

EPA does not necessarily endorse or agree with the statements made in this forward section.

**ATTACHMENT TO ~~FEBRUARY 19, 2008~~ ~~JULY 13, 2007~~ LETTER
RESOLUTION OF 'A' LEGACY SITE SERVICES - COMMENTS ON THE DRAFT
ARKEMA EARLY ACTION EE/CA WORK PLAN PREPARED BY
PARAMETRIX FOR US EPA**

This document contains a complete set of Legacy Site Services (LSS) comments on the Draft Arkema Early Action EE/CA Work Plan prepared by Parametrix for US Environmental Protection Agency (EPA Work Plan). The comments contained in this document include comments that LSS is willing to accept as well as comments that will need to be addressed prior to finalization of the EPA work plan for LSS to forgo formal dispute. Also, LSS notes that a significant number of the “non-responsive” comments included in EPA’s September 21, 2006 letter disapproving the LSS Revised Work Plan are not addressed in the EPA Work Plan. Many of these comments included requirements that have not been met in the EPA Work Plan although these requirements were the basis for EPA’s decision to disapprove and reserve to itself modification of the LSS Revised Work Plan. It appears that EPA has set different standards for Parametrix and LSS, and because LSS seeks assurance that the EPA Work Plan is sufficient to meet all EPA standards and will not be modified after these current negotiations are completed, LSS requests that EPA withdraw all of the “non-responsive” comments that are not addressed in the EPA Work Plan. For a more complete explanation of the issues related to the dispute, see the text of the July 13, 2007 letter.

Explanation of table column headings:

LSS Comment Number:	A sequential number applied by LSS to identify each individual comment in the table.
Comment Priority:	A hierarchical designation provided for each comment to indicate the level of priority placed on the comment by LSS. The “A” designation is a comment that will require further technical discussion and resolution to EPA’s and LSS’ satisfaction for LSS to forgo formal dispute. LSS will not dispute the “B” designated comments if the “A” designated comments are satisfactorily resolved.
EPA Work Plan Page/Section Number	Identifies the Page and Section number of the EPA work plan to which the comment is directed.

Comment/Problem Statement

Provides LSS' comment and/or problem statement that requires resolution.

Solution

Provides LSS' proposed solution for resolution of the comment/problem.

Comment Resolution

Provides the resolution of the comment.

EPA comment number

Provides a cross-reference to the original comment number provided by EPA on the September 26, 2005 work plan, where applicable.

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LSS Comment Number	Comment Priority	EPA Work Plan Page / Section No.	Comment/Problem Statement	Solution	Comment Resolution	EPA Comment Number
1	A	All/ All	EPA's work plan was non-responsive to a total of 46 government team comments that were provided in its work plan disapproval letter to LSS dated September 21, 2006.	LSS requests that EPA retract the "non-responsiveness" determination made in EPA's September 21, 2006 letter for all of these comments.	EPA's letter dated November 7, 2007 addresses this comment. LSS's letter dated November 16, 2007 continues to request that EPA retract its determination that Arkema's second draft Work Plan was not responsive to these comments. EPA and LSS most recently discussed the Category B comments in the November 13, 2007 meeting, and have come to agreement on the pathway forward on the Category B issues as documented in the Category B spreadsheet attached along with this spreadsheet. EPA and LSS agree to disagree on whether these comments were adequately addressed in Arkema's second draft Work Plan which ultimately does not affect the agreements reached that are attached.	16, 26, 32, 33, 70, 86, 88, 96, 97, 121, 130, 144, 147, 199, 140, 233, 234, 237, 242, 251, 257, 271 295, 300, 304, 305, 306, 307, 311, 313, 320, 321, 322, 323, 327, 361, 376, 439, 451, 452, 435, 436, 437, 498, 499, and 500
2	A	2-1 / 2.1	EPA indicated that there is clear evidence of recreational usage of the beach areas at the site.	LSS requests that EPA describe the "clear evidence" and estimates on how often the beach areas are used for recreational purposes.	The Work Plan addendum will note that the recreational user exposure scenario has been replaced with the trespasser scenario in the preliminary conceptual site model.→	NA
3	A	Fig. 4-1 / 4	Seeps have not been observed at the Arkema facility even	LSS requests that the figure which contains errors and	EPA and LSS agree that this will be revised and updated in	

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			<p>during a riverbank survey conducted from a boat. However, Figure 4-1 indicates that seeps have associated exposure routes in the form of “dermal contact or root uptake” and “dietary” for select ecological receptors. These exposures are marked as being “complete and significant pathways,” however, they are also highlighted in yellow to indicate that seeps are not present at the facility and are therefore, not considered in the EE/CA. This is a contradictory evaluation and these pathways should not have been flagged as being complete and significant. In addition, EPA’s figure indicates that there are several exposure routes that are either “complete and insignificant” or “complete and significance unknown.” Seeps are not present at the site and therefore, this is not a complete pathway.</p>	<p>confusing information be replaced with the figure from the Revised Draft Work Plan, which is site specific and correct.</p>	<p>the EE/CA report.-</p>	
4	A	Fig. 4-2 / 4	<p>Seeps are not present at the site and therefore, the Human Health CSM figure has similar issues to the Ecological CSM figure.</p>	<p>LSS requests that the figure which contains errors and confusing information be replaced with the figure from the Revised Draft Work Plan,</p>	<p>EPA and LSS agree that this will be revised and updated in the EE/CA report.</p>	

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				which is site specific and correct.		
5	A	4-10 / 4.2.3	EPA's Work Plan included an estimate of DDT loading from stormwater. It would be helpful if a description of the conditions used for the annual loading calculation was provided in the text rather than only referencing a letter in an appendix. Arkema has been periodically sampling stormwater at the site for several months and these data have not yet been reported. The amount of stormwater-related data available for EPA's loading estimates may have been rather minimal. In addition, EPA's calculations were performed using data collected prior to the plant's deconstruction. Therefore, this is likely an inaccurate estimate of current loading especially since the site conditions have changed so dramatically.	LSS did not receive the calculations with EPA's work plan but received the materials on June 29, 2007. LSS is currently reviewing the loading estimates and will provide additional comments when the review is complete. LSS is evaluating EPA's loading calculations. In addition, LSS has been periodically sampling stormwater at the site for several months and these data have not yet been reported but would probably be more appropriate for evaluating current loading estimates.	Revised stormwater loading estimates based on more recent stormwater data will be included in the work plan addendum if they have already been calculated. EPA will review the revised loading estimates in the addendum. This loading should include the latest LWG data as well as Arkema's <u>data</u> .	N/A
6	A	4-12 / 4.3	LSS does not agree that the exposure medium "air" should be ranked with receptors in the figure if these pathways will not be evaluated in the EE/CA. Since these pathways will be	LSS requests that the reference to air as an exposure medium be removed from the figures and text.	LSS and EPA agree that air is not an exposure medium that will be addressed. The addendum will clarify this point.	

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			evaluated during the Portland Harbor Human Health Risk Assessment, there is no reason to assign definitions in the CSM. Also included in Figure 4-2			
7	A	4-13 / 4.3	LSS does not agree that "on-site workers" will potentially be exposed to surface water via ingestion (i.e. drinking water), dermal contact from washing hands or showering, and inhalation of VOCs from showering. Willamette River surface water in the vicinity of the site has not been and is not expected to be used as a washing and/or drinking source to on-site workers. LSS imagines that a sophisticated treatment system would be employed to ensure that the surface water is suitable for consumption if it indeed became a resource. Also included in Figure 4-2	LSS requests that the references to on site workers drinking, washing hands, and showering in surface water be removed from the figures and text.	EPA says this is a policy issue and needs to be consistent with the PH RI. Sean and Todd will confer with respective counsel regarding language that can be included in the work plan addendum or administrative record. Per EPA's February 27, 2006 letter to Larry Patterson, EPA agreed that the MCL and PRG will be considered at this time for screening purposes only. EPA further agreed that MCL and PRG as ARARs may result at later stages of the EE/CA.	N/A
8	A	4-15 / 4.3	LSS does not agree that "residents" will potentially be exposed to untreated surface water from the vicinity of the site. The designated land use for the site and surrounding area as "industrial" precludes	LSS requests that the references to residential use of the site be removed from the figures and text.	Same issue as 7. The issue is not that the site will be residential but that the river can be used for municipal drinking water (i.e., that can then be consumed by residents and workers). EPA and LSS agree	N/A

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			residential uses. The ingestion and exposure of contaminated surface water seems a bit reckless and therefore, this does not represent a complete and significant exposure route. Also included in Figure 4-2.		to clarify in the addendum that the site is zoned for industrial use and the CSM is not intended to evaluate on-site residential exposure. <u>Also, see Otherwise, the resolution to ef comment 7 will address this comment too.</u>	
9	A	5-1 / 5	<p>"Using screening criteria that address potentially significant exposure pathways helps ensure that lists of COIs by media represent the greatest ecological and health threats for sediments at the site."</p> <p>The use of screening level values (SLVs) is adequate to identify chemicals of interest. However, SLVs and generic PRGs cannot be used meaningfully to identify principal threats. Although SLVs and PRGs are appropriate for problem formulation they are not site-specific and cannot be used to portray principal threats with any scientific certainty.</p>	LSS requests that the language regarding SLVs being used to define principal threats for the site be removed and instead a mass removal analysis be used to define the principal threat area for the removal action.	EPA made a proposal in its August 28, 2007 letter regarding eliminating the use of the phrase Principal Threat Material ("PTM") with respect to the DDT and constituents SLVs and PEC in the Work Plan. Arkema accepted EPA's proposal in its September 28, 2007 letter. EPA and Arkema agree on language to be placed in an addendum to the EE/CA Work Plan as confirmed in EPA's November 7, 2007 letter. EPA and Arkema have debated the use of a comprehensive addendum to document changes that EPA and Arkema agree to relative to the Work Plan. However, LSS's letter dated November 16, 2007 appears to agree that a comprehensive addendum can be the vehicle for documenting agreed to changes to the July	NA

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					Work Plan. EPA provides its assurance that the final Addendum will be attached to the beginning of the July Work Plan and the final Addendum and July Work Plan will be posted on EPA's website.	
10	A	5-2 / 5.1	Bullet – Toxicity from Direct Contact Exposure. The region- and harbor-specific sediment quality benchmarks developed by LWG are relevant and appropriate to the site and should be used instead of the consensus based TEC and PEC values for MacDonald et al. (2000).	LSS requests that region- and harbor-specific sediment quality benchmarks developed by LWG be used instead of the consensus based TEC and PEC values. Also, based on the context of the paragraph the double negative should be reworded to state that “Commercial industrial exposures are likely to overestimate the types of exposures associated with dockworker and transient use of the site.”	The revised sentence is accurate; however, do not need to include the revised sentence in the addendum. LWG sediment quality benchmark values can be included in the EE/CA process only after acceptance by EPA which has not occurred yet.	
11	A	5-2 / 5.1	Bullet - Adverse Impacts from COI Bioaccumulation or Food Chain Exposures. “...site-specific DDX compounds (DDD, DDE, DDT) SLVs (DEQ 2006b).” The reference provided in this statement does not	LSS requests that the final January 31, 2007 DEQ guidance document be the foundation for any SLVs selected for the site. Also if EPA wishes to modify these values to derive site-specific SLVs, then Arkema requests further clarification of this	EPA and LSS have agreed to use the most recent version of DEQ's (April, 2007) guidance document now and in the future.	

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			<p>indicate that the SLVs for DDT are site-specific. The referenced document is obviously a preliminary version of the draft guidance document that was released in September 2006 by DEQ (Public Review Draft Guidelines for Assessing Bioaccumulative Chemicals of Concern in Sediment), which was subsequently revised pursuant to peer review and comment and released in final form January 31, 2007.</p>	<p>decision as follows:</p> <ul style="list-style-type: none"> a. An explanation of why site-specificity is important in this case but not in others (e.g., SLVs for benthic invertebrates) b. an explanation of the assumptions in the final guidance document that were modified to derive site-specific SLVs c. an explanation any deviations from rules for site-specificity that are provided in Section 4.2 (p.11) of the final guidance document. 		
12	A	5-4 / 5.2.1	<p>“The DEQ 2006b values were derived specifically for DDX compounds (DDT, DDD, and DDE) at Arkema and are based on exposure assumptions being used for the Portland Harbor Superfund site.”</p> <p>In addition, LSS notes that this statement seems strangely inconsistent with the</p>	<p>LSS requests that site specific Round 2A iPRG's should be used as the starting point in developing the SLVs. See also LSS Comment 11 above.</p>	<p>EPA and LSS have agreed that; if EPA approves harbor specific SLV values developed during the RI/FS process, the Arkema EE/CA process can use such harbor specific SLVs.→</p>	

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			<p>assumptions that are typically inherent to screening level values and PRGs. Such values are conservatively based and designed around a lower threshold concentration below which risk is assumed to be de minimis. In site-specific evaluations, such assumptions are modified to more realistically represent the site with the result that actual remediation goals are higher than PRGs – yet still meet risk management objectives.</p> <p>LSS also lauds EPA's desire to adopt site-specific or harbor-specific values. However, this is the first indication of such site-specificity.</p>			
13	A	5-4 / 5.2.1	<p>"Sediment data comparison summaries are provided in Tables 5-3a–h" and are inaccurate or incomplete.</p>	<p>LSS requests that these tables be revised to:</p> <ul style="list-style-type: none"> ▪ Include MacDonald et al.'s (2000) PEC (572 ug/kg dw) for total-DDT. ▪ Include harbor-specific sediment quality benchmarks developed by LWG. 	<p>EPA has not approved use of the 572 ug/kg PEC. EPA and LSS have agreed that, if EPA approves harbor specific SLV values developed during the RI/FS process, the Arkema EE/CA process can use such harbor specific SLVs.</p>	
14	A	5-4 / 5.2.1	<p>"Human health and ecological bioaccumulative SLVs for DDD,</p>	<p>LSS requests that the ecological bioaccumulative</p>	<p>The addendum will include a note to reference the more</p>	

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			DDE, and DDT from the DEQ document Calculating Sediment Screening Levels for DDT (DEQ 2006b), ..." DEQ's (2006b) ecological bioaccumulative SLVs are missing from Table 5-1a and Table 5-3a-h.	values be included in Table 5-1a as they are for the human health exposures in Tables 5-3a-h.	recent DEQ guidance (DEQ 2007).	
15	A	5-7 / 5.4.1	Second paragraph beginning "The highest concentrations of DDX..." This paragraph introduces new samples and locations for concentration in tissue (FC017, FZ0609) that are not familiar to Arkema/LSS.	LSS requests that an explanation for the origin of these samples and whether they conform to QA and data integrity criteria adopted by the LWG and approved by EPA be provided.	An explanation for the newly identified samples was provided during the conference call. LSS will check to see if the samples were already included in previous draft work plan under a different sample ID. No other action required.	
16	A	5-8 / 5.5	Benthic Toxicity Studies. There are several items in this section that need clarification or further explanation.	LSS request the following: <ul style="list-style-type: none"> ▪ Please define control-adjusted impacts. Are these the same as simple statistical comparisons of toxicity test results to laboratory controls or do they represent something else (e.g., Abbott's correction)? • This paragraph seems to select data for only those tests with significant differences in comparison to controls. Please provide 	The interpretation of benthic toxicity data is moot since no new benthic toxicity data will be generated as part of the EE/CA work. If at a later date toxicity testing were to be considered these technical issues would be revisited.	

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				<p>a description of spatial patterns for all the toxicity testing results.</p> <ul style="list-style-type: none"> This paragraph also implies a correlation between the bioassay results and other SLVs. Please provide a description of the correlation that was conducted and a supporting citation for the statistical technique that was used. Please include additional comparisons to LWG sediment quality benchmarks, which were derived from the sediment toxicity data for all of Portland Harbor, including the Arkema site. 		
17	A	Figure 1-1 / 6	EPA declared that the "preliminary RAA" was not presented in the Revised Work Plan and therefore, LSS was non-responsive. However, this feature is clearly outlined in Figure 6-1 of the LSS Revised Work Plan. It is presented in EPA's Work Plan within Figure 1-1. LSS does not agree with the "non-responsive" comment.	LSS requests that the "non-responsiveness" determination be retracted.	This comment is only relevant to the original LSS EE/CA Work Plan and is resolved under comment No. 1.	233
18	A	6-2 / 6.1.1	"None of these documents establishes a universal	LSS requests that both principal and low level threat concepts	See resolution stated for Comment 9 above.	

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			<p>“threshold level” of toxicity or risk of “principal threat.” Instead, they provide general guidelines to be used for establishing principal threat for each site under consideration.”</p> <p>EPA’s (1991) also provides guidance for material that would be considered low level threat, which only needs to be near the “risk range.”</p> <p>EPA (1991) also states that “the principal threat/low level threat waste concept and the NCP expectations were established to help streamline and focus the remedy selection process not as a mandatory waste classification requirement.”</p> <p>EPA (1993) does not provide guidance on principal threat material, but does discuss the use of streamlined risk assessment. As stated by EPA (1993) “since removal and remedial action cleanup levels may differ, all early action decisions should consider the possible long-term action and</p>	<p>be provided in the EECA to provide additional perspective on what does and does not constituted principal threat material.</p> <p>LSS also requests that EPA consider additional dimensions to the NTCRA such as mass removal as described previously in correspondence and presentations to EPA.</p> <p>Based on this guidance, LSS also requests that EPA revise the draft EE/CA work plan to be consistent with the risk assessment methodology currently being used by LWG pursuant to EPA’s direction</p>		

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			corresponding cleanup levels. The OSCIRPM should ensure that all risk assessment activities are consistent with any future remedial action remaining to be taken (or potential for listing, if the site is not on the NPL) to achieve consistent risk goals.”			
19	A	6-2 / 6.1.2	Paragraph 1 – EPA has excluded actual data for biota (bioaccumulation data) be excluded, yet still be the object of conservative SLV calculations?	LSS requests that the PTM definition be revised to reflect the breakpoint in mass-to-volume removal.	See comment resolution for Comment 9 above.	NA
20	A	6-2 / 6.1.2	Paragraph 2 – The SLVs seem to be equated with a site-specific understanding of risk. They are not. The selection of the lowest among already conservative SLVs is appropriate for an initial problem formulation at the beginning of an RI/FS and risk assessment. Selection of an arbitrary 1,000X multiplier is simply a benchmark and cannot be construed to represent the results of a site-specific risk assessment. Such	LSS requests that the use of the 1,000X multiplier of an SLV not be equated with a site-specific understanding of risk and that the PTM definition be revised to reflect the breakpoint in mass-to-volume removal.	See comment resolution to Comment 9 above.	NA

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			values serve only to initiate a problem formulation at the beginning of the risk assessment, not the end.			
21	A	6-3 / 6.1.3	Footnote 34 Please clarify. The footnote seems to equate total DDT with sum of DDx using a toxic equivalency factor of 1. Please provide the analysis for such a conclusion. Although some DDx isomers may degrade to DDE, the fact that some isomers (i.e. DDD) do not degrade to DDE and that all isomers exist in real time in their own isomeric configuration argues against this assumption.	LSS requests that the footnote be removed and that the PTM definition be removed based on this erroneous assumption.	See comment resolution to Comment 9 above.	
22	A	6-6 / 6.2	Paragraph 4 – “This analysis does not directly address exceedances of PECs and, in theory, could miss some PTM defined on the basis of acute effects for ecological receptors.” The PEC is a consensus based value that includes both chronic and acute data.	LSS requests that the sentence be deleted and also clarification as to how exceedances of a PEC will miss potential acute effects.	LSS will clarify in the addendum.	NA

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23	A	6-7 / 6.2	Paragraph 1 "Sample dilution raised respective DLs substantially for other chemicals."	LSS requests that only the 'D' qualified chemicals be reported in a re-analysis and that the detection limits from the original analysis be applied to those chemicals that were not 'D' qualified.	EPA and LSS agreed on this point for future data analysis. LSS will note in the addendum.	NA
24	A	6-8 / 6.2	First completed paragraph This paragraph implies that the pattern of exceeding Region 9 PRGs is the same or no different than that for the bioaccumulative or PEC SLVs and therefore does not yield any new information. This does not seem possible because as indicated in Table 5-1a the Region 9 PRGs for some substances may be over 1,200,000 times greater than the bioaccumulative SLV. Consequently, it seems obvious to LSS that the line of evidence based on comparisons to Region 9 PRGs would not show nearly the level of risk implied by comparisons to other SLVs.	LSS requests that this paragraph be deleted.	Instead of deleting the paragraph in the work plan the addendum text will clarify that the area of Region 9 PRG exceedance is much less than the 1,000x bioaccumulative SLV area.	
25	A	6-8 / 6.2	Groundwater, TZW, and Surface Water – Paragraph 1	LSS requests that this sentence be rephrased to include upriver sources and transport and	EPA and LSS agree on this issue. LSS will provide generalized clarifying language	NA

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			<p>“Aqueous media are not the focus of the EE/CA, but are included in the analysis because of the potential threat of recontamination of sediments from chemicals migrating in groundwater from upland portions of the site.”</p> <p>There are other possibilities for recontamination.</p>	deposition of particles via surface water.	in the addendum.	
26	A	6-9 / 6.3	<p>First Bullet - The uncertainty range seems arbitrary.</p> <p>Second Bullet – The vertical over dredge depth seems arbitrary and much greater than commonly practiced.</p> <p>Third Bullet – Specification of a hydraulic containment structure seems premature since the final RAA boundary has not been determined and the best remedial technology commensurate with the remedial action objective has not been finalized.</p>	LSS requests that a technical explanation for the selection of the uncertainty range and the over dredge depth be provided. LSS also requests that the specification of a hydraulic containment structure boundaries be deferred to the EE/CA.	LSS will propose language for the addendum that clarifies that the purpose of the EE/CA is to refine and better define the limits that will be used for things such as dredging boundaries and overdredge depths. The actual limits will be based on the data and data distribution at the time of the EE/CA report.	
27	A	6-9 / 6.4	<p>Paragraph 2 –</p> <p>This paragraph is just a re-iteration of the chemical</p>	LSS requests that this section be revised to remove redundancies associated with risk scaling and to focus on an	EPA and LSS agreed to no additional action on this comment.	

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			screening that has already been conducted in previous sections of the EE/CA. LSS understands how such screening can be used to scale chemical concentrations to risk-based SLVs to identify the most important substances at the site. However, recontamination is a fate and transport issue which does not seem well served by a simple reiteration of risk scaling.	analysis of uncontrolled sources and fate and transport pathways that may lead to recontamination of the site following remediation.		
28	A	6-9 / 6.4	Paragraph 3 – “In the third screen, emphasis was placed on chemicals present in concentrations that might represent an acute threat to ecological receptors (i.e., benthic invertebrates).” This sentence presumably refers to scaling against the PEC SLV. The PEC, as well as the TEC, are broadly based on many studies that include a wide range of exposure durations as well as benthic community data.	LSS requests that the references concerning “acute toxicity” in the context of PEC or TEC values be removed throughout the document, including Tables 5-3a-c.	EPA and LSS agree to include an explanation in the addendum.	
29	A	6-9 / 6.4	Last Paragraph –	LSS requests that a clear explanation be provided for how	EPA and LSS agreed to no additional action on this	

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			This paragraph cites kriging Methods in Attachment B of the work plan that were used to generate isopleths to delineate areas vulnerable to recontamination. However the figures generated in support of Section 6.4 do not appear to have any isopleths and seem to represent polygons for individual data points.	the figures were drawn and why isopleths are not apparent. See also specific comments on Attachment B below.	comment.	
30	A	6-10 / 6.4	First (continuing) paragraph – This paragraph contains a discussion of recontamination by PAH compounds. However, PAH compounds were not identified as substances with a high recontamination potential.	LSS requests that discussion of PAH compounds be deleted because it does not seem relevant.	EPA and LSS agree to no additional action on this comment.	
31	A	6-12 / 6.4.1	Paragraph 1 – The discussion of recontamination by PCBs seems to indicate that the Arkema site is a source of contamination that extends across the river. Also, the discussion seems to focus exclusively on dredge residuals as the source of recontamination. Presumably there are other recontamination	LSS requests clarification in the text of the source of PCB contamination, which appears to be ubiquitous within the river and that other recontamination mechanisms are discussed in the text.	The proposed language from EPA’s August 28 letter will be added to the addendum.	

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			mechanisms that should be discussed (e.g., bedload transport of sediment).			
32	A	6-12 / 6.4.1	Lindane (gamma-HCH) – The discussion of lindane focuses on screening level values that exceed 10X SLV. Why has risk scaling been modified in this instance from the previously adopted benchmark of 1000X SLV?	LSS requests that Lindane be deleted as a COI.	<u>LSS reviewed the data and found that Lindane should be deleted as a COI. LSS will propose language to resolve this comment in the Work Plan addendum. LSS will review the data and caucus on this issue and get back to EPA.</u> <u>EPA awaiting LSS' proposed language resolution.</u>	
33	A	6-14 / 6.4.1	Dioxins/Furans (TCDD Equivalents) – The AMEC (2005) citation appears to be a letter to EPA. LSS cannot accept any conclusions in the letter without reviewing this letter to judge the validity of the conclusions cited by EPA. LSS expects that such strong conclusions should at a minimum be vetted through generation of a report that has undergone a peer review.	LSS requests that the AMEC citation be deleted.	EPA and LSS have agreed to delete this citation in the addendum.	
34	A	6.4.2	Recontamination from Chemicals Migrating in Groundwater –	LSS requests an explanation of how one logically extrapolates 20 ug/l in water to 0.04 ug/kg in sediment and how such a	The addendum will state that this is a preliminary evaluation and that the evaluation will be further refined as the EE/CA	

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			<p>Paragraph 4 –</p> <p>This paragraph requires further explanation of the extrapolation of 20 ug/l in water to 0.04 ug/kg in sediment?</p> <p>.</p>	<p>conclusion is consistent with the following sentence that acknowledges that it may not "actually occur" and that the inaccurate and technically unsound text be deleted..</p>	<p>proceeds.</p>	
35	A	7-1/ 7	<p>It is premature to exclude the sediment remediation technologies In Situ thin-layer capping, dredging and onsite disposal, and monitored natural recovery from the EE/CA. Each is a viable technology in concert with other technologies considered for remediation of the principal threat material at the Arkema site. For example, thin-layer capping (or thin-layer placement as described in the EPA Sediment Guidance – 12/2005) may be used to cover the fringes of the principal threat area where contaminant levels in sediments are at levels not requiring active removal or where enhancement will expedite natural recovery. Thin-layer placement could also be used to amend residuals remaining after dredging the principal threat</p>	<p>LSS requests that thin layer capping, dredging and onsite disposal, and monitored natural recovery be retained as viable options to be considered in the EE/CA.</p>	<p>As discussed in the November 13, 2007 meeting, EPA agrees that mechanical dredging with hydraulic containment, localized capping (such as post-dredging capping, localized isolation capping, and fringe area capping) and on-site upland disposal are viable technology options that can be considered in the EE/CA.</p>	

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			<p>area. Dredging and on-site disposal is a viable option if LSS would be willing to construct a disposal site over portions of the upland property. There are land use and other issues that would have to be evaluated further, but this technology should be considered with the others in the EE/CA. Monitored natural recovery may also be appropriate for fringe areas where contaminants in surface sediments are above cleanup levels but there is no subsurface sediment contamination. Natural sedimentation processes may be adequate to provide natural recovery in a relevantly short time frame.</p>			
36	A	7-1 / 7	<p>Isolation capping should be considered a technology for the EE/CA. Most of the mass of DDx is located in subsurface sediments between docks 1 and 2. DDx has a high affinity for particles and does not readily migrate with groundwater except for co-solvency with solvents such as MCB. Therefore, placing a cap</p>	<p>LSS requests that isolation capping be retained as a viable option to be considered in the EE/CA.</p>	<p>Localized isolation capping is a viable option that can be considered in the EE/CA.</p>	

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			over all or a portion of this area may be viable depending on future site use, and should be considered in the EE/CA.			
37	A	7-2 / 7.1	Mechanical dredging is a viable technology to be considered for the removal of dredged material. Some mechanical dredge buckets are now designed to be entirely sealed to reduce sediment loss and resuspension in the water column, reducing water quality impacts and residuals during dredging (Herrenkohl et al. 2003). With the use of advanced positioning systems, mechanical dredges can cover the entire dredge area without leaving windrows between grabs. This technology is a viable alternative for the Arkema in-water site and should be further evaluated in the EE/CA.	LSS requests that mechanical dredging be retained as a viable options to be considered in the EE/CA.	Mechanical dredging with hydraulic containment is a viable option that can be considered in the EE/CA.	
38	A	7-5 / 7.2.3	Deletion of "nearshore CDF (constructed along the Willamette shoreline), and CAD" from disposal options. As previously commented, nearshore and upland disposal options should be considered as part of the in-water EE/CA.	LSS requests that nearshore CDF and CAD be retained as a viable options to be considered in the EE/CA.	This issue is currently in dispute. An on-site upland disposal facility is a viable option that can be considered in the EE/CA. A nearshore CDF or CAD remains excluded from consideration as stated in the May 11, 2007 Work Plan.	

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			These are viable options LSS would like to consider for future use of their property.			
39	A	8-5 / 8.1.4.2	Second and third paragraphs on surface water. There is no mention of the surface water and stormwater program currently being conducted as part of the LWG RI. This data should be adequate for evaluating baseline surface water conditions at the site. LSS again disagrees with EPA on the need for a comprehensive baseline water quality program in support of the EE/CA.	LSS has determined that the extensive, existing surface water data set is adequate for evaluating baseline surface water conditions at the site.	EPA and LSS agree that the current surface water data set is adequate for the EE/CA evaluation. No sampling will be specified in the EE/CA work plan. However, additional baseline surface water sampling will need to be proposed as a part of the removal action/design and completed before removal actions begin.	
40	A	8-11 / 8.2.1.2	Third paragraph, second to last sentence. The additional 10% confirmation sampling seems unwarranted given the recent surface sediment collections conducted for the LWG RI. The usability of the data has been confirmed by the Category 1 validation conducted as part of this and the LWG RI studies. Although the data are aged, they are still considered useful in the characterization of the site. This redundancy is an unnecessary cost to the	LSS requests that the 10 percent sampling program redundancy be removed from the characterization program.	EPA agrees that the sampling proposal can reconsider all of the information being used to evaluate data gaps (i.e., including the 3D kriging and mass removal approach) and therefore the revised FSP will include the rationale for the final sample locations.	

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41	A	8-11 / 8.2.1.2	<p>program.</p> <p>Fourth paragraph. The two areas referenced in this paragraph have not been adequately defined in the text, tables, or figures as to their necessity. From the previous data, there is no indication that the chromium or salt plumes (or other Arkema COIs) are moving upstream of the Arkema site property. LSS does not agree with the addition of sediment stations WS/WB-82, 83 and -84. However, if the TZW stations proposed for these locations indicate an impact from site COCs, sediment sampling may be required.</p>	LSS requests that sediment stations WS/WB-82, 83 and -84 be removed from the sampling program.	EPA and LSS agree that these details will be revisited and addressed in the FSP.	
42	A	8-11 / 8.2.1.2	<p>General. Based on the rationale given by EPA for conducting surface sediment sampling, we don't believe there is a need to collect all samples proposed. The primary rationale given by EPA is the need to provide baseline conditions for surface sediments. There is inadequate justification for the additional samples especially those stations upstream and</p>	LSS request that the drill guide tool in the EVS software be used to aid in the analysis of data gaps and site characterization needs for the purposes of completing the sediment investigation work. LSS also requests that the 10 percent sampling program redundancy be removed from the characterization program.	See response to 40. The revised FSP will include the rationale for the final sample locations.	

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			south of the property line. LSS requests more information be provided for these sample locations. LSS also disagrees with the need to reoccupy 10% of the previous sampling locations. The usability of the data has been confirmed by the Category 1 validation conducted as part of this and the LWG RI studies. Although the data are aged, they are still considered useful in the characterization of the site.			
43	A	8-12 / 8.2.1.2	Analytical Strategy. There is no justification given by EPA for analyzing all surface samples for each of the methods. For example, why is EPA requesting the analysis of chloride for samples analyzed downstream of Dock 2? From the previous data, elevated levels of chloride are not expected in most areas of the in-water site.	LSS requests that chloride sampling be deleted from this section because it is not considered a recontamination COI.	EPA and LSS have already agreed on this issue. An explanation will be added in the addendum that chloride sampling is not necessary.	
44	A	8-13 / 8.2.1.2	Analytical Strategy. There is no justification for analyzing dioxins/furans at these stations.	LSS request that dioxin/furan analyses be deleted from these stations	EPA and LSS agree that dioxin/furan sampling at certain stations will be needed. The revised FSP will include the rationale for the analytical strategy at each sample location.	

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45	A	8-15 / 8.2.1.2	Subsurface Sediment Sampling, Sampling Strategy. From the previous data, there is no indication that the chromium or salt plumes are moving upstream of the Arkema site property. LSS does not agree with the addition of sediment stations WS/WB-82, 83 and -84.	LSS requests that these stations be deleted from this section because chromium and salt are not considered recontamination COIs.	EPA and LSS agree that these details will be revisited and addressed in the FSP.	
46	A	8-15 / 8.2.1.2	Subsurface Sediment Sampling, Analytical Strategy. LSS questions the need for beryllium analysis in core samples. Visual inspection of the cores and surface sediment samples should be adequate for evaluating the depth of bioturbation. In addition the depth of bioturbation will have no effect on defining the RAA Boundary and no effect on dredging analysis.	LSS requests that beryllium analysis be deleted from the analytical strategy.	EPA and LSS agree. The proposed solution will be added to the addendum or other future documents.	
47	A	8-15 / 8.2.1.2	Subsurface Sediment Sampling, Analytical Strategy. EPA has not provided justification for increasing the number of samples initially analyzed in each core from three (as stated in the revised work plan) to four samples.	LSS request that the drill guide tool in the EVS software be used to aid in the analysis of data gaps and site characterization needs for the purposes of completing the sediment investigation work.	EPA agrees to look at the change in the sample density and location based on the work plan addendum and FSP.	
48	A	8-17 / 8.2.1.3	LSS disagrees with the need for a multi-event surface water	LSS requests that the multi-event surface water sampling	Same resolution as 39. EPA and LSS agree that the current	

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			<p>sampling program to provide baseline conditions for the Arkema site. The information obtained from the LWG RI should be adequate to address baseline conditions for this portion of the waterway.</p>	<p>program be deleted.</p>	<p>surface water data set is adequate for the EE/CA evaluation. No sampling will be specified in the EE/CA work plan. However, additional baseline surface water sampling will need to be proposed as a part of the removal action/design and completed before removal actions begin.</p>	
49	A	8-19 / 8.2.2.1 Tissue Samples - Rationale	<p>Paragraph 1 This paragraph states “These species—crayfish, clams, smallmouth bass, and sculpin—are anticipated to support both monitoring and risk assessment. Whole-body analyses will be used to support ecological risk assessment and food web modeling to be performed as part of the Harbor-wide RI/FS.”</p>	<p>LSS requests that additional language be included that recognizes that not all of the suggested target species may be available or present in sufficient quantities to collect meaningful samples. This limitation of availability and abundance of target species was identified in interim RI reports and may persist in subsequent sampling in support of the EE/CA. In particular, additional explanation is needed to justify inclusion of wide home-range species (e.g., small mouth bass) whose tissue concentrations may not be clearly related to the site and whose foraging range may be large with respect to the resolution needed to define the</p>	<p>Biota sampling for the EE/CA will be needed for several objectives, including but not limited to: (1) identifying baseline conditions in biota before the removal action, (2) assessing the impacts of the removal action on biota contaminant levels, and (3) assessing the effectiveness of the removal. The extent of biota sampling needed to meet these objectives is dependent upon the several factors, including the boundary of the removal action area, the methods used for removal, and the design of the final removal action. Therefore, the FSP/QAPP for the removal area characterization should contain language that discusses the</p>	

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				RAA boundary.	biota sampling objectives but defers biota sampling until later in the EE/CA process. At a minimum, a FSP/QAPP will be included as a part of the final EE/CA.	
50	A	8-19 / 8.2.2.1	<p>To date the EE/CA work plan has focused on a study design to determine the extent of principal threat material and provide sufficient information to establish a boundary for the remedial action area. However, the objectives in this paragraph seem much broader and are expressed in the context of a baseline study, monitoring program, risk assessment, and food web modeling in support of the harbor-wide RI/FS.</p> <p>LSS believes that the definition of PTM and delineation of the RAA boundary should be based on a mass removal approach (discussed elsewhere in these comments). LSS supports the LWG risk assessment, food web modeling, and harbor-wide RI/FS. However, the LWG risk assessment and food web</p>	LSS requests that EPA revise the draft EE/CA to omit any monitoring for the Portland Harbor risk assessment and food web modeling.	LSS has already agreed to share any data generated for the EE/CA with the LWG, and EPA agreed that no specific sampling in support of the PH RI/FS will be required.	

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			modeling have been omitted from the EE/CA to date.			
51	A	8-19 / 8.2.2.1 Tissue Samples - Rationale	<p>Paragraph 2</p> <p>This paragraph states "Passive tissue surrogate sampling devices (e.g., SPMDs or caged bivalves) will be deployed within areas where biota are collected to establish whether tissue surrogates can be used as a cost-effective means of reliably obtaining bioaccumulation data on the required spatial scale."</p> <p>LSS is aware of recent publications by Sethajintanin and Anderson (2006) that describes patterns of bioavailable DDX in water. Although this is a useful technique for water exposure, LSS questions it's applicability as a measure of success for sediment remediation.</p>	LSS requests removal of the references to the SPMD sampling procedures.	In lieu of the SPMD method, LSS has the option of proposing in the FSP an alternate data collection method as a surrogate, presenting the rationale for how these data could be collected another way, or presenting the rationale for why these data are not needed.	
52	A	8-19 / 8.2.2.1 Tissue Samples - Rationale	<p>Paragraph 2 (cont.)</p> <p>The remainder of the paragraph describes methods for exploring the SPMD data and possible correlations with measured concentrations in</p>	LSS requests removal of the SPMD analysis from the monitoring program or a more detailed explanation of the hypothesis and assurance of its success and cost-effectiveness in comparison to other	Same agreement as 51.	

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			concurrently collected fish tissue samples. LSS is concerned that SPMD technique and correlation analysis is a research hypothesis with an uncertain outcome.	monitoring techniques. At a minimum, LSS requests that an example of where the SPMD method has been used successfully in the past to monitor and verify sediment remediation success be provided.		
53	A	8-19 / 8.2.2.1 Tissue Samples - Rationale	Paragraph 2 (cont.) The paragraph concludes with the statement that “Details for use of passive surrogate devices will be provided in the QAPP developed to respond to this Work Plan.” LSS believes that EPA is placing the burden of proof for the feasibility of this technique on LSS without sufficient justification in the EE/CA work plan. Other indications that this technique needs additional thought and justification are its complete absence in subsequent sections of the EE/CA for <i>Sampling Strategy</i> and <i>Analytical Strategy</i> .	LSS requests removal of the SPMD technique from the monitoring program or at a minimum provide justification and specific examples of where it has been used and was effective to successfully monitor and verify sediment remediation success.	Same agreement as 51.	
54	A	Attachment B	The Technical memorandum (Attachment B-Isopleth Methods) defines an isopleth as “a line drawn on a map through all points of equal	LSS proposes that the two-dimensional kriging analysis and figures be removed from the EPA Work Plan. LSS has completed three-dimensional	Two-dimensional kriging will remain in the Work Plan; however, three-dimensional kriging can also be utilized for analysis of data gaps. A	

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			value of some measurable quantity, in this case concentration.” The Isopleths maps for COIs in sediments by depth interval fail to meet this very definition. Lines drawn on the maps in this case grid cells, which define areas of equal value, contain sample points that do not match the values. The isopleths areas should contain points of equal value as described in the definition.	kriging of total DDx that accurately represents the data, has appropriate spatial weighting, and that honors every data point in the analysis area. LSS proposes using figures for total DDx that are derived from its three-dimensional kriging analysis.	statement to this effect can be placed in the addendum.	
55	A		The Technical memorandum (Attachment B-Isopleth Methods) also states that “In some cases the data from the sample points shapefiles does not match the values in the resultant grid cells” followed by an explanation. This explanation is qualitative in nature while the Kriging methodology provides output variance as a quantitative tool to assess the degree of confidence or uncertainty with methodology. There is no mention in the memorandum of the output variance of prediction raster. Without the output variance information, there is no basis to have	LSS proposes that the two-dimensional kriging analysis and figures be removed from the EPA Work Plan. LSS has completed three-dimensional kriging of total DDx that accurately represents the data, has appropriate spatial weighting, and that honors every data point in the analysis area. LSS proposes using figures for total DDx that are derived from its three-dimensional kriging analysis.	Two-dimensional kriging will remain in the Work Plan; however, three-dimensional kriging can also be utilized for analysis of data gaps. A statement to this effect can be placed in the addendum.	

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			confidence in the Kriging predictions.			
56	A	Attachment B	The Technical memorandum states that “In order to make the resultant grid cell values match the point data as close as possible the variable search radius was set to 2.” However, the variable search radius of 2 seems too low considering the density of the sample points and the lack of agreement in the predicted results. A variable search radius of at least 4 would seem more appropriate so 4 points of equidistance in different directions would all have influence over the predicted value.	LSS proposes that the two-dimensional kriging analysis and figures be removed from the EPA Work Plan. LSS has completed three-dimensional kriging of total DDx that accurately represents the data, has appropriate spatial weighting, and that honors every data point in the analysis area. LSS proposes using figures for total DDx that are derived from its three-dimensional kriging analysis.	Two-dimensional kriging will remain in the Work Plan; however, three-dimensional kriging can also be utilized for analysis of data gaps. A statement to this effect can be placed in the addendum.	
57	A	Attachment B	The statement in the memorandum that “the grid cells are still accurately portraying the estimated concentrations” is concerning. Accuracy is a term not normally associated with the probabilistic approach of Kriging but instead the terms of confidence or uncertainty are more commonly used. When the input sample	LSS proposes that the two-dimensional kriging analysis and figures be removed from the EPA Work Plan. LSS has completed three-dimensional kriging of total DDx that accurately represents the data, has appropriate spatial weighting, and that honors every data point in the analysis area. LSS proposes using	Two-dimensional kriging will remain in the Work Plan; however, three-dimensional kriging can also be utilized for analysis of data gaps. A statement to this effect can be placed in the addendum.	

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			data grossly differ from the resulting predictions, there is a high degree of uncertainty and low degree of confidence. Interpolation technique predictions are not accurate when the sample input data is not honored.	figures for total DDx that are derived from its three-dimensional kriging analysis.		
58	A	Attachment B	The sample data z or elevation dimension is simplified in order to perform 2D Kriging. The preprocessing of separating sample points by depth interval breaks the z-dimension into unequal interval depths (0-1 ft, 1-4ft, 4-8ft, > 8ft). The result essentially is 4, 2 dimensional planes that simplify the vertical dynamics associated with the contamination. This limits weighted average of neighboring pairs performed by the Kriging to arbitrary depth intervals.	LSS proposes that the two-dimensional kriging analysis and figures be removed from the EPA Work Plan. LSS has completed three-dimensional kriging of total DDx that accurately represents the data, has appropriate spatial weighting, and that honors every data point in the analysis area. LSS proposes using figures for total DDx that are derived from its three-dimensional kriging analysis.	Two-dimensional kriging will remain in the Work Plan; however, three-dimensional kriging can also be utilized for analysis of data gaps. A statement to this effect can be placed in the addendum.	
59	A	Attachment B	For each depth interval, only the highest recorded values are used as input for interpolation. The interpolation result is skewed toward high concentrations at arbitrary depth intervals and ignores the known values for lower concentrations. Averaging of	LSS proposes that the two-dimensional kriging analysis and figures be removed from the EPA Work Plan. LSS has completed three-dimensional kriging of total DDx that accurately represents the data, has appropriate spatial weighting, and that honors	Two-dimensional kriging will remain in the Work Plan; however, three-dimensional kriging can also be utilized for analysis of data gaps. A statement to this effect can be placed in the addendum.	

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			sample concentrations would be more appropriate than disregarding lower concentration sample values.	every data point in the analysis area. LSS proposes using figures for total DDx that are derived from its three-dimensional kriging analysis.		
60	A	Attachment B	Interpolation extends beyond limits of the data set and the analysis area as defined 6.1.3.1. The use of a boundary to limit the interpolation to the analysis area will lead to different results.	LSS proposes that the two-dimensional kriging analysis and figures be removed from the EPA Work Plan. LSS has completed three-dimensional kriging of total DDx that accurately represents the data, has appropriate spatial weighting, and that honors every data point in the analysis area. LSS proposes using figures for total DDx that are derived from its three-dimensional kriging analysis.	Two-dimensional kriging will remain in the Work Plan; however, three-dimensional kriging can also be utilized for analysis of data gaps. A statement to this effect can be placed in the addendum.	