



Date: September 8, 2023 **Project No.** 350.0065.008

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Subject: **Remedial Investigation Work Plan - Addendum 11, Amendment A**
2023 Groundwater Monitoring Plan
Former Smurfit-Stone/Frenchtown Mill Site, Missoula County, Montana

BACKGROUND

This Amendment to Addendum 11 of the Remedial Investigation (RI) Work Plan (NewFields, 2021; NewFields, 2015) describes modifications to the groundwater monitoring event planned for Fall 2023 at the Former Frenchtown Mill (Site) located in Missoula County, Montana (**Figure 1**). This Amendment is being submitted on behalf of International Paper and WestRock, CP, LLC, representing two of the Potentially Responsible Parties (PRPs) for the Site. Proposed groundwater monitoring modifications include the addition of specific wells and analytes beyond those specified in Addendum 11 (NewFields, 2021).

Between March and May of 2023, EPA, MDEQ, various stakeholders, and the PRPs participated in multiple technical working group discussions. These discussions culminated in the development and submittal by the stakeholders of Data Quality Objectives (DQOs) to the EPA recommending additional groundwater sampling. EPA submitted a formal request to the PRPs to develop work plan(s) addressing the DQOs on May 16, 2023 (EPA, 2023a). The PRPs responded on May 24, 2023 with a letter requesting to meet with the EPA to clarify the additional sampling request(s) and discuss a path forward in accordance with the Administrative Order on Consent (AOC)¹. The PRPs met with EPA in Helena, Montana on June 21, 2023 to present a high-level proposal in response to EPA's request for additional sampling. In a July 11, 2023 email from EPA to the PRPs (EPA, 2023b), EPA was supportive of the initial approach and directed the PRPs to draft work plans in accordance with the AOC.¹

The PRPs are proposing two distinct work planning phases to address EPA's requests for additional sampling. This Amendment outlines activities to be completed during the upcoming Fall 2023 groundwater monitoring event, as the first phase of work. The second phase of work, which will be developed in a subsequent RI Work Plan Addendum 12, will include installation of new groundwater monitoring wells and details for future groundwater and surface water monitoring events. If Addendum 12 is not approved by Spring 2024, this Amendment A to Addendum 11 will remain in effect.

¹ Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study, CERCLA Docket -08-2016-0001, dated November 12, 2015.



MONITORING PROGRAM

Table 1 presents updated groundwater monitoring DQOs, which incorporate key elements of the EPA's requests. **Table 2** presents detailed descriptions of monitoring criteria to address DQOs, and **Table 3** presents a well-specific groundwater monitoring analytical summary. **Table 4** provides a list of bottle specifications for sampling. **Table 5** presents a detailed list of analytes proposed for testing, associated laboratory reporting limits, and applicable risk-based screening levels. A summary of the additional data collection not included in the original submittal of Addendum 11 is as follows:

1. Three new rationale categories have been added for further investigation of potential mobilization of groundwater constituents: 1) Groundwater-surface water interaction for wells adjacent to the Clark Fork River (CFR), 2) Proximity to primary settling ponds and solid waste basins, and 3) Wells adjacent to historic CFR channel locations² (**Table 2**).
2. Seven existing wells that were not proposed for sampling under Addendum 11 will be added back into the monitoring program for Fall 2023 in accordance with the new rationale described above: NFMW3, NFMW6, NFMW11, NFMW15, NFMW19, NFMW20, and SMW19 (**Table 3; Figure 2**).
3. The majority of sampled well locations included in this Amendment (**Table 3**) will include analysis for dioxins/furans, PCB congeners (individual PCB compounds), and PCB Aroclors (commercially distributed mixtures of multiple PCB congeners).
4. Hexavalent chromium has been added to the analyte list to address uncertainty associated with risk from chromium. Without available chromium speciation data from the Site, all chromium is assumed to be of the more toxic hexavalent form, which likely overestimates risks from total chromium, as stated in EPA (2022). Speciation data will allow for estimation of risk from hexavalent chromium and trivalent chromium separately, thereby reducing uncertainty in the risk conclusions.

In accordance with DQOs (**Table 1**), the PRPs will perform dioxin/furan and PCB sampling in wells with previous PCB Aroclor detections in addition to wells located downgradient from potential primary source areas or located within historic CFR channels (**Table 3; Figure 2**). The PRPs will also perform additional sampling of wells located near the CFR and other locations to support characterization of groundwater-surface water interaction (**Table 3; Figure 2**).

Appendix A includes an updated Standard Operating Procedure (SOP)-1 for Field Records and Field Sampling Forms (SOP-1), which incorporates electronic data collection procedures and supersedes the previous version from Addendum 11. Beyond the changes indicated herein, all other groundwater monitoring locations and procedures, including QA/QC and data validation procedures, will be performed in accordance with the EPA-approved Addendum 11 to the RI Work Plan (NewFields, 2021).

² Located within historic CFR channel in floodplain, based on channel mapping from LiDAR imagery and historic aerial photographs (NewFields, 2017 and 2018).



The PRPs plan to initiate the Fall 2023 sampling event during the week of September 18, 2023, and would appreciate EPA's approval of this Amendment as soon as possible.

Respectfully submitted,

David Tooke
Project Coordinator

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Appendix A SOP-1: Field Records and Field Sampling Forms (supersedes SOP-1 in Appendix A of Addendum 11)

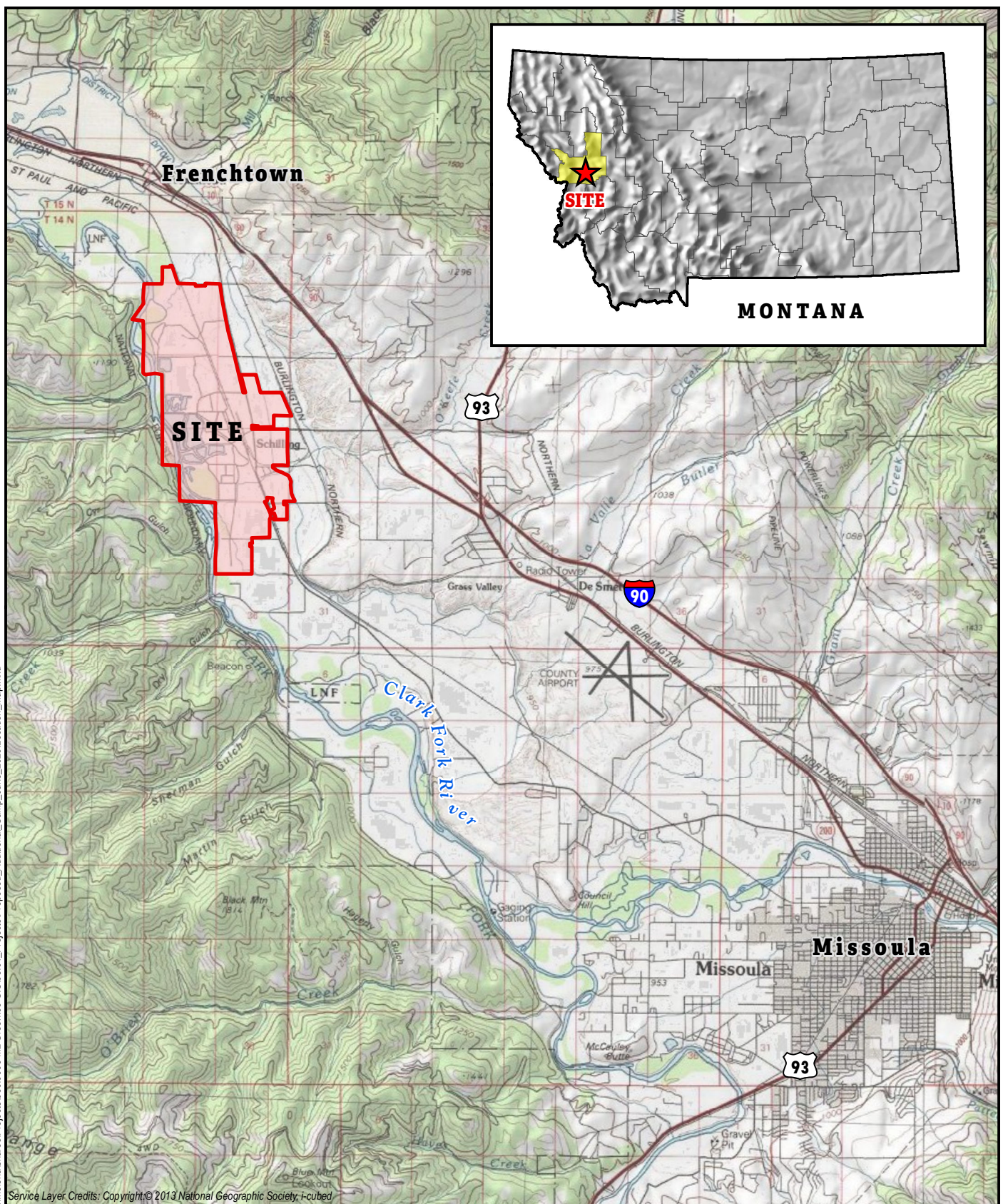
See RI Work Plan Addendum 11 (NewFields, 2021) for all other appendices



REFERENCES

- Abt Associates, 2022. Recommendations for Additional Sampling at the Smurfit-Stone Site in Frenchtown. October 21.
- Environmental Protection Agency (EPA), 2022. Final Human Health Risk Assessment for the Smurfit-Stone/Frenchtown Mill Operable Unit 3 Site Located in Missoula County, Montana. April.
- EPA, 2023a. Notice of Determination Regarding Additional Sampling Smurfit-Stone Mill Superfund Site, Frenchtown, Montana. May 16.
- EPA, 2023b. Smurfit Proposed Additional Sampling Update, Email communication from Allie Archer to David Tooke, Smurfit-Stone Mill Superfund Site, Frenchtown, Montana. July 11.
- EPA, 1996. Low-flow (minimal drawdown) ground-water sampling procedures (p. 12).
- Imbrigiotta, T. E., & Harte, P. T., 2020. Passive sampling of groundwater wells for determination of water chemistry (No. 1-D8). US Geological Survey.
- NewFields, 2015. Remedial Investigation Work Plan, Smurfit-Stone/Frenchtown Mill, Missoula County, Montana. November.
- NewFields, 2017. Addendum 6 to Remedial Investigation Work Plan, Geotechnical Stability Evaluation of the Clark Fork River Berm, November.
- NewFields, 2018. Geotechnical Evaluation of the Clark Fork River Berm, Version 2, December.
- NewFields, 2020. Draft Groundwater Conceptual Site Model, Former Smurfit-Stone/Frenchtown Mill Site, Missoula County, Montana. Version 3.
- NewFields, 2021. Addendum 11 of the Remedial Investigation Work Plan, Smurfit-Stone/Frenchtown Mill, Missoula County, Montana. September 9. Version 3.
- NewFields, 2022. Comments on Abt Memo Submitted in Support of Missoula City-County Health Department Recommendations for Additional Sampling at the Former Smurfit-Stone/Frenchtown Mill Site located in Missoula County, Montana. December 16.
- NewFields, 2023. Response to EPA's Notice of Determination Regarding Additional Sampling at the Smurfit-Stone Mill in Frenchtown, Montana. May 24.

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 **NewFields**

Site Location Map
Remedial Investigation Workplan
Amendment A to Addendum 11
Former Smurfit Stone/Frenchtown Mill Site
Missoula County, Montana
FIGURE 1

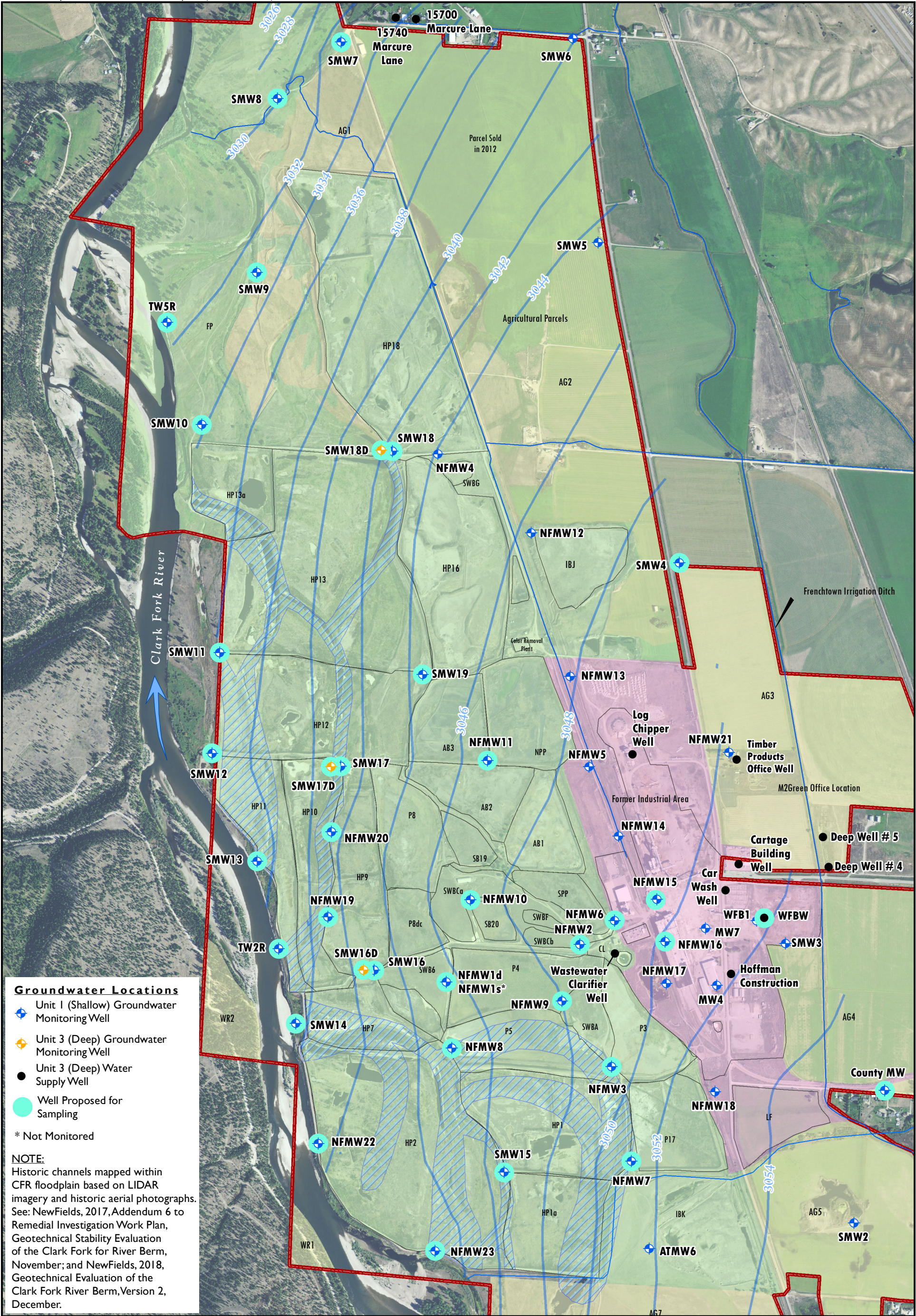


Table 1 - Data Quality Objectives: 2023 Groundwater Monitoring Amendment A to Addendum 11 of the Remedial Investigation Work Plan, Former Smurfit-Stone/Frenchtown Mill September 2023						
Step 1: Problem Statement	Step 2: Identifying the Decisions	Step 3: Decision Inputs	Step 4: Study Boundaries	Step 5: Decision Rules	Step 6: Tolerance Limits on Errors	Step 7: Optimization of Sample Design
Additional groundwater data (water levels and water quality) will further refine the nature and extent of contamination and support an analysis of remedial alternatives Additional data will further refine groundwater quality spatial and temporal trends. Further characterize constituent mobilization from potential sources into groundwater, and from groundwater into the Clark Fork River, or into historic river channels. The current risk assessment approach evaluates total chromium concentrations against chromium VI risk based screening levels. However, this approach may overestimate risks from total chromium, as much of the chromium could be present as chromium III, which is much less toxic to humans. Chromium speciation will help reduce uncertainty in the risk conclusions. PCB nature and extent in groundwater was previously investigated using Aroclors. Other (dioxin-like) PCBs could be present above concentrations that contribute to risk at the site.	Do new groundwater data support the current nature and extent conceptual model? Do new groundwater data support spatial and temporal water quality trends documented in the Groundwater CSM (NewFields, 2020)? Are there constituents in groundwater with the potential to mobilize into the Clark Fork River through groundwater-surface water interaction? Are constituents mobilizing from primary settling basins and/or solid waste basins via groundwater? Are constituents mobilizing along historic Clark Fork River channels? Which chromium species exist in Site groundwater? Do PCB congeners exist at detectable levels in Site groundwater? Is there a measurable relationship between PCB congeners and Aroclors in Site groundwater?	Groundwater monitoring will be conducted at wells located to supplement historic groundwater data and evaluate potential mobilization via groundwater-surface water interaction, through historic Clark Fork River Channels, and downgradient of primary settling basins/solid waste basins. Groundwater elevation measurements will be collected from numerous monitoring wells across the Site to monitor groundwater flow and gradient and to determine if wastes in settling ponds and solid waste basins are inundated during high groundwater conditions. Groundwater analytes include dioxins/furans, metals (including speciated chromium VI), anions, cations, PCB congeners and Aroclors, VOCs, and SVOCs.	Site groundwater includes Aquifer Unit 1 (shallow) and Unit 3 (deep) groundwater across the Site. Previous groundwater data collected from the Site and known sources of contamination will be used to select sample locations and parameters. Sampling described in this monitoring plan will be conducted in late September to early October of 2023. Sampling in 2024 and beyond will be defined in subsequent monitoring plans.	Groundwater elevations and water quality data will be used to make informed risk management and response action decisions. If analytical results deviate ($\pm$ 20%) from previously observed temporal and spatial patterns, workplan modifications may be prudent to investigate the deviations in 2024. The results of the chromium speciation will be used to reduce the uncertainty in risk conclusions. If a measurable relationship between PCB congeners and Aroclors in Site groundwater exists, new and existing Aroclor and congener data may be sufficient to confirm nature and extent of PCBs in Site groundwater.	Quality assurance and quality control procedures will be conducted and data usability will be evaluated in accordance with the Quality Assurance Project Plan (QAPP; NewFields, 2022). Acceptance criteria for the data collected as part of this study are outlined in the Quality Assurance Project Plan (NewFields, 2022).	Samples are proposed in areas thought to have the highest potential for mobilization from potential sources or to the Clark Fork River or along historic channels. Selected analyses are informed by results and observations from previous Site investigations. Groundwater data is used to evaluate the fate and transport of constituents from soil or waste materials upgradient of the monitoring well and along flow pathways toward receptors such as the Clark Fork River.

Table 2 - Revised Groundwater Monitoring Evaluation Criteria
Amendment A to Addendum 11 of the Remedial Investigation Work Plan, Former Smurfit-Stone/Frenchtown Mill
September 2023

Primary Rationale for Monitoring	Secondary Rationale for Monitoring	Applicable Analyte Group(s)	Evaluation Criteria
1a	Confirm Nature and Extent of Contamination	Metals Common Ions Dioxins/Furans ¹ VOCs ¹ PCBs ²	Background (Aquifer Unit 1): CountyMW Background (Aquifer Unit 3): WFBW Downgradient: See Addendum 11, Table 3 for specific wells
1b		Metals Common Ions Dioxins/Furans PCBs ²	Maximum TEQ 0DL (2014-2020) greater than EPA identified ³ background concentration (1.43 ug/L) See Addendum 11, Table 3 for specific wells
1c		Metals Common Ions Dioxins/Furans VOCs PCBs ²	SWBA: NFMW2, NFMW9, and NFMW10 SWB6: NFMW1d, and SMW16
1d		Metals Common Ions Dioxins/Furans PCBs ²	Monitoring wells SMW16D, SMW17D, and SMW18D Background monitoring well WFBW
2	Monitor Temporal Trends	Metals Common Ions PCBs ²	Strong statistical increasing or decreasing trend in water quality indicators according to Mann-Kendall statistical tests See Addendum 11, Table 3 for specific wells ⁴
3a	Investigate Potential for Mobilization of Groundwater Constituents	Metals Common Ions Dioxins/Furans PCBs ²	Adjacent to Clark Fork River or along-gradient from river-adjacent wells; see Table 3 for specific wells
3b		Metals Common Ions Dioxins/Furans PCBs ²	Downgradient from primary settling basins and solid waste basins and/or previous PCB Aroclor detections; see Table 3 for specific wells
3c		Metals Common Ions Dioxins/Furans PCBs ²	Located within historic Clark Fork River channel in floodplain, based on channel mapping from LiDAR imagery and historic aerial photographs ⁶ ; see Table 3 for specific wells

Notes:

1 - Analyte groups for background monitoring locations are specific to Aquifer Units 1 and 3; see Table 3 for details.

2 - Polychlorinated Biphenyl (PCB) congener and Aroclor analysis to confirm nature and extent of PCBs.

3 - US EPA Draft Human Health Risk Assessment (HHRA) for Operable Unit (OU) 2, December 2020 and USEPA Draft HHRA for OU3, December 2020.

4 - Additional details and updated analysis to be presented in NewFields' Temporal and Seasonal Trends in Groundwater Quality document, anticipated Fall 2023.

5 - Typically refers to primary settling basins and/or solid waste basins, except for NFMW10 (SB20), SMW19 (AB3/NPP), and NFMW15 (OU2 2017 PCB removal action).

6 - NewFields, 2017, Addendum 6 to Remedial Investigation Work Plan, Geotechnical Stability Evaluation of the Clark for River Berm, November; and NewFields, 2018, Geotechnical Evaluation of the Clark Fork River Berm, Version 2, December.

References:

NewFields, 2021. Addendum 11 of the Remedial Investigation Work Plan, Smurfit-Stone/Frenchtown Mill, Missoula County, Montana. September 9. Version 3.

Acronyms and Abbreviations:

LiDAR - Light detection and ranging 0DL - TEQ calculated substituting 0 for congener concentrations reported below detection limits
PCBs - polychlorinated biphenyls VOCs - volatile organic compounds
SWB - solid waste basins ug/L - micrograms per liter
TEQ - toxicity equivalence dioxins/furans

Table 3 - Revised Groundwater Monitoring Summary

Amendment A to Addendum II of the Remedial Investigation Work Plan, Former Smurfit-Stone/Frenchtown Mill

September 2023

	Rationale: Confirm Nature and Extent of Contamination	Rationale: Investigate Potential for Mobilization of Groundwater Constituents			Amendment A to Addendum II: Monitoring Location	Proposed Analytes					
Well Identifier	Addendum II: Monitoring Location (Table 2 Rationale)	Groundwater-Surface Water Interaction	Potential Source Area ¹	Historic Clark Fork River Channel Location		Field Parameters	Metals ²	Common Ions ³	Dioxins/Furans ⁴	VOCs ⁵	PCBs ⁶
Aquifer Unit I											
County MW	Ia				X	X	X	X	X	X	X
ATMW6											
RE289											
NFMW1d	Ic		X		X	X	X	X	X	X	X
NFMW2	Ic, 2				X	X	X	X	X	X	X
NFMW3			X	X	X	X	X	X	X		X
NFMW4											
NFMW5											
NFMW6			X		X	X	X	X	X		X
NFMW7	2		X	X	X	X	X	X	X		X
NFMW8	2	X	X	X	X	X	X	X	X		X
NFMW9	Ib, Ic		X		X	X	X	X	X	X	X
NFMW10	Ic		X		X	X	X	X	X	X	X
NFMW11			X		X	X	X	X	X		X
NFMW12											
NFMW13											
NFMW14											
NFMW15			X		X	X	X	X	X		X
NFMW16	Ib	X			X	X	X	X	X		X
NFMW17											
NFMW18											
NFMW19		X		X	X	X	X	X	X		X
NFMW20		X		X	X	X	X	X	X		X
NFMW21											
NFMW22	Ia	X			X	X	X	X	X		X
NFMW23	Ia	X		X	X	X	X	X	X		X
SMW1											
SMW3											
SMW4	2				X	X	X	X	X		X
SMW5											
SMW6											
SMW7	Ia, 2				X	X	X	X			
SMW8	Ia				X	X	X	X			
SMW9	Ia				X	X	X	X	X		X
SMW10	Ia,2				X	X	X	X	X		X
SMW11	Ia,Ib, 2	X		X	X	X	X	X	X		X
SMW12	Ia, 2	X		X	X	X	X	X	X		X
SMW13	Ia,Ib	X		X	X	X	X	X	X		X
SMW14	Ia	X		X	X	X	X	X	X		X
SMW15	Ia	X		X	X	X	X	X	X		X
SMW16	Ic, 2		X		X	X	X	X	X	X	X
SMW17	Ib	X		X	X	X	X	X	X		X
SMW18	2	X		X	X	X	X	X	X		X
SMW19			X		X	X	X	X	X		X
SMW20											
TW2R	Ia	X		X	X	X	X	X	X		X
TW5R	Ia				X	X	X	X			
Aquifer Unit 3											
WFBW	Ia				X	X	X	X	X		X
SMW16D	Id		X		X	X	X	X	X		X
SMW17D	Id			X	X	X	X	X	X		X
SMW18D	Id				X	X	X	X	X		X
Total (RIWP Add II)	29	N/A	N/A	N/A	N/A	29	29	29	10	6	N/A
Total (Proposed)	N/A	14	12	15	36	36	36	36	33	6	33

X Monitoring as designated in RIWP Addendum II (NewFields, 2021)

X New monitoring rationale, location, or analyte added since RIWP Addendum II

- Notes:
- 1 - Typically refers to primary settling basins and/or solid waste basins, except for NFMW10 (SB20), SMW19 (AB3/NPP), and NFMW15 (OU2 2017 PCB removal action).
- 2 - Total and Dissolved Metals (Al, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Ag, Th,V, Zn) by EPA Method 6020, Hg by EPA Method 7470/7471 and Cr(VI) by EPA Method 7199
- 3 - Common ions includes Ca, Mg, K, and Na (Method 6010); Nitrate and Nitrite (Method 353.2); Phosphate (Method SM4500-P-E); TOC (Method SM 5310C); Sulfate, Chloride, and Fluoride (Method 300.0); Total Dissolved Solids (Method SM 2540-C)
- 4 - Dioxins/Furans by EPA Method 8290
- 5 - VOCs - Volatile Organic Compounds by EPA Method 8260
- 6 - PCBs - Polychlorinated Biphenyls by EPA Method 8082 (Aroclors) and 1668 (209 congeners)

References:

NewFields, 2021. Addendum II of the Remedial Investigation Work Plan, Smurfit-Stone/Frenchtown Mill, Missoula County, Montana. September 9. Version 3.

Table 4 - Bottle Counts, Preservatives, and Holding Times by Well Location
Amendment A to Addendum 11 of the Remedial Investigation Work Plan, Former Smurfit-Stone/Frenchtown Mill
September 2023

Well Identifier	Metals				Common Ions				Dioxins/Furans			Volatile Organic Compounds			Polychlorinated Biphenyls										
	Number of Bottles	Bottle Type and Preservation		Hold Time	Number of Bottles	Bottle Type and Preservation		Hold Time	Number of Bottles	Bottle Type and Preservation	Hold Time	Number of Bottles	Bottle Type and Preservation	Hold Time	Number of Bottles	Bottle Type and Preservation		Hold Time							
		Metals by EPA Methods 6020, 6010 & 7470/7471	Hexavalent Chromium			NO ₃ /NO ₂ & Phosphate	Fl, SO ₄ Cl, pH, Alkalinity, TDS									TOC	PCB Congeners		PCB Aroclors						
Aquifer Unit 1																									
County MW	3	2 x 250-mL HDPE bottles	1 x 125-mL HDPP tube	All analytes 6 months except mercury and chromium (VI) (28 days).	4	1 x 250-mL HDPE bottle	1 x 250-mL HDPE bottle and 1 x 1-L HDPE bottle	1 x 250-mL amber glass bottle	All analytes 28 days except TDS (7 days).	2	2 x 1-liter amber glass bottles	Store at 6°C or lower, in the dark. Extract within 30 days and analyze within 45 days of extraction. Analyze within 1 year if sample extracts stored in the dark at < -10°C.	3	3 x 40-mL VOA Vial	14 days	4	2 x 1-liter amber glass bottles	2x 100-mL amber glass bottles	Extract within 1 year of sample collection. Analyze within 40 days of extraction.						
NFMW1d	3				4					2			3	Cool to 6°C; HCl to pH<2; Na ₂ S ₂ O ₃ if Cl present		4									
NFMW2	3				4					2			3			4									
NFMW3	3				4					2						4									
NFMW6	3				4					2						4									
NFMW7	3				4					2						4									
NFMW8	3				4					2						4									
NFMW9	3				4					2			3	3 x 40-mL VOA Vial	14 days	4									
NFMW10	3				4					2			3	Cool to 6°C; HCl to pH<2; Na ₂ S ₂ O ₃ if Cl present		4									
NFMW11	3				4					2						4									
NFMW16	3				4					2						4									
NFMW19	3				4					2						4									
NFMW20	3				4					2						4									
NFMW22	3				4					2						4									
NFMW23	3				4					2						4									
SMW4	3				Cool to <6°C; nitric acid to pH < 2					Cool to <6°C; buffer solution ¹ to pH 9-9.5			4	Cool to <6°C; sulfuric acid to pH <2	Cool to <6°C; HCl to pH < 2	2							4		
SMW7	3												4										4		
SMW8	3												4										4		
SMW9	3										4									4					
SMW10	3										4									4					
SMW11	3										4									4					
SMW12	3										4									4					
SMW13	3										4									4					
SMW14	3										4									4					
SMW15	3										4									4					
SMW16	3										4			2	2 x 1-liter amber glass bottles	Store < 6°C, in dark. 30 days to extract, analyze within 45 days of extraction. Analyze within 1 year if sample extracts stored in dark < -10°C.	3	3 x 40-mL VOA Vial	14 days	4	2 x 1-liter amber glass bottles	2 x 100-mL amber glass bottles	Extract within 1 year of sample collection. Analyze within 40 days of extraction.		
SMW17	3										4			2			Cool to <6°C; sodium thiosulfate (Na ₂ S ₂ O ₃)	Cool to 6°C; HCl to pH<2; Na ₂ S ₂ O ₃ if Cl present		4					
SMW18	3										4			2						4					
SMW19	3										4			2						4					
TW2R	3										4			2						4					
TW5R	3										4									4					
Aquifer Unit 3																									
WFBW	3	2 x 250mL HDPE bottles	1 x 125-milliter HDPP tube	All analytes 6 months except mercury and chromium (VI) (28 days).	4	1 x 250 mL HDPE bottle	1 x 250 mL HDPE bottle and 1x1-L mL HDPE bottle	1 x 250 mL amber glass bottle	All analytes 28 days except TDS (7 days).	2	2 x 1-liter amber glass bottle	Same as above					4	2 x 1-liter amber glass bottle	2 x 100-mL amber glass bottles	Same as above					
SMW16D	3				4					2							4								
SMW17D	3				4					2							4								
SMW18D	3				4					2							4								

Notes:

°C - degrees Celsius; mL - milliliter; TDS - total dissolved solids; HDPE - high density polyethylene; HDPP - high density polypropylene; VOA - Volatile Organic Analysis; Fl - fluoride; Cl- chloride; SO₄ - sulfate; NO₃ - nitrate; NO₂ - nitrite; TOC - total organic carbon

See Table 5 for full analyte lists. Note that bottle counts do not include Quality Assurance/Quality Control (QA/QC) samples.

1 - Buffer solution consists of ammonium sulfate, ammonium hydroxide, and reagent water.

Analyte not proposed for analysis at well location.

Table 5 - Analytes Table
Amendment A to Addendum II of the Remedial Investigation Work Plan, Former Smurfit-Stone/Frenchtown Mill
September 2023

Analytical Method(s)	Target Analyte	CAS	Target Laboratory Reporting Limit	RBC ¹	DEQ-7 Water Quality Standard	Units
Dioxins / Furans						
EPA 8290 High Resolution	2,3,7,8-TCDD	1746-01-6	1.07	--	--	pg/L
	1,2,3,7,8-PeCDD	40321-76-4	1.74	--	--	pg/L
	1,2,3,6,7,8-HxCDD	57653-85-7	2.54	--	--	pg/L
	1,2,3,4,7,8-HxCDD	39227-28-6	2.99	--	--	pg/L
	1,2,3,7,8,9-HxCDD	19408-74-3	2.99	--	--	pg/L
	1,2,3,4,6,7,8-HpCDD	35822-46-9	3.72	--	--	pg/L
	OCDD	3268-87-9	4.83	--	--	pg/L
	2,3,7,8-TCDF	51207-31-9	0.91	--	--	pg/L
	1,2,3,7,8-PeCDF	57117-41-6	1.1	--	--	pg/L
	2,3,4,7,8-PeCDF	57117-31-4	0.97	--	--	pg/L
	1,2,3,6,7,8-HxCDF	57117-44-9	1.21	--	--	pg/L
	1,2,3,7,8,9-HxCDF	72918-21-9	1.24	--	--	pg/L
	1,2,3,4,7,8-HxCDF	70648-26-9	1.33	--	--	pg/L
	2,3,4,6,7,8-HxCDF	60851-34-5	2.08	--	--	pg/L
	1,2,3,4,6,7,8-HpCDF	67562-39-4	1.52	--	--	pg/L
	1,2,3,4,7,8,9-HpCDF	55673-89-7	2.55	--	--	pg/L
	OCDF	39001-02-0	6.85	--	--	pg/L
WHO 2005 TEF Calculation	TEQ	--	--	0.12 ²	2	pg/L
Target Analyte List Metals						
EPA 6020 (ICP-MS)	Aluminum	7429-90-5	20	2000	--	µg/L
	Arsenic	7440-38-2	0.5	0.052	10	µg/L
	Barium	7440-39-3	0.3	380	1000	µg/L
	Cadmium	7440-43-9	0.08	0.92	5	µg/L
	Chromium	7440-47-3	0.5	0.035	100	µg/L
	Cobalt	7440-48-4	0.5	0.6	--	µg/L
	Copper	7440-50-8	1	80	1300	µg/L
	Iron	7439-89-6	50	1400	--	µg/L
	Lead	7439-92-1	0.1	15	15	µg/L
	Manganese	7439-96-5	0.5	43	--	µg/L
	Nickel	7440-02-0	0.5	39	100	µg/L
	Silver	7440-22-4	0.5	9.4	100	µg/L
	Thallium	7440-28-0	0.1	0.02	2	µg/L
	Vanadium	7440-62-2	1	8.6	--	µg/L
	Zinc	7440-66-6	5	600	2000	µg/L
EPA Method 7199	Chromium (VI)	18540-29-9	0.5	0.035	100	µg/L
EPA 7470/7471 (CVAA)	Mercury	7439-97-6	0.2	0.57	2	µg/L
Polychlorinated Biphenyls (PCBs)						
EPA Method 8082A	Aroclor-1016	12674-11-2	0.1	0.14	--	µg/L
	Aroclor-1221	11104-28-2	0.1	0.0047	--	µg/L
	Aroclor-1232	11141-16-5	0.1	0.0047	--	µg/L
	Aroclor-1242	53469-21-9	0.1	0.0078	--	µg/L
	Aroclor-1248	12672-29-6	0.1	0.0078	--	µg/L
	Aroclor-1254	11097-69-1	0.1	0.0078	--	µg/L
	Aroclor-1260	11096-82-5	0.1	0.0078	--	µg/L
	Aroclor-1262	37324-23-5	0.1	--	--	µg/L
	Aroclor-1268	11100-14-4	0.1	--	--	µg/L
EPA Method 1668 ³	PCB-I through PCB-209	--	5 ⁴	--	--	pg/L
Calculation ³	Total PCBs	--	--	--	0.5	µg/L

Table 5 - Analytes Table
Amendment A to Addendum II of the Remedial Investigation Work Plan, Former Smurfit-Stone/Frenchtown Mill
September 2023

Analytical Method(s)	Target Analyte	CAS	Target Laboratory Reporting Limit	RBC ¹	DEQ-7 Water Quality Standard	Units
EPA Method 8260	Volatile Organic Compounds (VOCs)					
	1,1,1,2-Tetrachloroethane	630-20-6	1	0.57	2.0	µg/L
	1,1,1-Trichloroethane	71-55-6	1	800	200	µg/L
	1,1,2,2-Tetrachloroethane	79-34-5	1	0.076	--	µg/L
	1,1,2-Trichloroethane	79-00-5	1	0.041	3	µg/L
	1,1,2-Trichlorotrifluoroethane	76-13-1	1	0.33	--	µg/L
	1,1-Dichloroethane	75-34-3	1	2.8	--	µg/L
	1,1-Dichloroethene	75-35-4	1	28	7	µg/L
	1,1-Dichloropropene	563-58-6	1	--	--	µg/L
	1,2,3-Trichlorobenzene	87-61-6	1	0.7	--	µg/L
	1,2,3-Trichloropropane	96-18-4	4	0.00075	--	µg/L
	1,2,4-Trichlorobenzene	120-82-1	1	0.4	70	µg/L
	1,2,4-Trimethylbenzene	95-63-6	1	5.6	--	µg/L
	1,2-Dibromo-3-chloropropane	96-12-8	4	0.00033	0.2	µg/L
	1,2-Dibromoethane (EDB)	106-93-4	1	0.0075	0.017	µg/L
	1,2-Dichlorobenzene	95-50-1	1	30	600	µg/L
	1,2-Dichloroethane	107-06-2	1	0.17	4	µg/L
	1,2-Dichloroethene (Total)	540-59-0	2	--	--	µg/L
	1,2-Dichloropropane	78-87-5	4	0.82	5	µg/L
	1,3,5-Trimethylbenzene	108-67-8	1	6	--	µg/L
	1,3-Dichlorobenzene	541-73-1	1	--	600	µg/L
	1,3-Dichloropropane	142-28-9	1	37	--	µg/L
	1,4-Dichlorobenzene	106-46-7	1	0.48	75	µg/L
	2,2-Dichloropropane	594-20-7	4	--	--	µg/L
	2-Butanone (MEK)	78-93-3	5	--	--	µg/L
	2-Chlorotoluene	95-49-8	1	0.22	--	µg/L
	4-Chlorotoluene	106-43-4	1	--	--	µg/L
	4-Methyl-2-pentanone (MIBK)	108-10-1	5	0.88	--	µg/L
	Acetone	67-64-1	20	1400	--	µg/L
	Allyl chloride	107-05-1	4	0.21	--	µg/L
	Benzene	71-43-2	1	0.46	5	µg/L
	Bromobenzene	108-86-1	1	6.2	--	µg/L
	Bromochloromethane	74-97-5	1	8.3	--	µg/L
	Bromodichloromethane	75-27-4	1	--	10	µg/L
	Bromoform	75-25-2	4	3.3	80	µg/L
	Bromomethane	74-83-9	4	0.75	10	µg/L
	Carbon tetrachloride	56-23-5	1	0.46	3	µg/L
	Chlorobenzene	108-90-7	1	7.8	100	µg/L
	Chloroethane	75-00-3	1	2100	--	µg/L
	Chloroform	67-66-3	1	0.22	70	µg/L
	Chloromethane	74-87-3	4	19	600	µg/L

Table 5 - Analytes Table

Amendment A to Addendum II of the Remedial Investigation Work Plan, Former Smurfit-Stone/Frenchtown Mill

September 2023

Analytical Method(s)	Target Analyte	CAS	Target Laboratory Reporting Limit	RBC ¹	DEQ-7 Water Quality Standard	Units
EPA Method 8260	cis-1,3-Dichloropropene	10061-01-5	4	--	4	µg/L
	Dibromochloromethane	124-48-1	1	0.87	8	µg/L
	Dibromomethane	74-95-3	4	--	--	µg/L
	Dichlorodifluoromethane	75-71-8	1	20	1000	µg/L
	Dichlorofluoromethane	75-43-4	1	--	--	µg/L
	Diethyl ether (Ethyl ether)	60-29-7	4	390	--	µg/L
	Ethylbenzene	100-41-4	1	1.5	700	µg/L
	Hexachloro-1,3-butadiene	87-68-3	1	0.14	5	µg/L
	Isopropylbenzene (Cumene)	98-82-8	1	45	--	µg/L
	Methyl-tert-butyl ether	1634-04-4	1	14	30	µg/L
	Methylene Chloride	75-09-2	4	11	5	µg/L
	Naphthalene	91-20-3	4	0.12	100	µg/L
	Styrene	100-42-5	1	120	100	µg/L
	Tetrachloroethene	127-18-4	1	4.1	5	µg/L
	Tetrahydrofuran	109-99-9	10	340	--	µg/L
	Toluene	108-88-3	1	110	1000	µg/L
	Trichloroethene	79-01-6	0.4	0.28	5	µg/L
	Trichlorofluoromethane	75-69-4	1	520	2000	µg/L
	Vinyl chloride	75-01-4	0.2	0.019	0.2	µg/L
	Xylene (Total)	1330-20-7	3	--	10000	µg/L
	cis-1,2-Dichloroethene	156-59-2	1	3.6	70	µg/L
	m-Xylene (coelute)	108-38-3	2	--	--	µg/L
	p-Xylene	106-42-3	2	--	--	µg/L
	n-Butylbenzene	104-51-8	1	--	--	µg/L
	n-Propylbenzene	103-65-1	1	--	--	µg/L
	o-Xylene	95-47-6	1	19	--	µg/L
	p-Isopropyltoluene	99-87-6	1	--	--	µg/L
	sec-Butylbenzene	135-98-8	1	--	--	µg/L
	tert-Butylbenzene	98-06-6	1	--	--	µg/L
	trans-1,3-Dichloropropene	10061-02-6	4	--	2	µg/L
	trans-1,2-Dichloroethene	156-60-5	1	6.8	100	µg/L
Common Ions						
EPA 6010 (ICP-AES)	Calcium	7440-70-2	500	440000	--	µg/L
	Magnesium	7439-95-4	500	130000	--	µg/L
	Potassium	7440-09-7	2500	1900000	--	µg/L
	Sodium	7440-23-5	1000	560000	--	µg/L
EPA 300.0	Chloride	16887-00-6	1.2	310	--	mg/L
	Fluoride	7782-41-4	0.05	350	4	mg/L
	Sulfate	18785-72-3	1.2	--	--	mg/L
SM-4500P-H-2011 or EPA 365.4	Total Phosphorus	7723-14-0	0.01	130000	--	mg/L
EPA 353.2	Nitrate+Nitrite	NO3+NO2	0.1	10	--	mg/L

Table 5 - Analytes Table
Amendment A to Addendum II of the Remedial Investigation Work Plan, Former Smurfit-Stone/Frenchtown Mill
September 2023

Analytical Method(s)	Target Analyte	CAS	Target Laboratory Reporting Limit	RBC ¹	DEQ-7 Water Quality Standard	Units
SM 2320B	Alkalinity	ALK	5	--	--	mg/L
SM 2540C	Total Dissolved Solids	TDS	10	--	--	mg/L
EPA Method 9060; SM 5310C	Organic Carbon, Total (TOC)	TOC	1	--	---	mg/L

Notes:

-- :not available or not applicable

1 - RBCs from Final Human Health Risk Assessment, Operable Unit 3 (EPA, 2022)

2- RBC for TEQ 1/2DL (1/2 DL = TEQ calculated substituting one half the detection limit for congener concentrations reported below detection limits)

3 - All 209 PCB congeners (PCB-1 through PCB-209) will be analyzed by EPA method 1668. In some cases, PCB congener results are reported as coelutions of two or more congeners (when more than one graphical peak is visible). To avoid double counting, a QC check confirms that only coeluted congeners have data and not individual contributing congeners. The "Total PCB Congeners" value for a sample is calculated regardless of the number of reported congeners or coeluting pairs. A forward slash (/) is used to designate coeluted congeners (i.e. PCB-106/118).

4 - The number of coeluted congeners can effect laboratory reporting limits. In general, each additional coeluted congener may add 5 pg/L to the reporting limit listed in this table (i.e. the reporting limit for PCB-106/118 could be 10 pg/L).

Abbreviations:

RBC - Risk-Based Concentration	TEQ - toxicity equivalence
AES - atomic emission spectroscopy	mg/kg - milligrams per kilogram
CAS - Chemical Abstracts Service	mg/L - milligrams per liter
CVAA - Cold Vapor Atomic Absorption	MS - mass spectroscopy
ICP - inductively coupled plasma	pg/L - picograms per liter
EPA - United State Environmental Protection Agency	

References:

EPA. (2022). Final Human Health Risk Assessment for the Smurfit-Stone/Frenchtown Mill Operable Unit 3 Site located in Missoula County, Montana.

Montana DEQ, Water Quality Division, Water Quality Planning Bureau, Water Quality Standards and Modeling Section. (2019). DEQ-7 Montana Numeric Water Quality Standards. Helena, MT: Montana Dept. of Environmental Quality.

APPENDIX A



SOP-I

FIELD RECORDS AND FIELD SAMPLING FORMS

Field investigation and sampling information should be recorded on a daily field log and appropriate paper or digital sampling forms to provide a continual record of actions taken each day on the site. Electronic field forms are accessed on a field tablet or smart phone through Fulcrum, a secure external field data entry application. NewFields employees have unique logins to access the Fulcrum application on a computer, tablet, or smart phone. Each employee is responsible for completing a record of the day's activities in a daily field log and field forms of sufficient detail such that someone can reconstruct the field activities without relying on the memory of the field crew. At a minimum, entries on the field log shall include:

- Project and client name
- Purpose of the field effort
- Names of field crew leader and team members present on the site, and other site visitors
- Description of site conditions and any unusual circumstances, including weather conditions
- Details of actual work effort, particularly any deviations from the field work plan or standard operating procedures
- Location of sample site, including map reference, if relevant
- Field observations
- Field measurements made (e.g., PID readings, pH, temperature, water levels, field parameters) on appropriate forms
- Date and time of initiation and cessation of work

Specific details for each sample collected should be recorded using NewFields standardized paper field forms or electronic field forms. Electronic field forms have been developed by NewFields within the Fulcrum software application and were designed to have an identical format and contain the same information as the standard paper forms. Electronic field forms utilized by NewFields include daily field reports, electronic photograph logs, site inspection forms, groundwater sampling forms, equipment calibration forms, well development forms, water level measurement forms, and other specific forms developed for specific project objectives. Electronic field forms contain either text, numerical, or drop-down menu fields, some of which can be programmed for a specific routine sampling program to reduce typographical errors and increase consistency. Certain fields of the electronic forms are automatically recorded by the Fulcrum application and field tablet including a date/time stamp as well as GPS coordinates of any photographs collected within the application.

Field forms, both paper and digital, contain blank queries to be filled in by field personnel. Items typically recorded on field sampling forms include the following:

- Sample Location and attributes (e.g., well completion information)
- Photos of sample location and/or sample media (if applicable)
- Water Levels (static and during purging)

Purpose

Provide guidance on how to document activities completed in the field.

Goal and Objective

To provide a record of project work and decisions made in the field.

Equipment Needs

Indelible Ink Pen
Field Log Book
Field Sampling Forms
Field Tablet + Charger
Fulcrum Application



- Sampling method, particularly any deviations from standard operating procedures
- Water quality parameters (during purging and prior to sample collection)
- Sample name
- Time and date samples were collected
- Number and type (media; natural, duplicate, QA/QC) of samples collected
- Laboratory analysis requested
- Sample preservative (if applicable)
- Names or initials of samplers

All entries on the daily field log and field sampling forms must be made in indelible ink (if using paper) or typed into field computers, tablets, or smart phones and synchronized with the NewFields servers promptly when service is available. Upon completion of the field effort, the original log book and field forms (if paper forms were used) shall be scanned and maintained in the project file. Electronic field forms will be saved on external servers and are automatically copied to NewFields servers at the end of each day. Copies of electronic field forms from sampling events will also be stored on the project folder on NewFields servers and will be included in any subsequent sampling or data reports, as applicable.