

Response to Comments on the 2020 External Review Draft OU2 HHRA for the Smurfit-Stone/Frenchtown Mill Site

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1	PRP-Integral	Data Evaluation	On page 14, Section 3.3.2 in OU2, non-detects (NDs) were evaluated at $\frac{1}{2}$ the sample-specific detection limit (DL) when calculating toxicity equivalents (TEQs). Summary statistics are available in the EPA Scribe database for 3 alternative TEQ values (ND = 0, ND = $\frac{1}{2}$ method detection limit [MDL], and ND = $\frac{1}{2}$ sample-specific DL); EPA used ND = $\frac{1}{2}$ DL for calculating TEQs. Although EPA has not set a policy for the preferred way to handle NDs when calculating TEQs, it recommends a sensitivity analysis be conducted to evaluate the impact of the proxy value selected for NDs when calculating TEQs, as was done in USEPA's (2019) Final Technical Memorandum, Summary of the June 2019 Fish Sampling Event. Integral performed a sensitivity analysis comparing TEQs where ND = 0 using the TEQs calculated by EPA (i.e., using ND = $\frac{1}{2}$ DL). The relative percent difference (RPD) between the TEQs varied; the largest RPD between the lowest and highest TEQ value when evaluating different substitution methods is 200% (i.e., frequency of detects [FOD] were very low; in some cases FOD were 0%). As a result, the TEQs estimated using $\frac{1}{2}$ the DL resulted in TEQ concentrations that are higher compared to TEQs where zero was substituted, indicating that a large majority of congeners were not detected. Therefore, TEQ hazards are likely overestimated. In summary, TEQs that represent a low frequency of detection are highly influenced by the use of proxy values for NDs, which could be overestimating hazards. We recommend EPA include a sensitivity analysis regarding TEQ data considerations and associated risk and hazard implications to the risk conclusions. This sensitivity analysis will help in clearly identifying risk drivers and in turn inform risk management decisions.	For Superfund site assessments, EPA Region 8 calculates the toxicity equivalent (TEQ) assuming $\frac{1}{2}$ the sample-specific detection limit (DL). This approach is consistent with evaluations conducted at other sites in the region and is supported by Montana Department of Environmental Quality (MDEQ). The summary statistics tables in the human health risk assessment (HHRA) present TEQ calculations both ways: using non-detects equal to one-half the detection limit, and non-detects equal to zero. Setting non-detects equal to zero may underestimate actual TEQ concentrations for those congeners present at a non-zero concentration below the detection limit. Text will be added within the uncertainty assessment discussing the influence of non-detects on the calculated TEQ concentrations, but a sensitivity analysis will not be added to the risk assessment.
2	PRP-Integral	Data Evaluation	On page 13, Section 3.3.1 in OU2, non-dioxin-like polychlorinated biphenyls (non DL-PCBs) were calculated for OU2 and total PCB concentrations (which include dioxin and non DL-PCBs) were calculated for OU3 to evaluate exposure to PCBs. Table 3-9 of the draft OU2 HHRA lists total non DL-PCBs and total DL-PCBs as analytes for the soil contaminants of potential concern (COPCs) screening process. It is unclear why there is a total DL-PCBs analyte in addition to a TEQ DL-PCBs analyte since DL-PCBs are evaluated through a TEQ approach per USEPA (2010) recommendations. Although total DL-PCBs is not	Risks from exposures to polychlorinated biphenyls (PCBs) in soils were evaluated differently within the OU2 and OU3 assessments because PCB data in OU2 soils includes concentrations reported as both Aroclor mixtures and PCB congeners, whereas data for OU3 soils were only reported as Aroclor mixtures. The evaluation of TEQ concentrations based on the inclusion of dioxin-like PCB congeners evaluated the

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			considered a COPC, it is unclear why PCB data are segregated in this manner that is inconsistent with how exposures to PCBs are evaluated in OU3. We recommend EPA provide clarification to indicate why exposure to PCBs was evaluated differently per operable unit.	contribution from those specific PCB congeners. However, dioxin equivalence explains only part of a PCB mixture's toxicity. As such, risks associated with exposures to non-dioxin like PCB congeners were also evaluated in the OU2 HHRA.
3	PRP-Integral	COPC Screen	In the soil and groundwater COPC screening, the data sets for each media are aggregated in its entirety; however, the EPC data sets for each media are based on individual exposure units (e.g., per well or soil grid area). Therefore, if an analyte is identified as a COPC in the aggregated data set, it is carried forward as a COPC per individual exposure unit. The maximum detected concentration for each COPC per exposure unit may be less than the overall maximum detected concentration used during the screening. Therefore, the estimated risks and hazards per exposure unit are likely overestimated as certain constituents may have screened out of the COPC selection process if the COPC selection process reflected data aggregation per an exposure unit basis. We recommend EPA include these data considerations and associated risk and hazard implications within the COPC screening section of the reports.	The purpose of the COPC screening step is merely to focus the risk evaluation. The approach included in the HHRA is a standard method for conducting a COPC screening: determining COPCs based on the entire dataset, and then calculating risk in exposure areas using EPCs for each exposure area. No changes will be made as a result of this comment.
4	PRP-Integral	Data Evaluation	As stated on page 28 of the OU2 HHRA under the Groundwater header, the 95UCL was calculated for data sets where at least five samples and two distinct detected values were available. Per the ProUCL Version 5.1.002 Technical Guide (USEPA 2015), "statistics based upon only a few detected values (e.g., < 4) cannot be considered reliable enough to estimate EPCs. When the number of detected values is small, it is preferable to use ad hoc methods rather than using statistical methods to compute EPCs and other upper limits... For data sets with low detection frequencies, other measures such as the median or mode represent better estimates (with lesser uncertainty) of the population measure of central tendency." We recommend EPA calculate the 95UCL when there are at least four detections consistent with USEPA (2015) recommendations and that the OU3 HHRA include its data requirements for when a 95UCL was calculated.	Table 3-15 was accidentally left out of the compiled draft PDF report and will be included in the final HHRA. Table 3-15 summarizes the groundwater EPCs and shows that for individual wells with only a single sample, the measured concentration was used as the EPC. For all other detected contaminants, an EPC was generated in ProUCL based on at least six samples. The text in the HHRA will be updated to reflect the guidance in EPA (2015) of needing at least four detections to generate a 95UCL value.
5	PRP-Integral	Toxicity Values	Exposures to construction workers of one year or less are classified as subchronic exposures, per the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (USEPA 2002). USEPA (1989, 2002) recommends that subchronic exposures should incorporate toxicity values that are based on subchronic and not chronic effects. The construction	Subchronic toxicity values, where available, will be used to evaluate risk to the construction worker. In addition to Aroclor 1254, subchronic toxicity values for chromium, cobalt, 2,3,7,8-tetrachlorodibenzo-

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			worker hazards in the HHRAs are based on chronic toxicity values as presented in Appendix D. As a result, estimated HQs for the construction worker scenario are overestimated. We recommend EPA include a discussion within the uncertainty section regarding the implications resulting from the use of chronic toxicity values to evaluate the construction worker scenario (i.e., risk characterization results are overestimated).	<i>p</i> -dioxin (TCDD), and thallium differ from the chronic toxicity value.
6	PRP-Integral	Risk Characterization	The estimation of potential risks and hazards to the hypothetical future construction worker through the inhalation of soil particulates pathway is evaluated differently between OU2 and OU3. For OU2, inhalation risks and hazards are not presented for TEQ _{D/F} but are calculated for OU3 in Appendix D. Both OU2 and OU3 reports state in Section 4.2 under the Dioxin header that “there is no USEPA IRIS RfC or IRIS UR for TCDD. The USEPA RSL Tables (USEPA 2020) provide dioxin soil screening levels for the inhalation pathway based on the California EPA RfC and UR values. However, inhalation risk based on particulate emissions from soil, estimated using the California EPA RfC value, shows that the contribution of the inhalation pathway compared to the ingestion pathway is well below 1% (USEPA 2013a).” It is unclear from this statement if further evaluation of this pathway was conducted in the HHRAs with respect to inhalation exposures to TEQ _{D/F} . Furthermore, it is unclear if the statement “California EPA RfC value, shows that the contribution of the inhalation pathway compared to the ingestion pathway is well below 1% (USEPA 2013a)” also eliminates the need to evaluate potential cancer risks from TEQ _{D/F} because the California RfC is protective of both noncancer and cancer effects (as is stated for the reference dose [RfD] in Section 4.2) and/or the California UR value shows that the contribution of the inhalation pathway compared to the ingestion pathway is also below 1%. We recommend EPA update the reports to clarify if the inhalation of soil particulates pathway by a hypothetical future construction worker with respect to exposure to TEQ _{D/F} is considered a complete exposure pathway warranting further quantitative evaluation in the HHRA.	Inhalation of soil particulates by the construction worker is identified as a complete and potentially significant pathway in both HHRAs. As such, this pathway is quantified in both the OU2 and OU3 HHRAs. In the OU2 HHRA, inhalation risks were calculated for both TEQ _{D/F} and TEQ _{D/F/PCB} . This is similar to how risks were calculated for the ingestion and dermal pathways in the OU2 HHRA also. This was done in the OU2 HHRA because data are available on PCB congeners in OU2 soils. PCB congeners were measured in OU2 soils following the identification of localized areas within OU2 where PCB concentrations exceeded screening levels. The OU3 HHRA only evaluates TEQ _{D/F} because PCB congener data is not available for OU3 soils. PCB congener data were not collected in OU3 soils because Aroclor concentrations in OU3 soils were either not detected or below screening levels. The discussion of available inhalation toxicity values will be updated to remove the text referencing EPA (2013a).
7	PRP-Integral	Data Evaluation	The conservatively estimated risks and hazards for exposure to metals in groundwater by all receptors are based on total metal concentrations. We recommend EPA include a discussion in the uncertainty section to reflect estimated risks and hazards for receptors exposed to dissolved metals in groundwater to guide risk management decisions.	As noted in the HHRA, human health exposures were evaluated using total metal concentrations. No change will be made.

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8	PRP-Integral	Background Evaluation	Several of the background total metal concentrations in groundwater are greater than risk-based concentrations (RBCs). For example, the RBC for arsenic is 5.2E-02 µg/L and the average and maximum background concentration for total arsenic in groundwater is 2.92 µg/L and 6.7 µg/L, respectively. Although COPCs were not carried forward in the quantitative risk assessment if concentrations were considered below background, incremental risks due to background concentrations in groundwater were not discussed within the reports. We recommend EPA include an incremental risk evaluation for COPCs in groundwater to assist with risk management decisions.	Although conducting a comparison to background concentrations was included in the previous draft OU2 HHRA, upon further consideration of existing guidance it was determined that comparison with background levels should not be used to remove contaminants of concern from further evaluation owing to the need to fully characterize site risks (EPA 2001). Comparison to background is not a toxicological rationale for eliminating COPCs from further consideration. Comparisons of site concentrations to background concentrations should still be considered within the remedial investigation (RI) outside of the risk assessment to provide additional information to risk managers to better characterize the results presented in the risk assessment.
9	PRP-Integral	Site Characterization	Within the HHRA reports, there is minimal differentiation discussed between the two aquifer units. When there is a distinction made, the information was not presented clearly. For example, Unit 3 wells are presented as “water supply wells,” which does not indicate that these wells are screened in a distinct and deeper aquifer. We recommend EPA clearly define and describe the two aquifer units (i.e., the shallow aquifer Unit 1 and deeper aquifer Unit 3) in the HHRA reports as this information provides further clarity regarding the conceptual site model and potential pathways of exposure. Additional clarification should be provided within the documents to distinguish between Unit 1 and Unit 3 wells when individual wells are discussed in the reports.	The text will be revised to provide clarification, but the groundwater conceptual site model report will be cited for the detailed discussion. In addition, groundwater data collected in 2020 will be incorporated into the revised risk assessment.
10	PRP-Integral	Data Evaluation	In Attachment A-1, several updates are needed including: a. The MDL and DL data columns are equivalent for every media presented in each Excel worksheet. Therefore, it is unclear if the non-detect result reflects the MDL or DL. b. The data sets for OU2 are missing from the attachment. We recommend EPA update Attachment A-1 to include the laboratory-reported MDL and DL, and fish tissue dioxin/furan and PCB data.	The data in Attachment A-1 are consistent with the Scribe database. The value in the result column for non-detects matches the value in the “DL” column which represents the sample-specific detection limit. To improve clarity for the risk assessment, Attachment A-1 will be updated to only show the “DL” column. In addition, Attachment A-1 will be updated. As part of this update, the tabs of background groundwater and soil data

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				will be removed, as the background screen is being taken out of the risk assessment.
11	PRP-Integral	Editorial	Section 4.2 discusses USEPA's (2017) recommendations for evaluating human health exposures from dioxins using the noncancer RfD and considers it to be protective of both cancer and noncancer effects. However, Table 4-1 presents the cancer slope factor (CSF) for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). To avoid confusion, we recommend EPA remove the CSF for 2,3,7,8-TCDD from Table 4-1 in both reports and instead add a note providing the rationale from Section 4.2. Additionally, the USEPA reference should be updated to USEPA (2020) as it is still the current recommendation indicated on EPA's Risk Assessment for Dioxin at Superfund Sites web page.	In the revised OU2 HHRA, cancer risk will be evaluated for dioxins/furans using the CSF for TCDD (from CalEPA) shown in Table 4-1. Consistent with the language on the EPA website, the 2012 reference dose (RfD) for TCDD will be used as a starting point to develop site-specific risk-based cleanup levels outside of the risk assessment, but this does not preclude the evaluation of potential cancer effects within the risk assessment as the CalEPA CSF for TCDD meets the criteria of a "Tier 3" toxicity value suitable for use in CERCLA risk assessment per OSWER Directive 9285.7-53 (EPA 2003). The uncertainty section will be updated to discuss the uncertainties associated with the estimated dioxin cancer risks.
12	PRP-Integral	Editorial	On Figure 3-1, the residential receptor should be identified on these figures as hypothetical.	The current note states that OU2 is evaluated for "potential hypothetical residential development". However, to increase clarity, the note will be revised to state that all three receptor populations are hypothetical future populations.
13	PRP-Integral	Editorial	A time-weighted average (TWA) approach for assessing non-cancer hazards is discussed in USEPA (1991) Risk Assessment Guidance for Superfund (RAGS) Part B as opposed to the USEPA (1989) RAGS Part A guidance referenced in both reports. We recommend EPA update the reference cited in the HHRA reports.	RAGS Part A guidance discusses evaluating lifetime exposure by taking the time-weighted average of exposure over all age-groups and is a standard reference for risk assessment methodology. The reference will be retained.
14	PRP-Integral	Data Evaluation	As discussed on page 11, Section 3.2.1 and presented on Figure 3-1, incidental ingestion and dermal contact with surface and subsurface soil are indicated as complete exposure pathways for the construction worker. However, calculated risk and hazards (Appendix D; pp. 198–201 of the PDF) were based on exposures to surface soil only as indicated in the table title. Attachment A-1 does not provide the data for OU2, and Table 3-14 summarizing the soil EPCs is missing from the report; therefore, we are unable to replicate EPA's soil EPCs. We recommend EPA include the OU2-specific data in Attachment A-1. We also recommend that EPA update the construction worker risk and hazard calculations	There was a typo in the Appendix D table titles; these will be fixed. Risk to the construction worker was calculated using EPCs based on combined surface and subsurface soil. The uncertainty section will be updated to discuss uncertainties with the EPCs used to evaluate the construction worker. Attachment A-1 will include all relevant OU2 data used in the risk assessment.

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			for incidental ingestion and dermal contact with soil pathways based on the surface and subsurface soil data set.	
15	PRP-Integral	Risk Characterization	In Appendix D, it is not readily clear why there are “no data” available to calculate an EPC for the soil exposure pathways for specific grids. For example, on page 195 of the PDF, Grid 5 presents an EPC for TEQ-D/F, yet EPA reports “no data” available to calculate an EPC for TEQ-D/F/PCB (p. 196 of the PDF). We assume this indicates there are no data available for PCBs in that grid, only TEQ-D/F. Therefore, an EPC for TEQ-D/F/PCB could be calculated and it would be equal to the TEQ-D/F EPC. To evaluate risk from dioxins like PCBs, a TEQ reflecting DL-PCBs alone would be more appropriate. Table 3-9 reports TEQ DL-PCB as a COPC in soil; however, it is not included as a COPC in the Appendix D tables. Therefore, it is unclear why TEQ DL-PCB is not included further in the risk assessment. Additionally, in Tables 5-1 through 5-3, it is difficult to determine if the risk and hazard summaries represent exposure to TEQ-D/F/PCB and total non-DL-PCBs or TEQ-DF and Aroclor-1254 without doing a detailed comparison to Appendix D tables. We recommend EPA clarify why TEQ DL-PCB was not included in the soil risk characterization pathways and provide transparency and clarity regarding the soil risk summary tables.	Tables 5-1 through 5-3 summarize the estimated total non-cancer hazards and total cancer risks from direct contact exposures to soils. A footnote will be added to these tables clarifying the basis for the risk estimates shown for each grid. Because all risk estimates were below EPA’s threshold criteria ($HQ \leq 1E+00$, $Risk \leq 1E-04$), additional summary tables presenting the COPC specific HQs and risks were not generated as it was not determined that would add anything to the overall results discussion. However, all calculations are presented in Appendix D for transparency and completeness. As described in the HHRA, risk was estimated based on either Aroclor measurements or measurements of PCB congeners separately. It is misleading to present a concentration based on $TEQ_{(D/F)}$ as $TEQ_{(D/F/PCB)}$ when no PCB congener data were available to estimate that grid-specific TEQ concentration. Data in grid 5 are available for Aroclor-1254, whereby risks were estimated in this grid based on $TEQ_{(D/F)}$ and Aroclor-1254. Additional discussion will be added in the uncertainty section to discuss the lack of PCB data in grids 6, 12, 16, 17, 18 and 19.
16	PRP-Integral	Editorial	Tables 3-14 and 3-15 summarizing the soil and groundwater EPCs, respectively, are missing from the report.	These tables will be added to the report.
17	PRP-Integral	Editorial	We recommend EPA indicate that the groundwater COPC TEQ is based on dioxin and furan (i.e., $TEQ_{D/F}$) congeners consistent with the how the TEQs are further defined for the soil pathway.	Nomenclature will be made consistent between the different media.
18	PRP-Integral	Editorial	The acronym “DL” is defined both as “detection limit” and “dioxin-like,” which can lead to confusion by using the same acronym for different terminology. Additionally, the acronyms “RL” (for reporting limit) is sometimes used interchangeably with detection limit. We recommend EPA use unique terminology to make clear distinctions between terms; for example, “coplanar PCBs” rather than “dioxin-like” PCBs.	The HHRA will be updated to use “coplanar PCBs” instead of “dioxin-like PCBs”.

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19	PRP-Integral	Editorial	Figure 3-1 does not identify what the “X” means under the ingestion of homegrown produce pathway. We recommend updating the legend similar to how the information is presented in OU3 Figure 3-1.	The legend in Figure 3-1 will be updated.
20	PRP-Integral	Editorial	In Section 3.4.4 on page 18 under the Groundwater header, the first sentence states “five wells within the boundary of...” were identified as background groundwater locations, but only four wells are listed. We recommend updating the statement to remove the inconsistency.	The statement will be removed and this section of the text will be edited, as the background evaluation is being removed from the HHRA.
21	PRP-Integral	Editorial	In Table 4-1, source reference “P” needs to be defined and footnote 4 should be updated to state “USEPA (2013c)...” to be consistent with the text and references section of the report.	These text edits will be made to Table 4-1.
22	CFC	Aerial Deposition	Much of the area upstream of the Smurfit site was subject to decades of aerial deposition from emissions at the mill site, and EPA’s own research shows Kraft liner board facilities were common sources of airborne emissions of dioxins and furans. For these reasons, we ask that all reference conditions used in the ongoing investigations be located outside of Smurfit’s aerial deposition zone.	Although conducting a comparison to background concentrations was included in the previous draft OU2 HHRA, upon further consideration of existing guidance it was determined that comparison with background levels should not be used to remove contaminants of concern from further evaluation owing to the need to fully characterize site risks (EPA 2002). Comparison to background is not a toxicological rationale for eliminating COPCs from further consideration. Comparisons of site concentrations to background concentrations should still be considered within the RI outside of the risk assessment to provide additional information to risk managers to better characterize the results presented in the risk assessment. EPA recently published fact sheets on aerial deposition at the site and dioxins/furans at the site (EPA 2021a, b) that will be cited in the OU2 HHRA. Available data (MDEQ 2011) indicate that dioxins and furans in soils of Missoula are typical of rural areas elsewhere in the U.S., and well below urban areas elsewhere in the U.S. (Urban et al., 2013).
23	MDEQ	Toxicity Values	Please be aware that any compounds present above DEQ’s Water Quality Standards for human health and aquatic life will need to	A footnote will be added to the HHRA noting that compliance with DEQ-7 standards will be

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			be addressed when making risk management decisions in the future for both surface water or groundwater.	considered in the remedial investigation/feasibility study (RI/FS).
24	MDEQ	Exposure Assessment	Please note that DEQ does not support risk management decisions made based on the CTE evaluation in the risk assessment.	It is standard risk assessment practice to calculate risk using both CTE and RME scenarios. Risk management decisions occur outside of risk assessment.
25	MDEQ	Toxicity Values	Section 4.2, Manganese: DEQ agrees with the use of the EPA RSL screening level of 43 ug/L for manganese. Please note DEQ and DPHHS have developed a Manganese drinking water benchmark to protect bottle fed infants and children. This benchmark was derived to protect against neurological effects during development that have been observed in animal studies and in epidemiology studies. DEQ strongly urges EPA to recognize the RfD used in the benchmark as it moves forward in the risk assessment process for Smurfit. The current EPA oral RfD values are not based on toxicology studies, but rather on nutritional reports and even with a modifying factor, were not designed to protect the most vulnerable populations against neurological impacts. For more information, please see http://deq.mt.gov/Water/DrinkingWater/Manganese for additional information.	Based on further consideration, the RfD recommended for manganese in the EPA RSL table will be used in the HHRA. This value of 0.024 mg/kg-day incorporates subtracting out the dietary contribution from the normal U.S. diet (an upper limit of 5 mg/day) when evaluating non-food exposures to manganese. This RfD is consistent with the RfD used as the basis of the recently updated MDEQ drinking water benchmark of 0.025 mg/kg-day. This change does not alter the overall risk conclusion that manganese is a risk driver in groundwater.
26	MDEQ	Site Characterization	DEQ is concerned there is a potential data gap with the exclusion of dioxin-like PCBs from TEQ calculations in all media, except fish tissue. Please explain the rationale for not sampling dioxin-like PCBs and plans to ensure dioxin-like PCBs are not site-related and are not contributing to TEQ in OU2 or OU3.	Aroclors were measured in OU2 soils and groundwater. PCB congeners were evaluated in OU2 soils based on the presence of Aroclor concentrations above levels of concern. PCB Aroclors have been continuously monitored in groundwater, but risks associated with Aroclors in groundwater are below a level of concern. The uncertainty section will be updated to include a discussion of the available PCB data.
27	MDEQ	Exposure Assessment	While the analysis does not have to be included in the risk assessment, a determination regarding whether soil remediation is required cannot be made until a soil leaching to groundwater analysis is conducted. Soil concentrations should be evaluated using Part 2 of Montana DEQ's Soil Screening Flow chart to determine whether contaminant concentrations may represent a continuing or future source of groundwater contamination.	Evaluation following MDEQ's Soil Screening Flow Chart will be considered for inclusion in the RI/FS.
28	MDEQ	COPC Screen	DEQ has concerns about the process to determine COPCs for the following reasons: no consideration of risk-based water quality standards (federal or state), the use of a 5% rule with no analysis for hot spots, the statistical analyses of background and site data to	The approach used to determine COPCs in the HHRA that does not evaluate hot spots is consistent with RAGS (EPA, 1989). Although conducting a comparison to background

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			determine COPCs. In some cases, there does not appear to be sufficient data to ensure we are not prematurely screening out COPCs (e.g. surface water PAHs with DLs greater than screening levels). Please clearly describe all locations where background and site data are compared and for each location, reference a table where the data is presented (including background concentrations used with a reference to the source), along with the statistical analyses.	concentrations was included in the previous draft OU2 HHRA, upon further consideration of existing guidance it was determined that comparison with background levels should not be used to remove contaminants of concern from further evaluation owing to the need to fully characterize site risks (EPA 2002). Comparison to background is not a toxicological rationale for eliminating COPCs from further consideration. Comparisons of site concentrations to background concentrations should still be considered within the RI outside of the risk assessment to provide additional information to risk managers to better characterize the results presented in the risk assessment.
29	MDEQ	Background Evaluation	Appendix A, Section 2.1.2.2: DEQ does not agree with the use of the bulk fraction data for the background evaluation. Fine particles are known to be readily transported, ingested, or inhaled and typically are the fraction of soil inorganics readily sorb to as well. Therefore, bulk concentrations may not accurately capture exposure concentrations. Please conduct a background evaluation using the fine fraction soil.	Although conducting a comparison to background concentrations was included in the previous draft OU2 HHRA, upon further consideration of existing guidance it was determined that comparison with background levels should not be used to remove contaminants of concern from further evaluation owing to the need to fully characterize site risks (EPA 2002). Comparison to background is not a toxicological rationale for eliminating COPCs from further consideration. Comparisons of site concentrations to background concentrations should still be considered within the RI outside of the risk assessment to provide additional information to risk managers to better characterize the results presented in the risk assessment.
30	MDEQ	Editorial	Please delete any statements referring to “personal communication with Amy Reynolds of MDEQ.” Text indicating conversations with MDEQ or MDEQ’s Risk Assessor are acceptable. Specific personnel or their position may not be known by future reviewers. Please delete this statement throughout the document if used in other areas of the Risk Assessment.	This statement and any references to specific MDEQ personnel will be removed from the HHRA.
31	MDEQ	Editorial	Figure 3-1, Legend: Please define the “X” used in the table.	The legend in Figure 3-1 will be updated.

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32	MDEQ	Site Characterization	Section 2.5: Please list what chemicals were used in the paper process. Were fluorinated chemicals used for water resistant properties or was a fluorination process used? Were any other special processes used? Please reference the permit, ideally include it as a reference to answer the question of what analytes had permit limits and what the limits were.	The text in Section 2.2 (Basis for Potential Human Health Concern) will be expanded, and the permit will be referenced.
33	MDEQ	Site Characterization	Section 3.1.3 (Land Use): Please include a discussion of the current land use. It is DEQ's understanding that there are buildings in OU2 currently being leased for use. Please add the following sentence to the end of the paragraph in Section 3.1.3: <i>The agencies have not approved the use of such restrictive covenant as an element of the final remedial action, nor does the restrictive covenant limit the agencies' analysis of risk or reasonably anticipated future use.</i>	The sentence requested by MDEQ will be added to the end of this section.
34	MDEQ	Exposure Assessment	Section 3.1.4 (Potentially Exposed Populations): Please include the evaluation of a Trespasser scenario or include text discussing why this receptor is not considered.	The HHRA will be updated to note that a trespasser is expected to have lower exposure than a resident or worker whereby quantitative evaluation of those receptors is considered protective of a trespassing scenario. The uncertainty assessment will also be updated to include qualitative evaluation of a trespasser.
35	MDEQ	Exposure Assessment	In Section 3.1.4, under "Current and Hypothetical Future Commercial/Industrial Workers," it is DEQ's understanding that buildings with the OU2 footprint are being leased for use. Please verify and edit text if needed.	No information has been provided to EPA to confirm current leasing of the buildings within the OU2 footprint.
36	MDEQ	Exposure Assessment	Section 3.2.1, "Exposures to Surface Soil:" Please indicate the depth of surface soil used to evaluate exposure in this risk assessment. DEQ considers exposure to surface soil to occur from 0-2 feet below the ground surface.	Surface soil samples were collected from depths of 0 to 2.4 inches, 0 to 2 inches, 1 to 2 inches, and 0 to 6 inches over multiple sampling efforts, as shown in Table 3-2 of the HHRA. EPA considers exposure to surface soil to occur from 0-6 inches below the ground surface. This detail ("to a depth of 6 inches") will be added to Section 3.2.1.
37	MDEQ	Data Evaluation	Section 3.3 (Data Used in this Assessment): Re: the sentence, " <i>All of these data have been validated and are considered to be appropriate for use in risk assessment.</i> " Please describe the other ways data were determined to be appropriate for use in the risk assessment aside from being validated. For example, please describe or include in Table 3-2 what soil data represent the fine fraction and what soil data represent the bulk fraction and how these data were used differently to evaluate human health risks.	It is EPA's understanding that the soil contaminant concentration data correspond to bulk soil samples only. Bulk soil data is adequate for use in the risk assessment while identifying the associated uncertainties. The uncertainty assessment will be updated to include discussion of the uncertainties in the risk estimates based on evaluating

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				concentrations in bulk soil instead of smaller particle sizes.
38	MDEQ	Data Evaluation	Section 3.3.3 (Inorganic Water in Groundwater): Please include a comparison of groundwater data to Montana's DEQ-7 Water Quality Standards. Please ensure inorganic water data is compared using the dissolved concentrations.	Compliance of groundwater with DEQ-7 standards will be discussed separately in the RI/FS.
39	MDEQ	COPC Screen	Section 3.4.2 (Source of Risk-Based Screening Level Values): Groundwater screening level sources should also include Montana's DEQ-7 Water Quality Standards and NRWQC, the lowest of which should be used to generate the site COPCs.	COPCs were screened against RBCs derived from EPA's RSL tables, which is a standard EPA risk assessment approach. Compliance of groundwater with DEQ-7 standards will be discussed separately in the RI/FS.
40	MDEQ	Background Evaluation	Section 3.4.4: Regarding the sentence, " <i>The background soil and groundwater data evaluated in this assessment are provided in electronic format in Appendix A, and summary statistics are provided in Tables 3-7 and 3-8.</i> " Please also include the summary statistics for site data used in the background evaluation.	This sentence and Tables 3-7 and 3-8 will be deleted, as the comparison to background concentrations will be removed from the COPC screening process. Although conducting a comparison to background concentrations was included in the previous draft OU2 HHRA, upon further consideration of existing guidance it was determined that comparison with background levels should not be used to remove contaminants of concern from further evaluation owing to the need to fully characterize site risks (EPA 2002). Comparison to background is not a toxicological rationale for eliminating COPCs from further consideration. Comparisons of site concentrations to background concentrations should still be considered within the RI outside of the risk assessment to provide additional information to risk managers to better characterize the results presented in the risk assessment.
41	MDEQ	COPC Screen	Table 3-9: The RSL for TEQ (TCDD) using EPA's HQ 0.1 screening table is 4.8E-6. Table 3-20 is using the higher, non-cancer value of 5.1E-6 as a screening value. For the purposes of the COPC screening process, please update this table to reflect the screening value presented in EPA's HQ 0.1 Summary RSL table.	As dioxin/furans will be evaluated for cancer risk in the revised HHRA, the soil RSL for TEQ (TCDD) in both Table 3-9 (OU2 HHRA) and Table 3-20 (OU3 HHRA) will be updated to 4.8E-06.
42	MDEQ	Exposure Assessment	Section 3.5.3 (Exposure Areas): Please include a figure showing the exposure areas as well as a figure showing the data used to evaluate exposure in each area.	Figure 3-2 will be updated to show the sampling grids which represent the exposure areas evaluated in the HHRA (consistent with the sampling grids shown in Figure 3-3).

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43	MDEQ	Exposure Assessment	Section 3.5.3, Soil: Residential lot size should be determined using local land lot sizes and zoning restrictions and residential exposure should be considered within the smaller lot size to avoid averaging out areas of higher potential risk. Please include a discussion of the surrounding area lot sizes and zoning allowances to show the evaluation of residential exposure over 20 acres is protective of future residential use.	Soil exposure areas were determined based on the grids used for composite sampling. As noted in the Remedial Investigation Work Plan (RIWP) Addendum 7, the 20-acre grids represented the maximum spatial extent to be considered representative of the area within which a hypothetical future resident or commercial worker could be exposed. The uncertainty section will include language noting that the risk estimates presented in the HHRA are not necessarily representative of smaller lot sizes.
44	MDEQ	Exposure Point Concentrations	Section 3.5.4, Groundwater: Groundwater standards in DEQ-7 are composed of duration, frequency and magnitude. The duration is instantaneous and the frequency is not to exceed. Therefore, EPCs are not allowed to determine compliance with DEQ-7, the samples must be compared on a point-by-point basis using the maximum concentration collected from each well.	Groundwater risks were evaluated well-by-well using an EPC determined using standard EPA guidance; if the number of samples from the well was adequate, a 95UCL was calculated using ProUCL. This approach provides a protective estimate of potential chronic exposures to the human health receptors of concern and is consistent with risk assessment guidance. If the sample size from a well was too small, the maximum detected concentration was used as the EPC for that well. Compliance of groundwater with DEQ-7 standards will be discussed outside of the risk assessment process in the RI/FS.
45	MDEQ	Cancer risk benchmark	Regarding the cancer risk benchmark of 1E-04 in Section 5.1: Montana DEQ considers anything above 1E-5 an unacceptable risk. Please include this in the risk evaluation and bold, or highlight, cancer risks exceeding this threshold.	The risk characterization will focus on identifying excess cancer risks that exceed the EPA benchmark of 1E-04. However, tables and figures presenting risk results will also highlight risks that exceed 1E-05 and a footnote will be added to the HHRA noting that MDEQ considers 1E-05 as a cancer benchmark.
46	MDEQ	Editorial	Section 5.1.1, regarding the sentence, “ <i>Non-cancer hazards and cancer risks to hypothetical future residents within OU2 from incidental ingestion of and dermal contact with soil appear to be within usual USEPA guidelines.</i> ” The use of the word “appear” does not adequately discuss the risk of exposure. Please clearly state whether or not non-cancer hazards were above 1 and whether or not cancer risks were above 1E-5.	This language will be updated to clearly state whether or not non-cancer hazards were above 1 and whether or not cancer risks were above the acceptable cancer risk range used by CERCLA of 1E-04.

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47	MDEQ	Site Characterization	Section 5.1.2: Please see previous comments regarding current use of the buildings located within OU2.	No information has been provided to EPA to confirm current leasing of the buildings within the OU2 footprint.
48	MDEQ	Cancer risk benchmark	Section 5.1.2, second paragraph and cancer risk benchmark of 1E-04: Montana DEQ considers anything above 1E-5 an unacceptable risk. Please include this in the risk evaluation and bold, or highlight, cancer risks exceeding this threshold and discuss them in the text.	The risk characterization will focus on identifying excess cancer risks that exceed the EPA benchmark of 1E-04. However, tables and figures presenting risk results will also highlight risks that exceed 1E-05 and the uncertainty assessment text will be updated to note that MDEQ considers 1E-05 as a cancer benchmark.
49	MDEQ	Risk Characterization	Section 5.2: Please note, DEQ evaluates risk to groundwater based on a comparison of groundwater data, on a point-by-point basis to Montana's DEQ-7 Water Quality Standards. Compounds in groundwater with concentrations above DEQ-7 standards but not determined to be risk by EPA must still be carried forward as a COC for the site. Please add the following sentence to the end of the first paragraph in Section 5.2: "... <i>Inspection of Tables 5-4 and 5-5 reveals the following main conclusions. <u>Compliance of groundwater with DEQ-7 standards will be discussed separately in the RI.</u></i> "	A footnote will be added to the HHRA noting that DEQ-7 standards will be considered separately in the RI/FS.
50	MDEQ	Editorial	Section 6.2.1 (Uncertainties in Toxicity Values): Please reference the following statement: " <i>Because of the conservative methods USEPA uses in dealing with these uncertainties, it is much more likely that the uncertainty will result in an overestimation rather than an underestimation of risk.</i> "	The following reference will be added to this sentence: EPA. 2014. Framework for human health risk assessment to inform decision making. EPA100R14001.
51	MDEQ	Editorial	Section 6.2.1 (Uncertainties in Toxicity Values): Please reference the following statement: " <i>However, data on the neurotoxicity of orally ingested manganese at relatively low doses are less consistent, albeit suggestive.</i> "	The IRIS chemical assessment summary for manganese will be cited here.
52	MDEQ	Editorial	Section 6.2.1 (Uncertainties in Toxicity Values): Please reference the following statement: " <i>Because of the conservativeness of the oral RfD for manganese, it is likely that uncertainty associated with this toxicity value will result in an overestimation rather than an underestimation of risk.</i> "	The IRIS chemical assessment summary for manganese will be cited here.
53	WQAC	Site Characterization	The data upon which the risk assessment has been made are insufficient. Problems include: a. too few samples to adequately characterize risks on and beyond the site and no recent samples in important areas such as the 140 acres of sludge ponds.	Composite sampling reduces data variability and provides a reasonably unbiased estimate of mean contaminant concentrations in a specified decision unit (ITRC 2021). Groundwater monitoring has been ongoing and will continue, but additional data collection efforts to support the risk

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			b. combining samples together, which has the effect of losing important detail associated with the site given that contamination is not evenly distributed. c. need for additional dioxin testing of groundwater and surface water of the Clark Fork using high-volume sampling for dioxin-like PCBs that have detection limits above the risk-based levels. The lack of site and river sampling is hiding the potential connection of the site to the river, which limits the geographical extent of the “facility.” CERCLA’s definition of a facility is “any site or area where a hazardous substance has been deposited, stored, disposed of, placed, or otherwise come to be located,” so this type of testing is important for defining the facility site boundary to inform site remediation. For reference, we include text from WQAC letter sent to Sara Sparks and Keith Large on July 9, 2018: The WQAC discussed the May 23, 2018 Water Sample Results (Dioxin/Furans) Former Smurfit Stone/Frenchtown Mill Site at our June meeting. It was clear from looking at the results that the detection limits and reporting limits of the analytical method are not useful for resolving concentrations of dioxin near surface water standards. We understand this is a common situation at dioxin contaminated sites in the nation, because the standard method (EPA 8290) commonly results in detection limits of 1 pg/L at best, whereas surface water standards are 200 times or more below this detectable concentration. The human health standard for dioxin is very low, 0.005 pg/L, owing to its incredible high bioaccumulation and toxicity when accumulated in fish tissue. Dioxin is extremely expensive to sample for and we do not believe additional sampling at using the past method is likely to provide useful information about the contaminants at the Smurfit site or Clark Fork River water quality. Newer dioxin sampling methods are able to detect the presence of dioxin in surface water at lower concentrations. The Ohio River Valley Water Sanitation Commission (ORSANCO) uses a high-volume water sampling method to obtain detection limits and reporting limits 1000 times lower than the sampling method currently being used (DL below 0.001 pg/L (parts per quadrillion, ppq) for dioxin). This actually resolves pollution at and near the level of Montana DEQ-7 human health surface water of 0.005 pg/L. I (Ian Magruder, Chair of the WQAC) have personally talked with Sam Dinkins at ORSANCO	assessments are not planned at this time. Uncertainties associated with the available database are described in the uncertainty assessment. EPA has noted the recommendation for using the high-volume water sampling method but has sufficient data to complete the risk assessment.

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			who described their use of the method. He reports it has been useful for them to characterize ambient dioxin concentrations in the Ohio River at very low levels. The WQAC believes that using this method may help to resolve lingering questions about dioxin impacts to the Clark Fork from Smurfit. Given the expense of sampling dioxin we believe it would be more worthwhile to collect fewer samples using the high-volume method which provides meaningful results, than the current sampling plan which does not add much to site characterization.	
54	WQAC	Flooding Concerns	The assessment fails to include the scope of risks known to have the potential to affect the site and surrounding environment. Examples include risks associated with channel avulsion and berm failure.	Risk assessment does not/cannot account for potential future catastrophic events such as berm failure. However, the PRPs, with EPA and MDEQ oversight, conducted a berm stability study to address these concerns. Reference: https://semspub.epa.gov/work/08/1900526.pdf
55	WQAC	Site Characterization	The risk characterization in the documents we comment on here represent a gross under-sampling of the area and (given how data were combined) do not sufficiently identify hot spots or the extent of contamination (facility boundary). Consequently, the assessment very likely represents a lower level of risks than what actually exist. Further, the document completely omits potential known risks such as channel avulsion and berm failure. We believe that understanding of the site is therefore still subject to an unacceptably high level of uncertainty.	EPA believes that soil sampling conducted to date adequately characterizes surface soil conditions at the site for risk assessment purposes. Composite sampling reduces data variability and provides a reasonably unbiased estimate of mean contaminant concentrations in a specified decision unit (ITRC 2021). Risk assessment does not/cannot account for potential future catastrophic events such as berm failure or river channel migration. However, the PRPs, with EPA and MDEQ oversight, conducted a berm stability study to address these concerns. Reference: https://semspub.epa.gov/work/08/1900526.pdf
56	WQAC	Future Use	Population growth trends in Missoula County indicate that this prime area of land will be subjected to development pressure in the future. Such development is a question of when, not if. Future development of the site dictates that the cleanup must be done right. This is not a problem that we can effectively bury under a layer of clean fill, pretending that it has gone away. The failure to adequately identify risks has the potential to affect the implementation and outcome of the entire Superfund process. Again, this needs to be done right now so that Missoula County	Given that OU2 is currently a vacant industrial site, all of the receptors evaluated (resident, industrial/commercial worker, construction worker) were considered hypothetical future populations. Their evaluation, and the risks characterized, account for the potential for redevelopment of the OU2 site in the future.

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			and our watershed neighbors can be assured that the plans for remediation that are developed and implemented will adequately address the contamination associated with the site and lead to a solution that will protect the Clark Fork River, groundwater, land and soils, and plants and animals (including humans) living in and visiting this area, with some people depending on this area for subsistence. More details concerning what needs to be done to get this risk assessment right are provided by our colleagues from the Missoula Water Quality District, the Clark Fork Coalition, and the Frenchtown Smurfit Stone Community Advisory Group. We refer to the comments submitted by these groups to support the Missoula Water Quality Advisory Council's assertion that the risk assessment to date is insufficient, and that further work needs to be done to assure that the risk characterization is adequate to support a robust cleanup of the area.	EPA will address the Clark Fork Coalition, Frenchtown Community Advisory Group and Missoula Water Quality District comments submitted on the OU2 HHRA in this RTC table.
57	MVWQD	Conceptual Site Model (CSM)	Conceptual Site Models (site-wide, groundwater and air) need further development before finalizing risk assessments. Risk cannot be adequately assessed, nor pathways fully understood, until a sitewide CSM is complete, including an understanding of aerial deposition. We believe the comments that have been submitted regarding the Groundwater CSM should be addressed prior to evaluation of the risk assessments. We are fundamentally concerned that, because we don't understand the idiosyncrasies of the contaminant pathways that the risk assessments may be missing COPCs and evaluation of the most-contaminated areas (that would still be routes of exposure). Specifically: •Heterogeneity in well logs provides evidence of preferential flow paths not incorporated in any CSMs. •Background levels for metals within the Missoula aquifer are lower than those used in Smurfit Stone Assessments. •Studies indicate highly variable interaction between groundwater and surface water. Variable water levels will drive changes in groundwater pathways and need to be accounted for.	The CSM presented in the HHRA is specific to identifying potential human receptors within OU2 and associated complete exposure pathways. This objective differs from the fate and transport CSMs being developed in other site documents. EPA recently published an aerial deposition fact sheet (EPA 2021a), which will be cited in the HHRA. In addition, the groundwater CSM (NewFields 2020) is currently being revised and will be cited in the HHRA as well.
58	MVWQD	Data Evaluation	2017 soil sampling data includes surface soil samples and subsurface soil samples. The subsurface samples range in fines from 97% to 0.4% fines. Surface samples range from 87% to 3.7%. This range of variability means that contaminant results from data cannot be compared. Given the toxicity of even the tiniest amount of TEQ, data cannot be normalized to account for this degree of variability. Although it was stated in a presentation regarding the BERA and HHRA that samples were reflective of	As noted in the RI Work Plan Addendum 7, soil samples were submitted for particle size analysis to provide preliminary information about the physical properties and type of material present where contaminants were detected. For the purposes of the OU2 HHRA, all soil samples were collected and prepped consistently in accordance with Addendum 7

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			environments on the site, variability does not reflect onsite use. The primary use for OU3 was for fines to settle in order to meet permit requirements. Fines variability of this degree is likely a function of sampling rather than site characteristics. Further review of data is necessary to determine what data can be compared and is reflective of contaminants on site. Without this analysis, much of the data used within the BERA and HHRA is misleading.	to ensure comparability. The uncertainty section will be updated to include discussion of the uncertainties associated with evaluating risks to humans based on bulk soil samples.
59	MVWQD	Sampling Design	Overall, the risk assessments need improved spatial representation of soils in both operable units. Risk assessments inform risk management decisions. We fear that inadequate sampling now will underestimate risk and carry through to the feasibility study. We disagree with taking composite samples in exposure units being represented as a 20-acre grid for upland in OU3 and 100-acre grid for the OU3 floodplain. If these areas were comprised of homogenous strata and no knowledge of potential historic use differences existed between them, then it would be a more appropriate sampling design. However, at Smurfit, even within an exposure unit, the historic uses vary. Within each type of historic use, the waste types and stratification vary. Within a single grid there could be 10 ft deep solid waste dumps, settling ponds, aeration basins, conveyances, sludge impoundments, etc. If the goal of the sampling method is to identify hot spots or delineate extent of plumes, compositing on a heterogenous site and media is not appropriate when other sampling methods exist. One such method would involve dividing the site by strata (waste layers, use types, etc.), taking grid or random samples of those strata, and then employing an adaptive cluster method, would provide more meaningful insight. When a sample comes back elevated or a new contaminant is identified, this method allows those “hot spots” to be mapped as adjacent samples are taken instead of losing the spatial information and variability in the data common with compositing large areas.	EPA believes that soil sampling conducted to date adequately characterizes surface soil conditions at the site for risk assessment purposes. The focus of a risk assessment is on estimating exposures that a receptor may reasonably be exposed to within a given exposure area over their entire exposure duration. The random grid sampling captures the possibility that a receptor will likely be exposed to soils that are not delineated based on historic site uses. The composite grid sampling best represents potential exposure concentrations that a receptor may be exposed to chronically within a given exposure area. In addition, biased sampling was conducted based on site knowledge to identify areas of highest environmental concern (i.e., potential hot spot areas). These samples were collected from individual historical storage ponds and cells throughout the entire treatment chain. However, the objective of the risk assessment is to characterize the potential concentration that a receptor is exposed to over the exposure period, as opposed to evaluating a maximum concentration that could be contacted at any one time.
60	MVWQD	Toxicity Values	The EPA established a policy in 1995 (and reaffirmed in 2013 and 2018) to consider risks to infants and children “consistently and explicitly as a part of risk assessments.” We support this policy and recognize that exposures can affect infants and children differently as a result of many factors including ingestion rates, gene-expression, biochemical and physiological function, toxicokinetic and toxicodynamic differences, and immune status.	Based on further consideration, the RfD recommended for manganese in the EPA RSL table will be used in the HHRA. This value of 0.024 mg/kg-day incorporates subtracting out the dietary contribution from the normal U.S. diet (an upper limit of 5 mg/day) when evaluating non-food exposures to manganese.

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			However, this policy does not appear to have been applied in the OU3 toxicity assessment for groundwater exposures to manganese. The toxicity value used in this risk assessment for Mn, based on a total dietary intake of 10 mg/day and a modifying factor of 3 is 0.047 mg/kg/day. However, the recommendation from the author of the IRIS assessment for manganese is to subtract an upper limit of 5 mg/day when evaluating non-food (e.g., drinking water or soil) exposures to manganese, leading to a RfD of 0.024 mg/kg-day”. One of the most important uncertainties and rationales for this lower RfD is based on recent peer-reviewed scientific studies indicating that infants absorb, excrete, and regulate this nutrient differently than adults. There is evidence now that low levels of Mn in drinking water is associated with neurocognitive and neurobehavioral deficits in infants and children including lowered IQ, hyperactivity, memory deficits, and Parkinsonian-like symptoms. This recommended RfD of 0.024 mg/kg-day is also consistent with what Montana DEQ proposed when considering a Mn drinking water standard for DEQ7 in 2018 (0.025 mg/kg-day). The District requests that HQ calculations take into account Mn exposures in groundwater with the more current and protective RfD of 0.024 mg/kg-day. Additionally, we request that all other applicable RBC comparisons and RfD calculations incorporate exposures and risks to infants and children consistent with EPA’s Policy on Evaluating Health Risks to Children.	This RfD is consistent with the RfD used as the basis of the recently updated MDEQ drinking water benchmark of 0.025 mg/kg-day. This change does not alter the overall risk conclusion that manganese is a risk driver in groundwater. Risks to children were evaluated using standard EPA risk assessment methodology and guidance.
61	MVWQD	PCBs	In OU2 the Aroclor 1260 levels in the HDPT sampling area were above the residential and industrial screening levels and addressed in a targeted removal action as part of Addendum 5 of the Remedial Investigation. However, the High-Density Pulp Tank Foundation is just one of many locations in which PCB oil may have been used historically in OU2. There are seven additional tanks in the immediate area of the high-density pulp tanks. It is logical that if PCB-containing caulks, sealants, and paints were used around one HDPT, that there may be similar contamination surrounding the others. We have addressed this concern in past comments (See Addendum 5 comments dated 9/7/2017, and comments from February 2018 Draft HHRA) regarding the need for more complete PCB sampling in the HDPT area. The response the District received from this request was that this area was “visually investigated” and “nothing of concern” was found. This is unacceptable. Risk assessments inform risk management	In total, 16 surface soil samples were collected from OU2 and analyzed for Aroclors. Nine surface soil samples were collected from OU2 and analyzed for PCB congeners. PCBs (as Aroclors) were detected in only two areas in OU2. These included the High Density Pulp Tank Foundation and the Transformer Storage Basin. Soil within these areas have been removed. Removal Action is summarized in February 2018 “Construction Completion Report, PCB Impacted Soil in Operable Unit 2.”

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			decisions for FS and RI. Avoiding potentially contaminated sites when conducting a risk assessment serves to artificially decrease the exposure estimates in OU2 and weakens overall legitimacy of the RA process.	
62	MVWQD	Background Evaluation	Section 3.3.5: OU2 and OU3 soil concentrations of dioxins and furans onsite were compared to both the urban and rural TEQ background soil levels established by the state of Montana DEQ (Table 3-13 and Tables 3-1 to 3-3). However, it is unclear which of these background values was used in determination of TEQ as a COPC. Given that unknown contributions of dioxins from the site to nearby urban areas (Missoula) and considering that the Smurfit-Stone site was a non-industrial agricultural site prior to its operation, we support comparison of site soil TEQ concentrations to the MT DEQ rural TEQ value.	Although conducting a comparison to background concentrations was included in the previous draft OU2 HHRA, upon further consideration of existing guidance it was determined that comparison with background levels should not be used to remove contaminants of concern from further evaluation owing to the need to fully characterize site risks (EPA 2002). Comparison to background is not a toxicological rationale for eliminating COPCs from further consideration. Comparisons of site concentrations to background concentrations should still be considered within the RI outside of the risk assessment to provide additional information to risk managers to better characterize the results presented in the risk assessment.
63	Missoula Co Commissioners	Site Characterization	The structure of the sampling that has been used to evaluate the site is fundamentally structured in such a way that risks are muted.	Conservative bias of HHRAs believes that soil sampling conducted to date adequately characterizes surface soil conditions at the site for risk assessment purposes. The focus of a risk assessment is on estimating exposures that a receptor may reasonably be exposed to within a given exposure area over their entire exposure duration. Composite sampling reduces data variability and provides a reasonably unbiased estimate of mean contaminant concentrations in a specified decision unit (ITRC 2021). The 20-point/30-point composite samples were collected to provide an estimate of the mean concentration over an identified exposure area (e.g., grid). Discrete samples (5-point composites collected over a 1-m ² area) were collected under a biased sampling strategy to target areas of most concern. A weighted average was calculated to account for this bias and

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				give more weight to the composite sample which inherently provides a better estimate of the mean concentration for each exposure area (smaller variability around the mean). Due to low variability within the current data set, EPA is not currently recommending additional soil sampling to support the risk assessments.
64	Missoula Co Commissioners	Flooding Concerns	The risk of a catastrophic channel avulsion into the site from the Clark Fork River are not evaluated.	Risk assessments are performed using available site data and presumed exposure scenarios to estimate the chronic risks posed by the contaminants present at the site. CERCLA risk assessments cannot and should not be used to estimate short-term risks from hypothetical events such as flooding, since the extent of soil disturbance, the location of such erosion, and the lateral extent of deposition cannot be known ahead of time. The impact of potential flooding is something that is typically evaluated during the FS, which follows the remedial investigation and risk assessments.
65	Missoula Co Commissioners	Conceptual Site Model	Conceptual Site Model should include updated Groundwater Conceptual Site Model and an understanding of aerial deposition.	The groundwater CSM (NewFields 2020) and aerial deposition fact sheet (EPA 2021a) will be cited in the HHRA.
66	Missoula Co Commissioners	Site Characterization	Regarding sampling structure: Onsite sampling of soils and groundwater appear to be weighted heavily on grid-based sampling on 20-, 30- and 100-acre grids. We do not understand how this accurately describes the risks of the particularly toxic operations that occurred in discrete areas of the site (specifically the dumps and landfills). As stated in previous correspondence, along with provided references and photos, we are concerned that there are buried materials on this site that are contaminating groundwater or will contaminate groundwater (leaking drums and sludge from the days of bleaching pulp). We believe the risk assessment exposure units should be broken up by discrete units for each individual landfill and sludge pond. Some sites are difficult to ascertain where dumping took place and thus, require a grid-based approach. This site has very discernable boundaries of cells due to the tremendous amount of earth moving that took place (even artificially altering floodplain boundaries by filling the site with the waste that's being evaluated).	The random grid sampling captures the possibility that a receptor will likely be exposed to soils that are not delineated based on historic site uses. The composite grid sampling best represents potential exposure concentrations that a receptor may be exposed to chronically within a given exposure area. In addition, biased sampling was conducted based on site knowledge to identify areas of highest environmental concern (i.e., potential hot spot areas). These samples were collected from individual historical storage ponds and cells throughout the entire treatment chain. However, the objective of the risk assessment is to characterize the potential concentration that a receptor is exposed to over the exposure period, as opposed to evaluating a maximum

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				concentration that could be contacted at any one time.
67	Missoula Co Commissioners	Flooding Concerns	Regarding channel movement: The Clark Fork River meanders. Over time, our community has experienced the implications of this meandering in the loss of bridges, roads and structures. We know the best intentions to mitigate channel migration through engineering are not without their own consequences, shifting the problem upstream or downstream. Missoula's own floodplain regulations prohibit new use of riprap because of the consequences of shifting energy downstream. Plainly stated, the berms surrounding the Smurfit Stone site are masking a huge liability and risk to the ecosystem and to people. Catastrophic failure is a real threat, and that risk should be evaluated. What would the ecological and human health effects be of the Clark Fork's reoccupation of its flood plain or river channel?	Risk assessment does not/cannot account for potential future catastrophic events such as berm failure or river channel migration. The impacts of potential flooding is something that is typically evaluated during the FS, which follows the remedial investigation and risk assessments. However, the PRPs, with EPA and MDEQ oversight, conducted a berm stability study to address these concerns. This study will be cited in the HHRA. Reference: https://semspub.epa.gov/work/08/1900526.pdf
68	Missoula City-County Board of Health	Conceptual Site Model	Risk cannot be adequately assessed, nor pathways fully understood, until a sitewide Conceptual Site Model is complete. Determining risk, biological or human health, is premature when issues brought forward in the Groundwater Conceptual Site Model have not been addressed or responded to. Further, air deposition of contaminants is widely acknowledged, yet aerial deposition of contaminants is not fully discussed or included in identification of background levels. Even though current investigations are identifying contaminants at present, contamination from the site has extended beyond the site boundaries and should be included in risk assessments. Although CSMs can be updated, incorporating additional COPCs at a later stage puts the onus on the public as opposed to the PRPs to provide evidence of contamination.	The CSM presented in the risk assessment is specific to identifying potential human health receptors and exposure pathways within the current study area. This objective differs from the fate and transport CSMs being developed in other site documents. The risk assessments remain dynamic documents that can be amended as additional site information becomes available in the future if necessary. EPA has considered and investigated for aerial deposition within the risk assessment CSM and the broader RI. The groundwater CSM (NewFields 2020) and aerial deposition fact sheet (EPA 2021a) will be cited in the HHRA. Although conducting a comparison to background concentrations was included in the previous draft OU2 HHRA, upon further consideration of existing guidance it was determined that comparison with background levels should not be used to remove contaminants of concern from further evaluation owing to the need to fully characterize site risks (EPA 2002). Comparison to background is not a toxicological rationale for eliminating COPCs

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				from further consideration. Comparisons of site concentrations to background concentrations should still be considered within the RI outside of the risk assessment to provide additional information to risk managers to better characterize the results presented in the risk assessment.
69	Missoula City-County Board of Health	Toxicity Values	The Board recommends using a more conservative RfD for Manganese in the HHRA. There is evidence now that low levels of Mn in drinking water are associated with neurocognitive and neurobehavioral deficits in infants and children including lowered IQ, hyperactivity, memory deficits, and Parkinsonian-like symptoms. According to the EPA IRIS website, “The author of the IRIS assessment for manganese recommended that the dietary contribution from the normal U.S. diet (an upper limit of 5 mg/day) be subtracted when evaluating non-food (e.g., drinking water or soil) exposures to manganese, leading to an RfD of 0.071 mg/kg-day for non-food items. The explanatory text in IRIS further recommends using a modifying factor of 3 when calculating risks associated with non-food sources due to a number of uncertainties that are discussed in the IRIS file for manganese, leading to an RfD of 0.024 mg/kg-day.” One of the most important uncertainties and rationales for this lower RfD is based on recent peer-reviewed scientific studies indicating that infants absorb, excrete, and regulate this nutrient differently than adults. This recommended RfD of 0.024 mg/kg-day is also consistent with what Montana DEQ proposed when considering a Mn drinking water standard for DEQ7 (0.025 mg/kg-day). We request risk calculations take into account Mn exposures in groundwater with the more current and protective RfD.	Based on further consideration, the RfD recommended for manganese in the EPA RSL table will be used in the HHRA. This value of 0.024 mg/kg-day incorporates subtracting out the dietary contribution from the normal U.S. diet (an upper limit of 5 mg/day) when evaluating non-food exposures to manganese. This RfD is consistent with the RfD used as the basis of the recently updated MDEQ drinking water benchmark of 0.025 mg/kg-day. This change does not alter the overall risk conclusion that manganese is a risk driver in groundwater.
70	Trustees	Site Characterization	Request to Add Data to SCRIBES: As part of the remedial investigation /feasibility study process, the National Contingency Plan (NCP [40 CFR 300.430(b)(1)]) specifically requires the U.S. Environmental Protection Agency (EPA) to “(1) Assemble and evaluate existing data on the site, including the results of any removal actions, remedial preliminary assessment and site inspections, and the NPL listing process.” This specifically includes documents such as the Hazard Ranking System (HRS) evaluation for the Smurfit-Stone Mill Site (Site). This investigation revealed the presence of dioxin/furans and dioxin-like compounds in waste piles on the former mill property and sediment in unlined storage ponds on the former mill property.	Data collected prior to 2014 to support the Preliminary Assessment/Site Investigation are not used in the HHRA due to issues raised with data quality. EPA used those data to inform the sampling plan and focused collection on those areas identified as having potentially elevated contamination. The sampling conducted as part of RI activities are more recent, were collected in accordance with the EPA approved QAPP, and have been evaluated and determined to meet the needs of the risk assessment.

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			Furthermore, these compounds were also found in fish tissues near the Site and downstream of the Site. Accordingly, there is a clear pathway from the Site to the Clark Fork river and the presence of these highly toxic compounds in the environment both on the former mill property and off of it (including in fish tissue) requires further investigation. The Trustees specifically request this data be added to the Site database (SCRIBES) and used in the BERA and HHRA. If EPA is unwilling to include this data, the Trustees request a formal response regarding why this data should not be used in evaluating Site risks.	
71	Trustees	Site Characterization	The Trustees request that additional Site characterization, including potential locations in the Clark Fork River where hazardous substances have become located, be performed prior to finalization of the HHRA and BERA for the Site. Sampling completed to date is insufficient to adequately characterize risk to human health and the environment. Dioxins and furans are persistent highly toxic organic pollutants even at low level at or near analytic detection limits. Because of their hydrophobic nature and extremely low probability of detection, sampling methods such as surface water grab samples and groundwater samples are not adequate to characterize contamination and associated risk to human health and biota. Existing data show that there are coplanar PCBs in OU2. Further characterization is warranted to define the extent of coplanar PCBs and to identify potential pathway (both current and historic) to the river. The Trustees request that the overall Site Conceptual Model and the groundwater Site Conceptual Model be further developed and finalized to address all potential exposure pathways from the Site to the river prior to finalization of the BERA and HHRA. The NCP provides direction on collecting enough data to characterize the nature and extent of the contamination. The data collected must allow EPA to assess, “(iii) The general characteristics of the waste, including quantities, state, concentration, toxicity, propensity to bioaccumulate, persistence, and mobility, and (v) Actual and potential exposure pathways through environmental media.” 40 CFR 300.430(d)(2). The data collected then must be used to conduct a “site-specific baseline risk assessment to characterize the current and potential threats to human health and the environment that may be posed by contaminants migrating to ground water or surface water, releasing to air, leaching through soil, remaining in the soil, and	A large amount of data have been collected and evaluated at the site. Additional data and evaluations may occur as part of the RI/FS. The full nature and extent to which hazardous substances from site activities have come to be located is outside the scope of the risk assessment and will be evaluated within the RI/FS.

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			bioaccumulating in the food chain.” 40 CFR 300.430(d)(4). Therefore, the NCP requires enough data to identify quantities of contamination that have been released from the original mill property into the Clark Fork River and to determine the exposure pathways in the Clark Fork River downstream of the Site. As noted elsewhere in this comment letter, we do not believe that this data has been fully collected as required by the NCP. Further, the risk assessments are not complete until all the pathways for migration to and through surface water and bioaccumulating in the food chain have been identified, so we would request that EPA reevaluate the risk assessments as additional information is gathered as part of the process of finalizing the two Site Conceptual Models and as additional data is gathered to fully characterize the nature and extent of contamination in the Clark Fork River. The 104 Mill Study (USEPA, 1990) included samples of effluent, sludge, and pulp at the Site. 2,3,7,8-tetrachlorodibenzofuran (TCDF) was detected in samples of effluent, sludge, and pulp. Note the study had a relatively high detection limit. This study provides evidence that dioxin and furans were produced at the Site and have the potential to come to be located in the Clark Fork River sediments downstream of the Site. The Trustees strongly request that additional sampling of sediment depositional areas downstream of the Site within the Clark fork River be performed to further define the OU3 boundary and evaluate if contamination from the Site has come to be located in these areas. This type of paper mill has been shown (based on EPA studies) be a source of dioxins and furans and these depositional areas within the Clark Fork River (and likely many miles downstream from the Site, and even in the reservoirs downstream) may pose an ongoing unacceptable risk to the environment. In addition to sampling of sediment depositional areas downstream of the Site, the Trustees request high resolution analytical methods specifically targeted to quantify hydrophobic chemicals that pose a risk at low levels, such as dioxins, be used. These methods have been used for many years at other sites with known dioxin issues and are critical for informing risk management at sites where persistent organic pollutants are present.	
72	Trustees	Background Evaluation	Request for Additional Background Analysis: The Trustees understand that EPA is preparing a technical memorandum addressing air emission from the Site. The Trustees look forward	Although conducting a comparison to background concentrations was included in the previous draft OU2 HHRA, upon further

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			to reviewing and commenting on this document. However, the Trustees suggest that airborne emissions from the Site did contain dioxins and furans and the air deposition was widespread throughout the Missoula Valley. EPA has prepared technical guidance that dioxins and furans are aerially emitted from the type of kraft paper processes used at the Site (USEPA, 1997). Therefore, the Trustees disagree with using locations within the aerial emissions area to compare to background concentrations for all matrices including soil, sediment, water, and tissue. Further sampling and characterization should be performed to determine the aerial influence of the Site and to select background locations that are outside the area where aerial contamination from the Site came to be located.	consideration of existing guidance it was determined that comparison with background levels should not be used to remove contaminants of concern from further evaluation owing to the need to fully characterize site risks (EPA 2002). Comparison to background is not a toxicological rationale for eliminating COPCs from further consideration. Comparisons of site concentrations to background concentrations should still be considered within the RI outside of the risk assessment to provide additional information to risk managers to better characterize the results presented in the risk assessment. EPA's recently published fact sheets on aerial deposition and dioxins/furans (EPA, 2021a, b) provide information regarding how EPA has investigated potential impacts of aerial deposition. These documents, along with MDEQ's state-wide dioxin background investigation report (MDEQ 2011) provide information on how dioxin/furan soil concentrations at the site and in the Missoula area compare with those elsewhere in the U.S..
73	J Harrington	Site Characterization	I grew up here in Western Montana, surrounded by industry who have profited-handsomely from our resources but are not held responsible for the environmental damage they leave behind. From the first meeting with the EPA in the Frenchtown firehall in 2017, the public and Natural Resource Trustees have asked that action be taken that are protective of human health and the environment, the genesis of which is a thorough and complete characterization of the site. I do not feel confident that the actions taken so far have captured the decades of environmental impact that mill activities left behind. Transparency and accountability are lacking in this process, which leads to social and environmental injustice. EPA has been sharing limited and redundant information for years, without addressing data gaps and unanswered questions. It has been asked multiple	Comment noted. Data collected prior to 2014 to support the Preliminary Assessment/Site Investigation are not used in the HHRA due to issues raised with data quality. EPA used those data to inform the sampling plan and focused collection on those areas identified as having potentially elevated contamination. The sampling conducted as part of RI activities are more recent, were collected in accordance with the EPA approved QAPP, and have been evaluated and determined to meet the needs of the risk assessment. Risk assessments evaluate current and hypothetical future exposure scenarios, and sampling to support the risk assessments has been

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			times over the years why the 2011 URS and 2013 HRN reports (USEPA, 2013b) have not been incorporated into the sampling plans, nor in the draft HHRA or BERA, without an adequate answer. The presentations of the HHRA, BERA, and the long-awaited Ground Water Site Conceptual Model were superficial, and additionally, the continued use of statements like, “only 6% of the pulp was bleached” is concerning. It has been asked again and again that the Agency report actual figures, like, 1,600,000 tons of bleached pulp was produced, but reports and presentations by the EPA on the HHRA and BERA regurgitate the, “only 6%” figure without providing context. If a stratified soil sampling plan was in place, the deeper soil horizons may reveal different concentrations than the samples taken so far, especially in the ponds holding wastewater sludge from the bleaching plant operations. On page 4 of the EIS report it states that at the time, 14 years after the mill began bleaching pulp, there were still no EPA regulations for the bleached pulp industry. The volume of wastewater from the bleaching plant alone, especially before the EPA issued any regulations for Bleaching plants in the 1960’s and 1970’s, should trigger a concentrated sampling event of the lower horizons in the settling and sludge ponds associated with the Bleach plant discharge. On page 27 of the 1974 EIS: <i>An average of 159 tons (based on 350 operating days) of bleached product was produced in 1973 by HW. HW reports 30,000 gallons of water are required per ton of bleached product. The discharge from the bleach plant would, therefore, average 4.8 million gallons per day (MGD). The total contaminated waste flow (not including the uncontaminated cooling water which is discharged separately) averaged 15.8 mgd (MDHES 1974).</i> The report also identifies that the mill’s bleaching plant used 380 tons of chlorine monthly in 1973. It is important in attempting to understand the potential and real harm to human health and the environment that the study of the site include all areas that have been impacted by site activities.	determined to be adequate. The objective of the multimedia sampling conducted as part of the RI is to capture the likely contaminants in the data set and determine whether they pose an unacceptable risk to human health or the environment, regardless of the quantities historically used or produced. Remedial alternatives will be evaluated in the FS, and historical damage is evaluated within the NRDA process. The data supporting a discussion about cleanup needs came from intensive soil sampling across the site. EPA approved a work plan that included two approaches to sampling. The first approach is a targeted sampling strategy to assess areas identified as most likely to be contaminated by site operations, also known as potential source areas. This approach was implemented in OU2. As noted in the Remedial Investigation Work Plan (RIWP) (NewFields 2015), 17 target areas were identified through environmental data records, site walks, interviews with former Mill employees, and personal (NewFields’ staff) experience with the site operations. Further, the RIWP specifically identified boiler emissions (possible metals, dioxins, and PAHs), areas where transformers were stored (looking for PCBs), and other areas where localized impacts may have resulted from previous operations. The second approach is a composite sampling strategy which is used for estimating concentrations in soil for risk assessment. This approach was implemented across OU1 and OU3. The composite approach provides reasonable estimates of contaminant concentrations across a defined area, known as exposure units or decision units. The risk assessment then evaluates the concentration of

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				a contaminant across the area to determine the estimated exposure risk from each unit. For example, at a residential property, exposure units may include the front yard, the back yard, the garden, and a play area. Each of these units would be sampled separately since they are used differently and pose different exposure risks to humans (kids playing versus mowing the lawn versus planting in a garden). At Smurfit, the decision units were based on former land use or parcel boundaries. In OU1, the sampling was based on property boundaries and included 9 agricultural parcels and 2 forested lands. Statistical methods were then used to determine the number of composite samples per property. In OU3, the approach was based on historical data and the boundaries of the former ponds. Samples were collected using both single point and composite methods and the rationale is detailed in the RIWP. EPA's risk managers then take the information regarding nature and extent, apply the risk assessment conclusions, and make decisions on where remediation is necessary and of what contaminants to what concentrations (cleanup standards). These decisions guide the next step in the Superfund Process: the feasibility study.
74	J Harrington	Aerial Deposition	The argument that there has been no impact from aerial deposition during 53 years of operation is unsupported. Why would the mill need air pollution permits if what was being discharged over the years was not a hazard to human health and the environment? In the 1974 EIS for the proposed expansion of the mill, on page 1, it states: <i>HW has applied to the AQB for a permit to expand the capacity of its pulp and paper mill from 1150 tons per day (TPD) of paper products to 1850 TPD. Operation of the expanded plant would affect air pollution from the mill, and therefore a permit is required under regulations appurtenant to the 1967 Clean Air Act of Montana. The</i>	Comment noted. EPA is already considering aerial deposition within the risk assessment CSMs and the broader RI. EPA recently released an aerial deposition fact sheet (EPA, 2021a) that speaks to these issues; the fact sheet will be cited in the HHRA.

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			<i>act and subsequent regulations say there shall be no "installation, alteration, or use of any machine, equipment, device or other article which . . . may cause or contribute to air pollution ..." unless a permit is issued (MDHES 1974).</i>	
75	J Harrington	Background Evaluation	My comments on the HHRA in 2018 shared the research conducted by Paul Woods Bartlett. Barry Commoner, Kim Couchot, Brian Bush, Holger Eisl and Paul Cooney on established environmental impacts involving air pollution from industry (Bartlett et al. 2000). The fact that the background areas lie within reach of aerial deposition of the mill. The background sites are not far enough away from the potential impact area of the mill to be defensible. New background sites need to be chosen and sampled. On page 19 of the EIS the sources of pollution are described: <i>Nearly every item of process equipment in a pulp and paper mill can contribute to pollution of air and water. Air pollutants generated in the pulping process are many and varied. Gases and particulates are emitted as a variety of compounds. Many of the gaseous emissions are odorous, among them hydrogen sulfide (H₂S), methyl mercaptan, (CH₃SH), dimethyl sulfide (CH₃SCH) and dimethyl disulfide (CH₃SSCH) . Other gaseous pollutants emitted are sulfur dioxide (SO₂) and carbon monoxide (CO). Particulate emissions include wood fiber, sodium compounds from the recovery furnaces, fly ash, and calcium compounds. Table 1 summarizes the various pollutants and sources (MDHES 1974).</i>	Although conducting a comparison to background concentrations was included in the previous draft OU2 HHRA, upon further consideration of existing guidance it was determined that comparison with background levels should not be used to remove contaminants of concern from further evaluation owing to the need to fully characterize site risks (EPA 2002). Comparison to background is not a toxicological rationale for eliminating COPCs from further consideration. Comparisons of site concentrations to background concentrations should still be considered within the RI outside of the risk assessment to provide additional information to risk managers to better characterize the results presented in the risk assessment.
76	CAG	Site Characterization	Identification of the concentrations and distribution of contaminants across the Mill Site is most accurately done by on-site sampling. Rather than rigorously measuring for onsite contamination, the Draft Human Health Risk Assessment discusses Exposure Pathways of Chief Concern and indirect measurements. The soil sampling conducted is insufficient. Soil sampling density was far too low to adequately determine the presence or absence of contamination across the 3000-acre site (see figure 4.3 attached to original comment letter: "Surface Soil Sampling Locations in OU2: Smurfit-Stone/Frenchtown Mill Site, Montana"). Operational Unit 2 is approximately 265 acres in size. This to one sample taken for every 7.4 acres. Concerns have been expressed as to the adequacy of having such large areas	EPA believes that soil sampling conducted to date adequately characterizes surface soil conditions at the site for risk assessment purposes. The focus of a risk assessment is on estimating exposures that a receptor may reasonably be exposed to within a given exposure area over their entire exposure duration. Composite sampling reduces data variability and provides a reasonably unbiased estimate of mean contaminant concentrations in a specified decision unit (ITRC 2021). The 20-point/30-point composite samples were collected to provide an estimate of the mean concentration over an identified exposure area

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			represented by so few samples. Representing large areas with minimal sample locations may not represent the potential risks. No new soil samples since 2017.	(e.g., grid). Discrete samples (5-point composites collected over a 1-m ² area) were collected under a biased sampling strategy to target areas of most concern. A weighted average was calculated to account for this bias and give more weight to the composite sample which inherently provides a better estimate of the mean concentration for each exposure area (smaller variability around the mean). Due to low variability within the current data set, EPA is not currently recommending additional soil sampling to support the risk assessments.
77	CAG	Site Characterization	Soil sample data were collected in 2014, 2015 and 2016 as 5-point composite samples collected from locations across OU2 and OU3. Composite sampling would tend to mask samples with high concentrations and limit their use for statistical analyses and inference.	Composite sampling reduces data variability and provides a reasonably unbiased estimate of mean contaminant concentrations in a specified decision unit (ITRC 2021). The 20-point/30-point composite samples were collected to provide an estimate of the mean concentration over an identified exposure area (e.g., grid). Discrete samples (5-point composites collected over a 1-m ² area) were collected under a biased sampling strategy to target areas of most concern. The composite grid sampling best represents potential exposure concentrations that a receptor may be exposed to chronically within a given exposure area. The biased sampling was conducted based on site knowledge to identify areas of highest environmental concern (i.e., potential hot spot areas). However, sampling conducted to support the risk assessment is not necessarily equivalent to sampling conducted to evaluate nature and extent. Evaluation of nature and extent is outside of the scope of the risk assessment which focuses on evaluation of the current study area. Further evaluation of nature and extent is being conducted as part of the RI.
78	CAG	Site Characterization	A biased sampling approach (sampling locations selected based on site knowledge to identify areas of highest environmental concern) was used. Given that contamination may have been spread by post	The risk assessment is not the mechanism for characterizing the extent of contamination at a site. The risk assessment presents estimated

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			discharge surface flow as well as atmospheric deposition not using a sufficient number of randomized selections of sample sites across the Mill site limits any quantitative inference to identify the extent of contamination at the site. The number and spatial distribution of sites sampled should be related to the variability in the measurements.	risks to potential receptors within the study area of concern. Nature and extent of contamination is evaluated outside of the risk assessment. Nonetheless, although some site soil data was collected using biased sampling, random grid sampling was also used.
79	CAG	Site Characterization	Sampling design should have varying depths dictated by color or texture changes. Though auger bore hole logs appear to have been taken it is not clear that individual strata were sampled. Using trench sampling of strata could more accurately identify changes in soil profiles.	Data summary reports are cited in Section 2.3 of the OU2 HHRA. Please see those reports for details regarding soil profiles with depth.
80	CAG	Site Characterization	PCBs were detected in OU2 soils associated with the high-density pulp tank and transformer storage building. Testimonies of former mill workers conducted by Peter Nielsen in 2011 and 2012 strongly suggest that numerous spills and leaks of hydraulic fluids and black liquor wastes were a never remediated, but instead allowed to drain into the soils and into the sewer system. It is inaccurate to assume that the soil samples taken so far reflect the heterogeneity of the soil across the site, both horizontally and laterally. Further sampling should be conducted to accurately identify potential hot spots.	Anecdotal information is useful in understanding what may have occurred at the site historically but should not be the basis for development of a robust sampling plan EPA did targeted sampling to assess areas identified as most likely to be contaminated by site operations, also known as potential source areas. Target areas were identified through environmental data records, site walks, interviews with former Mill employees, and personal (NewFields' staff) experience with the site operations. Additional confirmation samples were collected as part of soil removal for PCBs, and groundwater monitoring continues at the site.
81	CAG	Site Characterization	PCBs, furans and dioxins strongly attach to soil particles, are very persistent, and can be transported via erosion and transport of contaminated soils. The BERA and HHRA soil samples were last taken in 2017, giving limited and potentially inaccurate assumptions about the current and future danger the Persistent Organic Pollutants pose to Human Health and the Environment.	EPA believes that soil sampling conducted to date adequately characterizes surface soil conditions at the site for risk assessment purposes. Site activities that could be expected to increase soil contamination have not occurred since the last round of soil sampling. Finally, EPA has released a PCB fact sheet (EPA 2021c) that addresses these concerns and will be cited in the HHRA.
82	CAG	PCBs	At a public meeting the EPA was asked about if a source for the PCB's found in OU2 was identified as the Power Company transformer, yet this data is not included in the HHRA for OU2. Please provide the CAG with documentation about the sampling done to assess the source of the PCB's in OU2.	Source attribution is outside the scope of the risk assessment. EPA has released a PCB fact sheet (EPA 2021c) that discusses PCBs at the Site; the fact sheet will be cited in the HHRA.

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83	CAG	Conceptual Site Model	GW Site Conceptual Model is flawed. It ignores the significant threat of erosion of contaminated materials into the Clark Fork River. It is incomplete, resulting in a questionably vetted HHRA and BERA. You are not getting a good picture of the risk without a good GWSCM.	The CSM presented in the HHRA is specific to identifying human health receptors and exposure pathways. This objective differs from the fate and transport CSMs being developed in other site documents. However, exposure to groundwater is included in the CSM for the HHRA. Each well is evaluated individually and is not influenced by information regarding the impacts of erosion to the CFR. Additional comments on the ongoing development of the groundwater CSM are outside the scope of the HHRA.
84	CAG	Site Characterization	The Channel Migration Zone and Avulsion hazards have not been accounted for.	Risk assessments are performed using available site data and presumed exposure scenarios to estimate the chronic risks posed by the contaminants present at the site. CERCLA risk assessments cannot and should not be used to estimate short-term risks from hypothetical events such as flooding, since the extent of soil disturbance, the location of such erosion, and the lateral extent of deposition cannot be known ahead of time.
85	CAG	Site Characterization	Exclusion of 104 Mill study (EPA 1990) and the 2011 URS data has not been justified and if the reasoning is not articulated, the data should be included in the HHRA and BERA.	Data collected prior to 2014 to support the Preliminary Assessment/Site Investigation are not used in the HHRA due to issues raised with data quality. EPA used those data to inform the sampling plan and focused collection on those areas identified as having potentially elevated contamination. The sampling conducted as part of RI activities are more recent, were collected in accordance with the EPA approved QAPP, and have been evaluated and determined to meet the needs of the risk assessment.
86	CAG	Site Characterization	Groundwater is neither uniform nor homogenous and yet grab samples from surface water are being used to describe the health of the entire water system associated with the former mill.	In order to perform the risk assessments, EPA analyzed a broad spectrum of information, including tissue concentration data from large fish and small fish from the Clark Fork River and its tributaries; macroinvertebrates (bugs) from on-site ponds and creeks; and small mammals on-site. Additionally, EPA considered data from sediment, surface water,

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				sediment porewater samples, surface soil and subsurface soil samples in the risk assessments. Over the course of the past 6 years, EPA has overseen collection of biannual groundwater samples. The HHRA will be updated to include groundwater data collected through 2020.
87	CAG	Site Characterization	It is unclear if the soil strata have been correctly profiled to make sure that each soil strata are represented.	The HHRA evaluates potential exposures to human receptors which (except for the construction worker) primarily occurs within the top 6 inches of soil. Available subsurface data were also evaluated for the construction worker. Additional soil characterization occurred as a part of informing nature and extent of contamination and will be detailed in the RI Report.
88	CAG	Flooding Concerns	Little attention was given to a low probability flood in excess of what is calculated to be a 100-year event would breach the berm and allow flood waters to scour large portions of the site. Climate change likely has and will continue to increase the risk of erratic weather and increase the probability of floods. What is estimated to be a 100-year flood at present may well become a much higher probability event in future years.	Risk assessments are performed using available site data and presumed exposure scenarios to estimate the chronic risks posed by the contaminants present at the site. CERCLA risk assessments cannot and should not be used to estimate short-term risks from hypothetical events such as flooding, since the extent of soil disturbance, the location of such erosion, and the lateral extent of deposition cannot be known ahead of time. The impact of potential flooding is something that is typically evaluated during the FS, which follows the RI and risk assessments. It is during the FS process that the EPA evaluates alternatives for cleanup against the nine criteria in the National Oil and Hazardous Substances Pollution Contingency Plan. The potential impacts of flooding would be evaluated against the criteria for compliance with applicable or relevant and appropriate requirements and long-term effectiveness and permanence.
89	CAG	General	It is impossible to quantify the risks without more intensive soil sampling. To date there is little data that would prove or disprove the sites impact to the Clark Fork River though State of Montana fish tissue data indicate an increase in Dioxins downstream of the	In order to perform the risk assessments, EPA analyzed a broad spectrum of information, including tissue concentration data from large fish and small fish from the Clark Fork River

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			site. These data were considered sufficient to issue a fish consumption advisory. It is always better to error on the side of caution when human health is at risk. Allocating resources to direct sampling of contaminants to determining the types, amounts, and locations of contaminants will give a much clearer and defensible picture of risks and identify areas needing treatment. In conclusion, the Frenchtown CAG is in support of actions that remove the sources of contamination instead of leaving contaminants for future generations to contend with. We are asking the EPA and MTDEQ for a commitment for a thorough Risk Assessment to protect human health and the environment now and for generations to come. A resident of the area has observed that the process is driving the data instead of the data driving the process. The desired result of the Risk Assessment is an accurate representation of the impacts that the site has had and continues to have on the environment. We do not feel that the process up to this point has done enough to characterize the influence and impact that 53 years of mill operations.	and its tributaries; macroinvertebrates (bugs) from on-site ponds and creeks; and small mammals on-site. Additionally, EPA considered data from sediment, surface water, sediment porewater samples, surface soil and subsurface soil samples in the risk assessments. Over the course of the past 6 years, EPA has overseen collection of biannual groundwater samples. Sampling conducted to support the risk assessment is not necessarily equivalent to sampling conducted to evaluate nature and extent. Evaluation of nature and extent is outside of the scope of the risk assessment which focuses on evaluation of the current study area. Further evaluation of nature and extent is being conducted as part of the RI. Risk assessments evaluate current and hypothetical future exposure scenarios, and sampling to support the risk assessments has been determined to be adequate. The objective of the multimedia sampling conducted as part of the RI is to capture the likely contaminants in the data set and determine whether they pose an unacceptable risk to human health or the environment, regardless of the quantities historically used or produced. Remedial alternatives will be evaluated in the FS, and historical damage is evaluated within the NRDA process.
90	J Salazar	Site Characterization	...The studies EPA has conducted to date are inadequate to address fully and meaningfully the risks associated with this site. From inadequate stratification of sampling to small sample sizes to omission of some key chemicals of concern, no meaningful conclusions can be drawn concerning the levels of risk presented by this site. Upstream and downstream comparisons are invalid both because small sample size means there is no power of the test, and because aerial deposition and fish migration can move chemicals upstream.	EPA believes that sampling conducted to date adequately characterizes site conditions for risk assessment purposes to evaluate the current study area. The focus of a risk assessment is on estimating exposures that a receptor may reasonably be exposed to within a given exposure area over their entire exposure duration.

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				EPA recently published fact sheets on aerial deposition, dioxins/furans, and PCBs at the Site (EPA, 2021a, b, c) that provides additional information and will be cited in the HHRA.
91	J Salazar	Flooding Concerns	One of the greatest inadequacies of the study design is the omission of one of the largest sources of risk associated with this site – the risk of dike failure and downstream transport of the toxic chemicals in the historic floodplain. As long as the mill’s toxic waste remains in the Clark Fork River’s historic floodplain, these risk assessments must also address the potential impacts of a dike failure followed by the river washing that waste downstream. The river will eventually reclaim its floodplain. And climate scientists predict that climate change will continue to produce bigger and bigger floods, hence the chance of such a catastrophic failure is increasing and will be even greater than historic flooding would suggest. Obviously, it is difficult to predict where the waste will wind up once it is washed downstream – but that does not mean this catastrophic scenario should be ignored. These risk assessments must assess all the possible outcomes of leaving the waste where it is (where it is subject to being washed downstream), as well as assessing the much lower risks if those wastes are moved to a location less likely to be impacted by bigger floods and dike failure. Without such an assessment, these risk assessments are missing information critical to making decisions about needed remediation actions at this site. In my view, the EPA should move quickly to require the removal of the toxic waste in the historic floodplain at the Smurfit-Stone/Frenchtown Mill site, as it has in removing the contaminated ponds at the Columbia Falls Aluminum Company Superfund site. That EPA action was taken to protect the Flathead River from the eventual failure of those ponds. The much larger area of contaminated historic floodplain at the Smurfit Stone site presents an even greater risk to the Clark Fork River.	Risk assessments are performed using available site data and presumed exposure scenarios to estimate the chronic risks posed by the contaminants present at the site. CERCLA risk assessments cannot and should not be used to estimate short-term risks from hypothetical events such as flooding, since the extent of soil disturbance, the location of such erosion, and the lateral extent of deposition cannot be known ahead of time. The impact of potential flooding is something that is typically evaluated during the FS, which follows the RI and risk assessments. It is during the FS process that the EPA evaluates alternatives for cleanup against the nine criteria in the National Oil and Hazardous Substances Pollution Contingency Plan. The potential impacts of flooding would be evaluated against the criteria for compliance with applicable or relevant and appropriate requirements and long-term effectiveness and permanence. The on-site toxic waste, referred to as the ‘waste management area’ is not located within the CFR 100-year floodplain.
92	V Watson	Site Characterization	...The studies EPA has conducted to date are inadequate to address fully and meaningfully the risks associated with this site. From inadequate stratification of sampling to small sample sizes to omission of some key chemicals of concern, no meaningful	EPA believes that sampling conducted to date adequately characterizes site conditions for risk assessment purposes to evaluate the current study area. The focus of a risk

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			conclusions can be drawn concerning the levels of risk presented by this site. Upstream and downstream comparisons are invalid both because small sample size means there is no power of the test, and because aerial deposition and fish migration can move chemicals upstream.	assessment is on estimating exposures that a receptor may reasonably be exposed to within a given exposure area over their entire exposure duration. Composite sampling reduces data variability and provides a reasonably unbiased estimate of mean contaminant concentrations in a specified decision unit (ITRC 2021). The 20-point/30-point composite samples were collected to provide an estimate of the mean concentration over an identified exposure area (e.g., grid). Discrete samples (5-point composites collected over a 1-m ² area) were collected under a biased sampling strategy to target areas of most concern. EPA recently published an aerial deposition fact sheet (EPA, 2021a) that provides additional information and will be cited in the HHRA.
93	V Watson	Flooding Concerns	One of the greatest inadequacies of the study design is the omission of one of the largest sources of risk associated with this site – the risk of dike failure and downstream transport of the toxic chemicals in the historic floodplain. As long as the mill’s toxic waste remains in the Clark Fork River’s historic floodplain, these risk assessments must also address the potential impacts of a dike failure followed by the river washing that waste downstream. The river will eventually reclaim its floodplain. And climate scientists predict that climate change will continue to produce bigger and bigger floods, hence the chance of such a catastrophic failure is increasing and will be even greater than historic flooding would suggest. Given the evidence that water moves through this uncertified, simple gravel dike during 25 year flood events, the dike does not have to be overtopped to fail. The dike can simply liquefy and wash away. Obviously, it is difficult to predict where the waste will wind up once it is washed downstream – but that does not mean this catastrophic scenario should be ignored. These risk assessments must assess all the possible outcomes of leaving the waste where it is (where it is subject to being washed downstream), as well as assessing the much lower risks if those wastes are moved to a location less likely to be impacted by bigger floods and dike	Risk assessments are performed using available site data and presumed exposure scenarios to estimate the chronic risks posed by the contaminants present at the site. CERCLA risk assessments cannot and should not be used to estimate short-term risks from hypothetical events such as flooding, since the extent of soil disturbance, the location of such erosion, and the lateral extent of deposition cannot be known ahead of time. The impacts of potential flooding is something that is typically evaluated during the FS, which follows the RI and risk assessments. It is during the FS process that the EPA evaluates alternatives for cleanup against the nine criteria in the National Oil and Hazardous Substances Pollution Contingency Plan. The potential impacts of flooding would be evaluated against the criteria for compliance with applicable or relevant and appropriate requirements and long-term effectiveness and permanence.

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			failure. Without such an assessment, these risk assessments are missing information critical to making decisions about needed remediation actions at this site. In my view, the EPA should move quickly to require the removal of the toxic waste in the historic floodplain at the Smurfit-Stone/Frenchtown Mill site, as it has in removing the contaminated ponds at the Columbia Falls Aluminum Company Superfund site. That EPA action was taken to protect the Flathead River from the eventual failure of those ponds. The much larger area of contaminated historic floodplain at the Smurfit Stone site presents an even greater risk to the Clark Fork River.	The on-site toxic waste, referred to as the ‘waste management area’ is not located within the CFR 100-year floodplain.
94	B Sims	Flooding Concerns	The Draft HHRA lacks assessment of risks associated with climate change and the soil sampling required to determine onsite risks should flooding occur. The following narrative shown in italics is quoted from sections of the Center for Climate and Energy Solutions memo, 2021. https://www.c2es.org/site/assets/uploads/2021/01/Climate-Policy-Priorities-for-the-New-Administration-and-Congress.pdf <i>“President Biden has assembled the strongest team ever to lead the government’s response to climate change. With his initial executive actions, he has already launched a wide range of efforts to dramatically strengthen that response. These include rejoining the Paris Agreement and directing agencies to initiate processes to strengthen climate-related regulations and to ensure the full consideration of science and climate related costs and benefits in federal rulemaking.” (pg. 3)</i> <i>“To better protect public and private property against rising flood risks:”</i> • <i>“Congress should codify the Federal Flood Risk Management Standard to reduce flood risk by requiring the use of protective design standards and forward-looking climate science when building or rebuilding federally-funded buildings and infrastructure, including projects funded through CDBG-DR or other programs.” (pg. 18)</i> • <i>“Congress should increase funding for the National Flood Insurance Program to update its flood insurance rate maps using forward-looking climate risk data, and to create new maps for currently unmapped areas, which account for more than half of U.S waterways and shorelines. 48 Updated maps would better assist planners and builders in determining which areas are</i>	Risk assessments are performed using available site data and presumed exposure scenarios to estimate the chronic risks posed by the contaminants present at the site. CERCLA risk assessments cannot and should not be used to estimate short-term risks from hypothetical events such as flooding, since the extent of soil disturbance, the location of such erosion, and the lateral extent of deposition cannot be known ahead of time. The impacts of potential flooding is something that is typically evaluated during the FS, which follows the RI and risk assessments. It is during the FS process that the EPA evaluates alternatives for cleanup against the nine criteria in the National Oil and Hazardous Substances Pollution Contingency Plan. The potential impacts of flooding would be evaluated against the criteria for compliance with applicable or relevant and appropriate requirements and long-term effectiveness and permanence.

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			<i>suitable for development and increase home- and business owners' awareness of their risks. To reduce wildfire risk.” (pg 18)</i> The HHRA documents fail to address the changed Biden Administration direction and changing environmental conditions as a result of climate change and the associated increased risk of flooding. A warmer atmosphere drives more extreme precipitation across all storm types, increasing the risk of flooding. Atmospheric Rivers are long, narrow bands of moisture in the atmosphere that extend from the tropics. They are responsible for most flood damage in the Western United States (Dettinger 2013). The amount of moisture carried by atmospheric storms from the North Pacific and released in the western US has increased from 1948–2017. The increase is linked to ocean surface warming. The most intense atmospheric river storms are becoming more frequent and increases the probability of a large magnitude flood event. Earlier this year I gave a Power Point presentation to the CAG which documented the February of 2020 atmospheric river that targeted the lower and middle Columbia River Basin. In 86 years of record the Umatilla River’s previous high peak flow near Gibbon, Oregon was 6,220 cfs. USGS stream gauge reading on February 6, 2020 was just over 12,000 cfs almost double the maximum flow measured over the past 86 years. An event of this nature hitting the Clark Fork River Watershed would very likely overwhelm the existing Smurfit Stone berms and significant channel adjustment would be likely.	
95	B Sims	Site Characterization	Soil sampling density appears to be far too low to adequately determine the presence or amounts of contamination across the 3000 acre site and the risks that may or may not be present (see OU2 figures 3.2, 3.3, 3.4). Direct sampling and identification of the aerial extent and concentrations of contamination are essential to assessing risks and planning remediation. Page 4 of the HHRA OU2: <i>“The CFR levee located west of the treated water holding ponds provides flood protection, and the inner levee provides a physical barrier between wastewater solids and treated water holding ponds.”</i> Any reliance on the existing un-engineered berms to protect the site from a significant flood is questionable and likely false. Reliance on the existing estimate of the 100 year flood plain map ignores climate change and the likelihood of increased risk of flooding. The possibility of the Clark Fork River	EPA believes that sampling conducted to date adequately characterizes site conditions for risk assessment purposes to evaluate the current study area. The focus of a risk assessment is on estimating exposures that a receptor may reasonably be exposed to within a given exposure area over their entire exposure duration. EPA recently published an aerial deposition fact sheet (EPA, 2021a) that provides additional information and will be cited in the HHRA.

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			flowing through the site and eroding new channels is real and must be assessed to determine risks. In such a scenario, significant quantities of whatever is buried would be transported downstream by the river.	Risk assessments are performed using available site data and presumed exposure scenarios to estimate the chronic risks posed by the contaminants present at the site. CERCLA risk assessments cannot and should not be used to estimate short-term risks from hypothetical events such as flooding, since the extent of soil disturbance, the location of such erosion, and the lateral extent of deposition cannot be known ahead of time.

Commenter Key:

B Sims: Bruce Sims

CAG: Frenchtown Community Advisory Group

CFC: Clark Fork Coalition

J Harrington: Jen Harrington

J Salazar: Jordan Salazar

MDEQ: Montana Department of Environmental Quality

Missoula Co Commissioners: Missoula County Commissioners

MVWQD: Missoula Valley Water Quality District

PRP: Potentially Responsible Party

Trustees: Montana Department of Justice Natural Resource Damage Program, Montana Fish Wildlife & Parks, Confederated Salish and Kootenai Tribes of the Flathead Reservation, U.S. Fish and Wildlife Service, U.S. Forest Service, and Kalispel Tribe of Indians

V Watson: Dr. Vicki Watson

WQAC: Missoula Public Health City-County Health Department Water Quality Advisory Council

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