UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TX 75202-2733

JAN 15 2014

Mr. David Keith
Project Coordinator
Anchor QEA, LLC
614 Magnolia Avenue
Ocean Springs, MS 39654

RE: Draft Feasibility Study Report
San Jacinto River Waste Pits Superfund Site, Harris County, Texas
Unilateral Administrative Order, CERCLA Docket No. 06-03-10

Dear Mr. Keith:

The Environmental Protection Agency (EPA) and other agencies have performed reviews of the above referenced document dated August 2013. The enclosed comments shall be incorporated in the Final Feasibility Study Report and copies provided for review and approval within 30 days of receipt of this letter.

If you have any questions, please contact me at (214) 665-8318, or send an e-mail message to miller.garyg@epa.gov.

Sincerely yours, for

Gary Miller
Remediation Project Manager

Enclosure

cc: Steve Ellis (TCEQ)
Bob Allen (Harris County)
Linda Henry (Port of Houston)
Jane Sarosdy (TGLO)

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Comments
Draft Feasibility Study (FS) Report dated August 2013

1. (General): The FS report shall include a detailed discussion of all problems noted with the TCRA cap and corrective actions performed to date or planned. Also, this discussion shall include the issues/recommendations identified in the U.S. Army Corps of Engineers' cap assessment.

2. (General): Statements regarding a recommended or preferred remedial alternative shall be deleted from the FS. The EPA will recommend a preferred alternative in the Proposed Plan for public comment, and will select a final remedial action for the site in the Record of Decision based on an evaluation of the CERCLA criteria after considering public comment.

3. (General): The FS Report shall include an additional remedial action alternative for the northern waste pits. This new alternative shall evaluate a removal that addresses a volume of material that contains dioxin/furan at levels greater than 220 ng/kg, except where the water depth is greater than 2 feet. This alternative shall also include a berm or sheetpile to isolate the excavated area from the river (unless constrained by river hydrologic/USACE requirements). Given the shallow water depths, it is feasible to construct a temporary earth/rock berm, or other engineering controls, around the majority of the waste pits. The berm could be placed where the existing ground surface elevation is minus approximately 2 feet (NAVD88 datum), or higher. A berm would provide complete containment of re-suspended sediment, which would eliminate impacts to water quality and sediment quality. The excavation could be sequenced to work from the center of the area that is above mean tide level towards the perimeter. The unexcavated area around the excavation would serve as a berm to contain re-suspended sediment. The new alternative shall also consider the impacts of this construction on the river hydrologic conditions, need for USACE permits, etc.

4. (General): The FS Report shall consider the potential for erosion and releases of contaminated material due to a major storm for each of the alternatives, and the relative impact should such a release occur.

5. (General): The FS Report shall describe the conditions where incineration would be required.

6. (General): The monthly site reports note that there are potential impacts from San Jacinto River Fleet's operations such as suspending sediments in the area. The FS shall note that the Remedial Design will include provisions for re-sampling the sediment area(s) that exceed the final sediment remediation goal to confirm the depth of the exceedences.

7. (General): The FS Report only considers institutional controls for the Southern Impoundment area. The FS shall include a range of alternatives for this area similar to the range of alternatives in the northern waste pits, including treatment and/or removal.

8. (General): No costs are included for institutional controls. The FS shall include these costs as appropriate.

9. (General): The FS shall clarify if dewatering costs and effluent disposal costs have been considered while developing the cost estimates for Alternatives 5 and 6.

10. (General): The FS shall clarify in the detailed analysis if USACE permits or other relevant permits are applicable to the implementation of the alternatives while addressing the Site. The FS shall consider the impact of any construction in the flood way of the River (impact on flooding and any offsets for this displacement that may be needed). This includes leaving the cap in place as it is or making any additions to its height or overall footprint.

11. (General): Please clarify why costs for five year reviews and present value analysis have not been included for each of the Alternatives. Please clarify if any periodic costs have been considered for the maintenance of institutional controls in each of the Alternatives.

12. (General): The FS shall consider as an ARAR the Toxic Substances Control Act (TSCA) governing transport, handling, and disposal of PCB-contaminated sediment or residues.

13. (General): The cost estimating tables in Appendix C of the FS shall include specific line items for establishing and monitoring institutional controls (for each alternative where ICs are included).

14. (General): The design approaches noted for the containment alternatives shall be in accordance with the U.S. Army Corps of Engineers recommendations developed in reference to the previous erosion of the TCRA cap, and revisions to the alternative descriptions and cost estimates shall be reflected in the FS Report.

15. (General): Worker safety concerns are discussed in the FS. It is noted that Alternatives 4, 5, and 6 include increased probabilities of non-fatal and fatal injuries compared to the other alternatives. The FS shall also state that all worker safety concerns will be appropriately addressed in the Remedial Design phase of the project with detailed health and safety plans. Complex remedial actions at other Superfund sites and including the TCRA implementation at the site have documented that safety concerns can and should be appropriately addressed.

16. (General): The FS notes that Alternatives 4, 5, and 6 will result in increased emissions compared to the other alternatives. Greenhouse gas, particulate matter, and ozone emissions associated with the alternatives will not have a significant impact compared to the three to five million cubic yards of dredging occurring annually for the Houston Ship Channel/Galveston Entrance, as well as the industrial/ commercial nature of the immediate site area, the presence of highly trafficked transportation corridors (1-10), and ambient air quality that exists. FS shall either delete the statement or shall include additional text that the emissions will not have any significant impact to the area.

17. (General): The FS has no discussion of floodplain management and impact considerations of construction in the floodplain and floodwater pathways and how that would impact flood control, river pathway and water flow issues and obstructions in navigable

waters. The FS shall include a discussion of these issues. In addition, the FS shall clarify in the detailed analysis if USACE permits or other relevant permits are applicable to the implementation of the alternatives while addressing the submerged areas.

18. (General): The FS shall include costs for five year reviews, and shall describe the assumptions used for the present value analysis, including discount rate, for each of the Alternatives. The EPA requires that present value analysis use a discount rate of 7%.

19. (General): The computer model application to the Site makes numerous assumptions and simplifications. Although many of the assumptions are typical of other model development efforts, the uncertainties these assumptions introduce into the model application in the FS were generally not clearly identified or assessed. Uncertainties that may impair the model's ability to evaluate FS alternatives shall be clearly identified and assessed, including the following:

a. Representation of upstream boundary conditions, particularly sediment loads at the Lake Houston Dam. Figure 4-15 of the Fate and Transport Study suggests that suspended sediment concentrations (SSC) at any flow rate range by a factor of 2 at the low end of the flow spectrum to nearly a factor of 100 at moderate to high flow rates. Given the nearly two orders of magnitude variation in SSCs at typical river flow rates, it is unclear what basis was used to conclude that examining a factor of 2 in upstream load estimates provides a "quantitative evaluation" of uncertainty. The FS shall clarify this.
b. Simulation of sediment transport and the representation of hard bottom areas along the river channel downstream of Lake Houston.
c. Oversimplification of processes, particularly the failure to account for the influence that salinity differences is expected to have on fine sediment deposition.
d. Representation of model initial bed properties such as grain size distributions.
e. Simulation of net sediment transport within the Preliminary Site Perimeter.
f. Application of the model at spatial and temporal scales finer than the scales over which model performance is reliable.

20. (General): The Texas Surface Water Quality Standard (30 TAC 307.6 (d)) provides numerical human health criteria in Table 2, including TCDD Equivalents (dioxins, furans, and PCBs). The FS shall discuss this criteria relative to the Site in accordance with 30 TAC 307.6 (d) (11).

21. (General): The FS Report does not take into account any post flood activities that will occur, especially dredging. With the sediment deposition carrying pollutants into a shipping channel, there will be dredging to clear any build up sedimentation. In addition, sediment deposition may eventually lead to increased prop-wash from vessels. Dredging polluted sediments and/or prop wash will cause more chemical transfer to the environment. These factors shall be discussed in the report.

22. (General): The FS shall describe how the unit costs were calculated and how the quantities were determined.

23. (List of Acronyms and Abbreviations): The FS shall add BCT, BAT, POTW, TCMP, TMDL, MCL, CMP, RCRA, NFIP, TCCC, MOU, T&E, CRNA, and CZMP (define in text) to acronym list at the beginning of report.

24. (Section: Executive Summary, p. ES-2): The FS states that Alternatives 1, 2, and 3 provide greater long term effectiveness than Alternatives 4, 5, and 6. This statement shall be deleted. Alternatives 1, 2, and 3 do not include any reduction of volume or mobility, nor any treatment or removal/disposal, as do Alternatives 4, 5, and 6. Treatment and removal remedies have been successfully designed, implemented, and monitored /maintained to ensure remedial action objectives are met at Superfund sites across the U.S.

25. (Section: Executive Summary, p. E-3): This section states that "... an outcome that has been documented at other sediment remediation projects in spite of significant efforts..." The FS shall provide a reference (s) for this statement.

26. (Section: Executive Summary, p. ES-3): Statements that there are no increased long-term benefits for Alternatives 4, 5, and 6 shall be deleted. As noted in the previous comment, these alternatives result in a reduction of volume or mobility, and include treatment or removal/disposal, which are important considerations for long-term permanence. Treatment or removal/disposal provides additional long-term protectiveness benefits compared to not doing treatment or removal/disposal. Similarly, statements that Alternatives 4, 5, and 6 provide less environmental benefit and reduction of risk shall be deleted. It is noted that the relative potential of the various alternatives for releasing contaminated material is an important issue and will be assessed as a part of the remedy selection process.

27. (Section: Executive Summary, p. ES-3): This section describes the drawbacks to Alternatives 4, 5, and 6, but does not discuss their benefits. The purpose of a FS is to evaluate the pros and cons of the alternatives so that their relative merits can be weighted and the best overall alternative can be selected based on the nine CERCLA criteria. This section shall also include a discussion of the merits of Alternatives 4, 5, and 6 (treatment, removal, long term protectiveness, etc.).

28. (Section: Executive Summary, p. ES-3): This section mentions the greater implementation uncertainty for Alternatives 4, 5, and 6. Containment, treatment, and removal remedies have been successfully designed and constructed at many sediment sites in the U.S. Higher uncertainties during implementation are inherent in more robust remedies; however, proper design should account for this. The uncertainty discussion shall be modified to also note the technologies' successful application experience with proper design.

29. (Section 2.2, p. 5): The FS shall provide detail regarding the statement that land uses north of the Site including industrial and municipal activities that may result in releases of dioxins and furans.

30. (Section 2.4.2, p. 9): The FS states that "Near-bed velocities generated by episodes of propeller wash are expected to be significantly higher than those due to tidal and riverine currents..." whereas, Section 2.2.1 states access to the TCRA Site via boat is currently

constrained to the North, West, South and Southeast. The FS shall clarify this apparent inconsistency.

31. (Section 2.5.3, p. 13): This section states "Technologies used to withstand forces sustained by the river must be structurally sufficient to withstand a storm event with a return period of 100-years...." However, complete erosion of the armor material occurred in some areas of the TCRA cap within a year of its construction, apparently by a routine storm event, exposing the underlying geomembrane, although a release did not occur. The FS does not sufficiently demonstrate that an enhanced version of the same technology would be able to withstand a severe storm event. The FS shall provide this demonstration.

32. (Section 3.3.1.5, p. 31): The FS shall include "TPWD 2008" in the reference list.

33. (Section 4.1, p. 36): The FS shall state the location of the following sample: *"The highest $TEQ_{DF,M}$ concentration observed in subsurface soil is 303 ng/kg."*

34. (Section 4.2, p. 37): This section states that deed restrictions will be placed south of I-10 where the depth weighted average TEQ concentrations in the upper ten feet of subsurface soil exceed the soil preliminary remediation goal. The deed restrictions, in the form of restrictive covenant(s) if possible, shall be placed over the entire area of a given parcel of land within the Southern Impoundment area if any soil boring within that parcel has a depth weighted average TEQ within the upper five feet or within the upper ten feet of the subsurface soil that exceeds the preliminary remediation goal. To accomplish this, the FS shall evaluate the risk within the upper five feet as was done for the upper ten feet.

35. (Section 4.4, p. 40): This section states that the raw material for solidification and stabilization could include fly ash or bottom ash. These ashes may contain elevated levels of metals. Also, 40 CFR § 423.12Cb)(4) identified oil and grease as contaminants in the transport water associated with these wastes. The FS shall provide additional information demonstrating how the risks of introducing these contaminants into the river will be mitigated or minimized.

36. (Section 5, p. 45): The alternative evaluations in Section 5 shall have sub-headings for each of the CERCLA criteria, except state and community acceptance, which can only be addressed after a public comment period.

37. (Section 5.1.1, p. 47; and Section 5.2.1): The section states that the no further remedial action alternative would be protective of human health and the environment. The TCRA cap is a temporary measure put in place until the final remedy can be selected. Also, cap design and/or construction issues have been identified by the USACE. The referenced statement shall be changed to relate that the no further action alternative is protective for the short term provided corrections identified by the USACE are completed.

38. (Section 5.1.2, p. 48): The text states that 3 cap maintenance events are included for Alternative 1, but the cost table lists 6 cap maintenance events. The FS shall clarify the estimated number of cap maintenance events.

39. (Section 5.2.2, p. 50): The second paragraph is confusing since it refers to Figure 2-3, but there are no sample IDs for SJB023 and SJB025 on the map. In addition, a 59.3 ng/kg location in the area south of I-10 could not be located on the figure. The text and/or figure shall be clarified.

40. (Section 5.2.2, p. 51): The text states that 3 cap maintenance events are included for Alternative 2, but the cost table lists 6 cap maintenance events. The FS shall clarify the estimated number of cap maintenance events.

41. (Section 5.3.1, p. 52): This section states that institutional controls would be used to establish limitations on dredging and anchoring. The FS shall clarify how the alternative will prevent damage associated with anchoring within the footprint of the permanent cap and how a dredging limitation will be imposed to insure that the upland sand separation area will not be disturbed.

42. (Section 5.3.1, p. 52): The model predicts that additional sediment will be transported to this area, thus further inhibiting potential for contamination to reach receptors. However, there is the potential for the opposite effect if a large event actually erodes sediment. The monitored natural recovery plan shall include methods to determine if there has been erosion or deposition in the area.

43. (Section 5.3.2, p. 54): The FS Report shall provide a timeline for the ongoing monitoring mentioned in the last paragraph of this section.

44. (Section 5.4, p. 54): As per Section 2.4.1 of the FS, salinity ranges in the River from 2 to 20 parts per thousand. The FS shall clarify what stabilizing agents will be considered for Alternative 4, and shall provide for the possible performance of a treatability study and include the costs.

45. (Section 5.4.2, p. 56): This section includes several statements regarding the effectiveness of solidification/stabilization (S/S) treatments. For example, it "may reduce the potential mobility of soil/sediment exceeding PCLs using S/S treatment; however, those wastes are already adequately contained within the TCRA cap"; also, it "would provide marginal additional enhancement of the reliability of the containment"; and "the material that would be stabilized is already currently immobilized by the TCRA cap." The FS shall be revised to state that the S/S treatment will provide additional long term effectiveness compared to containment alone and will enhance the ability of the most highly contaminated material to withstand major flood events. The FS shall also note that, while a 100-year storm event is the usual design approach, it cannot be guaranteed that a storm event of even greater magnitude would never occur. Finally, the FS shall include a discussion about the preference for treatment, which will not be included in Alternatives 1, 2, or 3, but is a component of Alternative 4.

46. (Section 5.4.2, p. 57): The draft FS describes effectiveness issues related to use of sheetpiles. The FS shall be revised to recognize that a sheetpile can be designed and installed to make an effective barrier and over-come the issues listed in the Draft FS. For example, there would not be significant gaps in a properly designed and installed sheet pile barrier. In addition,

a sheet pile barrier could be installed outside the area of highly elevated contamination, which would reduce the potential for re-suspension of contaminated sediment during pile installation and removal.

47. (Section 5.5.2, p. 60): The draft FS states that the long-term effectiveness would be reduced by dredge residuals. The FS shall include a discussion that describes measures for addressing any dredge residuals, which may include additional dredging and /or placement of cover material over those areas. Further, the FS shall describe that this alternative will result in a substantial removal (about 25%) of the most highly contaminated material and result in a substantial improvement in long term effectiveness compared to alternatives 1, 2, and 3, which do not remove any of the contaminated material and could result in a higher level release should unforeseen conditions result in a cap failure.

48. (Section 5.5.2, p. 60): The FS states that dredging may degrade the reliability of the existing containment due to scour; however, there is no explanation given. The FS shall describe why this could happen, and provide for proper design so that this will not be an issue.

49. (Section 5.5.2, p. 61): The FS states that removal of the existing cap would increase the risk of a release of highly contaminated soil/sediment. The FS shall also include a discussion of the design approaches, control measures, etc. to minimize this issue, including but not limited to the use of operational controls (may include reduced dredge rates, reduced over-penetration, sequencing dredging etc.), and/or engineered controls including silt screens/curtains, sheet piles, coffer dams, inflatable dams, etc.

50. (Section 6.1, p. 69): The FS shall include a figure reference so the location of SJNE032 can be found.

51. (Section 6.7, p. 73): This section states that Alternatives 4, 5, and 6 provide no predicted benefit and significantly increase the risks from environmental impacts. However, stabilization or removal always provide better protection over the long term. The report shall acknowledge this.

52. (Appendix A, Section 1.1, p. 1, footnote): The FS shall clarify whether the sensitivity analysis required by the USEPA in the letter dated September 12, 2012, is included as Section 2.2 in this document. This is not clear from the present state of the text.

53. (Appendix A, Section 2.1, p. 10): This section shall explain why the high flow event of 1994 was chosen over the other high flow events that occurred in the area.

54. (Appendix A, Section 2.1, p. 12): The last sentence before Section 2.2 states that the results from a 21-year sediment transport calibration simulation indicated that a net deposition will occur within the Site Perimeter on a "long-term basis". The FS shall define "long-term basis". Is this over that same 21-year period? If so, please state in the text.

55. (Appendix A, Figure 2-1): There appears to be little change in water surface elevation at the lower boundary during large flood events. The FS shall clarify what this figure is indicating.

In addition, the water surface elevation part of the figure shall show variations in water surface elevations for 2, 10, and 100 year events.

56. (Appendix A, Figure 3-14): In Figure 3-14, the chemical fate and transport model for the base case (pre-TCRA cap) conditions shows water column concentrations of TCDD declining from approximately 0.06 pg/L at the upstream boundary below Lake Houston down to nearly 0.01 pg/L at river mile 5 upstream of the TCRA site, before rising to approximately 0.07 pg/L at the TCRA site, then rising further to approximately 0.2 pg/L at the lower boundary near the confluence with Buffalo Bayou. Neither these levels nor the pattern are supported by data collected by the TCEQ TMDL effort, even considering the model uncertainty bounds. The TCEQ TMDL data, measured between 2002 and 2012 using high- volume sampling for low detection levels, showed TCDD concentrations of no more than 0.1 pg/L upstream of the TCRA site, rising sharply to approximately 1 pg/L at the I-10 bridge near the TCRA (0.23 – 2.16 pg/L, average = 1.07 pg/L, n=6), then falling to an average 0.4 pg/L at the confluence with Buffalo Bayou. The FS shall discuss this difference and assess its impact on evaluating the remedial alternatives.

57. (Appendix A, Figures 3-15 and 3-16): The FS shall explain why there is a dramatic change in flow variability from Lake Houston starting at year 7.

58. (Appendix A, Table 4-2): Table 4-2 includes TCDD and TCDF bed concentrations for the model for Alternative 6, the dredging alternative. The text states that the residuals layer concentration was set to the samples representative of the last dredge pass, or 3,956 ng/kg TCDD and 9,979 ng/kg TCDF. However, Alternative 6 is based on a full removal of materials exceeding the preliminary remediation goal of 220 ng/kg, so the samples representative of the last dredge pass would be 220 ng/kg and the corresponding residuals concentration would be 220 ng/kg. The assumed residual cover concentrations (in Table 4-2) of 198 ng/kg and 499 ng/kg for TCDD and TCDF, respectively, would result in a TEQ of 247.9 ng/kg, which is higher than the proposed preliminary remediation goal of 220 ng/kg and does not include the contribution from the other congeners. The FS shall clarify/revise the residuals layer concentration value used.

59. (Appendix B, Section 3.2, p. 6): This section states that "the limited water depth prohibits large vessels from operating close to the cap." This is not true at the northwest corner closest to barge traffic associated with San Jacinto River Fleet operations. Storm events or human error may continue to pose a danger of barge contact with the cap. The FS shall include provisions for prevention of any damage as a result of large vessels operating close to the cap.

60. (Appendix B, Figure 1): This figure shall include the information source location and date range.

61. (Table 4-1 and Appendix C): The quantities in Table 4-1 and the cost estimate in Appendix C do not match and shall be corrected. Specific examples are listed below:

a. For Alternative 4, Table 4-1 lists 1,400 linear feet of sheet pile, but the Appendix C cost table lists 800 linear feet.
b. For Alternative 4, Table 4-1 lists 3,400 cubic yards of armor rock and 6,900 cubic yards of TCRA armor rock replacement, but Appendix C cost table lists 6,100 tons of

additional armor rock, replace 9,000 tons of armor rock A and replace 5,000 tons of armor rock C/D.

c. The text in Section 4.4 states that the existing TCRA cap armor rock would be re-used if possible. This would also apply to Alternatives 4 and 5, but that is not stated in the text. Cost estimates in Appendix C for Alternatives 4 and 5 include costs of $682,000 for off-site disposal of TCRA riprap (i.e. armor rock) and $155,000 for washing riprap prior to disposal. The basis for these estimates shall be provided, as well as why reuse is discussed but disposal costs are included in the cost estimate.
d. The text in Section 4.5 and Table 4-1 states that Alternative 5 includes 53,300 cubic yards of dredging. The cost estimate in Appendix C lists 7,000 cubic yards of water-based excavation/dredging and 46,300 cubic yards of land- based excavation, for a total of 53,300 cubic yards of removal.
e. The text in Section 4.6 and Table 4-1 says that Alternative 6 includes 208,000 cubic yards of dredging. The cost estimate in Appendix C lists 208,300 cubic yards of water-based dredging and 46,300 cubic yards of land-based excavation. The FS shall provide consistent volumes.

62. (Appendix C): The cost estimates for Alternatives 5b, 6a, and 6b include $11.6 million, $10.3 million, and $63.7 million for mobilization/demobilization, respectively. The FS shall discuss the basis for these estimates.

63. (Appendix C): The cost estimate in Appendix C shows 421,500 tons for off-site disposal in Alternative 6. If the correct removal volume is 254,600 cubic yards (208,300 + 46,300), this is 1.65 tons per cubic yard. For Alternative 5, the weight is 74,600 tons for 53,300 cubic yards, or 1.4 tons per cubic yard. The conversion from volume to disposal weight is inconsistent and the FS shall either correct or clarify this difference.