

REPORT

DRAFT

NON-TIME-CRITICAL REMOVAL ACTION
DOCUMENTATION REPORT

VOLUME I

Grasse River Study Area
Massena, New York

Aluminum Company of America
Massena, New York

December 1995

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Executive Summary

Background/Objectives

In 1993, ALCOA proposed to remove PCB-containing sediment from a localized area within the Grasse River Study Area. Specifically, the sediment was located adjacent to ALCOA's Outfall 001. Based upon information and/or data that existed, the Agencies recommended that the remediation be implemented as a Non-Time-Critical Removal Action (NTCRA). The objectives of the NTCRA were to remove what was the most upstream major PCB source in the Grasse River while obtaining valuable site-specific data for use in the Analysis of Alternatives (AA) for the Grasse River Study Area. In accordance with the NCP, an Engineering Evaluation/Cost Analysis (EE/CA) was conducted to analyze removal action alternatives for the NTCRA. The EE/CA recommended that Grasse River sediments in the area of Outfall 001 be dredged, mechanically dewatered, and disposed in ALCOA's Secure Landfill located at the Massena Operations. Upon review of the EE/CA and comments received during a public comment period (May/June 1994), USEPA approved the NTCRA as recommended in the EE/CA.

ALCOA contracted with OHM Remediation Services Corporation (OHM) to prepare a removal design that would meet the objectives and recommendations set forth in the EE/CA. Final approval for this design was formally obtained from the Agencies in May 1995. In addition, Blasland, Bouck & Lee, Inc. (BBL) was responsible for developing a comprehensive environmental monitoring program that would provide sampling and monitoring to identify construction-related environmental issues. This program also was meant to provide site-specific data that would be used to develop the Grasse River AA Report.

NTCRA Operations Summary

In general, the NTCRA was conducted from June 19, 1995 to October 3, 1995, or a total of 110 days. During the project, ALCOA and its contractors accomplished the removal/dewatering/disposal of approximately 2,600 cy of sediments, along with 400 cy of boulders/debris, from within Removal Areas A and B (See Figure 5). All dewatered sediments and boulders were disposed in ALCOA's Secure Landfill.

From an operational perspective, the NTCRA program was very successful. Based upon the estimated volume of sediment remaining within Area A, approximately 84% of the sediments were removed. The operations also achieved approximately 27% removal of the total PCB mass estimated to be present throughout the Grasse River Study Area. In addition, based upon analytical data collected during the project, the containment system appeared to be very effective in controlling the release of suspended sediments resulting from the removal operations. This conclusion is evidenced by the fact that, although TSS readings inside the work area approached 250 mg/l, TSS levels outside the curtains were generally maintained well below the Agency-established action level of 25 mg/l above background. In accomplishing these operational successes, the project experienced only minor delays and only one significant design change (i.e., redesign of the silt curtain anchoring system). In addition, there was no lost time due to accidents.

Despite the successes, the project did experience some operational/technological limitations. Most notably, as dredging operations progressed, it became quite evident that given the general rocky nature of the River bottom, removal efficiencies associated with the horizontal auger were limited. As a result, a maximum of 14 inches (and an average of 4 inches) of sediment remains within Area A. Up to 6 inches of sediment also remains within Area B (Outfall 001), where removal was accomplished using manual hydraulic dredging techniques. In addition to the above, the project was extremely expensive. The actual total cost of the program was approximately \$4,870,000, or \$1,670 per cy. This includes design, construction, monitoring, sediment transportation/disposal, and construction management costs. Costs associated with Agency oversight and development of the EE/CA are not included.

NTCRA Monitoring/Environmental Effects

Post-NTCRA sediment sampling showed that PCBs were present in the remaining sediments. An overall arithmetic average of 75 mg/kg PCBs was detected within the remaining sediments located in Area A, with concentrations ranging between 1.1 mg/kg and 260 mg/kg. Although this average represents an overall decrease in PCB levels relative to original conditions (93% decrease, on average), concentrations in certain locations were

shown to increase significantly. In addition, although the arithmetic average PCB concentration decreased by approximately 86% in the top 12 inches of sediment (i.e., bioavailable zone), 30% of the post-NTCRA locations sampled experienced an increase in bioavailable zone PCBs from pre- to post-conditions. Up to 130 mg/kg PCBs also were found to be present within Area B following manual hydraulic removal, with a 64% reduction in average PCB concentrations noted in this area.

Water column data collected both during and after the removal operations showed that, despite the containment system's ability to significantly reduce TSS levels, PCBs did escape from the curtains. As indicated by the data collected at Transect 6.5 and throughout the entire Study Area, it appears that in addition to sediment-bound PCBs, soluble PCBs were released from the curtains. The presence of soluble PCBs likely developed as a result of the mixing that occurred within the curtained area. It is estimated that between approximately 5 and 30 pounds of PCBs were released from the containment system during removal operations. The data also showed that the PCBs escaping from the removal area also were migrating downstream. On several occasions, PCBs were detected above the acute Federal AWQC of 2 ug/l at locations adjacent to the curtain and, once at a location downstream of the Outfall 001 mixing zone. In fact, PCB concentrations as high as 13.3 ug/l were detected adjacent to the curtain perimeter. Relative to pre-NTCRA data, these levels are unprecedented and imply that the removal operations contributed significantly to such conditions.

Evidence of the release of PCBs from the containment system also is provided from the results of the biota monitoring activities. Specifically, in-situ exposure of fathead minnows during the caged fish studies (both during- and post-NTCRA study phases) demonstrated significant increases in PCB bioavailability as compared to the pre-NTCRA study (i.e., PCB concentrations increased 20- to 40-times). Similarly, post-NTCRA analytical results for a portion of the resident fish (i.e., spottail shiner samples) collected in the vicinity of the NTCRA area indicate that PCB concentrations were as much as six-times higher than PCB concentrations from previous years. Further evaluations in PCB bioavailability to Grasse River aquatic biota cannot be completed without long-term monitoring.

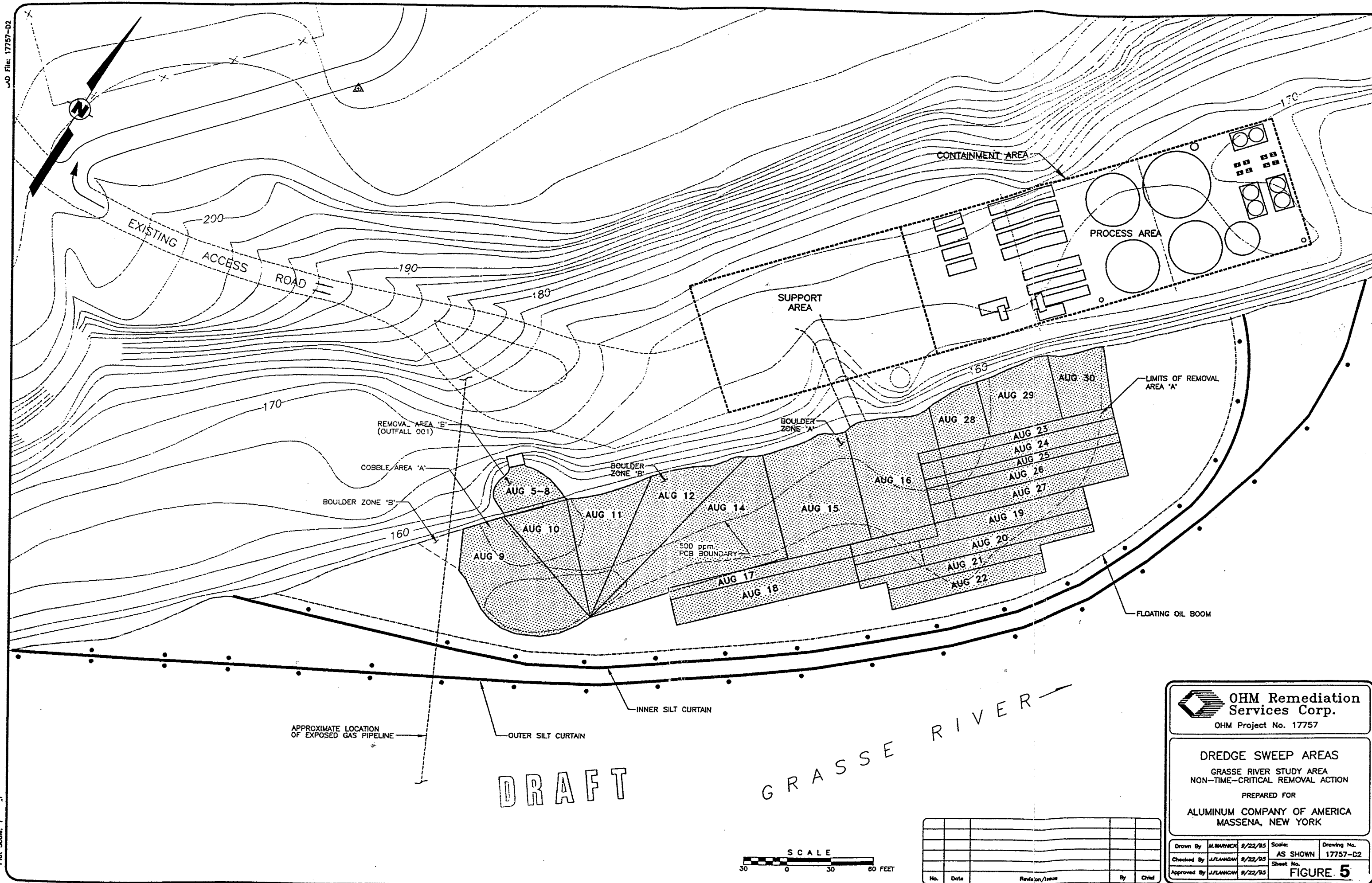
Finally, PCBs were not detected in any of the air samples that were collected throughout the duration of the project.

NTCRA Overall Summary

Overall, the NTCRA achieved the objectives defined in the EE/CA. The most upstream location of sediments containing the highest levels of PCBs in the Grasse River was remediated through sediment removal. Over 84% of the sediment was removed from the NTCRA area, along with 27% of the PCB mass in the Grasse River Study Area. In addition to these achievements, valuable information was obtained for use in the Grasse River AA.

Even though significant PCB mass was removed, PCB concentrations of up to 260 mg/kg were observed in the sediment which was left behind in the NTCRA area (average of 4 inches; maximum of 14 inches) after efforts to remove all sediment were executed. These efforts suggest that attaining relatively low levels of PCBs (e.g., 10 mg/kg or less) on a consistent basis via hydraulic dredging is not likely in the Grasse River. In addition, the short-term environmental effects of dredging (including observed levels of PCBs in water exceeding AWQC, as well as significantly increased PCB bioavailability in caged fish and spottail shiners) were exhibited. Finally, the NTCRA program was extremely costly (approximately \$4,870,000 total, or \$1,670 per cy of material removed).

Although the removal of such a significant mass of PCBs may be expected to reduce potential long-term risks to human health and the environment, it is unclear what absolute long-term effect, if any, the removal operations will have on the environment. While the short-term effects on the environment are well documented, data collected six months and beyond the completion of the project are crucial to performing a comprehensive evaluation of dredging. Therefore, additional monitoring of the River system is needed to adequately evaluate the longer-term effectiveness of the NTCRA activities.



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GRASSE RIVER



No.	Date	Rev's on/Issue	By	Chkd

OHM Remediation Services Corp.
OHM Project No. 17757

DREDGE SWEEP AREAS
GRASSE RIVER STUDY AREA
NON-TIME-CRITICAL REMOVAL ACTION

PREPARED FOR
ALUMINUM COMPANY OF AMERICA
MASSENA, NEW YORK

Drawn By: M. BARNICK	9/22/85	Scale: AS SHOWN	Drawing No. 17757-D2
Checked By: J. FLANNAGAN	9/22/85	Sheet No.	
Approved By: J. FLANNAGAN	9/22/85	FIGURE 5	