

Quality Control Certification
And Statement of Review

Lower Mahoning River, Pennsylvania
Environmental Dredging Study

Greenhorne & O'Mara, Inc., has completed the Final Report for the above referenced project. This document certifies that quality control and review of the study of documents has been performed in accordance with the Quality Control Plan (QCP) prepared for the project. Work products were reviewed by the technical team for accuracy and satisfactory completion and, as outlined in the QCP, review of the final submittals was conducted by the Project Manager and an independent reviewer for content and completeness.

We hereby affirm that the Environmental Dredging Study for the Lower Mahoning River and the associated technical information has been reviewed in accordance with the procedures set forth herein.

Signed: Irene Mendoza

Date: 8/2/01

Irene Mendoza, P.E.
Project Manager
Greenhorne & O'Mara, Inc.

Signed: Jamie R. Ingram

Date: 8/2/01

Jamie Ingram
Independent Reviewer
Senior Environmental Scientist
Greenhorne & O'Mara, Inc.

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Signed: Irene Mendoza

Date: 8/2/01

Irene Mendoza, P.E.
Project Manager
Greenhorne & O'Mara, Inc.

Signed: Ali Abbasi

Date: 8/2/01

Ali Abbasi
Independent Reviewer
Senior Engineer
Greenhorne & O'Mara, Inc.

| <i>Editorial comments from Ed Smith</i> | | | |
|---|--|---|--|
| Page | Paragraph, Line | Comment | Response |
| ES-1 | P 2, L 4 | Change Lower Mahoning to Upper Mahoning | Lower Mahoning is correct reach; changed to lower case |
| 1-1 | P 5, L 1 | Change Lower Mahoning to Upper Mahoning | Lower Mahoning is correct reach; changed to lower case |
| 2-1 | P 2, L 3 and P 3, L 1 | Change Lower Mahoning to Upper Mahoning | Lower Mahoning is correct reach; changed to lower case |
| 2-13 | P 2, L 5 | Insert comma after "bass" | Correction made |
| 3-3 | P 3, L 2 (italics) | Change "samples" to "sample" | This paragraph was deleted from report |
| 3-8 | P 2, L 2 | Change Lower Mahoning to Upper Mahoning | Lower Mahoning is correct reach; changed to lower case |
| 3-8 | | Delete extra line space after 2 nd paragraph | Space deleted |
| 3-10 | P 1, L 7; P 2, L 5; P 4, L 3; P 5, L 5; P 5, L 7 | Editorial changes | Changes made |
| 3-13 | P 4, L 14 | Insert "was" after "criterion" | Change made |
| 4-1 | P 5, L 4 | Change "to the river." to "of the river." | Change made |
| 4-18 | P 7, L 3 | Change "two" to "to" | Change made |
| 4-21 | P 1, L3; P 2, L 6; P 2 L 12; P 2 L14 | Editorial changes | Changes made |
| 6-2 | P 2, L 4 | Insert "City" after "Ellwood" | Change made |
| 7-2 | Bullets 1—3 | Delete periods at end of bullets | Periods deleted |
| 8-1 | P 1, L 6 | Change "PAP" to "PSP" | Correction made |
| 8-1 | P 1, L 7 | Capitalize "reconnaissance" | Correction made |
| 9-1; 9-2 | References | Editorial corrections | Corrections made |
| 10-1 | Acronyms | Editorial corrections | Corrections made |

Responses to comments on Draft Lower Mahoning River, Pennsylvania Environmental Dredging Study

| PAGE | PARAGRAPH | SENTENCE | SECTION | EXISTING | QUESTIONS/COMMENTS | SUGGESTED | RESPONSE |
|------|-------------|-------------|-------------------|---|--|--|---|
| | | | Executive Summary | | | | |
| ES-1 | 4 through 6 | | | Be specific about Project, since reference is made to both the OH and PA studies | | | Text was modified to refer specifically to PA study |
| ES-1 | 4 | 1 | | "The project goal..." | | The Mahoning River, PA project goal... | Text changed as suggested |
| ES-1 | 4 | 3 | | "This project goal is tied to..." | | "The success of the Mahoning River PA environmental dredging project is linked to the..." | Text changed as suggested |
| ES-1 | 5 | 1 through 4 | | | Too much emphasis on economic benefits and not enough emphasis on the project goal: "ecosystem restoration". Used the phrase "a focus for the revitalization of the Lower Mahoning River" twice. Confusing paragraph. What does "healthy vegetation mean?" | | Text revised to place more emphasis on ecosystem restoration. |
| ES-1 | | 1 | | | Rewrite | "Considering that the riparian corridor is mostly intact and aesthetically appealing, restoring in river habitat will not only benefit the aquatic ecosystem, but also will serve as a focus for the revitalization of recreation along the Lower Mahoning River." | Text changed as suggested |
| ES-1 | | 2 | | | Delete | | Sentence deleted |
| ES-1 | 5 | 3 | | "In addition, with the healthy vegetation along its banks, the river has the potential for being a more valuable aesthetic resource that would serve as a focus for the revitalization of the Lower Mahoning River" | Uncertain of meaning: what would serve as focus, the riparian zone or the fact that is aesthetically appealing? Delete. | | Sentence deleted |

| PAGE | PARAGRAPH | SENTENCE | SECTION | EXISTING | QUESTIONS/COMMENTS | SUGGESTED | RESPONSE |
|------|-----------|----------|---------|---|--|---|---|
| ES-1 | 6 | 1 | | "Work for this study included an evaluation of existing technical and historical data along with the collection of new data where data gaps were found to exist." | Which study? What kind of data? Isn't all of the data technical? What are data gaps? Shouldn't one emphasize that the primary goal was to determine the horizontal and vertical extent of and the physical and chemical characterization of contaminated channel sediments and bank soils? | | Paragraph revised to focus only on existing data (i.e., previous studies, pub |
| ES-2 | 1 | 1 | | "In contrast to the Ohio Study, the data collected for the current reconnaissance study revealed minimal industrial development..." | What data reveals industrial development? Rewrite. | In contrast to the Ohio portion of the lower Mahoning River basin, which is highly urbanized and was historically intensely industrialized, the PA portion was and continues to be primarily undeveloped. | Text changed as suggested |
| ES-2 | 1 | 2 | | "The land along the banks..." | "The land along the banks" infers the riparian corridor. Was the intent basin or watershed rather than riparian zone? If so, use modified sentence 1 and delete this one. | | Sentence deleted |
| ES-2 | 1 | 3 | | | | Insert: "There are a few urban areas in this portion of the basin. " before "The city of New Castle...". Capitalize Shenango River. | Text changed as suggested |
| ES-2 | 1 | 5 | | "Land uses along the river also include..." | Again, along the river or in the basin? What about agriculture? | Other land uses include rail and highway transportation corridors, a rail-to trails corridor, agriculture, and coal mining. | Text changed as suggested |
| ES-2 | 3 | 1 | | "...elements: a vertical profiling study, a land fill..." | Vertical profiling was conducted only along banks. The depth of channel sampling was 0 to 6 inches. | "...elements: a "worse case" river bank vertical profiling study, an in-stream surface sediment study, a land fill..." | The text was modified to eliminate the use of the term "vertical profiling". |

Responses to comments on Draft Lower Mahoning River, Pennsylvania Environmental Dredging Study

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| ES-1 | 4 through 6 | 1 | Executive Summary | Be specific about Project, since reference is made to both the OH and PA studies | | | Text was modified to refer specifically to PA study |
| ES-1 | 4 | 1 | | "The project goal..." | | The Mahoning River, PA project goal... | Text changed as suggested |
| ES-1 | 4 | 3 | | "This project goal is tied to..." | | "The success of the Mahoning River PA environmental dredging project is linked to the..." | Text changed as suggested |
| ES-1 | 5 | 1 through 4 | | | Too much emphasis on economic benefits and not enough emphasis on the project goal: "ecosystem restoration". Used the phrase "a focus for the revitalization of the Lower Mahoning River" twice. Confusing paragraph. What does "healthy vegetation mean?" | | Text revised to place more emphasis on ecosystem restoration. |
| ES-1 | | 1 | | | Rewrite | "Considering that the riparian corridor is mostly intact and aesthetically appealing, restoring in river habitat will not only benefit the aquatic ecosystem, but also will serve as a focus for the revitalization of recreation along the Lower Mahoning River." | Text changed as suggested |
| ES-1 | | 2 | | | Delete | | Sentence deleted |
| ES-1 | 5 | 3 | | "In addition, with the healthy vegetation along its banks, the river has the potential for being a more valuable aesthetic resource that would serve as a focus for the revitalization of the Lower Mahoning River" | Uncertain of meaning: what would serve as focus, the riparian zone or the fact that is aesthetically appealing? Delete. | | Sentence deleted |

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| ES-1 | 6 | 1 | | "Work for this study included an evaluation of existing technical and historical data along with the collection of new data where data gaps were found to exist." | Which study? What kind of data? Isn't all of the data technical? What are data gaps? Shouldn't one emphasize that the primary goal was to determine the horizontal and vertical extent of and the physical and chemical characterization of contaminated channel sediments and bank soils? | | Paragraph revised to focus only on existing data (i.e., previous studies, pub |
| ES-2 | 1 | 1 | | "In contrast to the Ohio Study, the data collected for the current reconnaissance study revealed minimal industrial development..." | What data reveals industrial development? Rewrite. | In contrast to the Ohio portion of the lower Mahoning River basin, which is highly urbanized and was historically intensely industrialized, the PA portion was and continues to be primarily undeveloped. | Text changed as suggested |
| ES-2 | 1 | 2 | | "The land along the banks..." | "The land along the banks" infers the riparian corridor. Was the intent basin or watershed rather than riparian zone? If so, use modified sentence 1 and delete this one. | | Sentence deleted |
| ES-2 | 1 | 3 | | | | Insert: "There are a few urban areas in this portion of the basin." before "The city of New Castle..." Capitalize Shenango River. | Text changed as suggested |
| ES-2 | 1 | 5 | | "Land uses along the river also include" | Again, along the river or in the basin? What about agriculture? | Other land uses include rail and highway transportation corridors, a rails-to trails corridor, agriculture, and coal mining. | Text changed as suggested |
| ES-2 | 3 | 1 | | ...elements: a vertical profiling study, a land fill... | Vertical profiling was conducted only along banks. The depth of channel sampling was 0 to 6 inches. | ...elements: a "worse case" river bank vertical profiling study, an in-stream surface sediment study, a land fill... | The text was modified to eliminate the use of the term "vertical profiling". |

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|------|-----------|----------|---------|---|--|---|---|
| ES-2 | 3 | 2 | | Sediment Characterization was intended to assess limitations... | Why not look for the best, most practical, most efficient, or most economical method rather than limitations? Also, there were more reasons for sediment characterization than determination of treatment methods. | Sediment studies were conducted not only to assess the distribution, quantity and quality of contaminated sediments/soils within the study area, as mentioned above, but also to facilitate the selection of alternatives for the remediation, removal, and disposal/treatment of dredged material. | The text was modified to address the multiple goals of the sediment sampling |
| ES-2 | 4 | | | "The findings of the sediment study revealed that the surficial silts and sands within the stream channel exhibited contamination above background levels but not above levels observed in the Ohio reaches of the river. | Be more specific. | The findings of the PA sediment study revealed that the surficial silts and sands within the stream channel exhibited contamination above background levels but lower than levels observed in composited, 0 to 4 feet deep sediments collected along the Ohio reach of the Mahoning River. | Text changed as suggested |
| ES-2 | 4 | 5 | | "....exhibited higher TRPH concentrations than samples collected from overbank areas." | | ...exhibited higher TRPH concentrations than samples collected further upslope but below the ordinary high water line. | Text changed as suggested |
| ES-2 | 5 | 3 | | "Under current regulations..." | This text comes from the Mahoning River OH report. Whether it is true in PA or not should be checked. It is possible that this dredge material could be classified as "clean fill"? Does COE policy agree with this? | " Under current state regulations..." | The status of dredged material in PA was researched. According to state regs., dredged material cannot be classified as "clean fill". |
| ES-2 | 6 | 1 | | The biological assessment of the Pennsylvania Mahoning River was conducted to compliment the biological assessment conducted upstream of the Pennsylvania-Ohio state line. | The biological assessment was not conducted to compliment the OH study but to determine/assess/document the existing biological conditions/health of the study area. | A biological assessment was conducted throughout the 12-mile long study area to characterize existing biological conditions, while complimenting previous studies conducted along the Ohio reach of the Lower Mahoning River. | Text changed as suggested |

| PAGE | PARAGRAPH | SENTENCE | SECTION | EXISTING | QUESTIONS/COMMENTS | SUGGESTED | RESPONSE |
|------|-----------|-------------|---------|---|---|--|--|
| ES-2 | 6 | 3 | | "...consistent with the procedures used in the biological assessment conducted upstream of the study area." | Somewhat redundant if revised sentence 1 above is used. | ...consistent with the procedures used for the Ohio study. | Text changed as suggested |
| ES-2 | 7 | 2 | | "The fishery remains degraded, but shows improvement from its historical conditions." | Cannot say fishery "remains" because there is no preceding reference to historical conditions. Also, the past tense should be used to reference previous studies. | Although degraded, the fishery showed a trend towards improvement when compared to historical conditions. | Text changed as suggested |
| ES-3 | All 1-5 | | | Plan 1, Plan 2, etc. | The word "plan" unnecessary, just use alternative numbers. | | The use of the term "Plan" facilitates cross-referencing in the text. Guidance documents for reconnaissance phase reports use "Plan Formulation" term. No change was made in text. |
| ES-3 | All 3 | 1 through 3 | | "Selective hydraulic dredging and bank excavation." | the word "Selective" infers incomplete removal of contaminated sediments and could be misconstrued. Rewrite. | "Worse case" reach of the study area. Removal of contaminated sediments and bank materials from the reach of the river located between river mile 6.8 and 11.85. All contaminated in-stream sediments and accessible contaminated bank materials will be removed, using hydraulic dredging equipment. Improve habitat structure..... | Text changed to incorporate suggested revision |

| PAGE | PARAGRAPH | SENTENCE | SECTION | EXISTING | QUESTIONS/COMMENTS | SUGGESTED | RESPONSE |
|------|-----------|-------------|---------|--|---|--|--|
| ES-3 | All 4 | 1 through 5 | | "Selective mechanical dredging and bank excavation. Remove ..." | Since bank excavation is a component of this alternative and the riparian corridor (the vegetated banks) are integral to the health of the ecosystem, efforts must be made to preserve and protect bank vegetation. Can one use a mechanical dredge to suck out soft materials from banks and stream edges, leaving the vegetation in tact or would this require hydraulic dredging? Would it even be impossible to remove soft in-stream sediments mechanically? Do we actually want two distinct alternatives, one for mechanical and one for hydraulic dredging? | "Worse case" reach of the study area. Removal of contaminated sediments and bank materials from the reach of the river located between river mile 6.8 and 11.85. All contaminated in-stream sediments and accessible contaminated bank materials will be removed, using mechanical dredging equipment. Improve habitat structure.... | Text changed to incorporate suggested revision |
| ES-3 | All 5 | 1 through 3 | | "Comprehensive mechanical dredging..." | "Comprehensive dredging" could be interpreted as removal of all sediments, good and contaminated. Rewrite. | Entire study area. Removal of contaminated sediments and bank materials from the entire study area, located between river miles 0 and 11.85. All contaminated in-stream sediments and accessible contaminated bank materials will be removed, using hydraulic dredging equipment. Improve habitat... | Text changed as suggested |
| | 4 | 5 | | "...the preferred alternative is alternative Plan 4, Selective Mechanical Dredging." | I agree with Carmen and Mike, that all surface in-river contaminated material should be removed although bank material could be selectively removed, based on "worse case". Also, hydraulic dredging should be the preferred method. | | Text has been revised and hydraulic dredging made the preferred method |

| PAGE | PARAGRAPH | SENTENCE | SECTION | EXISTING | QUESTIONS/COMMENTS | SUGGESTED | RESPONSE |
|------|-----------|----------|---------|---|--|---|---------------------------|
| 1-1 | 1 | 1 | 1.1 | The Lower Mahoning River Environmental Dredging... | | The Lower Mahoning River PA Environmental Dredging... | Text changed as suggested |
| 1-1 | 2 | 2 | 1.2 | "The portion of the Mahoning River... is referred to as the "Lower Mahoning River"." | | The reach of the Mahoning River... is referred to as the "lower Mahoning River". | Text changed as suggested |
| 1-1 | 2 | 2 | 1.2 | This reconnaissance study addresses problems and opportunities for ecosystem restoration related to contaminated sediments in the segment of the lower Mahoning River that lies between the Ohio-Pennsylvania state line (RM 12) and the River's confluence with the Shenango River at New Castle PA. | Are the opportunities related to contaminated sediments? | This reconnaissance study addresses problems and opportunities for ecosystem restoration throughout the reach of the lower Mahoning River that lies between the Ohio-Pennsylvania state line (RM 12) and the River's confluence with the Shenango River at New Castle PA (RM 0), which is degraded because of contaminated sediments. | Text changed as suggested |
| 1-1 | 3 | 2 | 1.2 | In addition to the review of available regulatory and scientific information, this reconnaissance study included data collection from two field investigations. | Be more specific. | In addition to the review of existing regulatory information and hydrologic, water and sediment quality, and biological data, this reconnaissance study also included both a biological assessment and a sediment quality survey. | Text changed as suggested |
| 1-1 | 4 | 1 | 1.2 | Based on previously collected information,... | | Based on historical information,... | Text changed as suggested |
| 1-1 | 4 | 2 | 1.2 | Recommendations for implementation were presented based on their costs and feasibility, as well as their impacts on natural, cultural, and socioeconomic resources. | | Recommendations for implementation were presented based on their benefits to the aquatic ecosystem, costs, and feasibility, as well as their impacts on natural, cultural, and socioeconomic resources. | Text changed as suggested |
| 1-2 | 3 | 3 | 1.3 | The findings showed that sediments along this stretch of the river violated the USEPA criteria for polluted sediments. | | The findings showed that sediments along this stretch of the river violated USEPA sediment quality criteria. | Text changed as suggested |

| PAGE | PARAGRAPHS | SENTENCE | SECTION | EXISTING | QUESTIONS/COMMENTS | SUGGESTED | RESPONSE |
|------|------------|----------|---------|---|---|--|---------------------------|
| 1-2 | 3 | 5 | 1.3 | The remedial alternative recommended in the report included the dredging and landfilling of sediments between RM 13 and RM 16.3. | Clean sediments will not be removed and sediments are located in the river not in the river mile. | The remedial alternative recommended in this report included the dredging and landfilling of contaminated sediments from the river throughout the entire study area, as well as selective removal of contaminated bank material. | Text changed as suggested |
| 1-2 | 4 | 3 | 1.3 | The sampling revealed localized "hotspots" of organic polychlorinated biphenyls (PCBs), selected pesticides, polycyclic....contamination in sediments and fish. | Cannot have a hotspots in fish. | The sampling revealed organic polychlorinated biphenyls (PCBs), selected pesticides, polycyclic....contamination in localized sediment "hotspots" and in fish. | Text changed as suggested |
| 2-1 | 2 | 5 | 2.1 | Other industrial effluents....coke quench water, cutting and lubricating oils. | | Other industrial effluents....coke quench water, and cutting and lubricating oils. | Text changed as suggested |
| 2-2 | 1 | 1 | 2.2 | "Land uses along the river also include...." | "The land along the banks" infers the riparian corridor. Was the intent basin or watershed rather than riparian zone? If so, use modified sentence. | In contrast to the Ohio portion of the lower Mahoning River basin, which is highly urbanized and was historically intensely industrialized, the PA portion was, and continues to be, primarily undeveloped. | Text changed as suggested |
| 2-2 | 1 | 3 | 2.2 | | Insert between 1 and 2. | There are a few urban areas in this portion of the basin. | Text changed as suggested |
| 2-2 | 1 | 4 | 2.2 | "Land uses along the river also include...." | Again, along the river or in the basin? What about agriculture? | Other land uses include rail and highway transportation corridors, a rail-to trails corridor, agriculture, and coal mining. | Text changed as suggested |
| 2-2 | 1 | 5 | 2.2 | There is little industrial development.... | Redundant, delete sentence. | | Sentence deleted |
| 2-2 | 2 | 1 | 2.2 | The railroad tracks located on the north side.... | For clarification. | The railroad tracks located on the north side or the left descending bank of the river | Text changed as suggested |

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|------|-----------|-------------|---------|---|--|--|--|
| 2-3 | 5 | 1 | 2.3.3 | Wetlands occur in and along most of the river channel in the study area. | | Riverine wooded and emergent wetlands, which are influenced by river hydrology, occur adjacent to the river channel and below the ordinary high water line, throughout the study reach. Major emergent wetlands are located closest to the river channel, primarily in gently sloped, depositional areas, and on islands. | Text changed as suggested |
| 2-3 | 5 | 2 through 7 | 2.3.3 | Mapped wetlands | Too confusing. What year were these palustrine wetlands mapped? Rewrite. | According to the USF&WS National Wetlands Inventory maps, palustrine groundwater fed wetlands, also occur throughout the riparian corridor, primarily between RMs 2 and 3 and in the vicinity of RMs 6, 8, 10, and 12. Palustrine wetlands near RMs 2 and 3 are primarily emergent wetlands. Palustrine wetlands near RMs 8 through 12 are deciduous forested while those near RM 6 are also mostly forested with some shrub-scrub wetland | Text changed as suggested. Mapping date added in text. |
| 2-4 | 2 | 1 | 2.3.4. | The database covers various times and extends, in some cases, back to 1964. | | Intermittent water quality sampling has been conducted at various locations throughout the Mahoning River PA study area, beginning as early as 1964. More specifically, historical sampling sites were located between RM 0.71 and RM 10.5, with the most frequently sampled location being RM 7 at the State route 224 bridge in Edinburg, PA. | Text changed as suggested. |
| 2-4 | 2 | 4 | 2.3.4 | PaDEP also collects ... | Change tense | PaDEP has also collected ... | Sentence deleted |

| PAGE | PARAGRAPH | SENTENCE | SECTION | EXISTING | QUESTIONS/COMMENTS | SUGGESTED | RESPONSE |
|------|-----------|--------------|---------|--|--------------------|---|----------------------------|
| 2-4 | 3 | 1 | 2.3.4 | Water quality in the water column throughout the Ohio and Pennsylvania reaches of the Mahoning River generally meets water quality criteria. | | Water quality throughout the Ohio and Pennsylvania reaches of the Mahoning River generally meets State water quality criteria. | Text has been modified |
| 2-4 | 3 | 3 | 2.3.4 | Pennsylvania criteria have been applied. | Delete sentence. | | Sentence deleted |
| 2-4 | 3 | 4 | 2.3.4 | Even including Ohio data, criteria exceedances have been recorded only for total iron, copper, and dissolved oxygen. | | Throughout both the PA and the OH reaches of the lower Mahoning River, State water quality criteria exceedances have been recorded only for total iron, total copper, and dissolved oxygen. | Text has been modified |
| 2-4 | Table 2-2 | Title | 2.3.4 | Water Quality Data Since 1990 and Mahoning River Criteria | | Mahoning River, PA Mean Water Quality Analyses 1990 to 1999 and State Water Quality Criteria | Text changed as suggested. |
| 2-4 | Table 2-2 | Line 2 Units | 2.3.4 | N/A | | pH Units | Text changed as suggested. |
| 2-4 | 4 | 1 | 2.3.4 | Total iron data illustrate improvement in water quality as industrial discharges to the Mahoning River were reduced | Clarify. | Between 1970 and 1999, as industrial and municipal discharges to the Mahoning River were reduced, decreasing, warm season, mean total iron concentrations illustrate a significant trend towards improving water quality. | Text changed as suggested. |

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| 2-4 | 4 | 4 | 2.3.4 | <p>In addition, with the exception of the 1990-1999 period in the Pennsylvania and the reference reach, mean concentrations in all reaches improved over time.</p> | <p>Delete sentence because data summaries presented in tables 2.2, 2.3 and 2.4 are likely biased. During the 1980 to 1990 period, samples were collected over the winter season, when DO values are high and metal concentrations are low. However, during the 1990 to 1999 period, samples were primarily collected during the period between May and Oct, to represent "worse case" warm season conditions. Including winter data in the 80-89 data set biases this data, making water quality look better for this period. To accurately compare data, winter analyses must be removed from the data set (as was done with the dissolved data). Also, all tables must be modified accordingly. For example, a quick review of District data for 3 stations located in the PA corridor after removing winter data, shows average total iron concentrations during the same three periods would be 2.548, 1.100 and 1.055 mg/l. It may be a good idea to include # of observations in tables as well.</p> | | <p>Sentence deleted. Winter analysis data removed from Tables 2-2, 2-3, and 2-4 and tables revised.</p> |

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| 2-4 | 5 | 1 | 2.3.4 | Figure 2-1 provides a snapshot of 1999 iron data., the most recent year available. | | Figure 2-1 provides a snapshot of total iron concentrations for Mahoning River, PA water samples collected between May and October 1999, compared to the control reach. The control reach is a free-flowing reach of the Mahoning River located upstream of the Warren-Youngstown industrialized corridor and downstream of the Leavittsburg, Lovers Lane Dam, between river miles 43.0 to 46.17. | Text changed as suggested. |
| 2-4 | 5 | 1 | 2.3.4 | Of the observations in that year, only the PADEP criterion of 1.0 mg/l. | Figure 2-1 erroneously lists mile 63 as a control station. This reach of the Mahoning River is located directly downstream of Milton Dam and cannot be compared to our project reach. Add modified sentence to the previous paragraph | Of the observations in that year, only one value (collected from the Mahoning River at mile 20 in August) slightly exceeded the PADEP maximum iron water quality criterion of 1.0 mg/l. | Mile 63 data removed from Figure 2-1. Text modified. |
| 2-5 | Figure 2-1 | Title | 2.3.4 | Total Iron Measurements for 1999 | Be more specific. | 1999 May through October Lower Mahoning River Water Quality Analyses, Total Iron (ug/l) | Title changed as suggested. |
| 2-5 | Figure 2-1 | Plot | 2.3.4 | | Remove data from mile 62.2 from the chart. Add a line titled "PA Maximum Total Iron Criteria" parallel to the x axis at 1 on the Y axis. | Modify plot. | Mile 63 data removed from Figure 2-1. Line added to Figure. |
| 2-5 | Table 2-3 | Title | 2.3.4 | Total Iron Data Summary | Be more specific. As per line 53 above, modify chart using only warm season data. | Lower Mahoning River May through October Water Quality Statistical Analyses for Period of Record, Mean (Standard Deviation) Total Iron (ug/l) | Title changed as suggested. |
| 2-5 | 1 | 1 | 2.3.4 | Dissolved oxygen data also illustrate improvement in water quality as industrial discharges ... | Redundant, see line 52. | Dissolved oxygen data also demonstrated a trend towards improving water quality throughout the same time period. | Text changed as suggested. |

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|------|-----------|----------|---------|---|--|--|--|
| 2-5 | 1 | 1 | 2.3.4 | The data show the partial recovery of conditions necessary for a healthy aquatic habitat. | Questionable meaning. Does this mean that water quality continues to improve while sediment quality remains degraded? Delete or modify. | | The sentence was modified to indicate that water quality has improved while sediments remain contaminated. |
| 2-5 | 1 | 4 | 2.3.4 | For all sampling periods, concentrations in the control reach are higher than in the Ohio and Pennsylvania study reaches, as would be expected. | Clarify. | As can be seen in Table 2-4, for all sampling periods, dissolved oxygen concentrations were higher in the control reach than in downstream reaches, as would be expected, but also demonstrated a trend towards improvement throughout the PA reach when compared to the Ohio reach. | Text changed as suggested. |
| 2-5 | 1 | 5 | 2.3.4 | In addition, the data recorded for the 1990-1999 period exhibit concentrations meeting criteria in all reaches. | Delete. It doesn't matter if the mean DO value for each decade met the State warm water habitat mean daily criteria of 5.0 mg/l. During this 10 year period, there were at least 18 values less than the State standard. | Delete sentence. | Sentence deleted. |
| 2-6 | 1 | 3 | 2.3.4 | Of the observations in that year, all met or exceeded the PaDEP criteria of 5.0 mg/l. | Be more specific. | Of the observations in that year, all met or exceeded the PaDEP warm water mean daily dissolved oxygen criteria of 5.0 mg/l. | Text changed as suggested |
| 2-6 | 1 | 4 | 2.3.4 | The data for this year also seem to exhibit an oxygen sag curve pattern where higher levels of dissolved oxygen occur in the control reach. | Be more specific. | The 1999 dissolved oxygen (DO) data also exhibited an oxygen sag downstream of the control reach, where lowest values were observed in the Youngstown, OH reach, and moderate recovery occurred in the PA reach. | Text changed as suggested |
| 2-6 | 1 | 5 | 2.3.4 | Downstream in the Ohio study reach where heavier oxygen-demanding loads to the river are expected, more depressed oxygen concentrations occur. | "Downstream in the Ohio study reach" is confusing. | More depressed oxygen concentrations occur throughout the OH reach of the lower Mahoning River because there are heavier oxygen-demanding loads to the river. | Text changed as suggested |

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| 2-6 | Table 2-4 | title | 2.3.4 | Dissolved Oxygen Data Summary | | Lower Mahoning River May through October Water Quality Statistical Analyses for Period of Record , Mean (Standard Deviation) Total Dissolved Oxygen (mg/l) | Title changed as suggested. |
| 2-6 | Table 2-4 | Data | 2.3.4 | Pennsylvania mean DO values : 4.9, 4.2, and 7.4. | Check and revise data summaries. I did a quick review of District data for our 3 stations located in the PA corridor. After removing winter data, results show average dissolved oxygen for the three decades would be 4.9 (only 1 year 1977), 4.9 (1980-1989), and 7.38 (1990-1999) mg/l. | Revise and check. | Winter DO values were not included in the Table 4 data. |
| 2-6 | Table 2-4 | footers | 2.3.4 | | Delete footer #1 and include info in title (line66). | Delete footer. | Footer deleted |
| 2-6 | Table 2-4 | footers | 2.3.4 | | Delete this footer since this 0 value DO data should not have been included in the database. The bridge at mile 21.1 has always caused electronic interference with the water sampling equipment. | Delete footer. | Footer deleted |
| 2-7 | Figure 2-2 | title | 2.3.4 | Dissolved Oxygen Data (May through October 1999) | Be more specific. | 1999 May through October Lower Mahoning River Water Quality Analyses, Total Dissolved Oxygen (mg/l) | Title changed as suggested. |
| 2-7 | Figure 2-2 | Plot | 2.3.4 | | Remove data from mile 62.2 from the chart (not the control reach). Add line titled "PA Mean Daily Dissolved Oxygen Criteria" parallel to the x axis at 5.0 mg/l. on y axis. | | RM 62.2 data removed from table. Line added to figure |
| 2-9 | 2 | 1 | 2.3.5 | Several low-head dams... | | Ten low-head dams.... | Text changed as suggested |
| 2-13 | 1 | | | | | | No comment was provided |

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| 2-13 | 2 | 1 | 2.3.4. | The database covers various times and extends, in some cases, back to 1964. | | Beginning as early as 1964, intermittent water quality sampling has been conducted at various locations throughout the Mahoning River PA study area. More specifically, historical sampling sites were located between RM 0.7 and RM 10.5, with the most frequently sampled location being RM 7 at the State route 224 bridge in Edinburg, PA. | Text changed as suggested |
| 2-13 | 3 | 2 | 2.4 | The State of Ohio posted a Human Health Advisory in 1988 for the Mahoning River below RM 4.5; the advisory cautioned against "contact" with sediments and frequent fish consumption. | Be more specific. | The State of Ohio posted a Human Health Advisory in 1988 for the Mahoning River for the reach located between RM 41.5 and RM 12.8 (the PA-OH State line). This advisory cautioned against "contact" with sediments and frequent fish consumption. | Text changed as suggested |
| 2-13 | 3 | 3 | 2.4 | Ohio's current (2001) advisory applies to white crappie, smallmouth bass spotted bass, and walleye (ODH 2001) | What kind of advisory, a contact advisory, a fish consumption advisory, or both? Revise sentence to clarify. | Ohio's current (2001) sediment contact and fish consumption advisory specifically cautions against the consumption of white crappie, smallmouth bass, spotted bass, and walleye (ODH 2001) | Text changed as suggested |
| 2-13 | 3 | 4 | 2.4 | Pennsylvania's current (2001) Public Health advisory, however, does not include fish from the Mahoning River (PaDEP 2001). | Clarify. Does PA have a contact advisory for the Mahoning PA or only a fish consumption advisory? Does this sentence mean that PA advises against consumption of species of fish other than those OH has flagged? | | The text was revised to indicate that the PA advisory applies only to consumption, and fish from the Mahoning River are not included in the advisory |

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| 2-13 | 3 | 5 & 6 | 2.4 | <p>The Mahoning River in Pennsylvania is currently underutilized. Although the Mahoning River is designated a warm water fishery by the PaDEP, the currently degraded state of the river prevents its effective use as a resource.</p> | <p>Clarify. Underutilized in what way? Suggest rewriting and incorporating thoughts on the riparian corridor as alluded to in sentence 3 of paragraph 5.</p> | <p>The existing intact, biologically healthy, and aesthetically appealing riparian corridor is an extremely valuable resource. Not only is a healthy riparian corridor an integral component for successful stream restoration, but also it is beautiful enough to attract recreational enthusiasts. However, because of the degraded state of the river, the recreational potential of the Pennsylvania reach of the lower Mahoning River, which has been designated as a warm water fishery by the Pa PaDEP, is currently underutilized.</p> | <p>Suggested paragraph added</p> |
| 2-13 | 4 | 1 | 2.4 | <p>The project goal is to remediate the Mahoning River within the Pennsylvania 12-mile reach of the river to restore the aquatic ecosystem to the biotic integrity existing on a model reach of the lower Mahoning River located just upstream of the reach investigated in the 1998 Ohio study.</p> | <p>Clarify and be specific.</p> | <p>The project goal is to restore the aquatic ecosystem of PA reach of the lower Mahoning River, utilizing multi-metric biological indicators to measure success and the same control or reference reach as was used for the 1998 Mahoning River Ohio Reconnaissance study. This reference reach was also located on the lower Mahoning River, but in Ohio, upstream of all principal industrial sources of sediment contamination (between RM 43.0 and 46.17).</p> | <p>Text changed as suggested</p> |
| 2-13 | 5 | 2 | 2.4 | <p>Potential uses of the river include robust fishery and recreational opportunities that pose no environmental or health concerns.</p> | | <p>Additional potential benefits from successful ecosystem restoration will be the removal of the existing public health advisory, enhancement of the native fishery, and recreational opportunities that pose no environmental or health concerns.</p> | <p>Text changed as suggested</p> |

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| 2-3 | 5 | 3 | 2.4 | In addition, with the healthy vegetation along its banks, the river has the potential for being a more valuable aesthetic resource. | Delete. | | Sentence deleted |
| 2-4 | 5 | 4 | 2.4 | These potential uses are dependent on successful implementation of one or more restoration activities as discussed later in this report. | Delete or modify. Uses and benefits are not the project goal. "Can" or "will" restoration be accomplished? | Restoration of the aquatic ecosystem, with associated benefits and uses, can be accomplished through the successful implementation of one or more of the restoration activities as discussed later in this report. | Text changed as suggested |
| 2-5 | 1 | Section Title | 2.5 | Regulatory Issues | Be specific. There may be other regulatory issues, such as sedimentation control or wetlands. | Landfill Regulatory Issues. | Text changed as suggested |
| 2-5 | 1 | 2 | 2.5 | Landfill profiling samples were collected at several sampling locations in the river including RM 4.6, 6.9, 7, and 10.6. | Include bank and in-river sampling efforts, with specifics. Check to see if bank samples collected during the PA supplemental bank sampling efforts were analyzed for TCLP. If they were, modify sentence appropriately. | Landfill profiling samples were collected from the top six inches of sediment at several sampling locations within the stream channel, including RM 4.6, 6.9, 7, and 10.6. Landfill profiling samples were also collected from river banks at six transect locations (RMs 11.25, 11.2, 9.9, 6.8, 4.6/4.7, and 0.4), which were selected to characterize "worse-case" in-bank materials. Bank core samplers were driven to resistance and samples were collected from each distinct soil horizon. | Text modified to reflect the actual location, depth and type (river channel or bank) of TCLP sample collected |
| 2-5 | 2 | 1 | 2.5 | Under current regulations, | Be specific: | Under current Pennsylvania regulations, | Text changed as suggested |
| 3-1 | 1 | 1 | 3.1.1 | For this feasibility study, analytical data from 24 sampling stations were evaluated. | Be specific, paragraph should stand alone. | For the 1976 USACE feasibility study, sediment and water quality data from 24 sampling stations were evaluated. | Text changed as suggested |

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| 3-1 | 1 | 3 | 3.1.1 | The sediment samples were analyzed for oil and grease, metals, and several other parameters. | Which other parameters? | | Other parameters were specified in text. |
| 3-1 | Bullet 1 | 1 | 3.1.1 | PI values were above one for all locations except at the upstream RM 46.2. | Be more specific. | Sediment samples from all in-stream locations except in the control reach (RM 46.2 to xx) were characterized as polluted, with PI values greater than one. | Text changed as suggested |
| 3-1 | Bullet 2 | 1 | 3.1.1 | Zinc levels in the bottom deposits... | | Elevated zinc levels in the river bottom sediment... | Text changed as suggested |
| 3-1 | 1 | Bullet 3 | 3.1.1 | The oil and grease content of the bottom sediment was the second most significant pollutant characteristic, with the standard exceeded ten or more times from RM 24 downstream. | Replace "pollutant characteristic". Clarify, what standard? | Oil and grease, in river bottom sediment from the reach located between RM 24 and RM 1.8, was the second most significant contaminant, with concentrations ten or more times greater than the USEPA PI value. | Text changed as suggested |
| 3-1 | 2 | 1 to 3 | 3.1.1 | For this study, ten sediment background samples from Hickory Run and eight samples from various sampling points from RM 12 to RM 0 in the Pennsylvania reach. Hickory Run is a tributary that flows into the Mahoning River just upstream of its confluence with the Shenango River. Only one sample was collected from riverbank materials. | Be specific, each paragraph should stand alone. | For the USFWS' 1992 study of the sediments and fish of the Pennsylvania reach of the Mahoning River (RM 0 to 12), ten surface sediment samples were collected. Seven of these were collected from the river channel of the study reach and one was collected from river bank materials. In addition, two background samples were collected from Hickory Run, a right descending bank tributary which confluences with the Mahoning River at RM 2. | Text changed as suggested |

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| 3-2 | 2 | 3 | 3.1.1 | Insert new sentence after sentence 3. | Provide the same info as provided for the first study. | The sediment samples were analyzed for heavy metals, oil & grease, PAHs, pesticides, PCB's, (???) Check parameters) and the analytical results were compared to the USEPA (1977) guidelines for the classification of Great Lakes sediments. | Text changed as suggested. Parameters were checked. |
| 3-2 | bullet 1 | 2 | 3.1.1 | PAH concentrations in the Pennsylvania reach of the river showed somewhat lower concentrations than in the Ohio reaches of the river. | Are these data being compared to results of analyses from another study or did the EPA sample in the Ohio reach of the Mahoning R? If didn't sample the OH reach, modify sentence. | PAH concentrations observed in river channel surface sediments of the PA reach were somewhat lower than those observed during previous sediment studies conducted in the Ohio reach. | Text changed as suggested |
| 3-2 | bullet 2 | 1 | 3.1.1 | The riverbank sample was consistently the most contaminated of the Mahoning River samples. | Explain "the most contaminated" | The riverbank sample contained higher concentrations of ??? (all parameters analyzed ???) than the sediment samples collected from the river channel. | Text changed as suggested. Parameters were checked. |
| 3-2 | 1 | 1 | 3.1.1 | Missing Study. | Include info on the USACE 1999 Mahoning River Ohio Environmental Dredging Reconnaissance Study. | Insert: <i>USACE Mahoning River Ohio Environmental Dredging Reconnaissance Study, May 1999</i> , with details. | A discussion of the Ohio report was inserted into the text. |
| 3-2 | 1 | Title | 3.1.1 | Results of Supplemental River Bank Sediment Sampling Conducted.... | Use exact name of the study. | | Name of study was obtained from the subject line of a Memorandum dated March 22, 1999 |

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| 3-2 | 1 | 1 to 4 | 3.1.1 | As part of the Mahoning River Ohio study, USACE personnel collected samples along seven representative transect stations on the banks of the Mahoning River. A total of 46 bank material samples were collected from 19 core holes. The purpose of the sampling was to supplement the initial Ohio study where bank sampling was not a major focus. A total of 46 bank material samples were collected from 19 core holes. | Be specific, put purpose up front, then describe study. Also, bank sampling surveys were conducted on two different dates: July and then in Sept 1998. 46 samples were collected from 19 core holes during the September survey only. | As a supplement to <i>The USACE Mahoning River Ohio Environmental Dredging Reconnaissance Study, May 1999</i> , which focused on characterizing in-stream sediments, in July and September 1998, USACE personnel conducted a cursory survey of the quality and distribution of bank sediments/soils of the lower Mahoning River Ohio. A total of 57 bank material samples were collected from 31 core holes, located at 11 transects, which were distributed between RM 40.95 and RM 16.2. Transect locations were purposefully biased to represent a "worse case" scenario. | Text changed as suggested |
| 3-2 | 1 | add before sentence 5 | 3.1.1 | | Add sentence providing info on analyses, as with the first study. | The sediment samples were analyzed for TRPH, heavy metals, PAHs, pesticides, PCB's, and dioxin (Check). | Text changed as suggested Parameters were checked. |
| 3-2 | bullet 3 | 1 | 3.1.1 | ...and occur at similar locations and elevations as , the... | Remove comma | ...and occur at similar locations and elevations as the... | Text changed as suggested |
| 3-2 | bullet 5 | part 3 | 3.1.1 | there was a finite lower depth limit to the bank contamination. | Be more specific | there was a distinct horizontal and vertical limit to the extent and distribution of the contaminated soils/sediments in the river banks, with the deeper, most contaminated materials lying closest to the soil/water interface. | Text changed as suggested |
| 3-2 | bullet 6 | 1 | 3.1.1 | ... were found to correlate well with the concentrations reported for other contaminants. | Be more specific | ... were found to correlate well with the concentrations reported for other contaminants of concern, such as PCBs and heavy metals. | Text changed as suggested |

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| 3-2 | 2 | 1 | 3.1.2 | For this current reconnaissance study, sampling and analyses of sediment was performed in the Pennsylvania reach of the Mahoning River. | Be more specific. | Sediment quality sampling and analyses were also conducted on in-stream and bank sediments/soils along the Pennsylvania reach of the lower Mahoning River, in support of <i>The Lower Mahoning River, Pennsylvania Environmental Dredging Reconnaissance Study</i> . | Text changed as suggested |
| 3-2 | 2 | 3 | 3.1.2 | Sections from the "Sampling and Analyses Report, Lower Mahoning River" are provided on Appendix B; | Be more specific. | Sections from the "Sampling and Analyses Report, Lower Mahoning River", which outlines the complete sampling plan for this reconnaissance study, are provided in Appendix B; | Text changed as suggested |
| 3-2 | 2 | 3 | 3.1.2 | For the current study, sampling of river and bank sediments was performed at seven transects located at RMs 10.6, 8.8, 6.9, 6.8, 4.2, 1.7, and 46.2. | | Sampling of surface (0 to 6 inches) in-river and bank sediments was performed at seven transects located at RMs 10.6, 8.8, 6.9, 6.8, 4.2, and 1.7, and in the control reach at RM 46.17. | Text changed to reflect suggestion |
| 3-2 | 2 | 4 | 3.1.2 | Additional bank sampling was performed near RM 6.8/6.9 and RM 4.6/4.7 in a second sampling event, and RM 11.25, 11.2, and 0.4 in a third sampling event. | No need to separate each sampling event. | Additional sampling was conducted to characterize the quality and vertical and horizontal distribution of contaminated material in the river banks. Six bank sampling transects were selected at RMs 11.25, 11.2, 9.9, 6.8, 4.6/4.7, and 0.4, where transect locations were biased to represent a "worse case" scenario and sample cores were driven to resistance. | Text changed to reflect suggestion |
| 3-2 | 2 | 6 | 3.1.2 | Select samples were also analyzed for volatile organic.... | | Select samples were also analyzed for the USEPA's priority pollutant volatile organic.... | Text changed as suggested |
| 3-2 | 3 | 1 | 3.1.2 | Where appropriate, the sampling data collected during... | | Where appropriate, the sediment quality and quantity data collected during... | Text changed as suggested |

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| 3-2 | 3 | 2 | 3.1.2 | In particular results from the Ohio Mahoning study were used as a basis for comparing upstream and downstream conditions. | | PA data was compared primarily to data collected for the 1999 Mahoning River Ohio Environmental Dredge Reconnaissance Study, to demonstrate differences between conditions in the PA reach and those further upstream and closer to the sources of historical pollution. | Text changed as suggested |
| 3-2 | 3 | 3 & 4 | 3.1.2 | Before the Ohio and Pennsylvania data can be compared, however, it is important to note the differences in the sampling and data collection methodologies. In both studies it was the intent to characterize the manner in which contamination in the sediments varied with depth (also known as the "vertical profiling"). | | Although there were some differences between sample analyses and sample collection methodologies, the intent of both studies was to characterize the quality and vertical and horizontal distribution of contaminated sediments and bank material. All studies demonstrated a general trend towards decreasing concentrations of contamination with distance from historical sources. | Text changed as suggested |
| 3-2 | 3 | 5 | 3.1.2 | The degree to which this goal was attained varied between the two studies. It also varied between the in-stream and riverbank sampling efforts. | | Delete | Sentence deleted |
| 3-3 | 2 | 1 & 2 | 3.1.2 In-Stream Sampling | In the current reconnaissance study, direct push samplers were advanced in the river transects until refusal was encountered. At least four in-stream samples were collected at each transect. | | For the current reconnaissance study, a minimum of 4 sediment samples were collected along each of the seven transects. Samples were collected utilizing a 1" diameter sampler (?? check), which was hand pushed into the river bottom until refusal was encountered. | |

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| 3-3 | 2 | 3 | 3.1.2 In-Stream Sampling | ...this was reportedly due to the coarse nature of the sediments, possible bedrock protrusions, and/or a very dense clay layer. | | ...this was likely because the usefulness of a hand pushed auger is limited in coarse or hard sediments. | Text changed as suggested |
| 3-3 | 2 | 5 | 3.1.2 In-Stream Sampling | Field screening using a photoionization detector (PID) revealed that in all cases, the sediment collected from the 0- to 6-inch interval exhibited the highest PID readings. Therefore, all of the sediment samples collected for laboratory analyses were from the 0- to 6- inch interval. | Add qualifier to end of sentence 5. | In addition, a PID, which detects only volatile organic compounds (VOCs), is not an effective screening tool for Mahoning River sediments where the primary contaminants of concern are TRPH, heavy metals, PAHs, and PCBs. This sampling effort must therefore be considered as surface sampling. | Suggested wording not used since it implies that the PID was the "wrong" instrument to use. Field screening with a PID is a standard method for collecting qualitative data to supplement visual observations. It was not intended to provide quantitative data. |
| 3-3 | 3 | 1 to 3 | 3.1.2 In-Stream Sampling | In the Ohio study, only one in-stream sample was collected at each transect. Although it was the intent to establish a vertical profile, the in-stream samples were collected from the top 4 feet of sediment as described below. The exact interval from which these samples were collected was not evident. | | For the Mahoning Ohio Reconnaissance in-stream sediment quality survey, one mid-channel sediment quality sample was collected upstream of each of the ten existing low head dams. Samples were extracted utilizing a 3" diameter split barrel sampler, driven by a 140-lb hammer to resistance. Material from each core, which averaged 4 feet deep, was composited for analyses. When recovery was poor because material was too coarse, these composited samples were "worse case" biased with the addition of near shore silts. For the landfill profiling samples (TCLP), which were also collected upstream of each dam, a hand auger was utilized. | Text changed as suggested |

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| 3-3 | 4 | 1 to | 3.1.2 In-Stream Sampling | <p>From the above it can be inferred that for both studies, the in-stream sampling was biased towards the collection of surficial materials, and additionally biased towards the collection of near-shore silts. Therefore, there appears to be a reasonable bias for comparing Ohio and Pennsylvania results for the instream samples and observing how contamination appears to vary as a function of distance from former industrial sources.</p> | <p>For the Ohio study, samples were collected from 0 to 4 feet and the PA study, only 0 to 6 inches. Also, sampling methods were different.</p> | <p>From the above it can be inferred that, since the in-stream sediment quality samples for the Ohio reach were composited sediments from the surface to 4 feet deep or resistance and those collected from the PA reach were from the surface and also sampling techniques were very different, the data from these two studies are only slightly comparable.</p> | Text changed as suggested |
| 3-3 | 6 | Header | 3.1.2 In-Stream Sampling | <p>Pennsylvania Reconnaissance Study (Current Study)</p> | <p>Section 3.1.2 is the Current Study. This header is redundant.</p> | <p>A summary of the results of the Mahoning River PA in-stream sediment quality analyses follows.</p> | Text changed as suggested |
| 3-3 | Bullet 1 | | 3.1.2 In-Stream Sampling | <p>The highest TRPH concentrations...</p> | | <p>The highest Total Recoverable Petroleum Hydrocarbons (TRPH) concentrations...</p> | No change; TRPH defined earlier |
| 3-4 | Title | | 3.1.2 In-Stream Sampling | <p>Compared to the Ohio Reconnaissance Study (1999) (Figures 3-1 and 3-2)</p> | <p>Title confusing, present in sentence form.</p> | <p>Comparing the results of analyses of in-river sediments from the PA reach with those documented during the 1999 Mahoning River Ohio reconnaissance study revealed the following (Figures 3-1 and 3-2):</p> | Text changed as suggested |
| 3-4 | Bullet 1 | 2 | 3.1.2 In-Stream Sampling | <p>The highest concentrations were reported at around RM 16 and RM 37.</p> | | <p>The highest concentrations were reported at around RM 16 and RM 37 in the Ohio reach. The highest TRPH concentration documented in the PA reach was at mile 6.8, upstream of the only low head dam in this reach.</p> | Text changed as suggested |

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| 3-4 | Bullet 2 | 2 | 3.1.2 In-Stream Sampling | However, with the exception of one outlier (2,089 ppm at RM 18.2)... | | However, with the exception of one outlier (2,089 ppm from a site located upstream of the Youngstown-Hasselton Center Street Dam in the Ohio reach at RM 18.2), | Text changed as suggested |
| 3-4 | Bullet 3 | 1 | 3.1.2 In-Stream Sampling | ...however, low concentrations of PCBs were reported in select samples. | Samples with low concentrations of PCBs were not selected. | ...however, low concentrations of PCBs were reported in a few sediment samples collected from the Ohio reach of the Mahoning River. | Text changed as suggested |
| 3-4 | 1 | 1 & 2 | 3.1.2 River bank sampling Results | Bank sampling methodology was not consistent from transect to transect. At some locations, both surface and deeper samples were collected; at other locations, both surface and deeper samples were collected. | Specifics on bank sampling were addressed earlier in this report, repeat them here or refer to the appropriate section. Note that when efforts were made by COE staff to address the vertical component of the distribution of contaminated bank materials during the supplemental bank material quality survey, methodologies were consistent. Also during this effort, samples were collected from each distance horizon, including the surface (0 to 6 inches). Bank samples collected WasteTron's initial bank survey were basically surface samples. These results must be compared appropriately and it must be clear that there was a "a method to this madness". Also, since the previous paragraph mixed the PA with the OH studies, be specific as to which study you are talking about. | | In order to avoid confusion, no distinction was made between Wasiron and COE sampling efforts. The text was modified slightly to clarify that PA bank sampling was being discussed. |

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| 3-4 | 1 | 3 | 3.1.2 River bank sampling Results | Where contamination at various depths could be characterized, some trends could be inferred from the data. | | Where deeper samples were collected and distinct soil horizons were analyzed, trends could be inferred from the data. | Text changed as suggested |
| 3-4 | 1 | 6 | 3.1.2 River bank sampling Results | It was also noted that the most contaminated sediments were the sandy silts/ silty sands encountered at the bank/river interface. | Was this observation true of the surface data collected by WasteTron during their first survey or of the vertical profile data collected later? If it is the later, this material would more likely be described as oily, clayie mucky, silt with little or no sand. | | Text was deleted because it was only a visual observation noted at a limited number of locations. |
| 3-5 | Figure 3-1 | Title | 3.1.2 River bank sampling Results | Contaminant Concentrations in Sediments from the Stream Channel | All titles should stand alone. Also why pick these parameters, because of exceedances? If so, modify sentence. | Lower Mahoning River Ohio and PA, Stream Channel Sediment Quality Analyses for Parameters with Significant Analytical Exceedences, 1998 and 2000 | Title changed as suggested. |
| 3-5 | Figure 3-1 | Plot | 3.1.2 River bank sampling Results | | No distinction between OH and PA data or the control reach. | Add line on the chart at State line and also at the downstream end of the control reach. | Line added to chart |
| 3-5 | Figure 3-1 | Plot | 3.1.2 River bank sampling Results | | Since data isn't quite comparable a qualifier is necessary. | Add a qualifier to bottom of chart indicating that the OH samples were composited 0 to 4 feet deep and the PA samples were 0 to 6 " or surface. | Qualifier added to chart |
| 3-6 | Figure 3-2 | Plot | 3.1.2 River bank sampling Results | Metal Concentrations In sediments from the Stream Channel. | All titles should stand alone. | Lower Mahoning River Ohio and PA, Stream Channel Sediment Quality Metal Analyses, 1998 and 2000 | Title changed as suggested. |
| 3-6 | Figure 3-2 | Plot | 3.1.2 River bank sampling Results | | No distinction between OH and PA data or the control reach. | Add line on the chart at State line and also at the downstream end of the control reach. | Line added to chart |

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| 3-6 | Figure 3-2 | Plot | 3.1.2 River bank sampling Results | | Since data isn't quite comparable a qualifier is necessary. | Add a qualifier to bottom of chart indicating that the OH samples were composited 0 to 4 feet deep and the PA samples were 0 to 6 " or surface. | Qualifier added to chart |
| 3-7 | 1 | 2 through 4 | 3.1.2 River bank sampling Results | A limitation in comparing the Ohio and Pennsylvania studies however, related to the size of the two data sets. In the Ohio study, only 11 bank samples were collected. In the Pennsylvania study, over 100 bank samples were collected. | This is not true. As discussed above, only three bank samples were collected by AWK during the first sampling round. However, 56 bank samples were collected from 31 core holes at 11 transects locations along the Ohio reach of the Mahoning River. Delete these sentences. | | Sentences were deleted |
| 3-7 | bullet 5 | 1 | 3.1.2 River bank sampling Results | Total SVOCs (mostly PAHs) were highest at RM 6.9 (... | | Total SVOCs (mostly PAHs) were highest at RM 6.9, upstream of the only lowhead dam located within the PA reach of the lower Mahoning River (.... | Text changed as suggested |
| 3-8 | bullet 1 | 1 | 3.1.2 River bank sampling Results | Metal concentrations were within the ranges observed in the stream channel; however, chromium, lead, and zinc were generally reported at higher concentration within the stream channel. | Clarify. | Metal concentrations observed in bank samples were within the ranges of those observed in the stream channel. However, chromium, lead, and zinc were generally reported at higher concentrations in the stream channel than in the banks. | Text changed as suggested |
| 3-8 | 1 | 1 | 3.1.2 River bank sampling Results | ...in the Pennsylvania reaches of the Mahoning River revealed that the surficial silts and sands within the stream channel exhibited contamination above background levels but not above levels observed in the Ohio reaches of the river. | Qualify. | ...in the Pennsylvania reach of the lower Mahoning River revealed that the surficial fine grained sediments located within the stream channel exhibited levels of contamination above background but lower than levels observed in the 0 to 4 feet deep composited samples collected in the Ohio reach. | Text changed as suggested |

June 4, 2001

Ms. Irene Mendoza, P.E.
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Greenbelt, Maryland 20770

Dear Irene:

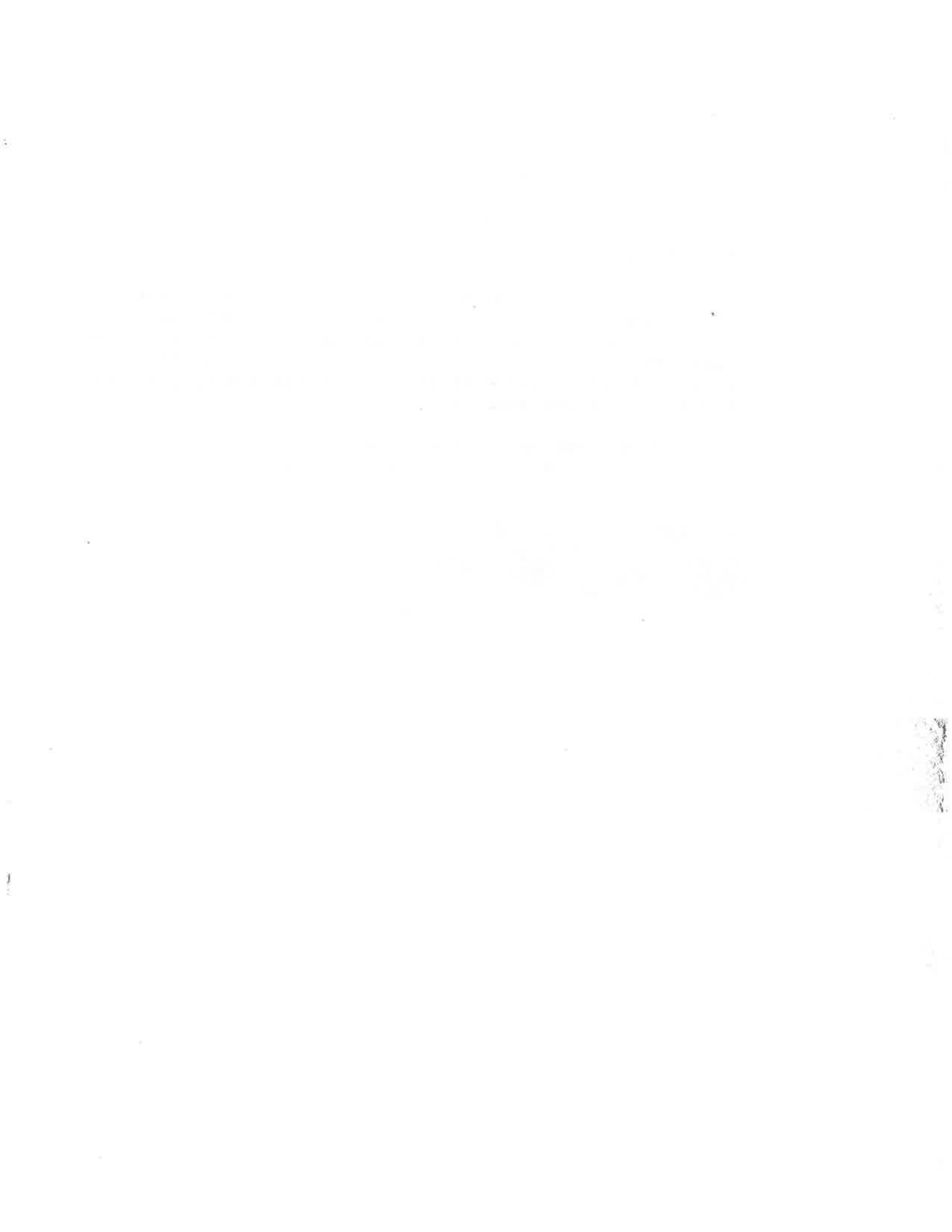
Enclosed are copies of comments prepared to date on the Draft Lower Mahoning River, Pennsylvania Environmental Dredging Reconnaissance Study that you submitted by letter dated March 30, 2001. As indicated to you by phone message on June 4, the balance of review comments and real estate input will follow shortly.

Please begin addressing the comments as soon as possible and refer any questions to me at 412-395-7210.

Sincerely,



Edward J. Smith
Chief, Plan Formulation Section
Pittsburgh District



Smith, Edward J LRP

From: Kothari, Dilip J LRP
Sent: Thursday, May 10, 2001 3:34 PM
To: Smith, Edward J LRP
Cc: Rozzi, Carmen LRP
Subject: FW: Review of the Lower Mahoning River - PA, Environmental Dredging Reconnaissance Study

Ed:

This completes ED review of the subject report.

Dilip

-----Original Message-----

From: Debes, Michael R LRP
Sent: Thursday, May 10, 2001 3:23 PM
To: Kothari, Dilip J LRP; Rozzi, Carmen LRP
Cc: Debes, Michael R LRP
Subject: Review of the Lower Mahoning River - PA, Environmental Dredging Reconnaissance Study

Hi Dilip and Carmen,

From the sections that I read in the Environmental Dredging Reconnaissance Study, Lower Mahoning River, Penn, it was well written and I have no comments.

Michael Debes.....7327.

Smith, Edward J LRP

Sent: Thursday, April 26, 2001 9:05 AM
To: Kothari, Dilip J LRP
Cc: Rozzi, Carmen LRP; Sekela, James E LRP; Rozzi, Carmen LRP; Lebder, Carmen A LRP
Subject: RE: Mahoning PA Recon Report Review

I reviewed the draft Recon Report and found it to be very complete and thorough. My one comment would be that a general plan map be included with the Recon that shows the limits of the potential dredging. (The Plate 1 Base Map at the rear of the Report gives details of Sed Sampling, Hist Structures sites, etc. but I could not find a general, overall Plan view--unless it's in there and I missed it).

-----Original Message-----

From: Kothari, Dilip J LRP
Sent: Thursday, April 19, 2001 7:12 AM
To: Lebder, Carmen A LRP; Debes, Michael R LRP; Carney, Craig LRP
Cc: Rozzi, Carmen LRP; Sekela, James E LRP
Subject: Mahoning PA Recon Report Review

REVIEW COMMENTS BY DILIP KOTHARI (ED-GD)
DRAFT LOWER MAHONING RIVER, PENNSYLVANIA ENVIRONMENTAL
DREDGING RECONNAISSANCE STUDY, MARCH 2001

1. Page 1-1, Section 1-2, First Paragraph, Second Sentence
Add a note here that all River Miles mentioned throughout the report are USACE River Miles and they are different from Ohio EPA River Miles.
2. Page 3-3, section 3.1.2, next to last bullet item.
Provide source of background levels.
3. Page 3-3, section 3.1.2, last bullet item.
Provide background concentrations of each metal listed. Also state the source of background concentrations.
4. Page 3-4, section 3.1.2.
Reference to Figures 3-1 and 3-2 should only be made at fourth bullet. These figures are for metal results and first three bullets refer to parameters other than metals.
5. Page 3-7, section 3.1.2, second bullet.
Figure 2.5 is not provided. Should it be Figure 3-4? Please check. If it is Figure 3-4, it should be moved to page 3-8.
6. Page 4-8, section 4.2.3, second paragraph, first sentence.
Remove the word "bioremediation". Solidification/Stabilization, chemical treatment methods and ground freezing are not considered bioremediation.
7. Page 4-8, section 4.2.3, second paragraph, fourth sentence.
See comment 5. Recommend replacing the word "bioremediation" with "treatment".
8. Page 4-10, section 4.3
Why do the numbering for alternatives start from 6 and not 1?
9. Page 4-10, section 4.3, Plan 1.
The word "bioremediation" should be deleted. Natural processes are not limited to biological processes. It can be physical, chemical, biological or any combination of them.
10. Page 4-12, Table 4-3.

Change "bioattenuation" to "attenuation". Attenuation will not be limited to biological processes. It can be physical, chemical, biological or any combination of them.

11. Page 4-12, Table 4-3

Reference to rail trail and rail crossings are made here and on page 4-21 but no detail is provided in any other sections of the report. It should be discussed in detail elsewhere.

12. Page 4-18, section 4.4.3, last paragraph, last sentence.
"two" should be changed to "to".

13. Page 4-19, section 4.4.4, fourth paragraph, third sentence.
How would increase in property values considered aesthetic benefit? It is understandable that it is financial or economic benefit.

14. Page 4-20, section 4.4.6, Plan 1.
Change "bioattenuation" to "attenuation". As stated in previous comments, attenuation is not limited to biological processes.

15. Page 5-1, Real Estate.
This section needs to be completed.

16. Page 6-1, section 6.3
Please provide Hazardous, Toxic, and Radiological Waste database search report in its entirety as an appendix to the report.

17. Page 10-1, section 10.0
USGS is repeated.

18. Appendix A (Ordinary High Water Determination), Page 10, first paragraph, sixth sentence.
"the" is misspelled".

19. Appendix A (Ordinary High Water Determination), Page 10, first paragraph, sixth sentence.
"sandbar" is misspelled.

20. Appendix B (Revised Sampling and Analysis Report).
Appendices C through I listed on page i are missing. Please provide the Sampling and Analysis Report in its entirety including all Appendices, Figures and Tables.

21. Appendix B (Additional Sampling and Analysis Report), Page 1 (of unnumbered report) Section 1.0, first paragraph, first sentence.
Change "immobilized" to "mobilized".

Reviewer Name: Groenjes, Cheryl
Discipline Chemistry
CX Project Review No. 67660
Date: 06/04/2001
Project Location Lower Mahoning River, PA – Environmental Dredging Reconnaissance Study
Document Name: Draft Reconnaissance Study Report

Comment # 1: p.2-4. Sec. 2.3.4, last two paragraphs. It should be noted that the means for the 1990-99 water quality data for each of the areas (PA, OH, and Control reaches) are very similar to the degree that they are not statistically different. For example, due to the high degree of variability in the iron data as reflected by the standard deviations shown; all area's mean iron values are within one standard deviation, and do not provide a clear distinction of these areas as being 'contaminated' vs. 'noncontaminated'. This is further complicated by the PADEP Water Quality Criteria of 1 mg/L being within this range also. These complexities are supported by figure 2-1 of the 1999 field data, which shows two exceedances of the PaDEP WQ criteria - the highest of which was found in the upstream control reaches. These facts should be clarified within these paragraphs in addition to existing text.

Comment # 2: p.2-4. Tbl 2-2, and explanatory text within 2.3.4. Data is discussed on an individual point basis, and as reflected by the mean and standard deviation. If possible, clarify whether the intent of PaDEP guidelines concerning the published WQ criteria is for application and comparison on an individual data point basis or on the basis of mean and some confidence interval.

Comment # 3: p.2-5 and 2-7, figs.2-1 and 2-2. If application of the PaDEP WQ criteria is on a point/point basis, suggest highlighting the appropriate levels on the figures.

Comment # 4: p.2-14, section 2.5, 1st paragraph. Disagree with the last sentence that further TCLP analyses is needed for verification to confirm the regulatory status of the dredged materials. During the current study, a conservative approach was taken to submit the most highly contaminated samples (as designated by field analytical measurements) for TCLP analyses in order to evaluate whether the waste is potentially hazardous. Data from the landfill profile table of App. B shows (predominantly) nondetects for all TCLP constituents with the exception of barium. The barium detections are small (2.01 and 1.18 ppm) in comparison to the TCLP limit of 200 ppm, and is not a source for concern. The text noted here states that from this information, the dredged materials were to be regulated as 'residual wastes'. Unless there is project knowledge or additional information available (substantially higher field readings, or totals data) that shows the materials have not been represented by the current TCLP data generated, suggest the deletion of this sentence for the following. Suggest the residual waste designation continue to be used during the feasibility study and the analytical protocols proposed be based on the potential scenarios for handling and disposal of this material as 'residual wastes'. Also, include any criteria established by waste receiving facilities within the feasibility study also.

Comment # 5: p.3-2, section 3.1.2. Define the maximum depth to which the vertical profiling sampling goals were obtained.

Comment # 6: p.3-3, section 3.1.2. Define the basis for the need for additional sampling, i.e., uncertainty or data gaps identified.). Without technical justification, these statements do not add value and should be stricken.

Comment # 7: p.3-3 to 3-4, section 3.1.2 – PA Recon. Study and PA compared to OH Recon. Study bullets.

a. Suggest the general bulleted statements be augmented with actual concentration ranges (as noted in the third bullet) to clarify the ambiguous 'several (or a number) times higher' 'order of magnitude' statements used.

b. Boring logs should be included within Appendix H to allow an evaluation of reference made in the 2nd paragraph, as well as providing additional data from the field analytical measurements. For instance, field analytical measurements for ST4 of RM6.9 transect should be investigated to evaluate the validity of the TRPH value of 4960 ppm in light of its discrepancy to other samples taken at that transect (i.e., 20, 106, 780 ppm).

c. The use of the term 'background levels' within this report is misleading – for the data does not represent a statistically valid assessment of background conditions, but is data from two upstream sampling locations. Appendix H refers to the data as being representative of the clean reach or control, which is more accurate.

Comment # 8: p.3-7, 2nd bullet. Verify reference is accurate, for there is no fig 2.5.

Comment # 9: p.3-7 5th bullet. Refer to 7.c as it pertains to the use of the term background.

Comment # 10: p.4-3. Verify the volume estimates for 4.2 and 6.8, (5th and 6th columns), they appear to have been reversed.

Comment # 11, app B.

a. p.8, second paragraph. The TRPH value of 4960ppm was found in a sample at 0-6". Text implies a depth of 8-12".

b. Include Boring logs.

MAHONING PA RECONNAISSANCE REPORT (DRAFT) REVIEW- COMMENT SHEET

Reviewer/Section: M. R. Ali/ED-CV

Date: 26 April, 2001

KTM/Section: Dillip Kothari/ED-GD

Comment No. 1
Reference Item: 4.4.1 Cost
Page: 4-11

Cost estimate should be prepared in accordance with the current engineering guidance, standards and policies as specified in the following document:
ER 1110-2-1302, CIVIL WORKS COST ENGINEERING, Section 19 and Appendix D
There is no indication whether this cost estimate was prepared per above guidance or not.

Comment No. 2
Reference Item: Hydraulic Dredging Cost Table 4-4
Page: 4-13

The location of the sediment disposal facility should be close to reducing the transportation cost. It is not clear that how far the truck driver to drive to dispose the excavated material. Is there any HTRW material needs to be removed? Table 4-1 on page 4-3 summarizes the volume of contaminated sediment but there is no cost shown for the decontamination work prior to disposal the sediment.

Comment No. 3
Reference Item: Mechanical Dredging Cost Table 4-5
Page: 4-14

Mobilization and Demobilization Cost: This cost should be based on the type of equipment that would be required for each type of dredging or other work. The tables 4-4 through 4-8 have the same cost for this item although there will be no same kind of equipment involvement. Since contractor will not use the same type of equipment for each alternative, this cost should not be the same as shown on this report.

Comment No. 4
Reference Item: Cost Table 4-4 through 4-8
Pages: 4-13 through 4-17

There is no cost for the subcontractor's item. If any portion of this task needs to be completed by the subcontractors, then Subcontractor's overhead & profit costs should be included with the unit price.

SUMMARY:
Contractor (A-E) should supply information on the basis of his/her unit costs.

Smith, Edward J LRP

From: Rozzi, Carmen LRP
Sent: Wednesday, May 02, 2001 2:42 PM
To: Smith, Edward J LRP
Cc: Koryak, Michael LRP; Kothari, Dilip J LRP; McAteer, Jennifer LRP; Reilly, Rosemary J LRP; Rozzi, Carmen LRP; Smith, Edward J LRP
Subject: Mahoning, PA - Comment



RE: Mahoning
Dredging - Alter.

Hi Ed,

1. Plan 5. The comprehensive dredging and bank removal should be the preferred plan, per Mike Koryak's comments to Jeff Benedict on the attached email; whether there is 5 feet or one inch of contaminants to be removed, it is surface area contact that is critical for ecosystem restoration purposes. Due to the problems encountered with characterization, if enough information is not available, we will need to obtain it in the next phase.

2. Recommendation page FCSA/PSP

Thanks CR

Smith, Edward J LRP

From: Benedict, Jeffrey M LRP
Sent: Wednesday, March 14, 2001 2:34 PM
To: Rozzi, Carmen LRP
Cc: Purdy, James A LRP; Koryak, Michael LRP; Reilly, Rosemary J LRP
Subject: RE: Mahoning Dredging - Alternatives

Carmen - I talked to Mike Koryak again about the general subject of sediment removal when sparsely distributed (compared to behind the dams or in depositional areas along bends).

He drove it home to me after significant effort that it is not merely tons of deposition, it is **surface area** of exposure that is also critical to aquatics or humans. This is obvious on the surface (no pun intended) but quite an awakening for me, as it assigns clear benefit and good rationale for removing even relatively sparse areas of contaminated sediment. We will be making a case of removing channel material either on the grounds that it is easy to get (low cost per ton) where it is very concentrated (behind dams along bends), or that the benefit of removing it is high per ton (sparsely distributed). What this suggests to me is that we very well could be making a point to remove a very high proportion of (or nearly all) of the channel material and the "easy to get" stuff under the banks. Mike did say that there will still have to be hard decisions made about "bank material" that is not very accessible. So we will still have degree of removal alternatives to consider. One way to look at that is that the deeply buried bank material **may** not cause any problems if it doesn't become exposed, but will be problematic if it does, that is the risk if we, knowingly or not, leave bank material behind.

I believe that we have a great deal of data on channel distribution of sediments from the YSU survey. My guess is that we could actually make a pretty good stab, not perfectly but pretty accurately, at exposure in terms of surface area of contaminated sediment per ton of sediment or per mile of river channel based on the information in Appendix H of the Recon Report (Sediment Volume Distribution Study). Scott's data should give us info on depths and distribution. This point would appear vital to include in our Feasibility Study. Making inferences on bank material will be tougher, as we will probably have to use considerable judgment based on limited sampling.

Thoughts?

-Jeff

-----Original Message-----

From: Rozzi, Carmen LRP
Sent: Wednesday, March 14, 2001 7:21 AM
To: Benedict, Jeffrey M LRP
Cc: Campbell, Deborah LRP; Debes, Michael R LRP; Koryak, Michael LRP; Kothari, Dilip J LRP; Lebder, Carmen A LRP; Reilly, Rosemary J LRP; Rozzi, Carmen LRP; Wood, Roger G LRP; Zaitsoff, Mark P LRP
Subject: RE: Mahoning Dredging - Alternatives

Hi Jeff,

Sorry I made that impression, my fault, your point is very well stated. we need to focus on an alternative that maximizes effectiveness. CR

-----Original Message-----

From: Benedict, Jeffrey M LRP
Sent: Tuesday, March 13, 2001 2:14 PM
To: Rozzi, Carmen LRP
Subject: Mahoning Dredging - Alternatives

Carmen - one follow up to our meeting this a.m. I agree that we want to remove as much material as we can and leave the river as pristine as possible, but we need to keep in mind that there could very well be limits as to what is reasonable to clean up every last square inch of the river. For example, if we need to spend, say, 20% of the dredging budget to remove 1% of the material, then it only makes sense to ask if that relatively huge expenditure is worth it. The sponsor will also have some say as to what we recommend, they're paying 50%, so I am concerned of a Corps attitude that "we're not going to be very receptive to alternatives A, B, C, D, E, F, G." That attitude is damaging and not good.

Have a good team meeting tomorrow.

-Jeff

RESPONSES TO MISCELLANEOUS COMMENTS ON DRAFT LOWER MAHONING RIVER,
PENNSYLVANIA ENVIRONMENTAL DREDGING RECONNAISSANCE STUDY

| <i>ED SMITH</i> | | |
|----------------------|--|---|
| Comment | Page & Section | Response |
| 1 | Plan map | Given the scale of the map, the limits of dredging cannot be delineated very clearly in a general plan map. The text prior to Table 4-1 was revised to clarify limits as follows: "Potential dredging limits for RM 0.0 to 6.8 are adjacent to the banks and approximately symmetrical. Limits for RM 6.8 to 11.85 cover the entire channel width. These limits should be refined in the feasibility analysis." |
| <i>DILIP KOTHARI</i> | | |
| Comment | Page & Section | Response |
| 1 | Pg. 1-1, Sec.1.2, 1 st ¶, 2 nd sentence | Note about the numbering of River Miles was added |
| 2 | Pg. 3-3, Sec. 3.1.2, next to last bullet | Text was modified to provide source of information. Background levels were derived from the control reach - RM 46.2. |
| 3 | Pg. 3-4, Sec. 3.1.2, last bullet | Text was modified to provide background levels were provided for each of the metals. |
| 4 | Pg. 3-4, Sec. 3.1.2, | Reference to Figures 3-1 and 3-2 was moved to the 4 th bullet. |
| 5 | Pg. 3-7, Sec.3.1.2, 2 nd bullet | Figure 3.4 was moved in the report and figure number corrected in text. |
| 6 | Pg. 4-8, Sec. 4.2.3, 2 nd ¶, 1 st sentence | The word "bioremediation" was deleted in the sentence. |
| 7 | Pg. 4-8, Sec. 4.2.3, 2 nd ¶, 4 th sentence | The word "bioremediation" was replaced with "treatment." |
| 8 | Pg. 4-10, Sec. 4.3 | Text was revised to incorporate proper numbering. |
| 9 | Pg. 4-10, Sec. 4.3, Plan 1 | Text was revised and the word "bioremediation" deleted |
| 10 | Pg. 4-12, Table 4.3 | The word "bioattenuation" was replaced with the word "attenuation." |
| 11 | Pg. 4-12, Table 4.3 | After the 2 nd paragraph in section 4.4.1 (cost) the following paragraph was added: "Plans 3 and 4 require construction access either by temporary road crossings over an active rail line at approximately RM 8 and RM 11.3 or by the bike trail (rails-to-trails). The feasibility of using the bike trail for construction access should be evaluated in the next study phase." |
| 12 | Pg. 4-18, Sec. 4.4.3, last ¶, last sentence | Text was revised to replace "two" with "to." |

| | | |
|----|---|---|
| 13 | Pg. 4-19, Sec. 4.4.4, 4 th ¶, 3 rd sentence | It is a subtle, perhaps minor point, but the aesthetic benefit relates to the satisfaction of having higher property values over and above the actual economic benefit. Sentence was deleted. |
| 14 | Pg. 4-20, Sec.4.4.6, Plan 1 | The word "bioattenuation" was replaced with the word "attenuation." |
| 15 | Pg. 5-1, Real Estate | The Corps' Real Estate text was added to the text to complete section. |
| 16 | Pg. 6-1, Sec 6.3 | The HTRW sites have been mapped on Plate 1. None of the mapped sites is within close proximity to proposed project areas. The database report was not included because it does not provide any additional pertinent information. |
| 17 | Pg. 10.1, Sec 10.0 | Text was corrected. |
| 18 | App. A Pg. 10, 1 st ¶, 6 th sentence | Editorial correction was made to the Ordinary High Water Report. |
| 19 | App. A Pg. 10, 1 st ¶, 6 th sentence | Editorial correction was made to the Ordinary High Water Report. |
| 20 | Appendix B | As per G&O's conversation with Ed Smith, the sampling and analysis report was not included in its entirety since it includes extraneous information in its Appendices (i.e. analytical data sheets, QA/QC documentation, the scope of work, etc.). Instead, it was noted in the text in Section 3.1.2 that, "Sections from the Sampling and Analysis Report, Lower Mahoning River" are provided in Appendix B; the complete sampling and analysis report is available in the Pittsburgh District files under separate cover." |
| 21 | Appendix B | No changes could not be made to this Final Report. |

CHERYL GROENJES

| Comment | Page & Section | Response |
|---------|---------------------------------------|---|
| 1 | Pg. 2-4, Sec. 2.3.4, last 2 ¶ | Text added to indicate values are not significantly different and to clarify the text. |
| 2 | Pg. 2-4, Sect. 2.3.4 & Table 2-2 | Water quality criteria are for application on an individual point basis. Statistical comparisons were used to evaluate general water quality conditions in the Mahoning River data. |
| 3 | Figures 2-1 and 2-2 | A line was added in the figures to indicate PADEP water quality standards, |
| 4 | Pg. 2-14, Sec. 2.5, 1 st ¶ | Text revised. |
| 5 | Pg. 3-2, Sec. 3.1.2 | The depth of sampling is discussed under sampling results. Boring logs have been added to Appendix B. |
| 6 | Pg. 3-3, Sec.3.1.2 | This was a reconnaissance level study and additional sampling is typically performed during the feasibility phase. |

| | | |
|----|---|---|
| 7 | Pg. 3-3-4, Sec. 3.1.2 | a. Only general statements were made when comparing Ohio and Pennsylvania data because of the inherent differences in sampling methodologies between the two studies. . b. Boring logs have been included. c. Text was changed to refer to the "control reach." |
| 8 | Pg. 3-7, Sec. 3.1.2, 2 nd bullet | The text has been revised to correctly refer to Figure 3-4 instead of Figure 2.5. |
| 9 | Pg. 3-7, Sec. 3.1.2, 5 th bullet | Instead of referring to "background" concentrations, the text now refers to "control reach" concentrations. |
| 10 | Pg. 4-3 | The volumes are correct, but the table (Table 4-1) was reformatted to clarify the amounts. Table 4-2 was also reformatted. |
| 11 | Appendix B | Text of the Final Sampling and Analysis Report in Appendix B could not be revised. Boring logs have been included. |

M.R. ALI

| Comment | Section & Page | Response |
|---------|--------------------------------|---|
| 1 | Pg. 4-11, Sec. 4.4.1 | The following sentence was added to the beginning of section 4.4.1 (Cost). "Cost estimates were prepared in accordance with ER 1110-2-1302, Civil Works Cost Engineering, as it applies to reconnaissance level study." Section 19 of the document applies to the Feasibility phase. |
| 2 | Pg. 4-13, Table 4-4 | We agree that the location of the disposal facility should be as close to the source of material as possible. At the end of the Section 4.2.1 under disposal, we added the following paragraph: "One of the closest potential landfill locations may be the Carbon Limestone facility, just over the Ohio state line. Other facilities include the Seneca Landfill in Allegheny County, PA or the NW Sanitary Landfill in Butler County, PA. Transportation costs to the landfill facility are based on an average distance to these facilities from the center of the project area." Treatment costs are not included because the existing sampling data do not indicate the sediments are hazardous. (See the 2 nd paragraph under Treatment in Sect. 4.2.1) |
| 3 | Pg. 4-14, Table 4-5 | We agree that the type of equipment will affect mobilization costs. The location of the contractor will also determine costs. The value provided is considered a reasonable estimate based on a range of possibilities. The specifics will be determined in the feasibility stage. |
| 4 | Pg. 4-14-17, Tables 4-5 to 4-8 | The unit prices include overhead and profit in the cost tables. |

| | | |
|---------------------|---------------------------|--|
| 5 | Costs | The unit prices are based on other studies (including the study of the Ohio portion of the Mahoning) and are adjusted to conditions in Pennsylvania and to year 2001 dollars. |
| CARMEN ROZZI | | |
| Comment | Page & Section | Response |
| 1 | Pg. 4-21 et al. | In our justification of plan 4 over plan 5 we cited lower cost, less potential for environmental damage, and greater likelihood of attracting a non-Federal cost share partner. Although "one inch" has an effect on aquatics and humans, one inch is much more likely to be naturally attenuated than 5 feet. Also, according to our biological study, there is evidence that recovery is already occurring in Pennsylvania, evidence that apparently does not exist in Ohio. We have discussed this important subject at several of our meetings and it is a complex situation. Since there can be legitimate differences of opinion, we should defer to the Corps on this point. |
| 2 | Pg. 8-1 | FCSA/PAP was changed to FCSA/PSP. |

