 1.

Table 1. Summary of 2Q 2020 Monthly Effluent Sampling.

Parameter	Units	Permit Limits	April 2020		May 2020		June 2020	
			monthly avg	*daily max*	*monthly avg*	*daily max*	*monthly avg*	*daily max*
Flow	**MGD**	0.396	0.079	0.112	0.076	0.106	0.084	0.116
pH	**S.U.**	6.5 – 9.0*	7.2 – 7.5		7.1 – 7.4		7.01 – 7.43	
BOD_5	**mg/L**	24 / 64**	0.75	3.0	<QL	<QL	<QL	<QL
TSS	**mg/L**	40 / 130**	0.35	1.4	<QL	<QL	<QL	<QL
CS_2	**µg/L**	0.1 mg/L***	<QL	<QL	<QL	<QL	<QL	<QL

Where parameters were non-detect, the value '0' was used for calculating average and maximum concentrations.
* = Permit limit range for pH as specified in the ARARs.
** = These values represent monthly average and daily maximum permit limits.
*** = There is no established permit limit for CS_2. The value is a monthly action level specified in ARAR.
MGD = million gallons per day
S.U. = standard units
mg/L = milligrams per liter
µg/L = micrograms per liter
<QL = reported less than the quantitation limit

Discharge flow was monitored continuously. Additionally, flow rates for the lift stations, test wells and viscose basins for the months of April, May, and June 2020, are provided in Table 4.1 of **Attachment 4**.

The pH was monitored continuously during the days that discharge occurred. The pH monitoring results for each month of the reporting period were included with the monthly DMRs. The effluent pH was within the range of 6.5 to 9.0, as specified in the ARARs.

TSS was monitored weekly. The permitted monthly daily average limit for TSS of 40 mg/L and the permitted monthly maximum daily limit of 130 mg/L for TSS were not exceeded during the reporting period. The April 2020 TSS monthly average and daily maximum concentrations were 0.35 mg/L and 1.4 mg/L, respectively, and concentrations were below method detection limit / quantitation limit in May and June 2020.

BOD_5 was also monitored weekly. The permitted monthly daily average limit for BOD_5 of 24 mg/L and the permitted monthly maximum daily limit of 64 mg/L for BOD_5 were not exceeded during the reporting period. The April 2020 BOD_5 monthly average and daily maximum concentrations were 0.75 mg/L and 3.0 mg/L, respectively, and concentrations were below the method detection limit / quantitation limit May and June 2020.

Carbon disulfide was monitored monthly although no limit is established in the ARARs. The results for the monthly samples collected in the second quarter of 2020 were less than the 0.1 mg/L monthly action level specified in the ARARs.

3.2 ACTION ITEMS AND DATA GENERATED (SECOND QUARTER 2020)

Flow totals for the lift stations, test wells and viscose basin are contained in **Attachment 4** (**Table 4.1**). DMRs were submitted to the VADEQ and USEPA by the tenth of each month.

The annual Whole Effluent Toxicity (WET) event was completed in May 2020. The results indicated zero percent mortality and were included in the June 2020 DMR.

The annual GLTP discharge sample was collected in June 2020. Constituent concentrations were below permit limits, and the results were presented in the June 2020 DMR.

3.3 ACTIONS TO BE TAKEN NEXT PERIOD (THIRD QUARTER 2020)

- Continue operations and maintenance of the GLTP.
- Continue to collect GLTP system discharge samples as required by the July 24, 2014, VADEQ Final Fact Sheet and ARARs for the discharge of effluent from the GLTP.

3.4 PROBLEMS ENCOUNTERED AND REMEDIES (SECOND QUARTER 2020)

- TW#1 experienced an issue with the programmable logic controller (PLC). It appeared that the PLC code was damaged from a storm related electrical event, causing a communication failure between the pump and the PLC; the pump was operated manually until the issue was resolved in late April 2020.
- As part of the basin repairs, the viscose basin pumps were removed for cleaning and inspection. Well W-08, in Viscose Basin 9, was found collapsed around the pump. It's theorized the subsurface shifted during basin settlement causing the collapse. The pump could not be removed, and the well is no longer viable.

- On June 1, 2020, the communication module in the GLTP PLC failed and had to be physically removed and reset. Therefore, no pH data were recorded from 6:15 a.m. through 10:15 a.m. The GLTP was not discharging during this time.

4.0 OTHER SITE RELATED DOCUMENTS AND ITEMS

4.1 ACTIONS TAKEN AND REPORTS PREPARED (SECOND QUARTER 2020)

Quarterly inspections of seep areas, river berms and gas vents were conducted, and inspection reports were completed.

The viscose basin repairs and gas vent extensions work began in mid-May 2020 and were completed in late June 2020, with the exception of three small areas which were too wet due to continued rain. These three areas will be completed at a later date as conditions allow. The construction memo and daily reports summarizing the repair activities are presented in **Attachment 5**.

Rainfall data are presented in Table 4.2 (**Attachment 4**). A total of 11.7 inches of precipitation fell on the Site during the second quarter of 2020 (April, May, and June 2020). The total precipitation for the second quarter of 2020 represents approximately 30% of the average Site total yearly precipitation of 39.6 inches.

4.2 ACTIONS TO BE TAKEN NEXT PERIOD (THIRD QUARTER 2020)

Quarterly inspections of seep areas, river berms and gas vents will be conducted, and inspection reports will be completed.

ATTACHMENTS

1. Summary of Monthly Correspondence
2. Site-Wide Quarterly Inspection Reports (with repairs photo log)
3. OU-7 and Site Perimeter Air Monitoring Results
4. GLTP Discharge Monitoring and Information
   a. Table 4.1 – Monthly Flow Totals Avtex Site Lift Stations, Test Wells and Viscose Basin
   b. Table 4.2 - Site Rainfall Data
5. Viscose Basin Repairs and Gas Vent Extensions Memorandum

ATTACHMENT 1

SUMMARY OF MONTHLY CORRESPONDENCE

ATTACHMENT 1

LIST OF CORRESPONDENCE AND DELIVERABLES FOR THE PERIOD APRIL 1, 2020 TO JUNE 30, 2020, AVTEX FIBERS SUPERFUND SITE, FRONT ROYAL, VIRGINIA

FMC to VADEQ

- April 3, 2020: Submission of Discharge Monitoring Report – March 2020 (submitted to VADEQ and EPA)
- May 6, 2020: Submission of Discharge Monitoring Report – April 2020 (submitted to VADEQ and EPA)
- June 10, 2020: Submission of Discharge Monitoring Report – May 2020 (submitted to VADEQ and EPA)

VADEQ to FMC

- April 3, 2020: Discharge Monitoring Report Received, and notification of new VDEQ Project Manager (sent to FMC and EPA)
- May 7, 2020: Avtex - EPA Quarterly Report for Oct – April 2020; no comments or questions (sent to FMC and EPA)
- June 11, 2020: Discharge Monitoring Report Received (sent to FMC and EPA)

FMC to EPA

- April 13, 2020: Quarterly Progress Report for the Avtex Fibers Superfund Site for the Period 1 January to 31 March 2020 (submitted to VADEQ and EPA)
- April 14, 2020: Draft Versions of the Off-Site Environmental Covenants for the Axtex Fibers Superfund Site, Front Royal, VA (submitted to EPA and VADEQ)
- May 19, 2020: Avtex Front Royal Vegetation & Wildlife Use Assessment (submitted to EPA and VADEQ)

EPA to FMC

- June 15, 2020: Avtex - EPA Quarterly Report for January - March 2020 Received (sent to FMC and VADEQ)

ATTACHMENT 2

SITE-WIDE QUARTERLY INSPECTION REPORTS

Quarterly Inspection Report

Inpected by: M. Harder / K. Teague
Report No.: 2020-06

Date: 06-24-2020
Areas Inspected: See Map

Questions	Response		Comments and Recommendations
1. Remediation/Restoration Areas			
Is settlement or standing water evident? If Yes, describe the degree of settlement(s) (slight, moderate, significant), record approximate dimensions, and indicate the location(s) on an attached map.	☑ Yes	☐ No	Slight to moderate settlement in small/isolated areas. Settlement repairs to more signifcant areas are underway across the site.
Is erosion evident? If Yes, describe the type of erosion (rills, gullies), record approximate dimensions (length, width, depth) and indicate location(s) on an attached map.	☐ Yes	☑ No	
Are potential leachate seeps evident or migration of contamination? If Yes, describe the nature (size, color, flow rate), record location on an attached map, and photograph. [Note: Check former seep areas in unnamed tributary north of VB 4-6, check pond area north of VB 9, and check other likely areas (e.g., embankments of VBs, SBs)]	☑ Yes	☐ No	See map for locations. Potential seeps: -SE of VB-2&3 (Wet) -NW of VB-7&8 (Dry)
Do landfill/basin embankments show signs of erosion, failure (e.g., cracking, sloughing) or migration of contamination (e.g., seeps, exposed waste)? If Yes, describe the nature (type, size), record location on an attached map, and photograph [Note: Check river-side of embankments along river, if safe to do so.]	☐ Yes	☑ No	
Is vegetation distressed or are bare areas evident? If Yes, describe the type of disorder (distressed, sparsely vegetated, bare), record approximate dimensions and indicate location(s) on an attached map.	☑ Yes	☐ No	Isolated/minor bare areas noted. See map for locations. With few exceptions, vegetation is filling in.

Quarterly Inspection Report

Inpected by: M. Harder / K. Teague

Date: 06-24-2020

Report No.: 2020-06

Areas Inspected: See Map

Questions	Response		Comments and Recommendations
Is there woody vegetation greater than 2 inches in diameter or 5 feet in height on the cover system(s)? If Yes, describe where and actions to be taken (refer to Section 4.2 of the O&M Plan).	☐ Yes	☑ No	
Is any other damage evident? If Yes, describe the type of damage(s) and indicate the location(s) on an attached map.	☐ Yes	☑ No	
Are obstruction(s) (brush, debris, timber, leaves, sediment) interfering with the proper functioning of ditches, gutters or flumes? If Yes, describe the type(s) of obstruction(s) and indicate the location(s) on an attached map.	☐ Yes	☑ No	
Is sediment deposited in diversion berms, ditches gutters, flumes or culverts deeper than ¼ of the original channel depth (shown on the contract drawings) or culvert diameter? If Yes, record approximate dimensions and indicate locations on an attached map.	☐ Yes	☑ No	

Quarterly Inspection Report

Inpected by: M. Harder / K. Teague
Date: 06-24-2020
Report No.: 2020-06
Areas Inspected: See Map

Questions	Response		Comments and Recommendations
2. Surface Water Drainage and Erosion Control System			
Is erosion evident? If Yes, describe the drainage structure inspected (ditch, gutter, flume, culvert, outfall, rip-rap), the type of erosion (rills, gullies, washouts, slope failure), record approximate dimensions (length, width, depth) and indicate location(s) on an attached map.	☐ Yes	☑ No	Minor erosion noted in a few isolated areas. Other previously noted areas have been repaired.
Is overall shape, configuration, and alignment of the drainageway as shown on the drawings? If No, describe the type of distortion (damaged, eroded, slope failure), record approximate dimensions and indicate location(s) on an attached map.	☑ Yes	☐ No	
Is erosion evident at drainage outlet aprons? If Yes, record approximate dimensions and indicate location(s) on an attached map.	☐ Yes	☑ No	

Inspection Checklist (check items that were inspected; document concerns noted; refer to attached Drawings for specific areas)

Viscos Basins 1-3

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert Inlets & outles	☑ Rip-rap channels	☑ Access road near unit	☐

Viscos Basins 4-6

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert Inlets & outles - N, E, & W of VB 4-6; - Pond W of VB 4-6	☑ Rip-rap channels	☑ Down chutes	☑ Gas Vent Filter & Fence
☑ Former seep area - N of VB 4-6	☑ LS #1 & #2 and Fencing	☑ Access road near unit	☐

Viscos Basins 7-8

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert Inlets & outles (between VB-1 and VB-7)	☑ Rip-rap channels	☑ Down chutes	☑ Leachate Collection Manhole (MW VB7)
☑ Access road near unit	☐	☐	☐

Viscos Basins 9-11

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Drop inlests on VB-11	☑ Culver inlets & outlets (S&W VB-11; N VB-11 & VB-9; and SW VB-10)	☑ Rip-rap channels	☑ Down chutes
☑ Access road near unit	☑ Seep area in pond north of VB-9	☑ VB 9-11 fence and gates	☑ LS #4 and Fencing

New Landfill

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert inlets & outlets (NE & SE of NLF)	☑ Rip-rap channels	☑ Down chutes	☑ LS #3 and Fencing
☑ Access road near unit	☐	☐	☐

SB-1

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert inlets & outlets (NE SB-1; SB-2; SE SB-3; NE SB-4; & S SB-4)	☑ Rip-rap channels & outlets by River	☑ Down chutes (SB-1 & SB-4)	☐
☑ Access road near unit	☐	☐	☐

Inspection Checklist (check items that were inspected; document concerns noted; refer to attached Drawings for specific areas)

SB-2

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Culvert inlets & Outlets (S & W Sides)
☑ Berms along River (site & river side)	☑ Rip-rap channels & outlets by River	☑ Access road near unit	☐

SB-3

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert inlets & Outlets (SE))	☑ Rip-rap channels & outlets by River	☑ Drop inlets (W side)	☑ Access Road near unit
☐	☐	☐	☐

SB-4

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert inlets & outlets (NE & S sides)	☑ Down chutes (S Side)	☑ Drop inlet (N side)	☑ Berms along River (site & river side)
☑ Access road near unit	☐	☐	☐

SB-5

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Berms along River and E side	☑ Access Road near unit	☐	☐
☐	☐	☐	☐

FAB 1-3

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Culvert inlets & outlets (E & S FAB1-2; SW FAB3)
☑ Access Road near unit	☐	☐	☐

FAS & FARA

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Culvert inlets & outlets (E & N FAS; E FARA)
☑ Access Road near unit	☐	☐	☐

EL, PB 1-2, PB-3

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Rip-rap Channels
☑ Culvert inlets & outlets (E & W EL; NW PB-1-2; S PB-3)	☑ Access Road near unit	☐	☐

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 1

Unit: *OU-10*

Basin/Landfill:

VB-4, 5, & 6

Date : 06/24/2020

Photo Description: Two areas of standing water adjacent to LS-2.

Photo Number: 2

Unit: *OU-10*

Basin/Landfill:

VB-4, 5, & 6

Date : 06/24/2020

Photo Description: Repaired rills on access road to LS-1 west of VB-4, 5, & 6.

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 3

Unit: *OU-10*

Basin/Landfill:

VB-2&3, and NLF

Date : 06/24/2020

Photo Description: Standing water on access path west of VB-4,5, & 6 (path to LS-1)

Photo Number: 4

Unit: *OU-10*

Basin/Landfill:

VB-2&3, and NLF

Date : 06/24/2020

Photo Description: Area of standing water southeast of VB-2&3.

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 5

Unit: *OU-10*

Basin/Landfill:

VB-2&3, and NLF

Date : 06/24/2020

Photo Description: Bare soil (~10' x30`) with rills southeast of VB-2&3 (Sediment basin between NLF and VB-2&3). Stable, but wet during this inspection.

Photo Number: 6

Unit: *OU-7*

Basin/Landfill:

VB-9, 10, & 11

Date : 06/24/2020

Photo Description: Area around wells 103/203/303 – small area of standing water (rain).

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 7

Unit: *OU-7*

Basin/Landfill:

VB-10

Date : 06/24/2020

Photo Description: Sediment building up at end of culvert under access road.

Photo Number: 8

Unit: *OU-7*

Basin/Landfill:

VB-10

Date : 06/24/2020

Photo Description: Bare patches and exposed matting at down chute in south side of VB-10.

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 9

Unit: *OU-7*

Basin/Landfill:

VB-10

Date : 06/24/2020

Photo Description: Bare patches and exposed matting at down chute on south side of VB-10.

Photo Number: 10

Unit: *OU-7*

Basin/Landfill:

VB-10

Date : 06/24/2020

Photo Description: Settlement in southwest section of VB-10 (30’ x 30’) – repairs underway.

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 11

Unit: *OU-7*

Basin/Landfill:

VB-10

Date : 06/24/2020

Photo Description: Settlement on previously repaired areas on VB-9 (30' x 40)- repair ongoing

Photo Number: 12

Unit: *OU-7*

Basin/Landfill:

VB-9

Date : 06/24/2020

Photo Description: Settlement on previously repaired areas on VB-9 (30' x 40 each)- repair ongoing.

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 13

Unit: *NTCRA Basins*

Basin/Landfill:

SB-1

Date : 06/24/2020

Photo Description: Area of settlement (20'x40') in front of northernmost inlet between SB-3 and SB-2 – prepared for repairs.

Photo Number: 14

Unit: *NTCRA Basins*

Basin/Landfill:

SB-1

Date : 06/24/2020

Photo Description: Area of settlement (20'x20') in front of the second to northernmost inlet between SB-3 and SB-2 – prepared for repairs.

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 15

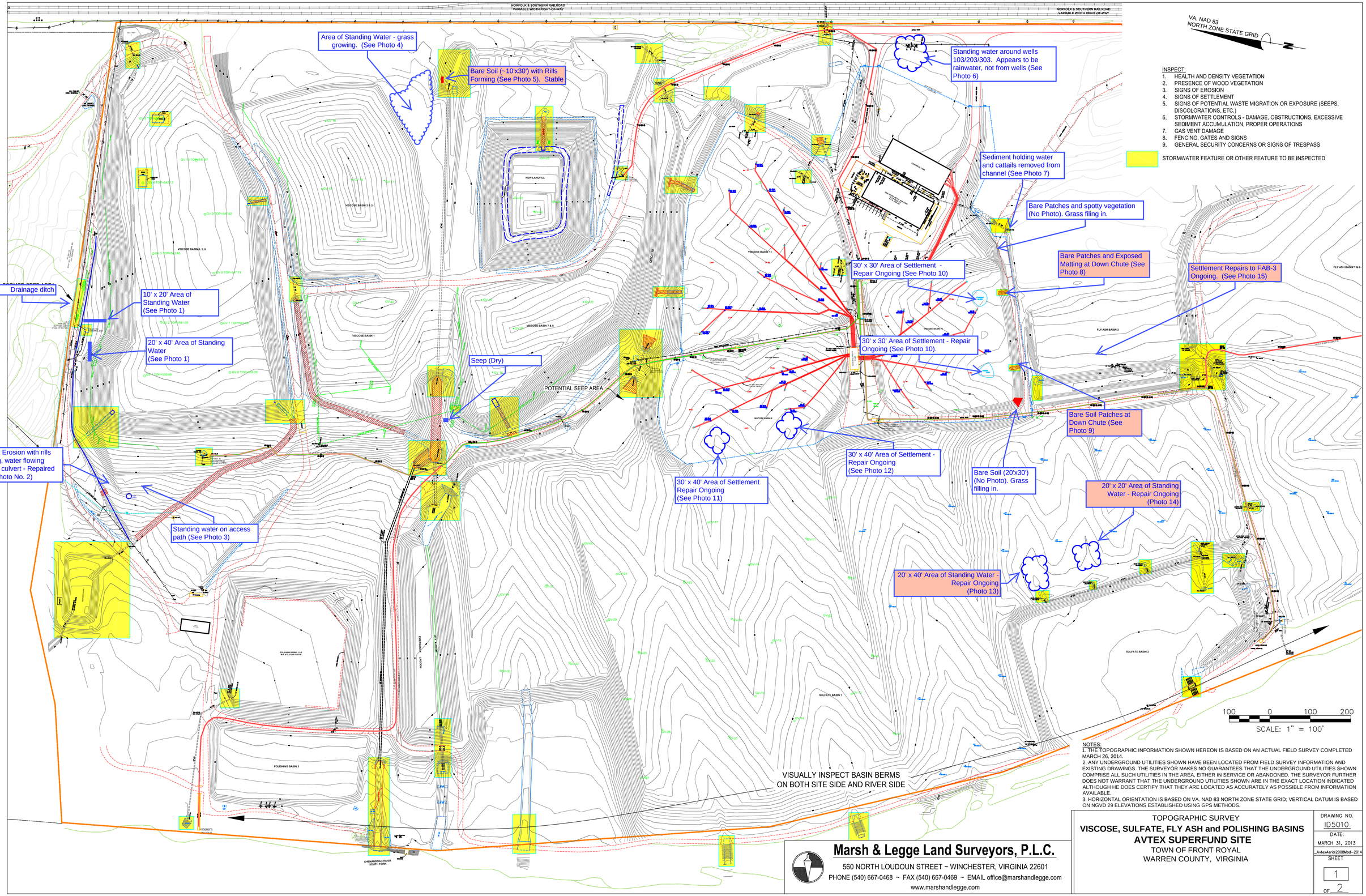
Unit: *NTCRA Basins*

Basin/Landfill:

SB-1

Date : 06/24/2020

Photo Description: Area of settlement on FAB-3 – repairs ongoing.



NOTES:
1. THE TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON AN ACTUAL FIELD SURVEY COMPLETED MARCH 26, 2014.
2. ANY UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.
3. HORIZONTAL ORIENTATION IS BASED ON VA. NAD 83 NORTH ZONE STATE GRID; VERTICAL DATUM IS BASED ON NGVD 29 ELEVATIONS ESTABLISHED USING GPS METHODS.

Marsh & Legge Land Surveyors, P.L.C.
560 NORTH LOUDOUN STREET ~ WINCHESTER, VIRGINIA 22601
PHONE (540) 667-0468 ~ FAX (540) 667-0469 ~ EMAIL office@marshandlegge.com
www.marshandlegge.com

TOPOGRAPHIC SURVEY
VISCOSE, SULFATE, FLY ASH and POLISHING BASINS
AVTEX SUPERFUND SITE
TOWN OF FRONT ROYAL
WARREN COUNTY, VIRGINIA

DRAWING NO. ID5010
DATE: MARCH 31, 2013
_AvtexAerial2008Mod-2014
SHEET 1 OF 2

VA. NAD 83
NORTH ZONE STATE GRID

NORFOLK & SOUTHERN RAILROAD
VARIABLE WIDTH RIGHT-OF-WAY

FLY ASH BASIN 6

FLY ASH BASIN 1 & 2

FLY ASH BASIN 3

SULFATE BASIN 5

SULFATE BASIN 4

SULFATE BASIN 3

SULFATE BASIN 2

SHENANDOAH RIVER

SHENANDOAH RIVER

See Sheet 1 of 2

VISUALLY INSPECT BASIN BERMS
ON BOTH SITE SIDE AND RIVER SIDE

INSPECT:

1. HEALTH AND DENSITY VEGETATION
2. PRESENCE OF WOOD VEGETATION
3. SIGNS OF EROSION
4. SIGNS OF SETTLEMENT
5. SIGNS OF POTENTIAL WASTE MIGRATION OR EXPOSURE (SEEPS, DISCOLORATIONS, ETC.)
6. STORMWATER CONTROLS - DAMAGE, OBSTRUCTIONS, EXCESSIVE SEDIMENT ACCUMULATION, PROPER OPERATIONS
7. GAS VENT DAMAGE
8. FENCING, GATES AND SIGNS
9. GENERAL SECURITY CONCERNS OR SIGNS OF TRESPASS

STORMWATER FEATURE OR OTHER FEATURE TO BE INSPECTED

100 0 100 200

SCALE: 1" = 100'

Marsh & Legge Land Surveyors, P.L.C.

560 NORTH LOUDOUN STREET ~ WINCHESTER, VIRGINIA 22601

PHONE (540) 667-0468 ~ FAX (540) 667-0469 ~ EMAIL office@marshandlegge.com

www.marshandlegge.com

TOPOGRAPHIC SURVEY

VISCOSE, SULFATE, FLY ASH and POLISHING BASINS

AVTEX SUPERFUND SITE

TOWN OF FRONT ROYAL

WARREN COUNTY, VIRGINIA

DRAWING NO. ID5010

DATE: MARCH 13, 2014

_Avtexterial2008Mod~2014

SHEET 2 OF 2

ATTACHMENT 3

OU-7 AND SITE PERIMETER AIR MONITORING RESULTS

Air Monitoring Form
Avtex Superfund Site
Front Royal, Virginia

Date 6/23/2020
Technician M. Harder / K. Teague

Air Samples Collected?
☐ Yes
☑ No

Gas Monitoring Devices	Used (Y/N)	Calibrated (Y/N)	Date Calibrated	Initials
Jerome613X (low-level H_2S)	Y	Y	1/21/2020	MH
MiniRae 3000 (PID)	Y	Y	6/23/2020	MH
MultiRae (PID, O2, CO, H2S, LEL)	N	N		
Landtec GEM 5000	N	N		

Weather Conditions:

Precipitation (Current): ☐ Rain ☐ Snow ☐ Sleet ☐ Mix ☐ Other ☑ None
☐ Light ☐ Moderate ☐ Heavy

Current Temperature: 86 °F
Wind Direction (blowing from): S (N, NE, SW, variable, etc.)
Wind Speed: 4 mph
Barometric Pressure: 29.69 inches
Cloud Cover: ☑ Clear ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy/Overcast ☐ Foggy

Monitoring Location	Time	H_2S (ppm)	Oganic / VOC (ppm)	CS_2 (ppm)	Methane (%LEL)	Comments
OU-7 Perimeter - (H_2S Indicator Value = 0.006 ppm)						
N	1545	0.000	0.0	--	--	
NE	1540	0.000	0.0	--	--	
SE	1610	0.000	0.0	--	--	
S	1600	0.000	0.0	--	--	
SW	1555	0.000	0.0	--	--	
NW	1550	0.000	0.0	--	--	
Site Perimeter - (H2S Indicator Value = 0.0014 ppm)						
N	1700	0.000	0.0	--	--	
NE	1620	0.000	0.0	--	--	
E	1625	0.000	0.0	--	--	
SE	1630	0.000	0.0	--	--	
S	1635	0.000	0.0	--	--	
SW	1649	0.000	0.0	--	--	
W	1650	0.000	0.0	--	--	
NW	1655	0.000	0.0	--	--	
Downwind (location: N)	1710	0.000	0.0	--	--	

Activities Occuring on-site that might relate to air emissions:
Groundwater extraction and treatment.

If monitoring results are greater than one or more of above levels & sustained for 1 minute or longer, take following actions:
1. Notify FMC Site Manager, SSO, and EPA/EPA oversight representative; 2. Stop on-site intrusive operations and assess source(s);
3. Step-up work-zone & perimeter monitoring; 4. Perform monitoring the next day to verify levels.

If H2S > 0.1 ppm sustained for 5 minutes at Site Perimeter - Notify Warren County/Front Royal LEPC and Health Department.

FIGURE 1
AIR MONITORING LOCATIONS DURING OU-7 WORK
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

LEGEND

PROPERTY BOUNDARY

SITE PERIMETER LOCATION

OU-7 PERIMETER LOCATION

NOTE: DOWNWIND LOCATION TO BE DETERMINED BASED ON FIELD CONDITIONS.

500 250 0 500

SCALE IN FEET

G:\CAD\Drawings\FMC_Avtex Front Royal\0122736\A207.dwg

MLB/4-6-11

ERM, INC.

ATTACHMENT 4

GLTP DISCHARGE MONITORING AND INFORMATION

Table 4.1 Monthly Flow Totals - Second Quarter 2020
Avtex Fibers Superfund Site
Lift Stations, Test Wells and Viscose Basin

April 2020

Lift Stations Flow Report			Test Wells Flow Report					Viscose Basin Flow Report			
Date	Total LS Flow (MGD)		Date	TW1 Flow (MGD)	TW2 Flow (MGD)	TW3 Flow (MGD)		Date	VB9 Flow (MGD)	VB10 Flow (MGD)	VB 11 Flow (MGD)
4/1/2020	0.000		4/1/2020	0.059	0.000	0.000		4/1/2020	0.004	0.000	0.028
4/2/2020	0.000		4/2/2020	0.066	0.000	0.000		4/2/2020	0.003	0.000	0.028
4/3/2020	0.000		4/3/2020	0.066	0.000	0.000		4/3/2020	0.000	0.000	0.028
4/4/2020	0.000		4/4/2020	0.066	0.000	0.000		4/4/2020	0.000	0.000	0.028
4/5/2020	0.000		4/5/2020	0.066	0.000	0.000		4/5/2020	0.000	0.000	0.028
4/6/2020	0.025		4/6/2020	0.066	0.000	0.000		4/6/2020	0.003	0.002	0.028
4/7/2020	0.025		4/7/2020	0.059	0.000	0.000		4/7/2020	0.003	0.002	0.028
4/8/2020	0.020		4/8/2020	0.066	0.000	0.000		4/8/2020	0.003	0.000	0.028
4/9/2020	0.017		4/9/2020	0.063	0.000	0.020		4/9/2020	0.000	0.000	0.028
4/10/2020	0.013		4/10/2020	0.066	0.000	0.023		4/10/2020	0.000	0.000	0.028
4/11/2020	0.012		4/11/2020	0.066	0.000	0.005		4/11/2020	0.000	0.000	0.028
4/12/2020	0.003		4/12/2020	0.066	0.000	0.000		4/12/2020	0.000	0.000	0.028
4/13/2020	0.016		4/13/2020	0.066	0.000	0.000		4/13/2020	0.003	0.002	0.028
4/14/2020	0.016		4/14/2020	0.066	0.000	0.000		4/14/2020	0.004	0.002	0.028
4/15/2020	0.028		4/15/2020	0.066	0.000	0.000		4/15/2020	0.003	0.000	0.028
4/16/2020	0.028		4/16/2020	0.066	0.000	0.000		4/16/2020	0.000	0.000	0.028
4/17/2020	0.016		4/17/2020	0.066	0.000	0.000		4/17/2020	0.000	0.000	0.028
4/18/2020	0.003		4/18/2020	0.066	0.000	0.000		4/18/2020	0.000	0.000	0.028
4/19/2020	0.000		4/19/2020	0.066	0.000	0.000		4/19/2020	0.000	0.000	0.028
4/20/2020	0.026		4/20/2020	0.066	0.000	0.000		4/20/2020	0.003	0.002	0.028
4/21/2020	0.026		4/21/2020	0.066	0.000	0.019		4/21/2020	0.004	0.002	0.028
4/22/2020	0.006		4/22/2020	0.066	0.000	0.025		4/22/2020	0.004	0.000	0.029
4/23/2020	0.000		4/23/2020	0.066	0.000	0.028		4/23/2020	0.002	0.000	0.029
4/24/2020	0.013		4/24/2020	0.066	0.000	0.028		4/24/2020	0.000	0.000	0.029
4/25/2020	0.013		4/25/2020	0.066	0.000	0.015		4/25/2020	0.000	0.000	0.029
4/26/2020	0.006		4/26/2020	0.066	0.000	0.000		4/26/2020	0.000	0.000	0.029
4/27/2020	0.031		4/27/2020	0.066	0.000	0.000		4/27/2020	0.002	0.002	0.029
4/28/2020	0.031		4/28/2020	0.066	0.000	0.000		4/28/2020	0.002	0.002	0.029
4/29/2020	0.018		4/29/2020	0.066	0.000	0.000		4/29/2020	0.002	0.000	0.029
4/30/2020	0.010		4/30/2020	0.066	0.000	0.010		4/30/2020	0.000	0.000	0.029

Table 4.1 Monthly Flow Totals - Second Quarter 2020
Avtex Fibers Superfund Site
Lift Stations, Test Wells and Viscose Basin

May 2020										
Lift Stations Flow Report			Test Wells Flow Report					Viscose Basin Flow Report		
Date	Total LS Flow (MGD)		Date	TW1 Flow (MGD)	TW2 Flow (MGD)	TW3 Flow (MGD)		Date	VB9 Flow (MGD)	VB10 Flow (MGD)	VB 11 Flow (MGD)
5/1/2020	0.025		5/1/2020	0.066	0.000	0.013		5/1/2020	0.001	0.001	0.029
5/2/2020	0.025		5/2/2020	0.066	0.000	0.006		5/2/2020	0.001	0.001	0.029
5/3/2020	0.020		5/3/2020	0.059	0.000	0.000		5/3/2020	0.000	0.000	0.029
5/4/2020	0.027		5/4/2020	0.066	0.000	0.000		5/4/2020	0.001	0.001	0.029
5/5/2020	0.027		5/5/2020	0.062	0.000	0.000		5/5/2020	0.003	0.001	0.029
5/6/2020	0.016		5/6/2020	0.066	0.000	0.000		5/6/2020	0.003	0.000	0.029
5/7/2020	0.013		5/7/2020	0.066	0.000	0.000		5/7/2020	0.003	0.000	0.029
5/8/2020	0.013		5/8/2020	0.066	0.000	0.020		5/8/2020	0.003	0.000	0.029
5/9/2020	0.003		5/9/2020	0.066	0.000	0.025		5/9/2020	0.002	0.000	0.029
5/10/2020	0.000		5/10/2020	0.066	0.000	0.028		5/10/2020	0.000	0.000	0.029
5/11/2020	0.000		5/11/2020	0.066	0.000	0.028		5/11/2020	0.002	0.001	0.029
5/12/2020	0.022		5/12/2020	0.059	0.000	0.005		5/12/2020	0.002	0.001	0.029
5/13/2020	0.022		5/13/2020	0.066	0.000	0.000		5/13/2020	0.002	0.000	0.029
5/14/2020	0.013		5/14/2020	0.059	0.000	0.000		5/14/2020	0.002	0.000	0.029
5/15/2020	0.013		5/15/2020	0.066	0.000	0.000		5/15/2020	0.002	0.000	0.029
5/16/2020	0.003		5/16/2020	0.066	0.000	0.000		5/16/2020	0.001	0.000	0.029
5/17/2020	0.000		5/17/2020	0.066	0.000	0.000		5/17/2020	0.000	0.000	0.029
5/18/2020	0.011		5/18/2020	0.066	0.000	0.000		5/18/2020	0.001	0.002	0.029
5/19/2020	0.011		5/19/2020	0.061	0.000	0.000		5/19/2020	0.002	0.002	0.029
5/20/2020	0.010		5/20/2020	0.066	0.000	0.000		5/20/2020	0.002	0.001	0.029
5/21/2020	0.010		5/21/2020	0.059	0.000	0.000		5/21/2020	0.001	0.001	0.029
5/22/2020	0.012		5/22/2020	0.066	0.000	0.000		5/22/2020	0.000	0.000	0.029
5/23/2020	0.012		5/23/2020	0.066	0.000	0.000		5/23/2020	0.000	0.000	0.029
5/24/2020	0.010		5/24/2020	0.066	0.000	0.000		5/24/2020	0.000	0.000	0.029
5/25/2020	0.011		5/25/2020	0.045	0.000	0.000		5/25/2020	0.000	0.000	0.029
5/26/2020	0.011		5/26/2020	0.059	0.000	0.000		5/26/2020	0.001	0.001	0.029
5/27/2020	0.002		5/27/2020	0.066	0.000	0.000		5/27/2020	0.002	0.001	0.029
5/28/2020	0.014		5/28/2020	0.066	0.000	0.000		5/28/2020	0.002	0.000	0.029
5/29/2020	0.014		5/29/2020	0.047	0.000	0.000		5/29/2020	0.002	0.000	0.029
5/30/2020	0.005		5/30/2020	0.059	0.000	0.000		5/30/2020	0.001	0.000	0.029
5/31/2020	0.000		5/31/2020	0.066	0.000	0.000		5/31/2020	0.001	0.000	0.029

Table 4.1 Monthly Flow Totals - Second Quarter 2020
Avtex Fibers Superfund Site
Lift Stations, Test Wells and Viscose Basin

June 2020										
Lift Stations Flow Report			Test Wells Flow Report					Viscose Basin Flow Report		
Date	Total LS Flow (MGD)		Date	TW1 Flow (MGD)	TW2 Flow (MGD)	TW3 Flow (MGD)		Date	VB9 Flow (MGD)	VB10 Flow (MGD)	VB 11 Flow (MGD)
6/1/2020	0.000		6/1/2020	0.066	0.000	0.000		6/1/2020	0.001	0.000	0.029
6/2/2020	0.026		6/2/2020	0.029	0.000	0.000		6/2/2020	0.001	0.000	0.029
6/3/2020	0.026		6/3/2020	0.029	0.000	0.000		6/3/2020	0.001	0.001	0.029
6/4/2020	0.024		6/4/2020	0.000	0.000	0.000		6/4/2020	0.001	0.001	0.029
6/5/2020	0.020		6/5/2020	0.000	0.000	0.000		6/5/2020	0.001	0.000	0.029
6/6/2020	0.020		6/6/2020	0.000	0.000	0.000		6/6/2020	0.001	0.000	0.029
6/7/2020	0.009		6/7/2020	0.000	0.000	0.000		6/7/2020	0.000	0.000	0.029
6/8/2020	0.008		6/8/2020	0.024	0.000	0.000		6/8/2020	0.000	0.001	0.029
6/9/2020	0.004		6/9/2020	0.044	0.000	0.000		6/9/2020	0.000	0.001	0.029
6/10/2020	0.018		6/10/2020	0.059	0.000	0.000		6/10/2020	0.000	0.000	0.029
6/11/2020	0.018		6/11/2020	0.066	0.000	0.020		6/11/2020	0.000	0.000	0.029
6/12/2020	0.012		6/12/2020	0.065	0.000	0.023		6/12/2020	0.000	0.000	0.029
6/13/2020	0.000		6/13/2020	0.065	0.000	0.017		6/13/2020	0.000	0.000	0.029
6/14/2020	0.000		6/14/2020	0.065	0.000	0.000		6/14/2020	0.000	0.000	0.029
6/15/2020	0.017		6/15/2020	0.065	0.000	0.020		6/15/2020	0.000	0.001	0.029
6/16/2020	0.017		6/16/2020	0.066	0.000	0.025		6/16/2020	0.000	0.001	0.029
6/17/2020	0.010		6/17/2020	0.065	0.000	0.028		6/17/2020	0.000	0.000	0.029
6/18/2020	0.007		6/18/2020	0.065	0.000	0.028		6/18/2020	0.000	0.000	0.029
6/19/2020	0.008		6/19/2020	0.065	0.000	0.010		6/19/2020	0.001	0.000	0.029
6/20/2020	0.006		6/20/2020	0.065	0.000	0.025		6/20/2020	0.003	0.000	0.029
6/21/2020	0.000		6/21/2020	0.065	0.000	0.028		6/21/2020	0.003	0.000	0.029
6/22/2020	0.014		6/22/2020	0.065	0.000	0.029		6/22/2020	0.003	0.001	0.029
6/23/2020	0.021		6/23/2020	0.042	0.000	0.005		6/23/2020	0.003	0.001	0.029
6/24/2020	0.021		6/24/2020	0.046	0.000	0.000		6/24/2020	0.003	0.003	0.029
6/25/2020	0.018		6/25/2020	0.059	0.000	0.020		6/25/2020	0.002	0.003	0.029
6/26/2020	0.003		6/26/2020	0.066	0.000	0.025		6/26/2020	0.002	0.002	0.029
6/27/2020	0.000		6/27/2020	0.066	0.000	0.028		6/27/2020	0.001	0.000	0.029
6/28/2020	0.011		6/28/2020	0.066	0.001	0.028		6/28/2020	0.000	0.000	0.029
6/29/2020	0.017		6/29/2020	0.046	0.001	0.010		6/29/2020	0.001	0.001	0.029
6/30/2020	0.017		6/30/2020	0.059	0.000	0.013		6/30/2020	0.002	0.002	0.029

Table 4.2 Monthly Flow Totals - Second Quarter 2020
Avtex Fibers Superfund Site
Site Rainfall Data - April 1 - June 30, 2020

Month	Average Rainfall for Winchester, VA (in)*	Average Site Rainfall 1990-2013 (in)	2006 Actual Rainfall (in)	2007 Actual Rainfall (in)	2008 Actual Rainfall (in)	2009 Actual Rainfall (in)	2010 Actual Rainfall (in)	2011 Actual Rainfall (in)	2012 Actual Rainfall (in)	2013 Actual Rainfall (in)	2014 Actual Rainfall (in)	2015 Actual Rainfall (in)	2016 Actual Rainfall (in)	2017 Actual Rainfall (in)	2018 Actual Rainfall (in)	2019 Actual Rainfall (in)	2020 Actual Rainfall (in)	Percent of Average Site Rainfall (%)
January	2.4	2.7	2.0	1.2	1.0	1.4	3.35	0.9	2.0	3.8	1.1	1.4	1.2	2.5	1.8	3.9	3.1	115%
February	2.5	2.3	1.7	1.9	2.3	0.0	4.35	1.4	2.3	0.9	3.2	0.7	2.2	0.8	2.0	3.4	1.8	77%
March	3.1	3.6	0.1	3.7	2.9	1.5	5.7	4.6	1.9	3.9	2.3	1.7	1.0	2.4	0.8	4.6	1.6	44%
April	3.1	3.2	2.8	3.4	6.2	3.2	1.59	6.5	2.5	1.3	1.5	2.9	1.3	1.7	2.4	2.8	3.7	116%
May	3.7	3.8	1.0	1.9	5.2	5.8	3.25	5.6	3.6	2.4	7.2	1.6	3.9	7.0	7.7	5.1	2.9	76%
June	3.9	4.4	9.7	3.5	4.3	4.6	0.6	4.0	3.6	5.2	1.5	3.9	3.8	1.3	9.9	1.6	5.1	115%
July	3.9	3.4	2.2	1.7	3.8	3.0	1.8	3.1	4.3	1.9	4.6	1.8	5.4	6.7	6.1	2.7		
August	3.5	3.1	1.3	2.8	3.5	2.1	3.3	3.4	5.2	2.6	3.7	1.0	2.3	2.1	4.1	4.8		
September	3.1	4.7	6.1	2.0	4.3	1.3	5.7	5.5	4.9	2.5	1.6	3.6	6.1	1.3	5.9	0.3		
October	3.2	3.0	4.3	4.1	1.2	2.7	0.65	3.9	4.3	5.1	5.17	1.65	0.6	3.5	1.3	2.0		
November	3.1	2.9	5.2	1.6	2.5	3.7	1.8	3.0	1.1	1.6	1.83	1.36	0.8	0.9	4.7	0.6		
December	2.5	2.6	0.7	2.8	1.4	5.0	2.0	3.6	1.55	1.5	3.02	2.46	1.5	0.4	3.7	0.3		
Totals to	**37.9**	**39.6**	**36.9**	**30.4**	**38.5**	**34.2**	**34.1**	**45.2**	**37.0**	**32.8**	**36.7**	**24.1**	**30.0**	**30.4**	**50.3**	**32.1**	**18.1**	**46%**

* Source: National Climate Data Center TD 9641 Clim 81

ATTACHMENT 5

VISCOSE BASIN REPAIRS AND GAS VENT EXTENSIONS MEMORANDUM

FRONT ROYAL BASIN REPAIR CONSTRUCTION SUMMARY REPORT

AVTEX FIBERS SUPERFUND SITE FRONT ROYAL, VIRGINIA

Prepared For:

FMC Corporation
2929 Walnut Street
Philadelphia, PA 19104

Prepared By:

301 Plainfield Road, Suite 350
Syracuse, New York 13212

JULY 2020

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FIGURE 1 – 2020 BASIN SETTLEMENT REPAIRS

1.0 PURPOSE

The former Avtex Fibers Superfund Site in Front Royal, Virginia (Site) primarily manufactured viscose-based rayon, polyester, and polypropylene. Although extensive remediation has been performed to date, and the Site is currently in the operation and maintenance (O&M) phase, there remain below-ground constituents of concern including: carbon disulfide, hydrogen sulfide, methane, and the heavy metals arsenic, cadmium, chromium. As detailed in the *Groundwater Leachate Extraction System Operations, Maintenance and Monitoring Manual* and the *Site-Wide Post Closure Care Operation and Maintenance Plan* (Site-Wide O&M Plan 2015), Viscous Basin (VB) gas vents (GV) are routinely inspected, and an annual topographic survey is conducted throughout the Site basins to monitor settlement. Yearly survey results (2016-2019) indicated settling above established allowable limits in VB 4 ,6, 9 and 10, and Fly Ash Basin (FAB) 3. Existing high-density polyethylene GVs located in the Sulfate Basins (SB) had also settled with the basins and required extensions. These areas and associated well systems contained therein required elevation adjustment to correct differential settlement. The associated well systems included extraction well piping, well system containment boxes and GVs. FMC submitted to United States Environmental Protection Agency (USEPA), a *Basins Repair Work Plan* dated August 2019, to demonstrate the repairs needed. The Work Plan was reviewed and approved prior to commencement of work activities. Approval was received in a letter dated August 13, 2019 from Mr. Jeffrey Thomas, USEPA Region III.

Field activities commenced on May 13, 2020 and were completed on June 30, 2020, with the few minor exceptions mentioned below. This construction summary report summarizes the basin repair work field activities conducted to address basin settlement and associated well system components.

As required by the Site-Wide O&M Plan, this summary report will be included in the next annual report submitted to the USEPA and the Virginia Department of Environmental Quality.

2.0 HEALTH AND SAFETY

Prior to initiating work, the possibility existed that air monitoring would require the use of Level B personal protective equipment (PPE) for the basin pipe work. Continuous air monitoring for Site contaminants of concern (COC) was completed during all intrusive activities associated with the well pipe extension work, as documented in daily field reports. Based on ambient air monitoring data, it was determined modified Level D PPE protection was required for personnel engaged in intrusive activities. Personal protective equipment had to be in compliance with the appropriate Occupational Health and Safety Administration (OSHA) permissible exposure limits and National Institute Safety and Health (NIOSH) recommended exposure limits for the Site's listed COC.

Additionally, personnel performing the work and all Site personnel were 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) trained, and daily safety inspections were conducted to record observations and air monitoring data.

3.0 SCOPE OF WORK

The scope of work outlined in the *Basin Repair Work Plan* (August 2019) included the following tasks:

- Extend extraction well piping
- Adjust well system containment boxes
- Place approved soils as needed
- Place compost into top 3 to 4 inches of fill
- Seed and mulch disturbed areas

- Install GV extensions
- Abandon wells as approved by the USEPA
- Conduct final as-built survey

3.1 Extraction Well Piping, Well Containment Boxes and Gas Vent Extensions

There are 14 extraction well systems within the limits of the basins that required settlement repairs. Each extraction well system is composed of one extraction well, one isolation valve, and one low-point leak detection port. Each component has its own containment box. The boxes are interconnected by Poly-Flo polyethylene (PE) pipe Double Wall with 1-inch-diameter Standard Dimension Ratio (SDR) 11 carrier pipe and 2-inch SDR 17 outer containment pipe. Existing Poly-Flo Double Wall extraction well piping, which enters the extraction well casing from the isolation valve, required reconfiguration to allow for Quazite box elevation adjustments, and to allow for personnel to gain access to perform routine O&M activities. In the Work Plan, it was reported that the 1-inch x 2-inch pipe is no longer being produced by ASAHI-America and was only available in 1-inch x 1.5-inch pipe, therefore, a transition piece was used to make the butt fusion from the existing pipe to the new. All containment box elevations were adjusted as per the approved Work Plan to match basin surface elevations. During the repairs, some containment boxes that remained in good condition were able to be re-used, while some were replaced in kind.

The 18 existing "J type" GV in the SB required extensions to compensate for the settlement. The Work Plan identified 12 GV needing extending due to settlement, however, since the repairs were delayed due to weather, six additional vents were identified during first quarter 2020 inspections. Therefore a total of 18 were extended as per the details provided in the approved Work Plan.

3.2 Basin Repairs

Once the adjustments were made to the extraction well piping, well system containment boxes, and GV extensions, the basins were repaired by placing soil at appropriate depths to adjust the grade and facilitate drainage, covering the placed soil with a mushroom compost approved for use at the Site, and applying an appropriate seed mix with protective straw to assist in the restoration of the vegetative cover in the disturbed areas. A photo log of this work is included in **Attachment A**.

3.2.1 Soil Emplacement

Soil placement was conducted in accordance with the specifications noted in Section 02200 of the *Final Remedial Design* (ERM 2012). Soil material for the fill areas was delivered to the Site and stockpiled prior to use. The soil came from the previously approved Rappawan Inc. Quarry, Front Royal, Virginia, which is the same quarry (i.e., the same source material) as used for historical Site repairs. The Contractor provided on-site screening equipment to screen stockpiled fill soil to 2-inch minus. The Contractor then loaded the fill and transported it to the affected basins, where the soil was placed to elevation and machine-track compacted to the staked survey elevation. Approximately 3200 cubic yards of soil were used. There were three small areas (Work Plan Areas FAB-3A, SB3A, and SB3B) that, due to their location and drainage features, were impacted by rains from mid to late June (**Figure 1**). Wet conditions did not facilitate grading at these areas, as such, they were not completed due to safety and concerns of causing further damage. These three areas were graded to

approximate fill lines, as well as to facilitate drainage, and will be graded to the final contours and restored as per the Work Plan at a later date.

3.2.2 Compost (Topsoil), Seed and Mulch Emplacement

Compost, which was obtained from the local, approved compost vendor (PAK Transport Inc, LLC), was placed to the final grades indicated in the Work Plan. Finished grades for fill had a relatively uniform smooth surface with a tolerance of -0.1 to +0.1 foot from the elevations specified. The compost was uniformly placed/mixed in at the designated areas and evenly spread to reach final grades. The spreading was performed in such a manner that planting could proceed with little additional soil preparation or tillage, with compost placed so as to have an even visual distribution. The topsoil and amended cover soil contained from two to 20 percent organic matter as determined by loss on ignition in accordance with American Society for Testing and Materials (ASTM) D 2974 (**Attachment B**). The fill contractor reseeded compost-amended fill and other disturbed areas with the appropriate seed mix for the given areas, as well as placed straw mulch as described in the approved Work Plan. The Contractor placed straw mulch cover at the rate of two tons per acre.

3.3 Final As-Built Survey

The final as-built survey was completed by Marsh & Legge during the week of July 6, 2020. The survey included, but was not limited to, final grading elevations and top of casing elevations for the extended wells for inclusion in future Groundwater Monitoring Plan revisions. Results of the as-built survey will be included in a future submittal to USEPA.

4.0 REFERENCES

United States of America, 1999. *United States of America vs FMC Corporation, Consent Decree*. October.

Environmental Resources Management, 2012. *Final Remedial Design- Viscose Basin Cap System and Groundwater & Leachate Extraction Operable Unit 7*. Avtex Fibers Superfund Site Front Royal, Virginia. February.

Parsons Corporation, 2015 - *Site-Wide Post-Closure Care Operation and Maintenance (O&M) Plan*. April.

Parsons Corporation, 2019 – *Basin Repairs Work Plan* Avtex Fibers Superfund Site Front Royal, Virginia

ATTACHMENT A

PHOTO LOG

Front Royal Basin Repairs

Date: 5/13/2020

Photo Description: Silt fence installed at a runoff area for SB3A and SB3B.

Date: 5/14/2020

Photo Description: Power screener in use at stockpile area.

Date: 5/18/2020

Photo Description: Cap soil placement area SB4

Date: 5/19/2020

Photo Description: Support pipe installed at SB3 GV-5 location.

Date: 5/20/2020

Photo Description: Soil stockpile screening.

Date: 5/25/2020

Photo Description: VB10 WO-04 RW containment boxes excavated.

Date: 5/27/2020

Photo Description: New pipe configuration installed at VB10 W0-01 RW location

Date: 5/28/2020

Photo Description: Screening operations stockpile area.

Date: 5/29/2020

Photo Description: Power screener.

Date: 6/1/2020

Photo Description: View of new seal bead in new piping and plug installed in old piping at recovery well.

Date: 6/3/2020

Photo Description: Screened soil placement in new stockpile.

Date: 6/4/2020

Photo Description: Containment box for low point monitor installed at location VB10 W0-06.

Date: 6/8/2020

Photo Description: New boxes set at RW location W0-08.

Date: 6/9/2020

Photo Description: Screening operations.

Date: 6/10/2020

Photo Description: Management and shaping of soil stockpiles.

Date: 6/12/2020

Photo Description: View of VB10 area rough grading.

Date: 6/15/2020

Photo Description: Completed grading around replaced containment boxes at RW W0-06.

Date: 6/18/2020

Photo Description: Minor standing water in area VB10-A.

Date: 6/22./2020

Photo Description: Dozer working fill in FAB3-A area to try to dry out.

Date: 6/24/2020

Photo Description: Compost dumping in VB10-B

Date: 6/26/2020

Photo Description: Final tracking of VB10-B area.

Date: 6/29/2020

Photo Description: Completed VB10-A area.

Date: 6/30/2020

Photo Description: Completed stockpile area.

ATTACHMENT B

LABORATORY RESULTS

SOIL CONSULTANTS ENGINEERING

CONSULTING ENGINEERS • BUILDING OFFICIALS
CONSTRUCTION PROFESSIONALS • SOIL SCIENTISTS & GEOLOGISTS

SOIL ANALYSIS REPORT

Analytical Method(s): Mehlich 3 SMP Buffer pH Loss On Ignition Water pH

Date Received: 07/06/2020 **Date Of Analysis:** 07/07/2020 **Date Of Report:** 07/07/2020

Sample ID Field ID	Lab Number	OM	W/V	ENR	Phosphorus			Potassium	Magnesium	Calcium	Sodium	pH		Acidity	C.E.C
		% Rate	Soil Class	lbs/A	M3 ppm Rate	ppm Rate	ppm Rate	K ppm Rate	Mg ppm Rate	Ca ppm Rate	Na ppm Rate	Soil pH	Buffer Index	H meq/100g	meq/100g
Sample A	25304	5.3 H		132	406 VH			841 VH	398 M	3900 H	102 VL	6.9		0.4	25.8

Sample ID Field ID	Percent Base Saturation					Nitrate	Sulfur	Zinc	Manganese	Iron	Copper	Boron	Soluble Salts		
	K %	Mg %	Ca %	Na %	H %	NO_3 N ppm Rate	S ppm Rate	Zn ppm Rate	Mn ppm Rate	Fe ppm Rate	Cu ppm Rate	B ppm Rate	SS ms/cm Rate		
Sample A	8.4	12.9	75.6	1.7	1.6		1480 VH	11.0 VH	17 M	95 VH	1.7 H	1.6 H	3.4 VH		

Values on this report represent the plant available nutrients in the soil. Rating after each value: VL (Very Low), L (Low), M (Medium), H (High), VH (Very High). ENR - Estimated Nitrogen Release. C.E.C. - Cation Exchange Capacity.

Explanation of symbols: % (percent), ppm (parts per million), lbs/A (pounds per acre), ms/cm (milli-mhos per centimeter), meq/100g (milli-equivalent per 100 grams). Conversions: ppm x 2 = lbs/A, Soluble Salts ms/cm x 640 = ppm.

This report applies to sample(s) tested. Samples are retained a maximum of thirty days after testing.

Analysis prepared by: Waypoint Analytical Virginia, Inc.

by: Pauric McGroary

Pauric McGroary

Testing Completed by: Waypoint Analytical 7621 Whitepine Road Richmond, VA 23237	**Project Name: Front Royal BMP** **Project Number: 20-0283W**

FIGURE

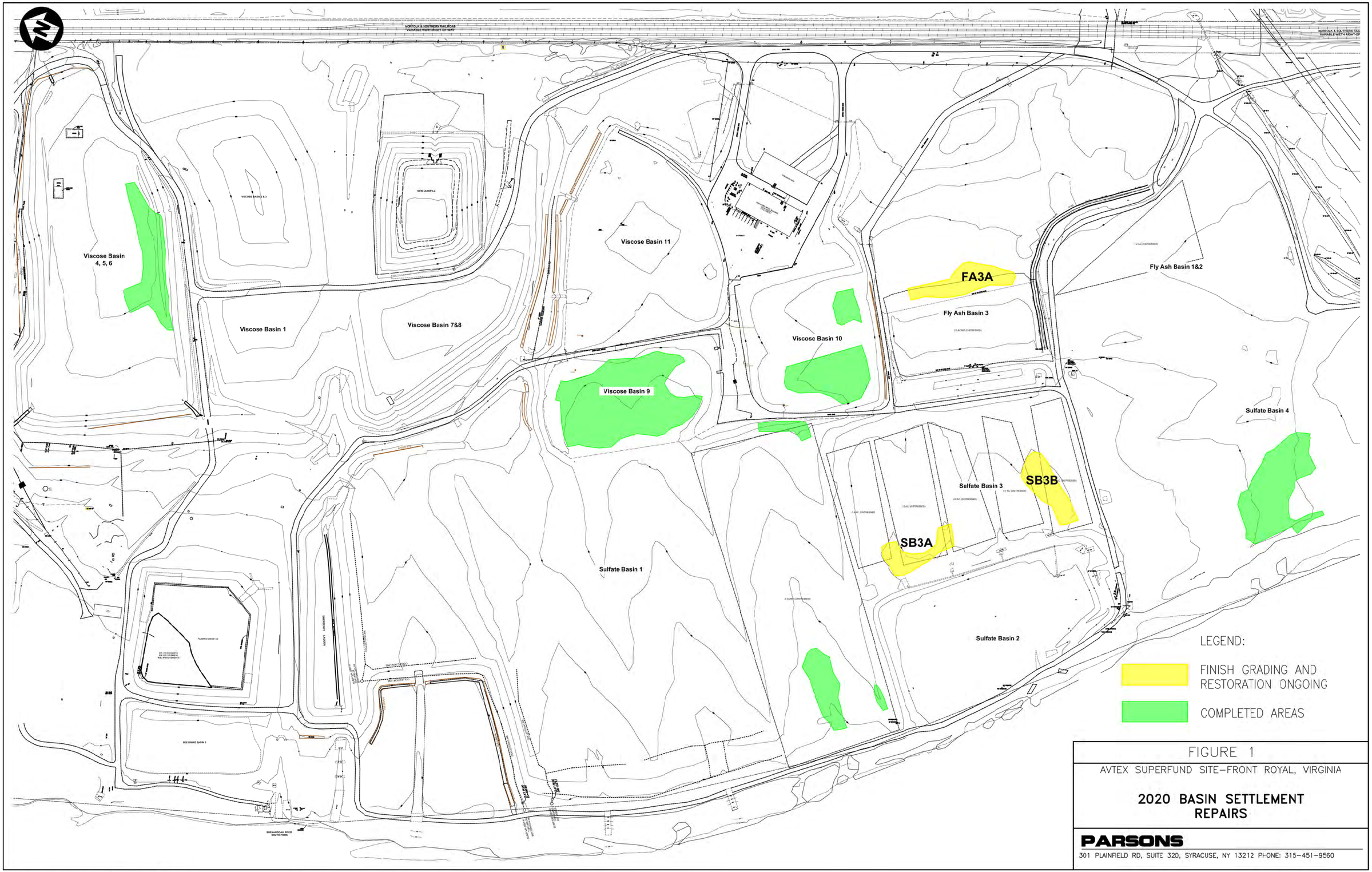

FIGURE 1

AVTEX SUPERFUND SITE–FRONT ROYAL, VIRGINIA

2020 BASIN SETTLEMENT REPAIRS

PARSONS

301 PLAINFIELD RD, SUITE 320, SYRACUSE, NY 13212 PHONE: 315–451–9560

FILE NAME: P:\FMC PROGRAM\MIDDLEPORT\BUILDING 21\INVESTIGATION WORKPLAN\CAD\TAG-MAPS\BLDG-21-TAGS-7-2019.DWG
PLOT DATE: 7/15/2019 10:31 AM PLOTTED BY: RUSSO, JILL