Aluminum Company of America
Massena Operations

ALCOA

January 30, 1998

98WLOL-0089-FE

Mr. Gregg A. Townsend, P.E.
NYSDEC
Region 6 Headquarters
317 Washington Street
Watertown, New York 13601

Subject: Alcoa Remediation Projects Organization
Waste Lubricating Oil Lagoon
Final Inspection Reports

Dear Mr. Townsend:

In response to your letter dated January 26, 1998, we offer the following.

Comment: 1.1 General

With respect to the list of reports at the bottom of page 1-1 and top of page 1-2, the Department reviews, but does not approve health and safety plans.

Response

Acknowledged. The sentence on page 1-1 has been edited to read, "...the NYSDEC (with the exception of the site health and safety plans)."

Comment: 3.2.4 Drainage Sand

The second sentence should reference DCF No. 10, rather than DCO No. 10.

Response

Acknowledged. The second sentence has been edited to reference DCF No. 10 rather than DCO No. 10.

Comment: 3.3.3.2 GCL Panel Placement

Figure 3-1 fails to account for panel P-04.

m.cp
2-2-98

Response

Acknowledged. Figure 3-1 has been revised to account for panel P-04.

Comment: 3.3.3.2 GCL Panel Placement *(continued)*

Contrary to the second sentence of the third paragraph on page 3-8, Record Drawing B-137714-JM does not show how the seepage barrier on the northeast and east sideslopes was installed.

Response

Acknowledged. A note has been added to Detail 3 on Record Drawing B-137714-JM to reflect the fact that a GCL anchor trench was not required on the northern and eastern berms.

Comment: Drawing B-1137714-JM

With regard to the underdrain sump detail, the 6-inch slotted, corrugated HDPE pipe; the filter fabric wrap; and the screened gravel have all been mis-labeled.

Response

Acknowledged. The drawing has been revised.

If you have any questions please contact me.

Sincerely,

Thomas C. Lightfoot

Thomas C. Lightfoot
Project Manager

WMK:tmp

Attachments

cc w/out attachment: James Harrington, NYSDEC
John Sheehan, NYSDOH
James Luz, NYSDEC
Ann Rice, NYSDEC
Frank Bifera, NYSDEC
Darrell Sweredoski, NYSDEC
Kevin Farrar, NYSDEC
Christine McGrath, NYSDEC
Patrick Dargan, Alcoa

cc w/attachment: Michael Cox, NYSDEC
James Shaw, Alcoa
Darrel Avery, MKE
Joseph Mihm, CDM
Michael Schultz, CDM
Wayne Kimball, CDM
Library, Archive, File/Alcoa

NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
317 Washington Street, Watertown, NY 13601
315-785-2513

64500S

John P. Cahill
Commissioner

January 26, 1998

Mr. Thomas C. Lightfoot
ALCOA - Massena Operations
P.O. Box 150
Massena, NY 13662

RE: WASTE LUBRICATING OIL LAGOON
FINAL INSPECTION REPORT

Dear Mr. Lightfoot:

We have reviewed the CQA Certification Report and other documentation associated with the completion of construction activities at the WLOL. Our comments are detailed in the subject report, a copy of which has been enclosed for your review and response.

Please feel free to call me if you have any questions.

Sincerely,

Gregg A. Townsend, P.E.
Environmental Engineer II
Region 6 - Env. Remediation

GAT:kw

cc: Darrell Sweredoski
Mike Cox
Kevin Farrar
Christine McGrath

WASTE LUBRICATING OIL LAGOON
FINAL INSPECTION REPORT

January 1998

CONSTRUCTION QUALITY ASSURANCE CERTIFICATION REPORT

Section 1 Introduction

1.1 General

- With respect to the list of reports at the bottom of page 1-1 and top of page 1-2, the Department reviews, but does not approve Health and Safety Plans.

Section 3 SOL Influence Mitigation and Seepage Barrier Installation

3.2 Pre-construction Activities

3.2.4 Drainage Sand

- The second sentence should reference DCF No. 10, rather than DCO No. 10.

3.3 Construction Activities

3.3.3 Seepage Barrier Installation

3.3.3.2 GCL Panel Placement

- Figure 3-1 fails to account for panel P-04.

- Contrary to the second sentence of the third paragraph on page 3-8, Record Drawing B-137714-JM does not show how the seepage barrier on the northeast and east sideslopes was installed.

RECORD DRAWINGS

Drawing B-137714-JM

- With regard to the Underdrain Sump Detail, the 6" slotted, corrugated HDPE pipe; the filter fabric wrap; and the screened gravel have all been mis-labeled.

Aluminum Company of America
Massena Operations

Cox

ALCOA

December 12, 1997 97WLOL-0086-FE

Mr. Gregg A. Townsend, P.E.
NYSDEC
Region 6 Headquarters
317 Washington Street
Watertown, New York 13601

Subject: Alcoa Remediation Projects Organization
Waste Lubricating Oil Lagoon
Final Inspection Reports

Dear Mr. Townsend:

Attached are two copies of the Construction Quality Assurance Certification Report, the Cleanup Verification Sampling and Analysis Report and the Record Drawings for the Waste Lubricating Oil Lagoon.

If you have any questions please contact me.

Sincerely,

Thomas C. Lightfoot
Project Manager

TCL:alb

Attachment

cc w/out attachment: James Harrington, NYSDEC
John Sheehan, NYSDOH
James Luz, NYSDEC
Ann Rice, NYSDEC
Frank Bifera, NYSDEC
Darrell Sweredoski, NYSDEC
Elaine Zuk, NYSDEC
Christine McGrath, NYSDEC
Patrick Dargan, Alcoa

cc w/attachment: Michael Cox, NYSDEC
James Shaw, Alcoa
Darrel Avery, MKE
Joseph Mihm, CDM
Michael Schultz, CDM
Wayne Kimball, CDM
Pete Skiadas, CDM
Library, Archive, File/Alcoa

ALUMINUM COMPANY OF AMERICA
MASSENA, NEW YORK

REMEDIATION PROJECTS ORGANIZATION

CONSTRUCTION QUALITY ASSURANCE

CERTIFICATION REPORT

FOR THE

WASTE LUBRICATING OIL LAGOON

December 12, 1997
(Revised January 30, 1998)

Prepared by

CDM Camp Dresser & McKee
Massena, New York 13662

ALUMINUM COMPANY OF AMERICA
MASSENA, NEW YORK

REMEDIATION PROJECTS ORGANIZATION

CONSTRUCTION QUALITY ASSURANCE

CERTIFICATION REPORT

FOR THE

WASTE LUBRICATING OIL LAGOON

December 12, 1997

Prepared by

CDM Camp Dresser & McKee
Massena, New York 13662

CERTIFICATION WITH SUBMITTAL OF THE CONSTRUCTION QUALITY ASSURANCE CERTIFICATION REPORT FOR THE WASTE LUBRICATING OIL LAGOON

All information contained in this document is to the best of our knowledge, factual and represents CDM's total understanding of the conditions and circumstances at the Alcoa facility and impacted area. The conclusions and recommendations contained in this document represent CDM's best professional engineering judgement on remediation that meets those applicable or relevant and appropriate requirements and represents sound engineering practices and principles required to protect public health and the environment.

Signature: Wayne M. Kimball

Wayne M. Kimball, P.E.
Construction Quality Assurance Officer
CAMP DRESSER & McKEE

Date: January 30, 1998

CERTIFICATION WITH SUBMITTAL OF THE CONSTRUCTION QUALITY ASSURANCE CERTIFICATION REPORT FOR THE WASTE LUBRICATING OIL LAGOON

All information contained in this document is to the best of our knowledge, factual and represents CDM's total understanding of the conditions and circumstances at the Alcoa facility and impacted area. The conclusions and recommendations contained in this document represent CDM's best professional engineering judgement on remediation that meets those applicable or relevant and appropriate requirements and represents sound engineering practices and principles required to protect public health and the environment.

Signature: Wayne M. Kimball

Wayne M. Kimball, P.E.
Construction Quality Assurance Officer
CAMP DRESSER & McKEE

Date: December 12, 1997

Contents

List of Figures

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Section 1
Introduction

1.1 General

The subject matter contained within this Certification Report deals with the Construction Quality Assurance (CQA) items associated with the Waste Lubricating Oil Lagoon (WLOL) remediation project at the Aluminum Company of America's (Alcoa) Massena, New York facility. The CQA organization functioned as an independent party that determined, documented and provided assurance that the project was constructed in a manner that met the intent of the *Final Design Report for the Waste Lubricating Oil Lagoon* (FDR) (CDM, June 1997). Statements of conformance with the FDR in this report are meant to imply conformance with the *Construction Quality Assurance Plan for the Waste Lubricating Oil Lagoon* (CQAP) (CDM, May 1997), Technical Specifications and Design Drawings.

CQA was distinct from Construction Quality Control (CQC) which was a planned system used by the Contractor, Morrison Knudsen Environmental (MKE) to control quality of work, cost and schedule.

Remediation procedures for the WLOL site (New York State Department of Environmental Conservation [NYSDEC] site code 6-45-005, unit 2) were established through a Record of Decision (ROD) dated January 1992 (amended June 1996). Pursuant with the ROD, reports were developed as an integral part of the overall remediation process and submitted to, and approved by, the NYSDEC (with the exception of the site health and safety plans). These reports are as follows:

- *Sampling at [the] Waste Lubricating Oil and Soluble Oil Lagoons Operational Health and Safety Plan*, MKE, October 1993;
- *Soluble Oil Lagoon/Waste Lubricating Oil Lagoon Predesign Sampling and Analysis Report*, CDM, April 1995;
- *Quality Assurance Project Plan*, CDM, July 1995;
- *Technologies Evaluation Report* for the *Waste Lubricating Oil Lagoon*, CDM, May 1996;
- *Preliminary Design Report for the Waste Lubricating Oil Lagoon*, CDM, June 1996;
- *Waste Lubricating Oil Lagoon Operational Health and Safety Plan*, MKE, March 1997;
- *Waste Lubricating Oil Lagoon Health and Safety Plan*, CDM, April 1997;
- *Construction Quality Assurance Plan for the Waste Lubricating Oil Lagoon*, CDM, May 1997;
- *Post-Closure Operation and Maintenance Manual for the Waste Lubricating Oil Lagoon*, CDM, May 1997;
- *Waste Lubricating Oil Lagoon Construction Work Plan*, MKE, May 1997;
- *Cleanup Verification Work Plan for the Waste Lubricating Oil Lagoon*, CDM,

June 1997; and

- *Final Design Report for the Waste Lubricating Oil Lagoon*, CDM, June 1997.

The Soluble Oil Lagoon (SOL) is adjacent to the WLOL and the two lagoons share a common dike. A location plan is shown in **Figure 1-1**.

1.2 Intent of Report

The intent of this Certification Report is to document that the work completed during the remediation of the WLOL was in conformance with the design intent of the FDR. As part of the documentation process, this report presents a discussion of the inspection activities and testing programs that were undertaken during construction. Moreover, this document is intended to satisfy the requirements of Section 6.10 of the CQAP. That section outlined procedures and requirements for the submittal of reports and documentation.

Documentation included minutes from weekly progress meetings, Construction Quality Assurance Inspector's (CQAI) Daily Reports (IDRs), Inspection Data Sheets, Design Change Orders (DCOs), Design Clarification Forms (DCFs), soils laboratory analysis and data summary sheets, Field Engineering submittals and project photographs. Section 1.4 provides additional information on DCFs, DCOs and Problem Identification and Correction Reports (PICRs). All of these items have been reviewed by the NYSDEC's onsite representative prior to submittal of this report and are archived in Building 65 at the Alcoa Massena, New York facility. A listing of these archived files is provided in Appendix A.

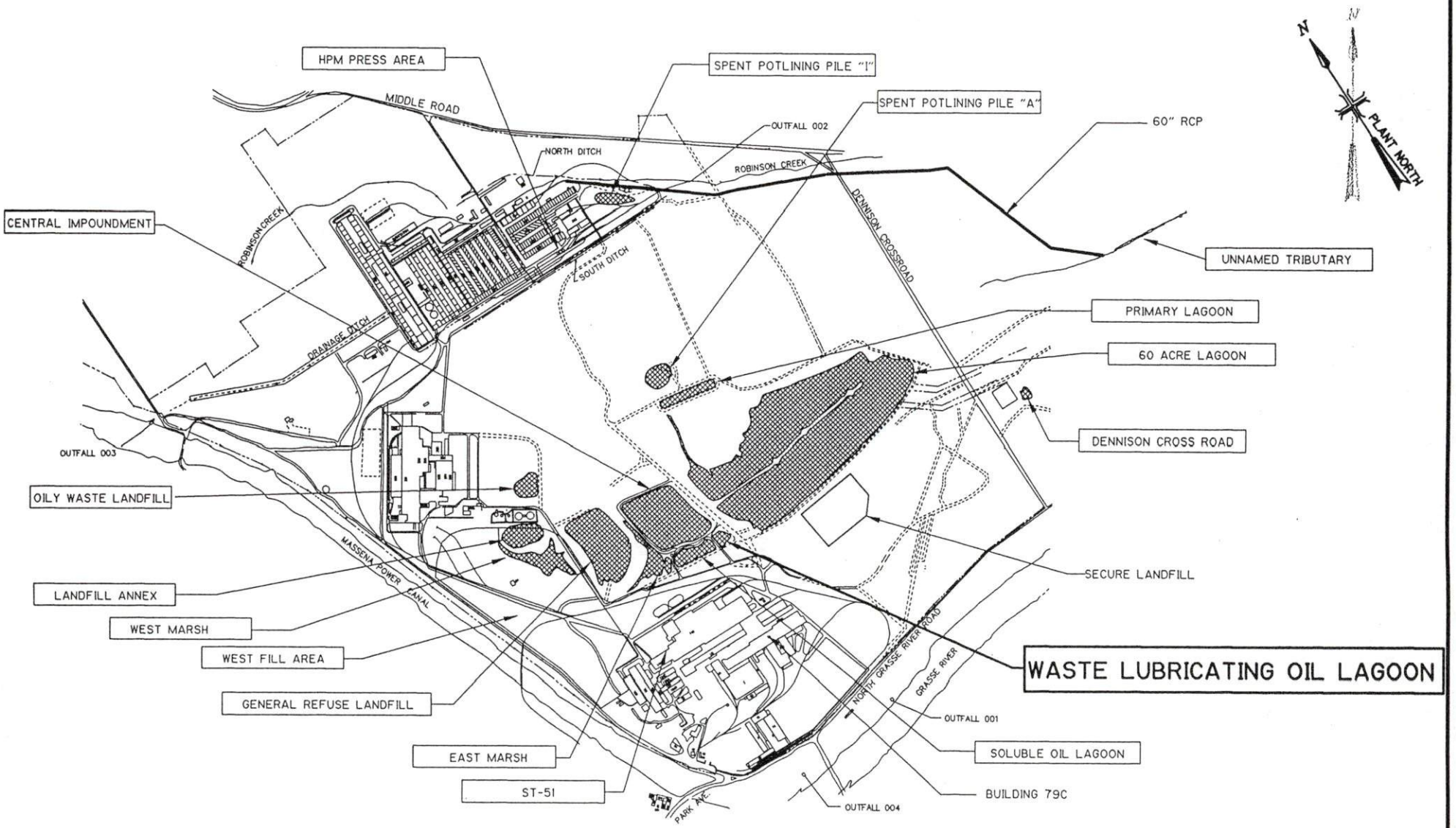
Record Drawings, the *Cleanup Verification Sampling and Analysis Report for the Waste Lubricating Oil Lagoon* and certification by the Engineer of Record will be submitted concurrently with this report to the NYSDEC.

1.3 Background Information

The WLOL site, approximately 1.2 acres in size, was operated from 1969 to 1980 as a disposal area for waste oils, hydrocarbons and grease. Closure of the WLOL began in 1980 and was completed in 1982. The 1980 closure activities included:

- decanting water to the adjacent SOL;

- solidification of residual oil and sludge with cement kiln dust and/or bulking with local soils;



SCALE IN FEET

2000 0 2000 4000

ALCOA - MASSENA, NEW YORK

SITE LOCATION PLAN
WASTE LUBRICATING OIL LAGOON

FIGURE 1-1

- grading to facilitate stormwater runoff; and
- installation of a closure cap consisting of sand, clay and seeded topsoil layers.

Required remedial action for this listed inactive hazardous waste site, as outlined in the approved FDR, included:

- solidification (as required), excavation and disposal of waste materials and contaminated soils meeting land disposal restrictions (LDRs) in the onsite Secure Landfill (SLF);
- performance of a post-excavation cleanup verification sampling program;
- installation of a seepage barrier between the SOL and WLOL;
- backfilling;
- installation of an interim cover; and
- installation of a final capping system as part of the SOL remediation project.

The location of the SLF is also shown in Figure 1-1.

The contaminants of concern included polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs). Installation of a final capping system will be performed as part of the SOL remediation project.

In addition to the proposed remedial activities listed above, the following items were performed pursuant to DCO No. 1:

- installation of an underdrain and underdrain sump at the toe of the common dike between the WLOL and SOL (Record Drawing B-137711-JM, et al.); and
- installation of a seepage barrier on the northern and eastern slopes of the WLOL excavation (Record Drawing B-137711-JM, et al.).

1.4 Supplemental Documentation

To facilitate documentation of the remediation of the WLOL, construction activities were divided into work items as listed in **Table 1-1**. The CQAI recorded construction activities by work item numbers in the IDRs.

Pursuant with the format of the CQAP, CQA program inspection activities conducted during the remediation of the WLOL are discussed under the following headings in this report:

- preconstruction activities;
- construction activities; and
- post-construction activities.

Modifications to the project design were implemented through DCOs which were issued by the Engineer of Record and approved by the NYSDEC. One DCO, listed in **Table 1-2**, was required during remediation of the WLOL.

Questions regarding design intent were answered via DCFs. DCFs for the WLOL are listed in **Table 1-3**.

Similarly, PICRs were to be issued if the CQAO was of the opinion that formal documentation was warranted to resolve issues significant enough to jeopardize the certification process. No PICRs were required during WLOL remediation activities.

1.5 Construction Approval

Construction approval for remediation of the WLOL site was issued by the NYSDEC on June 12, 1997.

1.6 Operation and Maintenance

Operation and maintenance activities are discussed in the *Post-Closure Operation and Maintenance Manual for the Waste Lubricating Oil Lagoon* (CDM, May 1997).

1.7 Construction Personnel and Equipment

General construction proceeded on a five day work week, single shift basis, consisting of the following average staffing level for MKE:

ALCOA REMEDIATION PROJECTS ORGANIZATION
WASTE LUBRICATING OIL LAGOON
CERTIFICATION REPORT

Table 1-1

Work Items

Work Item Number	Description
1	Mobilization
2	Stormwater and Erosion Controls
3	Site Survey
4	Health and Safety
5	Inclinometer and Check Plate Installation
6	Excavation of Waste Materials
7	Solidification/Bulking of Waste Materials
8	Drum Disposal and Removal
9	Seepage Barrier Installation
10	SOL Sump Installation
11	Cleanup Verification
12	Backfill and Final Cover Installation
13	Dewatering and Drainage Control
14	Demobilization
15	Outstanding Issues
16	Design Change Order No. 1 Work

ALCOA REMEDIATION PROJECTS ORGANIZATION
WASTE LUBRICATING OIL LAGOON
CERTIFICATION REPORT

Table 1-2

Design Change Orders

DCO No.	Description	Issue Date	Date of Approval
1	Provided details on installation of the underdrain piping system and seepage barrier at the western, northern and eastern limits of the WLOL excavation.	9/10/97	9/12/97

ALCOA REMEDIATION PROJECTS ORGANIZATION
WASTE LUBRICATING OIL LAGOON
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Table 1-3

Design Clarification Forms

DCF No.	Description	Issue Date	Response Date
1	Provided direction on recessing the eastern inclinometer below the access road.	6/23/97	7/02/97
2	Provided guidance on procedures used for pocket penetrometer testing and data transmittal.	6/26/97	7/03/97
3	Provided procedures for check plate installation.	7/01/97	7/02/97
4	Provided a sampling plan for three additional culverts that were discovered during remediation.	7/15/97	7/21/97
5	Provided direction for removal of a culvert located in the north slope of the WLOL excavation.	8/11/97	8/22/97
6	Provided procedures for determining the horizontal and vertical limits of the potentially contaminated sand lens. In addition, provided revisions to the sampling protocol.	8/12/97	8/22/97
7	Provided clarification on the cleanup verification analytical laboratory method to be used.	8/22/97	8/29/97
8	Provided details for the north railroad ditch final cover.	8/21/97	8/22/97
9	Provided additional information for the installation of the seepage barrier as detailed in DCO No. 1.	8/27/97	9/10/97
10	Provided gradation requirements for underdrain aggregates (i.e., drainage sand and screened gravel).	9/18/97	9/19/97

- 1 - construction superintendent;
- 1 - health and safety representative;
- 1 - survey crew;
- 2 - operators; and
- 5 - laborers.

Staffing levels varied directly with the nature of the work being performed. The entire operation was overseen by a sitewide construction manager and monitored by CQC personnel. Equipment utilized for excavation of waste materials and contaminated soils, subgrade preparation, placement and compaction of common borrow and geosynthetic clay liner (GCL) placement adequately achieved specified requirements.

Section 2
Excavation of Waste Materials and Contaminated Soils

2.1 General

The excavation and removal of waste materials and contaminated soils to design limits of contamination were intended to expose soil that tested in compliance with the cleanup goals presented in the *Cleanup Verification Work Plan for the Waste Lubricating Oil Lagoon* (CDM, June 1997). The preconstruction, construction and post-construction remedial activities associated with the excavation of waste materials and contaminated soils are discussed in Sections 2.2, 2.3 and 2.4, respectively.

CQA program requirements for excavation of waste materials and contaminated soils was presented in Section 3 of the CQAP. CQA inspection activities were recorded in the IDRs under Work Item No. 6 during excavation of waste materials and contaminated soils unless noted otherwise.

2.2 Preconstruction Activities

Preconstruction activities consisted of:

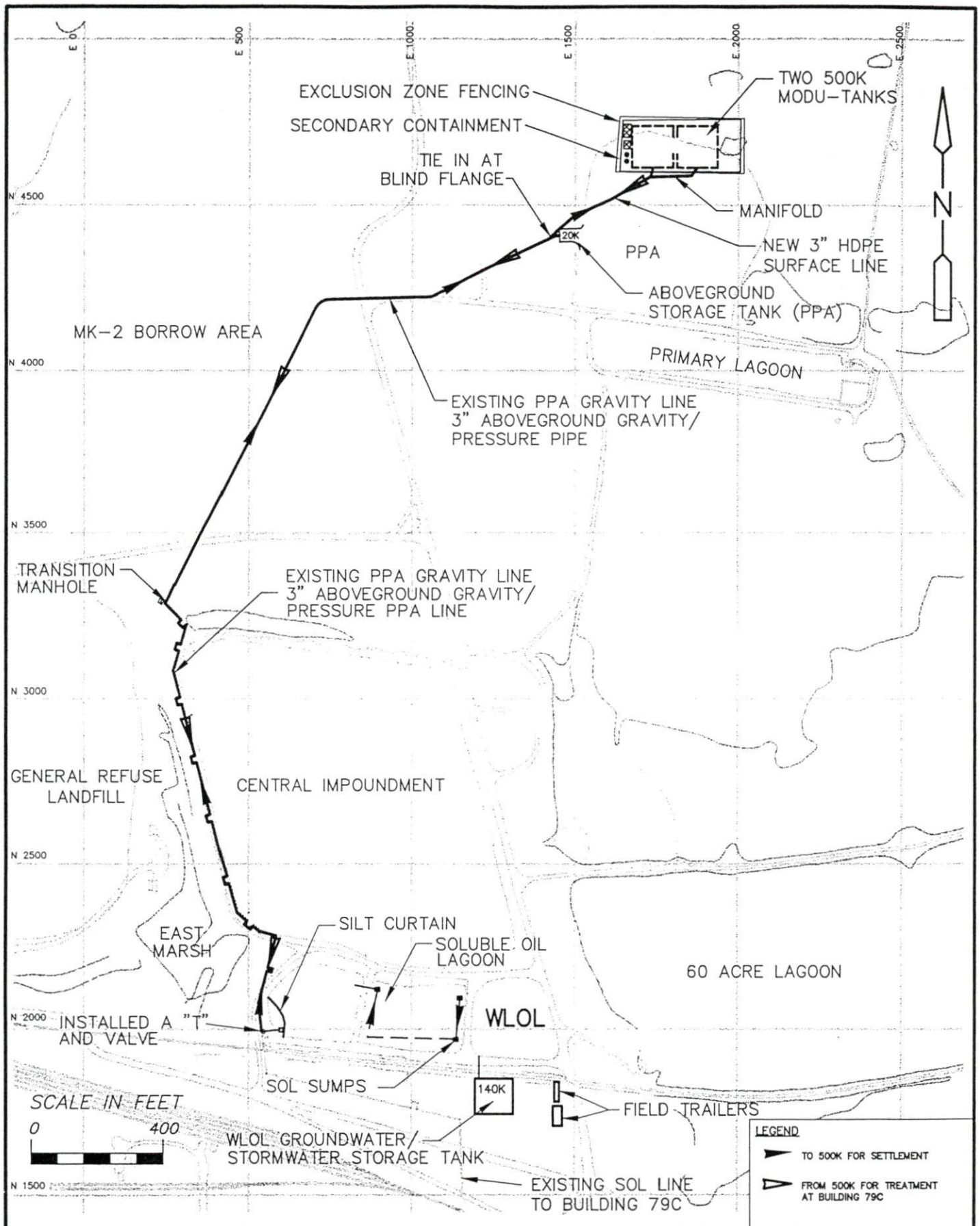
- mobilization;
- mitigating the influence of the SOL on the WLOL;
- installation of the inclinometers and check plates; and
- excavation and staging of the WLOL closure cap material.

2.2.1 Mobilization

Mobilization began on June 16, 1997. The CQAI confirmed that mobilization activities proceeded in conformance with the Technical Specifications and the Construction Work Plan (CWP). Mobilization activities consisted of clearing and grubbing, establishing an exclusion zone and installing stormwater/groundwater controls.

Stormwater/groundwater controls for the WLOL included the installation of a 140,000 gallon modu-tank with a lined secondary containment area (**Figure 2-1**).

During mobilization three drainage culverts were identified that were not included in the Design Drawings. The locations of these culverts are shown on Record Drawing B-137708-JM. One culvert is labeled as a 24-inch corrugated metal pipe (CMP) and the other two as 12-inch CMP.



ALCOA – MASSENA, NEW YORK

WASTE LUBRICATING OIL LAGOON DEWATERING AND STORMWATER/ GROUNDWATER CONTROLS

FIGURE 2-1

DCF No. 4 described the fact that the inlet and outlets of the culverts were sealed with clay to prevent offsite migration of construction water and requested guidance on any additional requirements. The response to DCF No. 4 outlined a sampling strategy to determine if contamination was present in the area of the south railroad ditch influenced by the outlet of the southern 12-inch CMP culvert. Analytical results indicated low levels of PCBs at the outlet of the southern 12-inch CMP culvert. This subject was discussed in Weekly Progress Meeting Report No. 9, Section VII, Item 3. The decision was made at this meeting to address remediation of the portion of the southern railroad ditch affected by the 12-inch CMP culvert as part of the planned SOL remediation project. Weekly Progress Meeting Report No. 9 has been included in Appendix B.

2.2.2 Mitigating the Influence of the SOL on the WLOL

The influence of the SOL on the WLOL was mitigated by minimizing the hydraulic gradient between the two sites and installing an isolating seepage barrier. To accomplish this, the east cell of the SOL was dewatered and residual sludge pulled back (i.e., consolidated) from the toe of the SOL side of the common dike between the two sites. This effort provided a sump in the SOL that could be maintained in a dewatered state (Record Drawing B-137711-JM). GCL installed on the WLOL side of the common dike, served as a seepage barrier to prevent migration of liquid from the SOL into the remediated WLOL site. The extent of the GCL seepage barrier was later expanded as part of DCO No. 1. The expanded extent of the GCL seepage barrier is discussed in Section 2.3.1.6.

SOL dewatering, SOL sludge consolidation and installation of the seepage barrier is discussed in Section 3.

2.2.3 Installation of Inclinometers and Check Plates

The FDR indicated that calculated factors of safety at the WLOL were low and highly sensitive to the elevation of the Stratum IIA-L and Stratum IIA-M layers (**Table 2-1**) relative to the depth of the excavation. Therefore, inclinometers and check plates were installed to monitor soil movement during the excavation process.

Inclinometers were installed on the eastern, western, northern and southern sides of the excavation area in conformance with the Technical Specifications, Section 02276, and as shown on Record Drawing B-137711-JM. Installation was performed by Atlantic Testing Laboratory (ATL) under observation by Field Engineering personnel. The inclinometers were installed a minimum of 7 feet into Stratum IIB. The depth of the Stratum IIB was determined during the installation process by the Field Engineer. DCF No. 1 noted that the east inclinometer was in potential conflict with work being performed on a separate construction project (i.e., the Central

ALCOA REMEDIATION PROJECTS ORGANIZATION
WASTE LUBRICATING OIL LAGOON
CERTIFICATION REPORT

Table 2-1

Stratigraphy Designations

CDM Designated Strata	Physical Description (Burmister)	USCS Classification	Common Name and Formation Name[1]
Stratum I	Dry to wet, loose to very dense, poorly to well graded sand, to sand and gravel, and silt, or/and clay, or various waste materials.	SM/ML, CL, SP, GP	Fill, Winnowed Till, Fort Covington Drift
Stratum IIA-L	Wet, soft to stiff, brown to brown grey mottled clay, some silt, to silt and clay, trace to little sand, trace gravel with occassional layers of peat and sand (rhythmites, desiccation fractures noted).	CL, CL/ML	Lacustrine clay and silt, Fort Covington Drift
Stratum IIA-S	Wet to moist, loose, poorly graded, sand to gravel and sand, trace silt, trace shell fragments.	SP, GP	Shallow water deposits, deltaic sands
Stratum IIA-M	Wet, very soft to very stiff, grey clay, some silt, trace to little sand, trace gravel with occasional sand layers.	CL, CH	Marine clay and silt, Fort Covington Drift
Stratum IIB	Wet to moist, loose to very dense, poorly to well graded, sand, gravel and sand, or sand and silt, trace to some silt, trace to little gravel (includes stratified deposits).	SP, SW, SM, SP/GP	Sand, outwash, till, Fort Covington (upper till)
Stratum III	Moist, dense to very dense silt, sand and silt, or clay, to some sand, some clay, trace to little gravel, with occasional clay layers.	ML, ML/CL, SM, CH	Silt, till, Malone (middle/lower till)
Bedrock	Dolomite, light to dark grey, fined grained, horizontal bedded, massive and competent to fractured, with occasional to common solution cavities.	Not Applicable (rock)	Dolomite, Lower Beekmantown Group

Note:

1. Formation names after MacClintock and Stewart, 1965.

Impoundment) and requested procedures for recessing the inclinometer below the road surface. Although this request was addressed, recessing the inclinometer was not required. Installation of the inclinometers began on June 17, 1997 and was completed on June 24, 1997.

In addition, two check plates were installed at the top of each excavation slope (total of eight check plates). DCF No. 3 addressed the fact that fill material in the roadways made installation of the check plates difficult without causing damage to them and requested installation guidance. The response to DCF No. 3 allowed the removal of up to 3 feet of material prior to driving the check plates the remaining 2 feet. Installation was performed by MKE.

Monitoring and evaluation of the inclinometer and check plate data is discussed in Section 2.3.1.1.

CQA inspection activities during installation of the inclinometers and check plates were recorded in the IDRs under Work Item No. 5.

2.2.4 Excavation and Staging of Closure Cap Materials

Prior to excavation of waste materials and contaminated soils, the WLOL closure cap material was removed and stockpiled in a staging area. The components of the closure cap included topsoil, clay and drainage sand. It was intended to use the closure cap material as backfill for the remediated WLOL site. Excavation of closure cap materials began on June 30, 1997 and was completed on July 7, 1997.

During removal, the closure cap material that appeared "visually clean" was stockpiled in a staging area located to the east of SLF Cell 2. The staging area was constructed in compliance with the Technical Specifications, Section 02200. Activities associated with mobilization and demobilization of the staging area were monitored by the SLF CQAI. Inspection of the transport, stockpiling and confirmatory testing of the closure cap materials was performed by the WLOL CQAI.

The topsoil and clay was observed to be "visually clean" with the exception of some soil excavated from the northern and eastern toe of slope of the closure cap. These areas contained black stained debris and brick. The "visually clean" topsoil and clay stockpiles were segregated from the black stained material at the staging area. The drainage sand appeared "visually clean", but emitted a petroleum odor during excavation. The sand was stockpiled within the WLOL exclusion zone and not transported to the staging area. Weekly Progress Meeting Report No. 1, Item VIII, Sections 1 and 2, addressed the segregation and testing of the stained soil, brick and the sand. Weekly Progress Meeting Report No. 2, Item I, Section 1, addressed testing of the sand at the WLOL. Weekly Progress Meeting Report Nos. 1 and 2 are included in Appendix B. The stained debris, topsoil/clay and sand stockpiles were sampled at a frequency of 3 tests per

stockpile as outlined in the FDR. The samples were analyzed for the contaminants of concern (i.e., PCBs, PAHs and VOCs). Analytical results from the samples indicated that there were PAH and PCB exceedances in the debris pile and PCB exceedances in the debris, sand and topsoil/clay stockpiles. Therefore, the debris and topsoil/clay were transported to SLF Cell 2 for disposal. The sand was used as a bulking agent during the WLOL waste excavation stage. Analytical results for the stockpiled material are archived with the project files.

2.3 Construction Activities

The CQAI observed and documented that the excavation of waste materials and contaminated soils from the WLOL was in accordance with the requirements of the FDR. Excavated waste materials and contaminated soils were transported directly to SLF Cell 2 for disposal with the exception of the staged closure cap material discussed previously in Section 2.2.4. Hazardous waste control forms were issued by MKE CQC personnel for each load of contaminated material transported to the SLF. The hazardous waste control forms are on file with the SLF CQAI.

Construction activities included excavation and disposal of:

- WLOL waste materials and contaminated soils;
- contaminated soils from the surface of the original top of dikes; and
- contaminated soils from the north railroad ditch.

During the remediation of the WLOL, excavation activities included the use of bulking reagents (i.e., dry material, Portland cement or quicklime) to improve the handling characteristics of the waste materials and contaminated soils.

Excavations performed in the north railroad ditch and original top of dike ran concurrently with the WLOL excavation.

2.3.1 Excavation of Waste Materials and Contaminated Soils

Waste and contaminated soils excavation began on July 8, 1997 and was completed on September 10, 1997. Although the limits of contamination depicted on Design Drawing B-137711-JM were used as a guide, actual vertical and horizontal limits of excavation were made to the waste/soil interface as determined in the field. Activities during excavation included:

- evaluation of inclinometer and check plate data;

- addition of bulking/solidification reagents to improve waste materials and contaminated soils handling characteristics;

- abandonment of monitoring and observation wells;
- removal of and disposal of Resource Conservation and Recovery Act (RCRA) (40 Code of Federal Regulations [CFR] 261.7) empty drums;
- maintenance of temporary stormwater/groundwater control trenches and sumps; and
- excavation of waste materials and contaminated soil beyond the design limits of contamination.

2.3.1.1 Inclinometer and Check Plate Data

Field Engineering personnel recorded and evaluated inclinometer readings and check plate data. Inclinometer readings were taken immediately following their installation to establish a baseline. As the excavation progressed below El. 226 feet, readings were taken at a minimum of twice per week. As the excavation progressed below El. 215 feet, inclinometer readings were taken on a daily basis. An evaluation and summary of inclinometer readings are provided in Appendix C. The rate of change of the readings were reported to be within allowable design limits. In general, instability of the sideslopes was not observed and excavation proceeded without significant delays.

2.3.1.2 Addition of Bulking/Solidification Reagents

The CQAI recorded the use of bulking/solidification reagents under Work Item No. 7 in the IDRs.

When appropriate, drier wastes were bulked with moister wastes to improve handling characteristics. However, on several occasions the use of Portland cement and quicklime (i.e., solidification reagents) was implemented to improve the handling characteristics of the waste materials and contaminated soils. Solidification reagents were emptied into a temporary mixing pit (i.e., sump area within the WLOL excavation) and mixed with a backhoe. The CQAI and MKE CQC personnel estimated the weight of waste materials and contaminated soils being solidified by measuring the dimensions of the stockpiles, computing their volume and multiplying by an average bulk density value of 116 pcf. The percent of solidification reagent in the mixture was calculated by dividing the weight of the reagent added by the estimated weight of the material in the stockpile. In general, the average dosage of solidification reagent did not exceed 1.5 percent on a weight basis. Overall, 338 tons of cement and 146 tons of quicklime were added to 31,635 tons of waste materials and contaminated soils. Calculations for the average percent dosage are included in Appendix D.

As noted in IDR-WLOL-21 (included in Appendix E), discussions between Alcoa and the onsite NYSDEC representative, resulted in the conclusion that implementation of a formal solidification program (Technical Specifications, Section 13740) was not warranted if the percentage of solidification reagent used remained less than 20 percent by weight. Field Engineering performed an onsite treatability study to confirm that solidification reagent dosages in lower percent ranges would result in a product that met the required long-term compressive strength of 16 psi for disposal in the SLF. The treatability study was conducted at the onsite Soils Laboratory. Extrapolation between the plots for a 0 percent and 2.5 percent waste/reagent mixture indicated that the required compressive strength of 16 psi would be attained within one to two days. Results of the treatability study were presented in a memorandum dated July 31, 1997 and is included in Appendix F.

Prior to transport to the SLF, the CQAI tested the excavated waste materials and contaminated soils for compressive strength at a frequency of 1 test/500 cy as outlined in Table 3-1 of the CQAP. Minutes from Weekly Progress Meeting No. 2, Item VIII, Section 1, included a summary of the discussion related to compressive strength testing and encompassed the understanding that:

- all unsolidified waste materials and contaminated soils leaving the WLOL would be tested for strength at the SLF;
- unsolidified waste materials and contaminated soils were to meet the 16 psi compressive strength requirement at the SLF prior to the placement of subsequent lifts;
- the waste materials and contaminated soils could be bulked at either the WLOL or the SLF to achieve minimum compressive strength requirements;
- after bulking/solidification, the short-term compressive strength of 0.5 tsf (6.9 psi) would be achieved prior to the waste leaving the WLOL; and
- the CQAI would perform paint filter tests when warranted.

Pocket penetrometer readings were used in the field as an indicator of compressive strength. DCF No. 2 requested confirmation that the procedures for sample preparation and testing for pocket penetrometer readings provided in Section 3.3.1.2 of the CQAP applied to CQC personnel. The response to DCF No. 2 provided confirmation and required transmission of test result data from CQC personnel to the CQAI on a daily basis. The bulked/solidified waste materials and contaminated soils met the minimum compressive strength of 0.5 tsf prior to leaving the WLOL. No paint filter tests were required. Pocket penetrometer test results are archived with the project files.

The final decision for accepting the compressive strength of waste placed at the SLF was at the responsibility of the SLF CQAI. The CQAO confirmed that the SLF CQAI allowed no subsequent lifts of waste materials and contaminated soils to be placed unless the previous lift had met a minimum compressive strength of 16 psi as measured with a pocket penetrometer.

2.3.1.3 Monitoring Well Removal

Monitoring wells MW-205, MW-106 and an unnumbered observation well were removed during excavation activities. As the vertical limits of the excavation extended beyond the depth of the wells, they were removed in their entirety. Therefore, abandonment procedures outlined in the *Quality Assurance Project Plan* (QAPP) (CDM, July 1995) were not applicable. The wells were removed with an excavator and the casings were transported to SLF Cell 2 for disposal.

2.3.1.4 Drum Removal

Nine crushed drums were encountered during excavation of waste materials and contaminated soils. The excavation of drums was overseen by the CQAI. All nine of the drums were found in a crushed condition and determined to be "RCRA" empty (40 CFR 261.7). The drums were transported to SLF Cell 2 for disposal.

2.3.1.5 Temporary Stormwater/Groundwater Control Trenches

Temporary control trenches were established to drain perched water, groundwater and stormwater to sump areas located at various points within the excavation. The locations of the sumps were constantly changing due to on-going excavation activities. WLOL stormwater and groundwater was pumped to a 140,000 gallon modu-tank (Figure 2-1). The modu-tank served as an equalization basin for the treatment process in Building 79C. Stormwater/groundwater pumped to the 140,000 gallon modu-tank was transported via tanker truck to Building 79C for treatment.

CQA inspection activities for dewatering and drainage were recorded in the IDRs under Work Item No. 13.

2.3.1.6 Excavation Beyond the Design Limits of Contamination

The three areas that required removal of waste material and contaminated soils beyond design limits of contamination included:

- the vicinity of borings B-094 and B-452;
- the common dike between the WLOL and SOL;
- the face of the eastern slope of the WLOL; and
- the original top of the northern dike.

Borings B-094 and B-452

The FDR stated that analytical data from borings B-094 and B-452 (Record Drawing B-137708-JM) had indicated the possible presence of contamination in the soils underlying the proposed soil/waste interface and required controlled excavations at these two locations. A controlled excavation to El. 211.6 for boring B-094 and El. 214.3 for boring B-452 (performed on August 12, 1997) revealed the presence of a clear, viscous "product" like liquid within the Stratum IIA-S layer. The controlled excavation is discussed in IDR-WLOL-40 and is included in Appendix E. Test results from samples taken after the controlled excavation indicated that additional removal of material that extended beyond proposed design limits of contamination was required.

DCF No. 6 requested procedures for delineating the extent of the affected area. Field Engineering personnel, with the assistance of the CQAI, executed the NYSDEC approved sampling and analysis plan presented in the response (memorandum dated August 15, 1997) to DCF No. 6 during the period of August 29 through September 6, 1997. The memorandum is included in Appendix F. The material in the delineated affected area was removed (with the exception of a lens of visible contamination in the common dike between the SOL and WLOL discussed below) and transported to SLF Cell 2 for disposal. To alleviate concerns that the Stratum IIA-S layer may have acted as a pathway for contaminant migration to the north, west and east of the site, Field Engineering (in conjunction with the onsite NYSDEC representative and the CQAI) collected samples at selected locations on the face of the excavation. The analytical results for these latter samples indicated that contaminant concentrations met soil cleanup goals.

A discussion of sampling results for the additional excavation in the vicinity of boring locations B-094 and B-452 can be found in the *Cleanup Verification Sampling and Analysis Report for the Waste Lubricating Oil Lagoon* (CDM, December 1997).

SOL/WLOL Common Dike

Areas of visible contamination (i.e., crushed drums, black stained soil, wood debris and liquid type waste) in the common dike between the SOL and WLOL extended beyond proposed design limits of contamination. DCF No. 9 was issued to address the fact that cleanup goals would not be achieved in this area and to solicit direction on how to protect the remediated WLOL from potential recontamination.

In response to DCF No. 9, DCO No. 1 was issued and included the addition of an underdrain piping system and sump at the toe of the common dike between the SOL and WLOL as shown on Record Drawing B-137711-JM. DCO No. 1 also included an extension of the proposed seepage barrier along the north side of the WLOL excavation. This item is discussed in further detail in Section 3.

Eastern Slope of the WLOL

Areas of visible contamination (i.e., black stained soil, brick and wood debris) on the eastern slope of the WLOL extended beyond design limits of contamination. Although cleanup goals were in statistical compliance for the eastern slope, DCF No. 9 (discussed above) solicited direction on how to isolate the clean backfill in the remediated WLOL from the old plant road materials.

In response to DCF No. 9, DCO No. 1 was issued and included an extension of the proposed seepage barrier along the eastern slope of the WLOL. The extension of the seepage barrier was added as a precautionary measure to prevent potential recontamination from old plant road materials. This item is discussed in further detail in Section 3.

It was the original design intent to remove a minimum of 9 inches from the surface of the original top of dikes located on the southern, western and northern dikes of the WLOL prior to cleanup verification sampling. The proposed design grades were adequate for achieving soil cleanup goals on the southern top of dike. The remediation of the southern top of dike took place on August 15, 1997.

However, waste material and contaminated soil was present at a depth beyond the design limits of contamination on the western and northern dikes and additional excavation was required. Remediation of the northern top of dike began on August 18, 1997 and was completed on August 21, 1997. DCF No. 5 was issued to address the discovery of a culvert pipe underlying the north top of dike. The response to DCF No. 5 required removal of the pipe. Removal of the pipe was performed concurrently with the additional road excavation. Removal of material from the northern top of dike proceeded as discussed in Weekly Progress Meeting No. 8, Section VIII, Item 2. Weekly Progress Meeting No. 8 is included in Appendix B. Cleanup goals were

statistically achieved in this area as reported in the *Cleanup Verification Report for the Waste Lubricating Oil Lagoon* (CDM, December 1997).

Attempted remediation of the common dike between the WLOL and SOL took place on August 18, 1997. Debris and visibly stained soil were observed up to 10 feet below the original top of dike surface. As this dike served as a physical barrier between the SOL and WLOL, Field Engineering halted the excavation. Cleanup goals were not achieved. Remediation of this area will be addressed as part of the planned SOL remediation project.

Final excavation grades are shown on Record Drawing B-137711-JM.

2.3.2 Excavation of the North Railroad Ditch

A minimum of 2 feet of contaminated soil was excavated from the north railroad ditch in compliance with the Technical Specifications, Section 02210. The proposed design limits of contamination were adequate for achieving soil cleanup goals. Contaminated soil was removed from the north railroad ditch and transported to SLF Cell 2 for disposal. Excavation activities were performed on August 14, 1997. The *Cleanup Verification Report for the Waste Lubricating Oil Lagoon* (CDM, December 1997) concludes that soils at the limits of excavation were in statistical compliance with the cleanup goals. DCF No. 8 requested details for covering the remediated ditch. The use of common fill was recommended to improve SOL accessibility. Final excavation grades are shown on Record Drawing B-137711-JM.

2.4 Post-Construction

Post-construction activities consisted of confirmation that the excavation was completed to the required horizontal and vertical limits and/or that all waste materials and contaminated soils were removed from the WLOL. Post-construction activities included:

- post-excavation cleanup verification sampling and analysis;
- temporary sump abandonment; and
- removal of inclinometers.

2.4.1 Post-Excavation Sampling and Analysis

After the CQAI had confirmed that the excavation was completed to the required horizontal and vertical limits and/or that all waste materials and contaminated soils had been removed from the WLOL, post-excavation sampling and analysis for PCBs, PAHs and VOCs was conducted as outlined in the *Cleanup Verification Work Plan for the Waste Lubricating Oil Lagoon* (CDM, June 1997). Sampling was performed by Field Engineering personnel. DCF No. 7 requested

clarification of the analytical methods to be used on analyzing samples. The response to DCF No. 7 required the use of Environmental Protection Agency (EPA) Method 8080 for PCBs, EPA Method 8270 for PAHs and EPA Method 8260 for VOCs with a Category B deliverable package. The response also allowed the use of immunoassay test procedures for screening purposes at the discretion of Field Engineering personnel. All cleanup verification samples were laboratory analyzed. Cleanup verification test results are presented in the *Cleanup Verification Sampling and Analysis Report for the Waste Lubricating Oil Lagoon* (CDM, December 1997). It was the conclusion of this report that contamination levels in remaining soils at the limits of excavation were in statistical compliance with the cleanup goals with the exception of the west dike. Final excavation grades are shown on Record Drawing B-137711-JM.

2.4.2 Temporary Sump Abandonment

Temporary sumps and control trenches were cleaned prior to the backfilling process. When a temporary sump or trench was abandoned it was typically dewatered and the saturated soil left in-place to dry. A minimum of 6 inches of material was removed from the sump/trench area and transported to the SLF for disposal. The method of dewatering a sump and removing 6 inches of material was discussed with the onsite NYSDEC representative.

2.4.3 Removal of Inclinometers

An additional post-construction activity, included as a punch list item in Section 5, involves abandonment of the northern, southern and eastern inclinometers. The western inclinometer will be left in-place.

2.5 Summary

Excavation acceptance was based on compliance with Design Drawing elevations, the removal of all visibly contaminated soils and the achievement of cleanup verification goals. The subgrade elevations shown on the Record Drawings were in conformance with the excavation requirements of the FDR.

Section 3
SOL Influence Mitigation and Seepage Barrier Installation

3.1 General

As stated in Section 2, the influence of the SOL on the WLOL was mitigated by minimizing the hydraulic gradient between the two sites and installing an isolating seepage barrier. Minimization of the hydraulic gradient was accomplished by dewatering the east cell of the SOL. A sump and an isolating seepage barrier were used as controls to maintain this condition.

The sump in the east cell of the SOL was formed by consolidating sludge in the western portion of the east cell. This effort provided a sump at the toe of the SOL side of the common dike between the two sites that could be maintained in a dewatered state (Record Drawing B-137711-JM).

GCL installed on the WLOL side of the common dike, served as a seepage barrier to prevent migration of liquid from the SOL into the remediated WLOL site. The extent of the GCL seepage barrier was expanded pursuant with DCO No. 1 which, as discussed in Section 2.2.1.2, was issued in response to DCF No. 9.

DCO No. 1 encompassed the influence of the following variances in field conditions:

- soil cleanup goals were not achieved in the common dike between the SOL and WLOL (discussed in Section 2.3.1.6);
- the Stratum IIA-S layer provided a potential pathway for contaminant migration from the SOL into the remediated WLOL; and
- the east side of the remediated WLOL site required isolation from plant road materials.

To address these field condition variances, DCO No. 1 required:

- installation of a temporary underdrain and sump to assist in monitoring conditions along the common dike seepage barrier;
- the extension of the GCL seepage barrier on the north side of the WLOL to intercept a Stratum IIA-S sand lens exposed by the additional excavation that extended beyond the design limits of contamination (Section 2.3.1.6); and
- placement of GCL on the east dike of the remediated WLOL to isolate the clean

backfill from the plant road materials.

Details of the underdrain, sump and seepage barrier installation are shown on Record Drawing B-137714-JM.

The preconstruction, construction and post-construction remedial activities associated with mitigating the influence of the SOL on the WLOL and installing the seepage barrier are discussed in Sections 3.2, 3.3 and 3.4, respectively.

CQA program requirements for mitigating the influence of the SOL on the WLOL and installing the seepage barrier was presented in Section 3 of the CQAP.

3.2 Preconstruction Activities

Preconstruction activities consisted of:

- dewatering the east cell of the SOL; and
- verification that the following materials delivered to the project site were in conformance with the FDR:
  - GCL;
  - common/select fill;
  - drainage sand;
  - screened gravel;
  - geotextile fabric;
  - HDPE corrugated underdrain piping; and
  - HDPE underdrain sump.

Observations during delivery of materials to the site were recorded in logs or the IDRs and are archived with the project files. The CQAI inspected and confirmed that the items were in conformance with the FDR. In addition, Field Engineering provided the CQAI with approved submittals and manufacturers' certifications for these items where required. The CQAI also reviewed the FDR installation procedures for these components where applicable.

3.2.1 Dewatering of the East Cell of the SOL

As discussed in Section 3.1, the east cell of the SOL was dewatered to provide access for construction of a sump. Dewatering activities were recorded under Work Item No. 13 in the IDRs.

As shown in Figure 2-1, water from the SOL was pumped to two, 500,000 gallon modu-tanks at a staging area located on the north side of the former Spent Potlining Pile A (PPA) site. The two 500,000 gallon modu-tanks were installed in a lined secondary containment dike. These tanks functioned as equalization and settling units for the treatment process in Building 79C. Conveyance of SOL water to the modu-tanks was accomplished by utilizing the existing 3-inch HDPE pipe that had been installed as part of the PPA remediation project. A new section of 3-inch HDPE pipe was installed at a tee on the existing 3-inch HDPE pipe to the west of the 20,000 gallon tank. The new pipe connected to a manifold that serviced the 500,000 gallon tanks. The arrangement was operated in reverse order (after making required valve position changes) to transfer the contents of the 500,000 gallon modu-tanks to Building 79C for treatment.

3.2.2 Geosynthetic Clay Liner

GCL was manufactured by Colloid Environmental Technologies Company. It was utilized to construct a seepage barrier on the western, northern and eastern slopes of the WLOL excavation. The CQAI reviewed approved submittals for these materials to confirm compliance with the FDR. Technical Specifications, Section 02275, detailed material property requirements for GCL. Section 3 of the CQAP discussed GCL inspection items and frequencies. The CQAI:

- inspected the rolls of GCL stored at the Alcoa site:
- maintained a log of the rolls used; and
- reviewed the manufacturer's certification sheets for compliance with the Technical Specifications prior to installation.

There were no noted defective rolls and specified storage procedures were implemented by the Contractor, MKE.

3.2.3 Common Fill/Select Fill

Common fill was utilized as backfill for the remediated WLOL and served as the subgrade for the interim cap. Common fill was provided from borrow sources MK-21 (Plumbrook Road) and MK-24 (Joy Road) both operated by Curran Logging of Massena, New York. The Technical Specifications, Section 02200, detailed the material property requirements for select and common fill and detailed material testing methods and frequencies. Results of common fill testing are archived with the project files.

Select fill was utilized as backfill for the GCL anchor trench and as protective layer beneath and above the GCL. Select fill was provided from borrow source MK-21. Preconstruction grain size analysis test results are archived with the project files.

3.2.4 Drainage Sand

Drainage sand was used as pipe bedding and cover for the underdrain system. DCF No. 10 requested gradation requirements for drainage sand. The response to DCF No. 10 provided gradation requirements for both drainage sand and screened gravel. Graded sand was supplied from an onsite stockpile that had been established for a separate project (i.e., the Central Impoundment). MK-5, (Parishville) operated by Sheehan Construction, was the source of the stockpiled material. Preconstruction grain size analysis test results are archived with the project files.

3.2.5 Screened Gravel

Screened gravel was placed around the base of the 24-inch HDPE underdrain sump, as shown on Record Drawing B-137714-JM. As stated in Section 3.2.4, DCF No. 10 provided the screened gravel gradation requirements. MK-21 served as the source for screened gravel. Preconstruction grain size analysis test results are archived with the project files.

3.2.6 Geotextile Fabric

Geotextile fabric was used to encapsulated the screened gravel placed around the base of the 24-inch HDPE underdrain sump as shown on Record Drawing B-137714-JM. Geotextile fabric (Polyfelt TS-750) was manufactured by Evergreen, Inc. Geotextile fabric was supplied from an onsite stockpile. There were no noted defects on the material placed for the underdrain sump.

3.2.7 HDPE Underdrain and Sump

HDPE pipe was used to construct the underdrain and sump. The 6-inch corrugated HDPE pipe and 24-inch HDPE sump pipe were manufactured by Driscopipe. HDPE pipe was supplied from an onsite stockpile. The CQAI inspected the pipe upon delivery to the WLOL. All materials were in conformance with the Technical Specifications, Section 02623 and DCO No. 1.

3.3 Construction Activities

Construction activities included installation of:

- the SOL sump;
- an underdrain system; and
- the GCL seepage barrier.

3.3.1 SOL Sump Installation

A sump was established within the east cell of the SOL to prevent the migration of contaminated water from the SOL into the WLOL through the common dike between the two sites. Although sump installation occurred concurrently with WLOL waste material and contaminated soils excavation, the sump was established before the excavation progressed below the shallow groundwater table (El. $228^{+/-}$).

Sump installation activity began on July 8, 1997 and was completed on July 15, 1997.

Construction of the SOL sump involved the consolidation of a portion of east cell SOL sludge. Sludge from within 30 feet of the SOL/WLOL common dike was relocated and consolidated within the confines of the SOL using an excavator. Low areas that encroached into the underlying soils were established in the sump at the southeast and northeast corners of the east cell as shown on Record Drawing B-137711-JM. Pumps were placed in the low areas on July 15, 1997. The sump was maintained in a dewatered condition.

Drums that were encountered during SOL consolidation activities were displaced with the sludge and left in the SOL.

The original objective of sludge consolidation was to transfer a majority of the sludge from the east to the west cell of the SOL and install an interim HDPE cap that would isolate the sludge from stormwater contact. This would have allowed ponded stormwater to be discharged directly to the stormwater collection system without processing through the treatment facility in Building 79C. MKE attempted to meet this objective by agitating the sludge in the east cell with an excavator to develop a mixture that could be managed with a solids handling pump. However, during the mixing operation an ignitable gas (or gases) was evolved that resulted in a flash ignition in the southwest quadrant of the east cell. For safety reasons the sludge consolidation effort was terminated. Investigation of the conditions causing the evolution of ignitable gases is on-going. Once the reaction is understood, a means to control it will be implemented and sludge consolidation efforts will resume.

Therefore, interim capping of the SOL has been included as a punch list item in Section 5. CQA inspection activities associated with this work item will be included in the Construction Quality Assurance Certification Report for the Soluble Oil Lagoon which is tentatively scheduled for completion in 1999.

CQA inspection and testing activities associated with the construction of the SOL sump were recorded under Work Item No. 10 in the IDRs.

3.3.2 Underdrain Piping System

An underdrain and sump was installed along the common dike between the SOL and WLOL as

discussed in Section 3.1. The CQAI confirmed that installation of the underdrain system was in conformance with the details presented in DCO No. 1. Installation of the underdrain piping system was performed on September 18, 1997.

Construction of the underdrain piping system included:

- installation a 6-inch corrugated HDPE pipe; and
- installation of a 24-inch HDPE monitoring sump.

3.3.2.1 Corrugated HDPE Pipe

A 6-inch corrugated HDPE pipe was installed at the toe of the eastern side of the common dike between the SOL and WLOL. The pipe was placed in a bedding of drainage sand that extended from 6 inches below the pipe invert to 12 inches above the crown as shown on Record Drawing B-137714-JM. Requirements for pipe trenching and subgrade preparation were included in the Technical Specifications, Section 02200. Field Engineering provided the CQAI with the approved submittals for drainage sand. The CQAI collected a sample of the drainage sand upon delivery to the site for analysis to verify that material was in conformance with gradation requirements provided in DCF No. 10. Gradation test results are archived with the project files.

3.3.2.2 HDPE Sump

The 24-inch HDPE sump was installed as shown on Record Drawing B-137714-JM. A panel of geotextile fabric was installed in the sump area prior to placement of the 24-inch HDPE sump pipe. The pipe was placed with a 4-foot section of slotted screen on the bottom. The 4-foot section of slotted screen was fabricated using a hand saw. Holes were cut in the side of the 24-inch HDPE to accommodate the 6-inch corrugated HDPE underdrain pipe. The sump area was then backfilled with screened gravel and the geotextile fabric wrapped around the assembly. Seepage barrier GCL was wrapped around the circumference of the 24-inch HDPE sump for a minimum of 3 feet along its length and secured with nylon straps.

Field Engineering provided the CQAI with the approved submittals for the screened gravel that were in compliance with the gradation requirements provided in DCF No. 10.

CQAI inspection activities during placement of the underdrain were recorded in the IDRs under Work Item No. 16.

3.3.3 Seepage Barrier Installation

As discussed in Section 3.1, the seepage barrier was extended along the northern and eastern side slopes of the WLOL excavation. The approximate limits of the seepage barrier are shown on

Record Drawing B-137711-JM. Seepage barrier installation details are shown on Record Drawing B-137714-JM. Installation of the seepage barrier was continuously observed by the CQAI to verify that the requirements of the FDR and DCO No. 1 were met. Seepage barrier installation began on September 10, 1997 and was completed on September 25, 1997. The items inspected during installation included:

- the preparation of an acceptable subgrade;
- GCL panel placement; and
- the placement of a protective layer over the GCL panels.

CQAI inspection activities during placement of GCL were recorded in the IDRs under Work Item No. 9.

3.3.3.1 Subgrade Surface Preparation

The sideslopes and bottom clay subgrade were dressed prior to the placement of GCL panels. A protective 6-inch layer of select fill was placed on the sideslopes to protect the GCL from any protruding sharp objects. Any backfill material that had inadvertently been deposited on the floor of the excavation within a minimum of 6 feet of the toe of the sideslopes was removed to expose undisturbed clay. This perimeter band of exposed clay was required to develop intimate contact with the GCL and establish the effectiveness of the seepage barrier.

3.3.3.2 GCL Panel Placement

Installation of the GCL was continuously observed by the CQAI to verify that the requirements of the FDR and Technical Specification, Section 02275, were met. The quality assurance parameters observed during installation included:

- panel orientation;
- seam preparation, location and overlap;
- seam augmentation;
- proper keying of the GCL into the anchor trench; and
- placement of the protective hydration restraining layer.

Table 3-1 lists the panel lot and roll numbers and corresponding field placement panel identification numbers. **Figure 3-1** provides a plan view of the panels field placement locations.

The panels were placed on the western, northern and eastern sideslopes as discussed in Section 3.3.1. The CQAI verified that:

- bentonite powder and pellets were applied to the undisturbed clay surface at the

toe of the sideslopes prior to panel placement;

- a minimum 6-foot length of GCL was in intimate contact with the undisturbed clay surface at the toe of sideslopes;
- seam overlaps were a minimum of 2 feet for all installed panels;
- panel seams were augmented with granular bentonite at a rate of 1/4 pound per linear foot; and
- no GCL panels became saturated before placement of the 12-inch select fill hydration restraining layer.

GCL was keyed into a top of slope anchor trench on the common dike between the SOL and WLOL and the western section of the north dike of the WLOL excavation as shown on Record Drawing B-137714-JM. The seepage barrier on the eastern section of the north and east sideslopes of the WLOL excavation were installed without an anchor trench as shown on Record Drawing B-137714-JM.

The CQAI inspected the anchor trench prior to backfilling to confirm that the subgrade was firm and dry, and free of sharps and rocks. After placement of the GCL, the anchor trench was backfilled with select fill. The CQAI performed moisture/density tests on the compacted material in the anchor trench to confirm that in-place density values met the minimum requirement of 90 percent of the maximum dry density modified Proctor value (138 pcf at 7 percent moisture). Moisture/density tests were taken with a nuclear densiometer and are archived with the project files. The CQAI collected samples of the select fill for gradation analysis to confirm that the material delivered to the site was in conformance with the Technical Specifications, Section 02200. Gradation analysis results for select fill are archived with the project files.

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Table 3-1

Panel Details

Factory Roll Number	In-Place Field Panel Number	Length (feet)	Width (feet)	Date Placed	Location (Leading Edge of Panel)	
					Northing	Easting
Unknown[1]	P1	15	45	9/10/97	1910	1447
Unknown[1]	P2	15	14.5	9/10/97	1865	1447
Unknown[1]	P3	21	13	9/16/97	2051	1381
2850	P3-B	18	13	9/16/97	2054	1399
2850	P4	38.3	13	9/16/97	2071	1413
2850	P5	38.3	13	9/16/97	2076	1376
2850	P6	38.5	13	9/17/97	2095	1407
2853	P7	38.5	13	9/17/97	2096	1367
2853	P8	38.5	13	9/17/97	2119	1399
2853	P9	38.5	13	9/17/97	2130	1396
2853	P10	12	13	9/19/97	2030	1396
31296	P10B	29	13	9/19/97	2034	1421
31296	P11	38.5	13	9/19/97	2015	1391
31296	P12	38.5	13	9/19/97	2005	1428
31296	P13	38.5	13	9/19/97	1989	1395
31296	P14	12	13	9/19/97	1977	1398
31293	P14B	29	13	9/19/97	1993	1429
31293	P15	38.5	13	9/19/97	1969	1436
31293	P16	38.5	13	9/19/97	1951	1402
31293	P17	38.5	13	9/19/97	1944	1439
31293	P18	12	13	9/19/97	1929	1441
31295	P18	29	13	9/19/97	1928	1412
31295	P19	12	13	9/19/97	1921	1436
31295	P20	38.5	13	9/19/97	1907	1431
31295	P21	40	13	9/19/97	1991	1234
31295	P22	36	13	9/19/97	1954	1227
31294	P23	40	13	9/19/97	2023	1236
31294	P24	40	13	9/19/97	2024	1222
31294	P25	40	13	9/19/97	2060	1231
31294	P26	40	13	9/19/97	2051	1239
31270	P27	42	13	9/22/97	2142	1387
31270	P28	16	13	9/22/97	2147	1381
31270	P29	42	13	9/22/97	2147	1381
31270	P30	12	13	9/22/97	2154	1370
31270	P31	42	13	9/22/97	2157	1351
31297	P32	42	13	9/22/97	2158	1341
31297	P33	42	13	9/22/97	2136	1325
31292	P34	50	13	9/22/97	2160	1330
31292	P35	52	13	9/23/97	2113	1305

Continued on next page

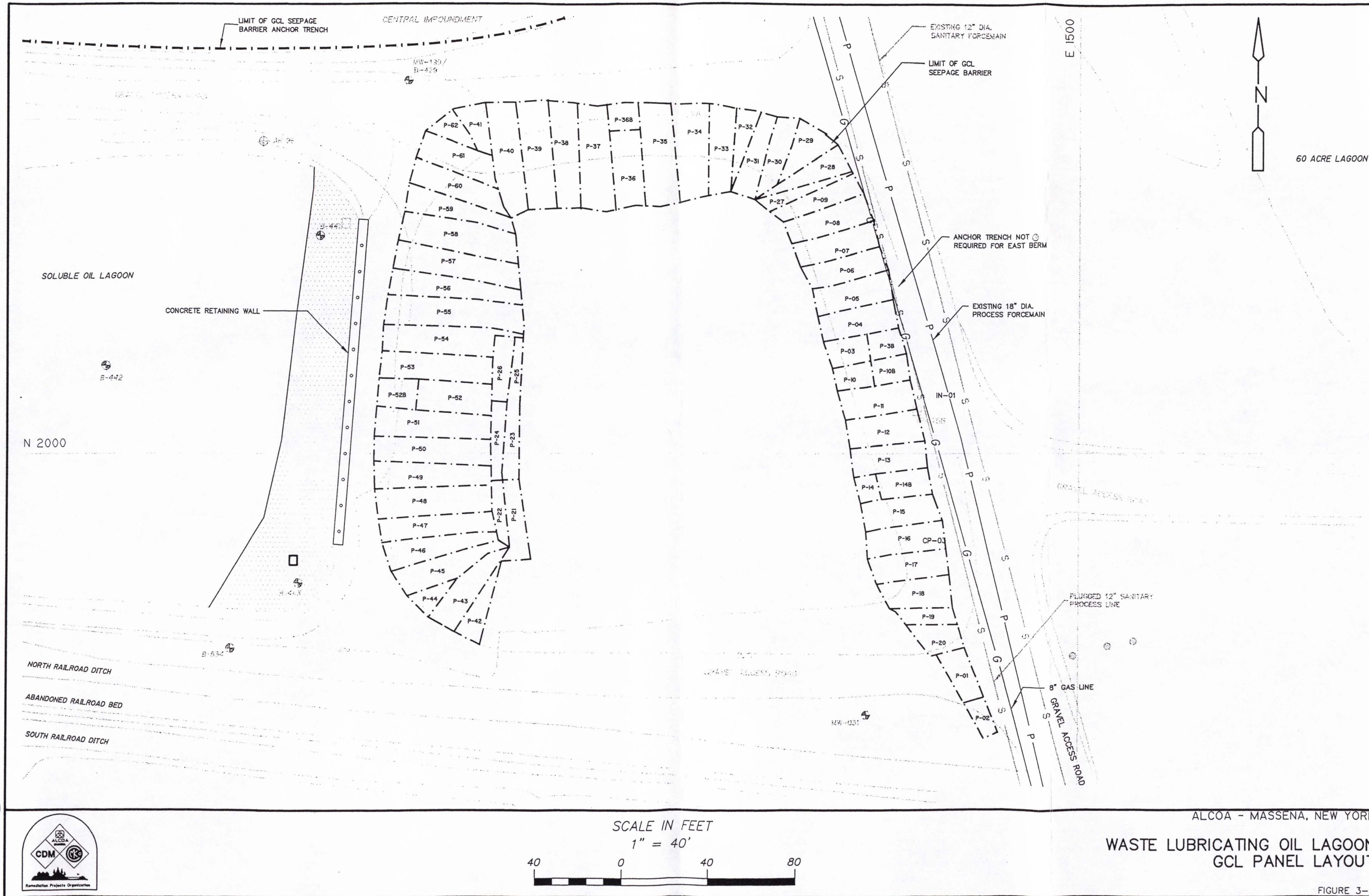
Table 3-1 *(Continued)*

Panel Details

Factory Roll Number	In-Place Field Panel Number	Length (feet)	Width (feet)	Date Placed	Location (Leading Edge of Panel)	
					Northing	Easting
31292	P36	48	13	9/23/97	2114	1294
31297	P36B	12	13	9/23/97	2162	1293
31269	P37	53	13	9/23/97	2160	1277
31269	P38	57	13	9/23/97	2113	1269
31266	P39	60	13	9/23/97	2112	1256
31266	P40	60	13	9/23/97	2112	1245
31266	P41	30	13	9/23/97	2113	1234
31269	P41B	40	13	9/23/97	2128	1222
31290	P42	58	13	9/24/97	2110	1225
31290	P43	58	13	9/24/97	1917	1212
31268	P44	20	13	9/24/97	1934	1190
31282	P45	30	13	9/24/97	1945	1183
31282	P46	60	13	9/24/97	1963	1221
31282	P47	60	13	9/24/97	1969	1177
31268	P48	60	13	9/24/97	1983	1175
31268	P49	60	13	9/24/97	1996	1175
31281	P50	60	13	9/25/97	2008	1175
31281	P51	60	13	9/25/97	2022	1176
31281	P52	30	13	9/25/97	2032	1221
31290	P52B	35	13	9/25/97	2034	1177
31291	P53	60	13	9/25/97	2047	1178
31291	P54	60	13	9/25/97	2057	1228
31265	P55	60	13	9/25/97	2073	1181
31265	P56	60	13	9/25/97	2077	1233
31264	P57	60	13	9/25/97	2088	1236
31264	P58	60	13	9/25/97	2111	1188
2852	P59	60	13	9/25/97	2124	1190
2852	P60	58	13	9/25/97	2135	1193
2852	P61	30	13	9/25/97	2148	1197
31264	P62	40	13	9/25/97	2157	1247

Note:

1. Unused portion of roll from Central Impoundment repair work.



ALCOA - MASSENA, NEW YORK

WASTE LUBRICATING OIL LAGOON GCL PANEL LAYOUT

FIGURE 3-1

C:\ALCOA\WLOL\CERT-RPT\ CSTWOL31 11-13-97 DeWayne R. Baillargeon Alcoa\RPO

3.4 Post-Construction

Post-construction activities include monitoring the pumping activities associated with the underdrain system over a two month period from the installation date of October 1, 1997.

3.5 Summary

Installation of the SOL sump, WLOL seepage barrier and underdrain piping system were in conformance with the requirements of the FDR. All components were installed as specified and required CQA testing was completed. Interim capping of the SOL has been included as a punch list item in Section 5 as discussed in Section 3.3.1.

Section 4
Interim Cap

4.1 General

The interim cap constructed over the WLOL consists of backfill (i.e., common fill) and plastic sheeting. A final capping system for the WLOL will be completed as part of the SOL remediation project.

The WLOL was backfilled with a 6-inch minus common fill following receipt of cleanup verification test results that were in compliance with the criteria presented in the *Cleanup Verification Work Plan for the Waste Lubricating Oil Lagoon* (CDM, December 1997). The backfill was graded to encourage stormwater runoff to flow from west to east. Grades for the final cap will incorporate those provided in the FDR for the SOL.

The preconstruction, construction and post-construction remedial activities associated with installation of the interim cap are discussed in Sections 4.2, 4.3 and 4.4, respectively.

A discussion of the CQA program requirements for installation of the WLOL interim cap was presented in Section 4 of the CQAP.

4.2 Preconstruction

4.2.1 Subgrade

Following excavation of the solidified waste/soils and receipt of acceptable cleanup verification test results, the CQAI verified that the subgrade was suitable for backfill placement in accordance with Technical Specification, Section 02200. The clay subgrade appeared firm and relatively dry.

4.2.2 Backfill

Prior to backfill delivery to the site, soil testing (i.e., grain size distribution and modified Proctor maximum dry density) was performed on samples from each borrow source. The soil test results were furnished to the CQAI prior to the date of the materials' placement at the WLOL site. The borrow sources used for backfill were MK-21 (Plumbrook Road) and MK-24 (Joy Road) both owned by Curran Logging of Massena, New York.

The CQAI reviewed the soil test results to assure that the materials meet the minimum requirements stated in Section 02200 of the Technical Specifications for common fill. Preconstruction soil test results are archived with the project files.

4.2.3 Plastic Sheeting

Plastic sheeting was supplied by Reef Industries, Inc. under the product name Griffolyn. Field Engineering approved the use of the 35 mil Griffolyn plastic sheeting as an equal to the 6 mil Aqua Shed product listed in the Technical Specifications, Section 02210, Part 2. The CQAI confirmed that the Griffolyn plastic sheeting was in conformance with the approved Field Engineering submittal and that the material was delivered undamaged to the site.

4.3 Construction

4.3.1 Common Fill

The CQAI collected samples of the common fill delivered to the site to assure that material met the grain size distribution requirements listed in Section 02200 of the Technical Specifications. A common fill sample was collected at a frequency of 1 test per 2,000 cy. The common fill was analyzed at the onsite Soils Laboratory. All collected sample test results met the requirements listed in Section 02200 of the Technical Specifications. Test results are archived with the project files.

During placement, the CQAI confirmed that common fill was placed in 12-inch to 18-inch thick lifts in accordance with the Technical Specifications. Nuclear moisture/density tests were taken at a frequency of 3 tests per lift. All in-place density readings met the required minimum 90 percent of the modified Proctor maximum dry density value. The average modified Proctor value was 142 pcf at 8 percent moisture content. In-place density test results are archived with the project files.

4.3.2 Plastic Sheeting

The CQAI verified that the 35 mil Griffolyn plastic sheeting was installed per the Field Engineering approved submittals. The sheets were laid with a minimal 12-inch overlap and the seams were clean and dry prior to placement of the tape. Seams were fastened using a product called Fab tape, provided by Reef Industries, Inc. Sand bags were placed over the plastic sheeting as a ballast.

CQA activities associated with installation of the interim cap were recorded in the IDRs under Work Item No. 13.

4.4 Post-Construction

Post-construction activities include periodic inspection of the site to monitor the integrity of the plastic sheeting and the maintenance of stormwater runoff controls.

Section 5
Conclusions

5.1 General

A CQA program was conducted during the WLOL remediation effort. The program implementation for the items discussed in this report was in accordance with the CQAP and met the objective of documenting that the project was completed in conformance with the requirements of the FDR.

CQA sampling and testing met or exceeded the requirements of the CQAP and the FDR. Any deviations from the provisions of these documents has been noted and discussed in the appropriate sections of this report.

It is the conclusion of the CQAO that construction was in conformance with, and met the intent of, the FDR.

5.2 Punch List Items

Table 5-1 provides a complete listing of punch list items.

ALCOA REMEDIATION PROJECTS ORGANIZATION
WASTE LUBRICATING OIL LAGOON
CERTIFICATION REPORT

Table 5-1

Punch List

Item No.	Description	Date Completed
1	Abandon inclinometers 593, 594 and 595.	
2	Installation of the interim SOL HDPE cap.	
3	WLOL underdrain sump monitoring.	on-going

Appendix A

Archived Files

Appendix A
Archive File List

File No.	Description
1-1	Specification 02276-Geotechnical Instrumentation
1-2	Specification 02273-HDPE
1-3	Specification 02275-Geosynthetic Clay Liner
1-4	Specification 13740-Solidification
1-5	Final Design Comments
1-6	Weekly Progress Meeting Notes
1-7	Survey Data
1-8	Specification 02200-Gryfolyn Plastic Cover
1-9	Specification 02200-Soil Lab Results
1-10	Water Levels
1-11	Inspector Daily Reports
1-12	Photo Logs
1-13	Specification 02200-Moisture Nuclear Density Test Results
1-14	Specification 02210-Pocket Penetrometer Test Results

Note: A complete set of archived design, field engineering and administration documents are archived with the project files in Building 65.

Appendix B

Weekly Progress Meeting Minutes

CDM Camp Dresser & McKee

Memorandum

97WLOL-0002-CQA

Wayne M. Kimball

To: *Distribution*

From: *Lisa Swan*

Date: *July 2, 1997*

Subject: *Alcoa Remediation Projects Organization*
Waste Lubricating Oil Lagoon
Weekly Progress Meeting, Report No. 1, July 1, 1997

Attendees:

Alcoa	Tom Lightfoot
CDM	Wayne Kimball Joe Mihm Lisa Swan Michael Bowen Jeanne Riley Pete Skiadas Bion Dalton
MKE	Dana Williams Brian Hansen Aaron Gillmore Darrell Avery Tom Davey
NYSDEC	Mike Cox

The meeting was convened by Lisa Swan of CDM. The following items were discussed:

I. Comments to Previous Meetings

None.

II. Construction Activities

A. Current Work Activities:

1. MKE established a perimeter drainage swale and sump in the southeast corner of the

WLOL.

2. MKE placed a clay dam on the inlet of the drainage culvert that connects southeast corner of the WLOL to the north railroad ditch.

3. MKE completed construction of the site decontamination pad.

4. MKE lined the staging area east of Cell 2 at the SLF that will be used for stockpiling potentially contaminated cap material.

5. MKE continued pumping the west cell of the SOL to the 500,000 gallon modu-tanks.

B. Anticipated Work Activities:

1. MKE will install survey check plates based on the response to DCF 3.

2. MKE will complete stripping potentially clean cap material and haul the material to the staging area east of Cell 2.

3. MKE will begin SOL sludge displacement and establish a sump in the southeast corner.

4. MKE will hold a major task meeting on Tuesday, July 8, 1997 at 7:30 am prior to waste excavation and hauling activities.

5. MKE health and safety personnel will collect airborne contaminant samples from sludge manipulation activities in the SOL.

6. CDM Field Engineering will be initializing the inclinometers this week.

III. Schedule

1. For weekending July 5, 1997, MKE will work four, 10-hour shifts, 7:00 am-5:30 pm, Monday through Thursday. Beginning July 7, 1997 MKE will work five, 10-hour shifts 7:00 am -5:30 pm, Monday through Friday.

IV. Record Drawings/Survey Controls

1. Survey will shoot the locations of the drainage culverts in the southeast corner of the WLOL and underlying the east end of the railroad bed.

V. Health and Safety

1. Brian Hansen will be collecting air samples during sludge manipulation activities in the SOL (i.e., prior to any excavation activities being performed).

VI. Submittals and Requisitions

1. MKE will be transmitting submittals on approved potential borrow sources for common fill and topsoil. Griffilin cover is being proposed as a substitute for visqueen for the interim cover system.

VII. Old Business

1. Field Engineering will be issuing responses to DCFs 1 and 2 this week.

VIII. New Business

1. During cap stripping activities on the eastern and northern edges of the WLOL, and the roads running contiguous with the WLOL, a black stained soil/brick mixture was encountered. CDM, MKE and Alcoa agreed that this material will be segregated from the remainder of the potentially clean cap material in the staging area east of Cell 2. Testing of the material will be performed concurrently with the testing of the remainder of the stripped cap material.

2. MKE stated that the potentially clean sand fill had a strong odor when uncovered during the test pitting operation. The sand fill therefore will be segregated from the other cap material and tested in the staging area east of Cell 2.

IX. Borrow Sources

1. Offsite common borrow will be coming from the Curran pit, MK21.

2. MKE might use stockpiled material in MK2 for backfilling the bottom layer of the WLOL. Tom Davey will keep the Soils Lab informed on any testing that may be required for grain size analysis and Proctors prior to using the material.

DP:tmp

cc: Attendees
Mike Schultz
Walt Chaffee

CDM Camp Dresser & McKee

Memorandum

97WLOL-0003-CQA

To: *Distribution*

From: *Lisa Swan*

Wayne M. Kimball

Date: *July 9, 1997*

Subject: *Alcoa Remediation Projects Organization*
Waste Lubricating Oil Lagoon
Weekly Progress Meeting, Report No. 2, July 8, 1997

Attendees:

Alcoa	Tom Lightfoot
CDM	Wayne Kimball Lisa Swan Michael Bowen Kelley Premo Christina Osvoldik Pete Skiadas
MKE	Dana Williams Brian Hansen Guy Griffin Aaron Gillmore Tom Davey
NYSDEC	Mike Cox

The meeting was convened by Lisa Swan of CDM. The following items were discussed:

I. Comments to Previous Meetings

1. The sand fill discussed under New Business, item 2, will be tested at the WLOL instead of the staging area east of Cell 2.

II. Construction Activities

A. Current Work Activities:

1. MKE held a major task meeting for waste excavation activities.

2. MKE completed stripping the WLOL cap. Approximately 150 loads of topsoil and clay and 9 loads of brick debris were stockpiled in the staging area east of Cell 2. In addition, approximately 500 cy of sand fill was stripped and stockpiled in the east end of the WLOL exclusion zone.

3. CDM initialized the inclinometers and took the first set of readings on July 7, 1997.

4. CDM Field Engineering sampled the cap material in the Cell 2 staging area for PCB, PAH and VOC analysis.

5. MKE continued pumping the west cell of the SOL to the 500,000 gallon modu-tanks.

B. Anticipated Work Activities:

1. MKE will begin SOL sludge displacement and establish a sump in the southeast corner.

2. MKE will complete SOL sludge displacement.

3. MKE will install the survey check plates.

4. MKE will continue waste excavation and hauling activities for approximately the next 30 days.

III. Schedule

1. MKE will work five, 10-hour shifts 7:00 am-5:30 pm, Monday through Friday.

IV. Record Drawings/Survey Controls

1. Survey will shoot the locations of the drainage culverts in the southeast corner of the WLOL and underlying the east end of the railroad bed.

2. Survey will topo the cap/waste interface prior to excavation activities.

V. Health and Safety

None.

VI. Submittals and Requisitions

None.

VII. Old Business

1. Field Engineering issued responses to DCFs 1, 2 and 3 last week.

VIII. New Business

1. MKE, CDM and Alcoa agreed that all of the unsolidified waste leaving the WLOL will be tested for strength at the Secure Landfill. Unsolidified waste must meet 16 psi bearing strength at the Secure Landfill prior to subsequent lifts being placed. The waste may be bulked at either the landfill or the WLOL to achieve the minimum bearing strength requirements. Upon solidification, the short-term strength of 0.5 tsf must be achieved prior to the waste leaving the WLOL. CQA will perform paint filter tests if necessary.

IX. Borrow Sources

None.

LS:tmp

cc: Attendees
Darrel Avery
Joe Mihm
Mike Schultz
Walt Chaffee

CDM Camp Dresser & McKee

Memorandum

97WLOL-0022-CQA

To: *Distribution*

From: *Lisa Swan*

Wayne M. Kimball

Date: *August 20, 1997*

Subject: *Alcoa Remediation Projects Organization*
Waste Lubricating Oil Lagoon
Weekly Progress Meeting, Report No. 8, August 19, 1997

Attendees:

Alcoa	Francis Gero Patti Kaulback
CDM	Wayne Kimball Joe Mihm Lloyd Silver Mike Bowen Pete Skiadas Christina Osvoldik Lisa Swan
MKE	Dana Williams Brian Hansen Aaron Gilmour Guy Griffin Tom Davey Darrel Avery
NYSDEC	Mike Cox

The meeting was convened by Lisa Swan of CDM. The following items were discussed:

I. Comments to Previous Meetings

1. The last sentence under the new business item 1 should be clarified to read "Further excavation in the west slope was discontinued until further notice."

Construction Activities

A. Current Work Activities:

1. MKE hauled contaminated soil from the road and ditch excavations and contaminated waste from the area surrounding B-094 to the Secure Landfill Cell 2.

2. CDM continued taking and evaluating the inclinometer readings.

3. MKE completed the excavation of a minimum of 2 feet of contaminated soil from the north railroad ditch.

4. CDM collected north railroad ditch cleanup verification samples NRD-01 through NRD-10.

5. CDM collected the south railroad ditch samples 01 and 02. Sample SRD-01 was collected at the outlet of the culvert and sample SRD- 02 was collected midway between the culvert and the east access road. Verbal results from the Alcoa Lab indicated PCB concentrations at <0.5 ppm and 1.3 ppm, respectively.

6. MKE completed excavation of the southern dike from sample location TOD-13 through sample location TOD -19. CDM collected cleanup verification samples TOD-15 through TOD-19.

7. SOL sludge transfer has been stopped until the reaction observed on August 18, 1997 has been investigated.

8. MKE began excavation of the west road dike on August 18, 1997. Activity was halted after debris was encountered at depths of 8-to 10-feet below the road surface.

9. MKE began excavation of the northern road dike on August 19, 1997.

B. Anticipated Work Activities:

1. MKE will complete excavation of the northern road dike.

2. CDM will continue to evaluate inclinometer and survey check plate readings.

3. CDM will perform visual inspections and cleanup verification testing upon excavation completion.

4. CDM will begin execution of the Stratum IIA-S sampling and analysis plan.

5. MKE will restart sludge transfer from the east SOL cell to the west SOL cell when so directed by CDM.

6. MKE will restart WLOL excavation activities when so directed by CDM.

III. Schedule

1. MKE will work five, 10-hour shifts, 7:00 am-5:30 pm, Monday-Friday.

IV. Record Drawings/Survey Controls

1. Lisa Swan requested final topos of the north railroad ditch. Final topo will be taken upon receipt of acceptable cleanup verification sampling results.

2. Lisa Swan requested that the sample locations on the north dike and WLOL test pits be located by survey.

3. Tom Davey stated that excavation activities in the vicinity of the survey check plates may be negatively impacting the usefulness of future data.

4. Pete Skiadas reported that the inclinometer readings are continuing to increase at the same rate. The readings are still within allowable limits.

V. Health and Safety

Nothing to report.

VI. Submittals and Requisitions

Nothing to report.

VII. Old Business

1. Alcoa received verbal results from the Alcoa Lab on the samples taken from the Stratum IIA-S and Stratum IIA-M interface from test pits in the northeast, southwest, southeast, center, B-094 and B-452. The viscous clear product-looking liquid from B-094 contained a PCB concentration of 58,000 ppm. The sample from B-452 contained a PCB concentration of between 1,500 and 3,000 ppm. The remaining test pit sample results were nondetect for PCBs. None of the samples were analyzed for VOCs or PAHs.

2. The NYSDEC approved the Stratum IIA-S sand lens sampling and analysis plan. CDM began collecting samples on August 19, 1997.

VIII. New Business

1. Tom Davey reported that MKE is awaiting further CDM direction concerning SOL sludge transfer, WLOL and western dike excavation activities.

2. MKE began excavation of the northern WLOL dike. The limit of visual contamination is substantially below 9 inches of the original road surface. The area at the east end of the dike is filled with construction debris at depths 6 feet below the ground surface. CDM Field Engineering advised MKE to remove the debris until waste/soil interface is encountered.

IX. Borrow Sources

1. Tom Davey reported that offsite source MK-21, will be used for common fill.

X. Secure Landfill

1. Lloyd Silver (CQAI) reported that unloading and waste placement is going well.

LS:tmp

cc: Attendees
Tom Lightfoot
Mike Schultz
Walt Chaffee

CDM Camp Dresser & McKee

Memorandum

97WLOL-0028-CQA

To: *Distribution*

From: *Lisa Swan*

Wayne M. Kimball

Date: *August 27, 1997*

Subject: *Alcoa Remediation Projects Organization*
Waste Lubricating Oil Lagoon
Weekly Progress Meeting, Report No. 9, August 26, 1997

Attendees:

Alcoa	Tom Lightfoot
	Patti Kaulback
CDM	Joe Mihm
	Lloyd Silver
	Mike Bowen
	Pete Skiadas
	Christina Osvoldik
	Lisa Swan
MKE	Steve Lawrence
	Bill Moon
	Brian Hansen
	Aaron Gilmour
	Guy Griffin
	Tom Davey
	Darrel Avery
NYSDEC	Mike Cox

The meeting was convened by Lisa Swan of CDM. The following items were discussed:

I. Comments to Previous Meetings

None.

Construction Activities

A. Current Work Activities:

1. MKE hauled contaminated soil from the road and ditch excavations to the Secure Landfill Cell 2.

2. CDM continued taking and evaluating the inclinometer readings.

3. MKE completed the first round of excavation on the northern and southern berm access roads.

4. CDM collected samples TOD-VER-01 through TOD-VER-05, TOD-VER-22, TOD-VER-23, ER-01, ER-02 and ER-03 on August 21, 1997.

5. CDM collected informational samples WB-01, WB-02 and WLOL-FS-01 from the WLOL excavation on August 22, 1997.

6. CDM collected samples TOD-VER-14, 20, 21 and ER-04 on August 25, 1997.

7. MKE began excavation of the Stratum IIA-S sand lens in grids 2, 3, 8, 9, 14, 15 and 20 on August 25, 1997.

B. Anticipated Work Activities:

1. MKE will backfill clean areas upon receipt of analytical results.

2. CDM will continue to evaluate inclinometer and survey check plate readings.

3. CDM will perform visual inspections and cleanup verification testing upon excavation completion.

4. MKE and CDM will sample the SOL and perform analyses to determine the probable cause of the reactions that lead to the flash ignition.

5. MKE will restart sludge transfer activities from the east SOL cell to the west SOL cell when CDM has completed its analysis.

III. Schedule

1. MKE will work five, 10-hour shifts, 7:00 am-5:30 pm, Monday-Friday. MKE will observe the holiday on September 1, 1997.

IV. Record Drawings/Survey Controls

None.

V. Health and Safety

None.

VI. Submittals and Requisitions

None.

VII. Old Business

1. Pete Skiadas reported that analytical results from test pit location PS-01 through 13 were received. PCB concentrations greater than 10 ppm were detected in PS-03, PS-02, PS-10 and PS-13. In addition, samples PS-04, 5, 8, 11 and 12 were analyzed for PAH concentration and were nondetect.

2. Analytical results for the samples collected on the access roads and the north railroad ditch will be transmitted upon receipt of written reports.

3. The response to DCF4 was discussed. The required two samples from the south railroad ditch were taken and analyzed. SRD-01 was located at the culvert outlet and SRD-02 was located between the culvert and the road. Analytical results indicated that PCB concentrations were nondetect and 1.3 ppm, respectively. Tom Lightfoot indicated that Alcoa intends to remediate the eastern portion of the ditch with the SOL.

4. The culvert referenced in DCF5 was removed during the north road excavation.

5. The Sampling and Analysis Plan dated August 15, 1997 was incorporated into the response for DCF6. MKE began the required additional excavation on August 25, 1997.

6. DCF8 allowed the use of common fill as backfill material in the north railroad ditch.

7. Christina Osvoldik reported that sample NRD-VER-01 analytical results were received from RECRA. PCBs, PAHs and VOCs were nondetect.

VIII. New Business

1. Tom Davey requested that Field Engineering provide updated excavation grades upon receipt of cleanup verification analytical results.

IX. Borrow Sources

None.

X. Secure Landfill

1. Lloyd Silver (CQAI) reported that unloading and waste placement are going well.

2. Lloyd Silver reported that Shelby tube data has been received. Mike Bowen added that the results would be transmitted to the NYSDEC.

LS:tmp

cc: Attendees
Mike Schultz
Walt Chaffee

Appendix C

Inclinometer Data

Appendix C
Inclinometer Data

Inclinometer Monitoring Results

The observational approach was applied to the WLOL excavation and required frequent monitoring of lateral movement of the soil sideslopes. Four inclinometers (IN-593, IN-594, IN-595 and IN-596) were installed in the northern, eastern, southern and western slopes, respectively, of the WLOL excavation to monitor lateral slope movement. The inclinometers were monitored twice a week from their initialization on July 1 and 2, 1997, until August 7, 1997. After August 7, 1997 monitoring was performed more frequently because of deeper excavations performed at the west side of the WLOL. The following observations were observed by the Field Engineer.

North Slope (IN-593)

Inclinometer IN-593 was monitored from July 2, 1997 until August 19, 1997. Monitoring was interrupted on August 20, 1997 because the extent of the excavation to the north of the WLOL impeded access to the inclinometer. Figure C-1 shows the lateral movement of the inclinometer in A (perpendicular to the excavation) and B (parallel to the excavation) directions. Excavation depth over time is shown on Figure C-5. Maximum deflection over time is shown on Figure C-6. Top deflection (deflection at ground surface) over time is shown on Figure C-7. Normalized maximum lateral deflection, ratio of maximum lateral deflection to excavation depth, over time is shown on Figure C-8. Mass instability of the slideslope was not observed and excavation proceeded without significant delays.

East Slope (IN-594)

Inclinometer IN-594 was monitored from July 1, 1997 until September 9, 1997. Lateral movement measured in IN-594 significantly decreased when excavation near the east side was completed on August 7, 1997. Figure C-2 shows the lateral movement of the inclinometer in A and B directions. Excavation depth over time is shown on Figure C-5. Maximum deflection over time is shown on Figure C-6. Top deflection over time is shown on Figure C-7. Normalized maximum lateral deflection over time is shown on Figure C-8. Mass instability of the sideslope was not observed and excavation proceeded without significant delays.

South Slope (IN-595)

Inclinometer IN-595 was monitored from July 2, 1997 until September 9, 1997. Lateral movement measured in IN-595 significantly decreased when excavation near the south side was completed on August 7, 1997. Figure C-3 shows the lateral movement of the inclinometer in A and B directions. Excavation depth over time is shown on Figure C-5. Maximum deflection over time is shown on Figure C-6. Top deflection over time is shown on Figure C-7.

Normalized maximum lateral deflection over time is shown on Figure C-8. Mass instability of the sideslope was not observed and excavation proceeded without significant delays.

West Slope (IN-596)

Inclinometer IN-596 was monitored from July 2, 1997 until September 9, 1997. Figure C-3 shows the lateral movement of the inclinometer in A and B directions. Excavation depth over time is shown on Figure C-5. Maximum deflection over time is shown on Figure C-6. Top deflection over time is shown on Figure C-7. Normalized maximum lateral deflection over time is shown on Figure C-8. Lateral movement increased with excavation depth and a maximum of 1.4 inches of movement was observed. However, mass instability of the sideslope was not observed and excavation proceeded without significant delays.

Figure C-1

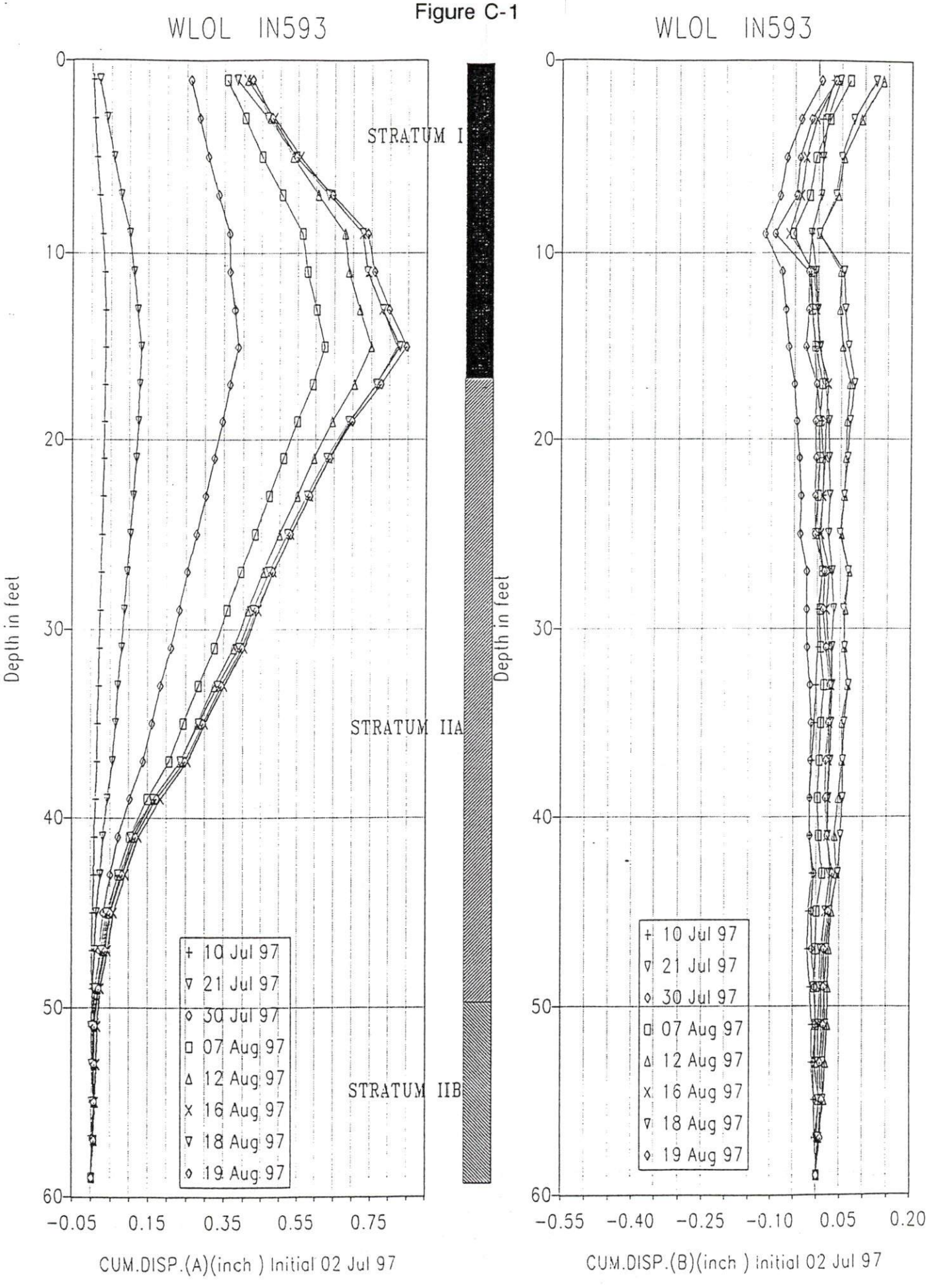

WLOL IN593
STRATUM I
STRATUM IIA
STRATUM IIB
Depth in feet
0
10
20
30
40
50
60
-0.05
0.15
0.35
0.55
0.75
+ 10 Jul 97
▽ 21 Jul 97
◇ 30 Jul 97
□ 07 Aug 97
△ 12 Aug 97
X 16 Aug 97
▽ 18 Aug 97
◇ 19 Aug 97
CUM.DISP.(A)(inch) Initial 02 Jul 97
WLOL IN593
Depth in feet
-0.55
-0.40
-0.25
-0.10
0.05
0.20
+ 10 Jul 97
▽ 21 Jul 97
◇ 30 Jul 97
□ 07 Aug 97
△ 12 Aug 97
X 16 Aug 97
▽ 18 Aug 97
◇ 19 Aug 97
CUM.DISP.(B)(inch) Initial 02 Jul 97

Figure C-2

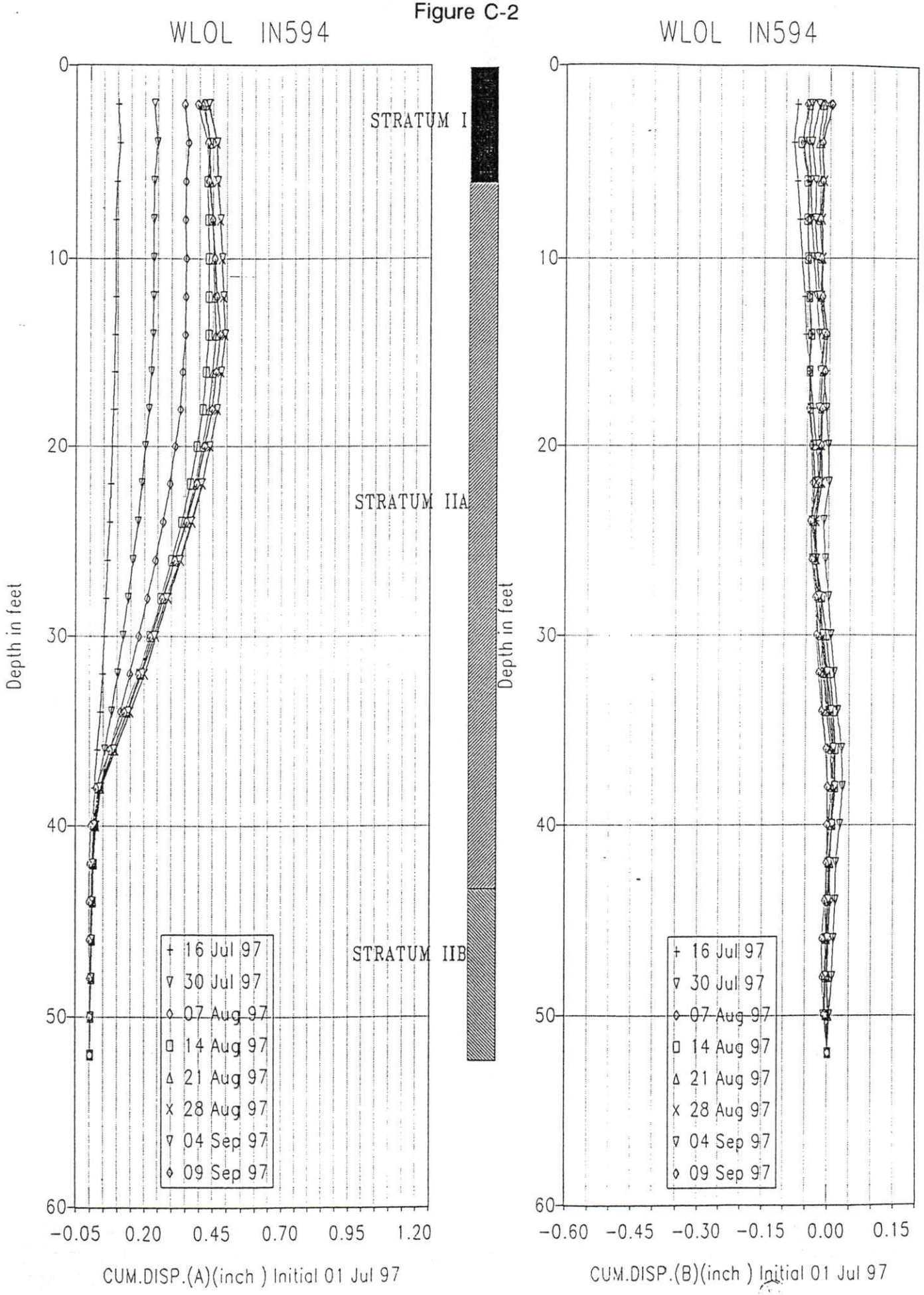

WLOL IN594
STRATUM I
STRATUM IIA
STRATUM IIB
Depth in feet
0
10
20
30
40
50
60
+ 16 Jul 97
▽ 30 Jul 97
◇ 07 Aug 97
□ 14 Aug 97
△ 21 Aug 97
X 28 Aug 97
▽ 04 Sep 97
◇ 09 Sep 97
-0.05
0.20
0.45
0.70
0.95
1.20
CUM.DISP.(A)(inch) Initial 01 Jul 97
WLOL IN594
-0.60
-0.45
-0.30
-0.15
0.00
0.15
CUM.DISP.(B)(inch) Initial 01 Jul 97

Figure C-3

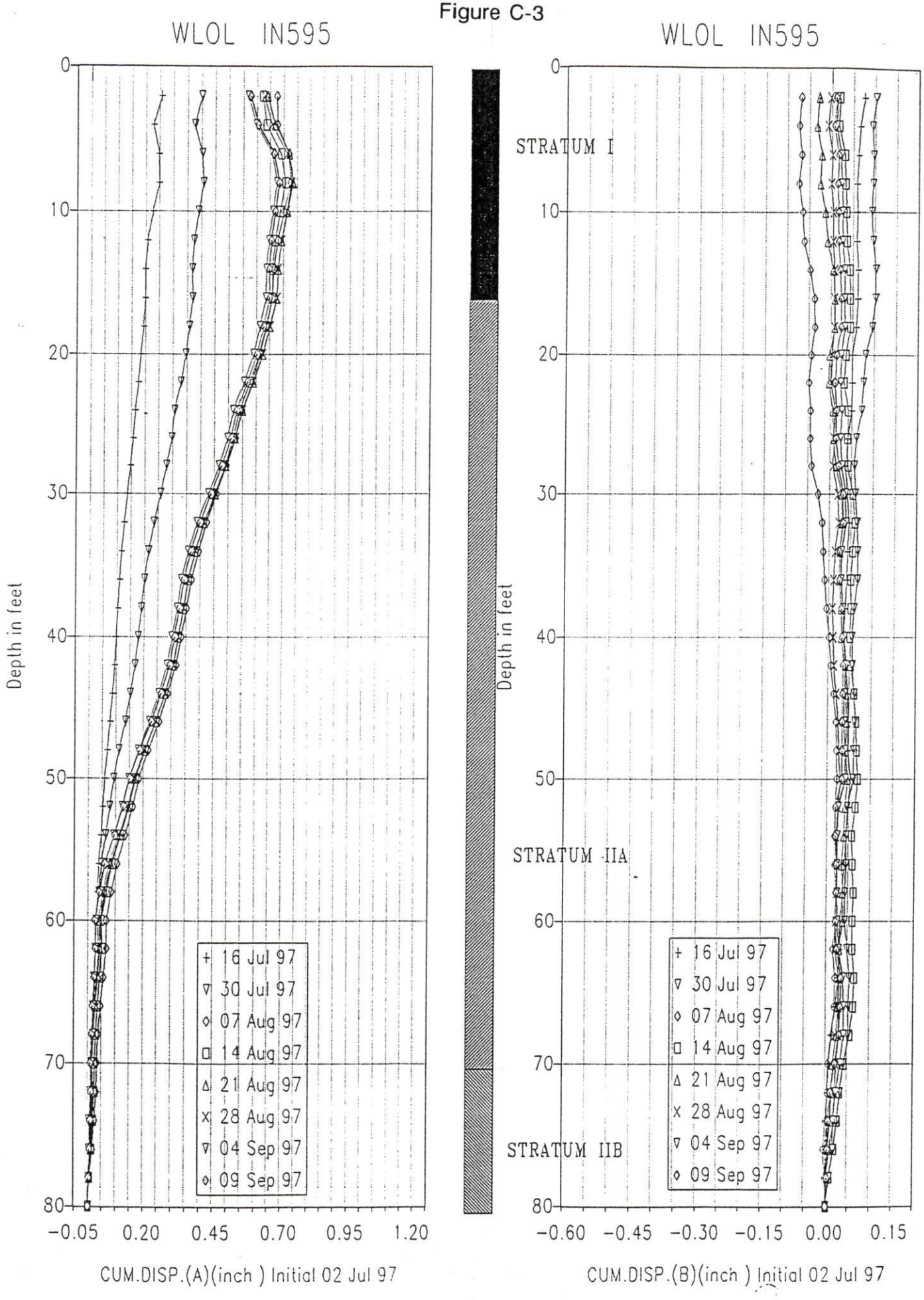

WLOL IN595
WLOL IN595
Depth in feet
Depth in feet
STRATUM I
STRATUM IIA
STRATUM IIB
0
10
20
30
40
50
60
70
80
+ 16 Jul 97
▽ 30 Jul 97
◇ 07 Aug 97
□ 14 Aug 97
△ 21 Aug 97
x 28 Aug 97
▽ 04 Sep 97
◇ 09 Sep 97
−0.05
0.20
0.45
0.70
0.95
1.20
−0.60
−0.45
−0.30
−0.15
0.00
0.15
CUM.DISP.(A)(inch) Initial 02 Jul 97
CUM.DISP.(B)(inch) Initial 02 Jul 97

Figure C-4

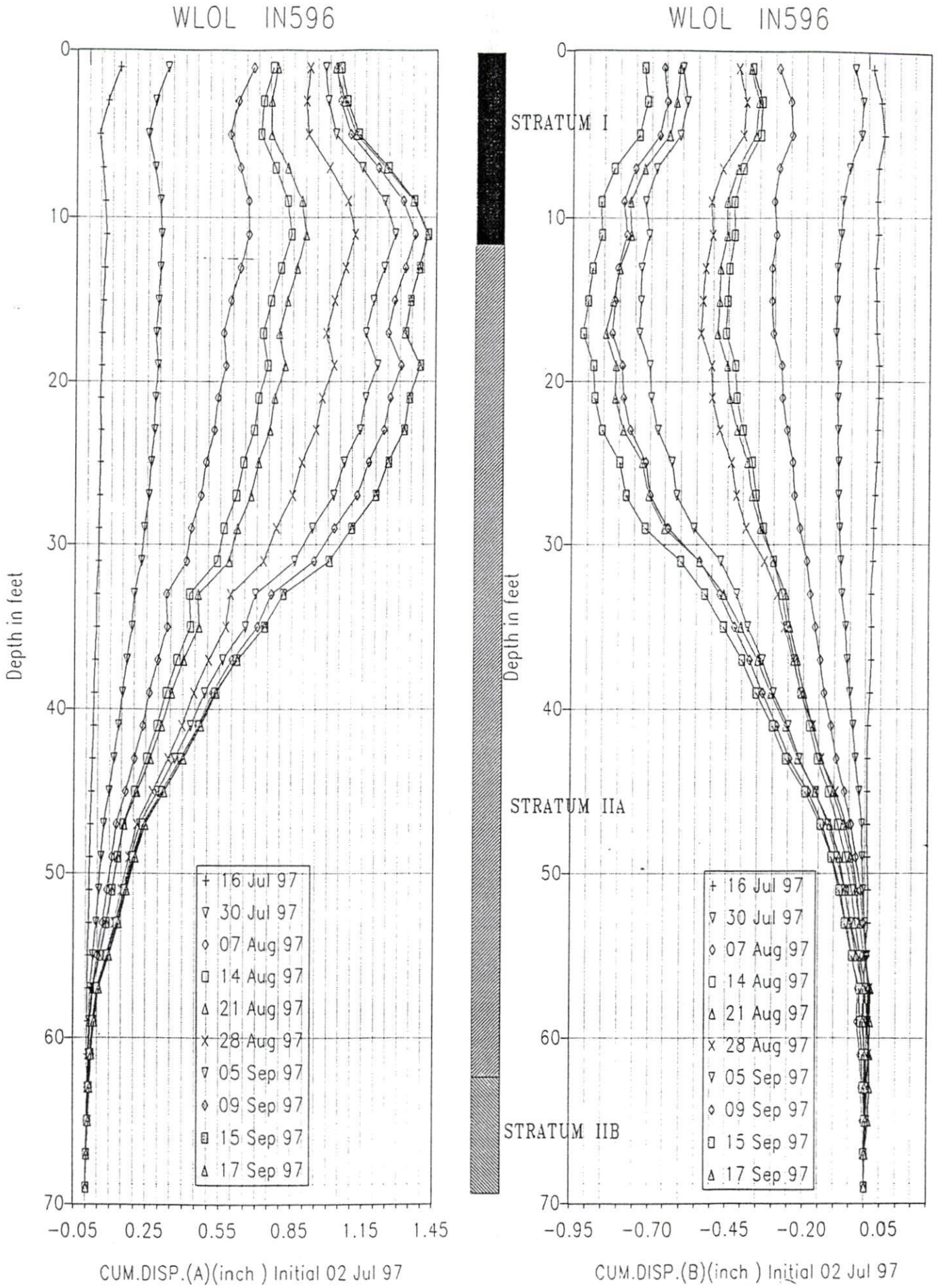

WLOL IN596
Depth in feet
0
10
20
30
40
50
60
70
+ 16 Jul 97
▽ 30 Jul 97
◇ 07 Aug 97
□ 14 Aug 97
△ 21 Aug 97
× 28 Aug 97
▽ 05 Sep 97
◇ 09 Sep 97
□ 15 Sep 97
△ 17 Sep 97
−0.05
0.25
0.55
0.85
1.15
1.45
CUM.DISP.(A)(inch) Initial 02 Jul 97
WLOL IN596
STRATUM I
STRATUM IIA
STRATUM IIB
Depth in feet
−0.95
−0.70
−0.45
−0.20
0.05
CUM.DISP.(B)(inch) Initial 02 Jul 97

Figure C-5
Excavation Depth vs. Time

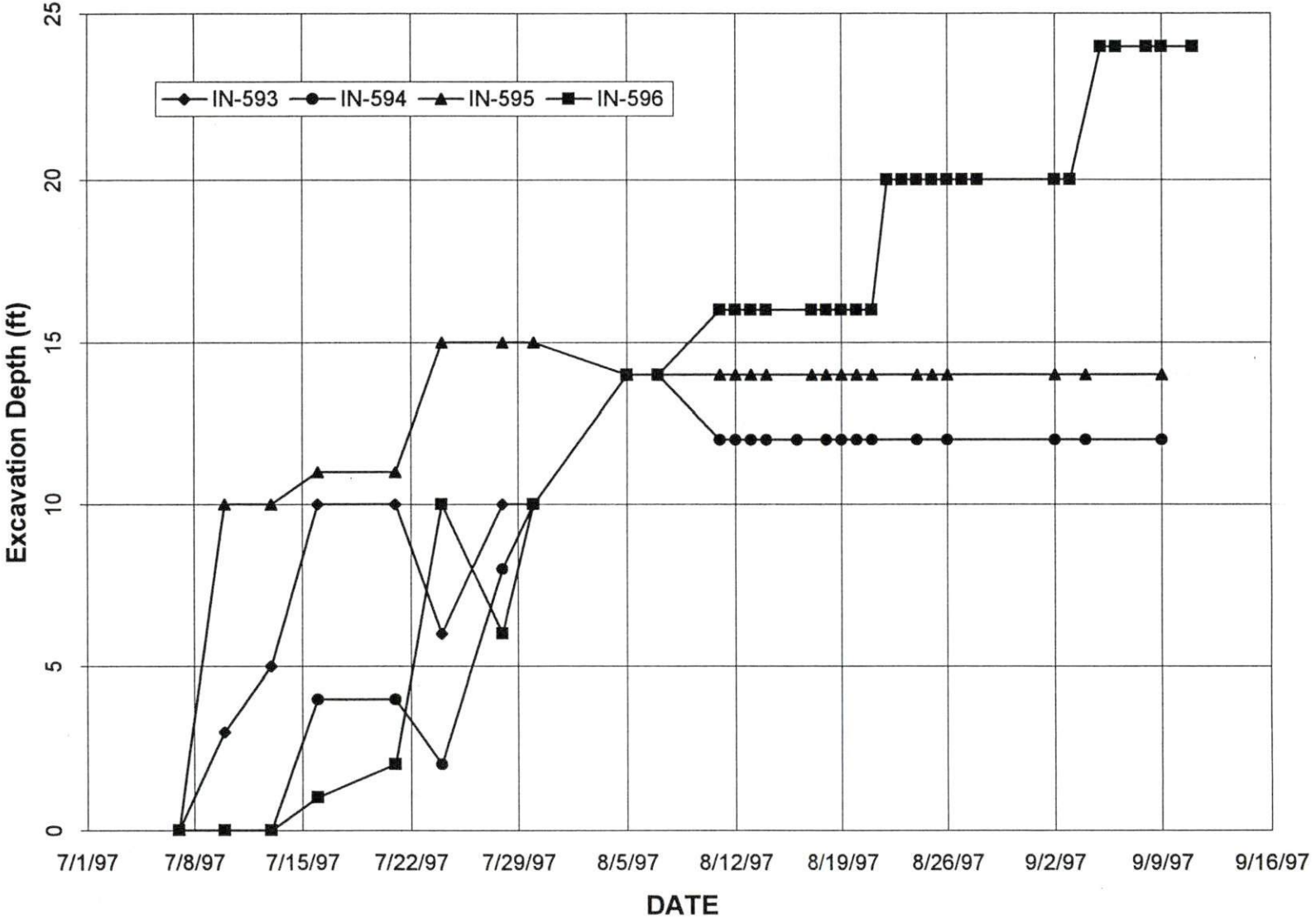


Figure C-6
Maximum Deflection vs. Time

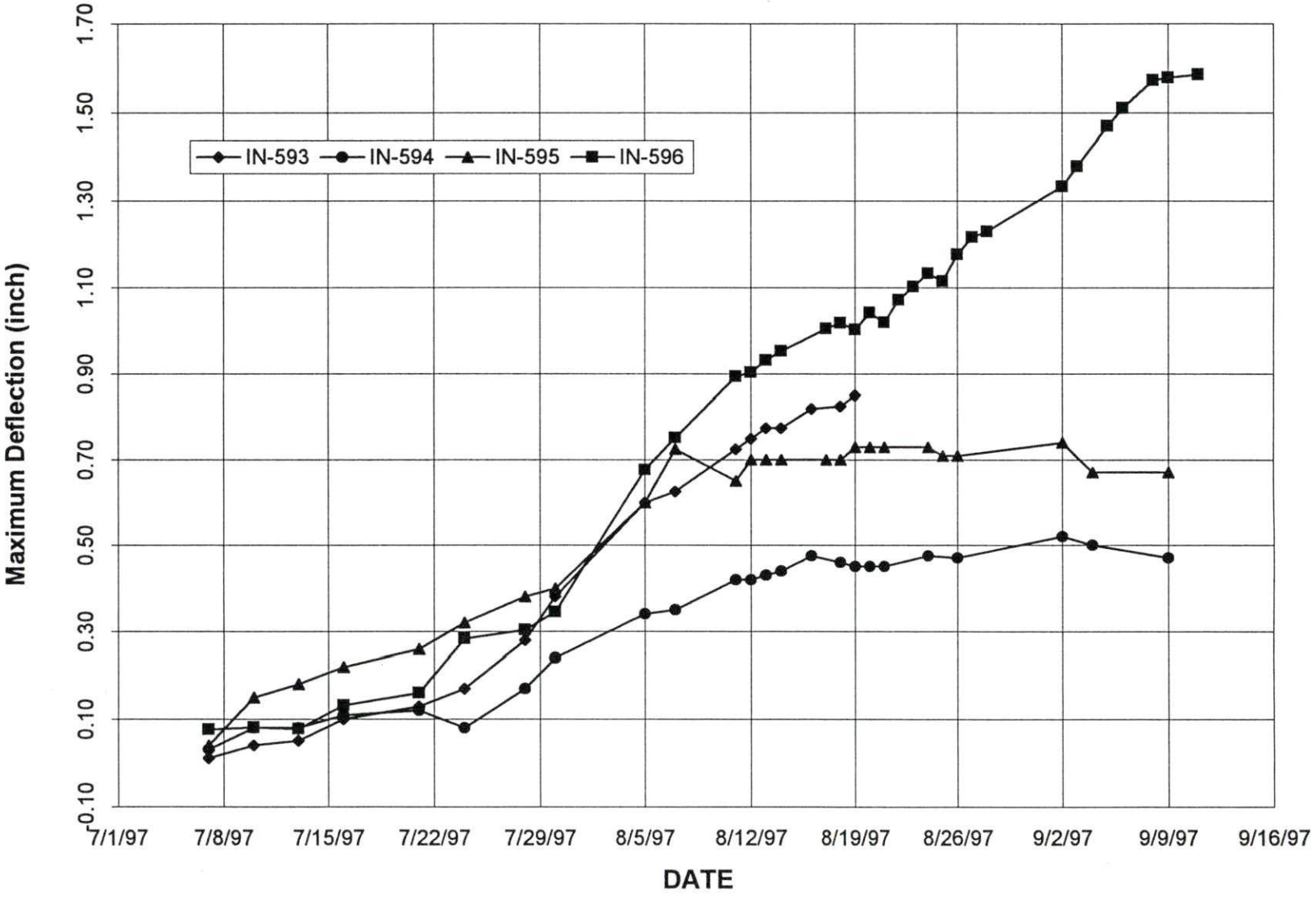


Figure C-7
Top Deflection vs. Time

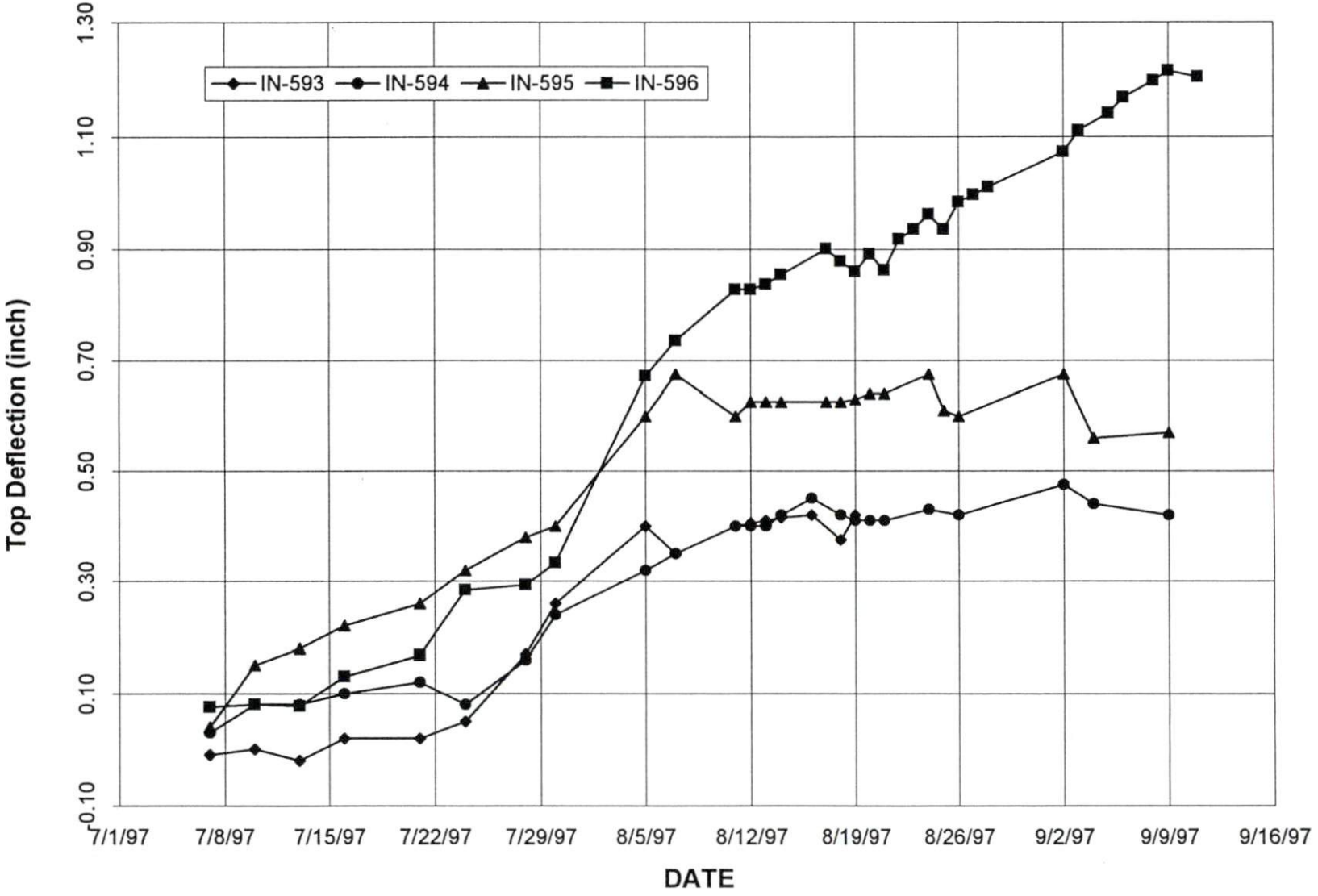
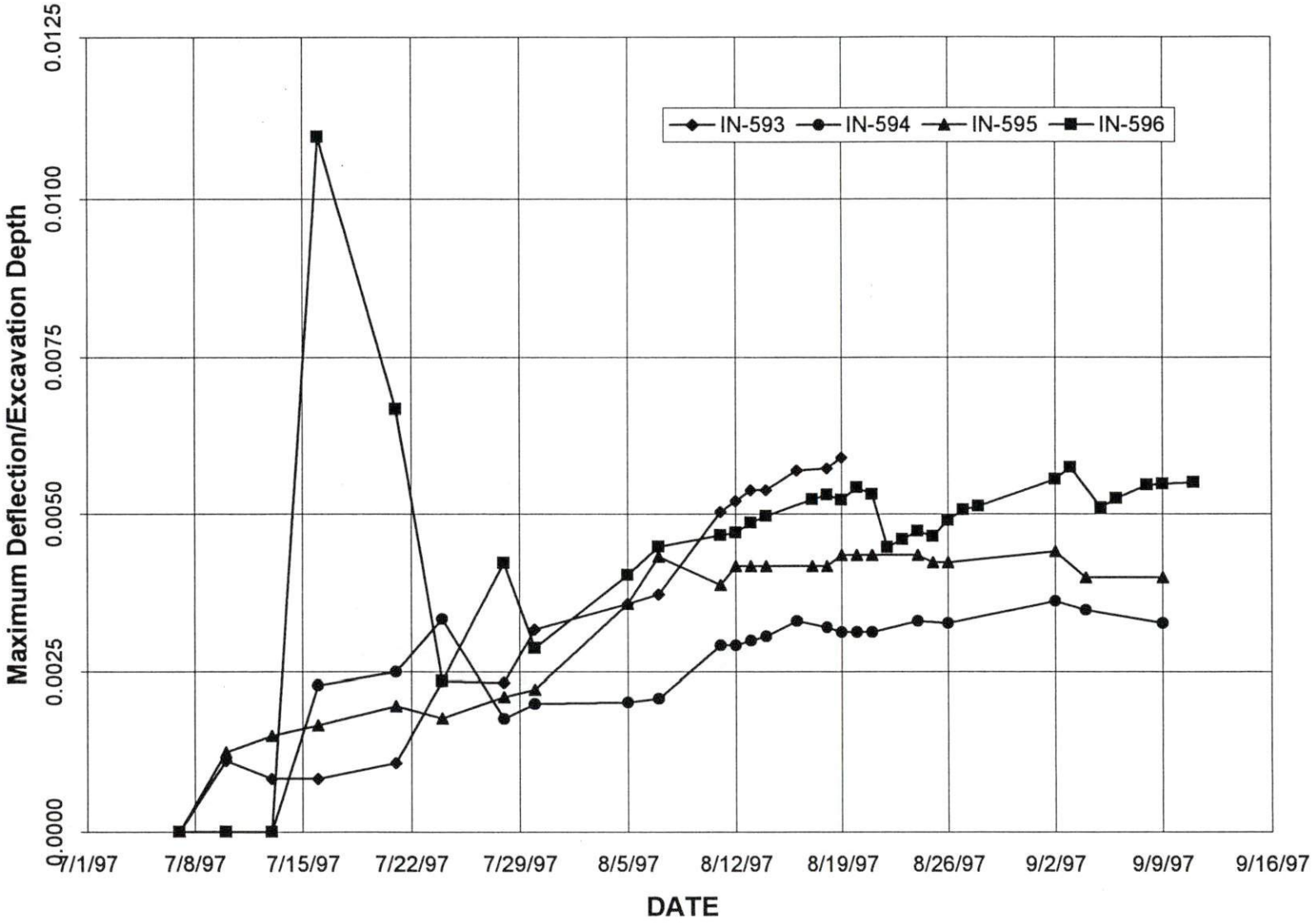


Figure C-8
Maximum Deflection/Excavation Depth vs. Time



Appendix D

Calculations

GIVEN: Unit Weight of Moist WLOL Waste = 116 lb/ft3
Unit Weight of Portland Cement = 76 lb/ft3
Unit Weight of Quicklime = 58 lb/ft3

Final Volume of WLOL Waste + Solidification Mixture = 20,717 cy
Total Weight of Portland Cement Added = 338 tons
Total Weight of Quicklime Added = 146 tons

Calculate: (1) Volume of Portland Cement
(2) Volume of Quicklime
(3) Volume of unsolidified waste
(4) Average Percent Reagent used to solidify.

1.) $\text{Volume}_{(\text{cement})} = \text{Weight cement (lbs.)} / \text{unit weight of cement (lb/ft3)}$

$= 338 \text{ tons} (2{,}000 \text{ lbs./ton}) / 76 \text{ lb/ft3} = 8895 \text{ ft3} \rightarrow \underline{329} \text{ cy}$

(2.) $\text{Volume}_{(\text{quicklime})} = \text{Weight}_{\text{quicklime}} \text{ (lbs.)} / \text{unit weight of quicklime (lb/ft3)}$

$= 146 \text{ tons} (2{,}000 \text{ lbs./ton}) / 58 \text{ lb/ft3} = 5{,}034 \text{ ft3} \rightarrow \underline{186} \text{ cy}$

(3) $\text{Volume}_{(\text{unsolidified waste})} = \text{Volume}_{(\text{solidified waste})} - \text{Volume}_{(\text{cement})} - \text{Volume}_{(\text{quicklime})}$

$= 20{,}717 \text{ cy} - 329 \text{ cy} - 186 \text{ cy} = \underline{20{,}202} \text{ cy}$

(4) % Solidification Reagent = $\text{Weight (reagent)} / \text{Weight (unsolidified waste)} \times 100$

$= \frac{338 \text{ tons} + 146 \text{ tons}}{(20{,}202 \text{ cy})(27 \text{ ft3/cy})(116 \text{ lb/ft3})(1 \text{ ton}/2{,}000 \text{ lbs})} = \frac{484 \text{ tons}}{31{,}635 \text{ tons}} \times 100 = \underline{1.53\%}$

∴ The average percentage of solidification reagent used to improve the handling characteristics of WLOL waste was 1.53%.

Appendix E

Inspector Daily Reports

ALCOA REMEDIATION PROJECTS ORGANIZATION
WASTE LUBRICATING OIL LAGOON

INSPECTOR'S DAILY QUALITY ASSURANCE SUMMARY REPORT

PAGE: 1 of 3 WEATHER:clear, 75°F-92°F
DATE: July 17, 1997 REPORT:WLOL-21

I. Construction Work Performed

A. Work Item and Description

Item #4 - Health and Safety

- MKE continued all waste activities in level C protection.

- Health and Safety shutdown all activities at 2:30 pm due to thunderstorms.

- During excavation activities a blue/grey smoke was observed and loud popping noise on the west side of the WLOL. Health and Safety was called. MKE felt that trapped gas was causing the smoke/noise. Everyone was advised to stay upwind of the excavation and keep an eye open for any projectiles.

Work Item #6 - Waste Excavation

- MKE continued waste excavation activities. A mixture of contaminated sand/waste was excavated, the waste was dry. 41 loads , MKE load tickets 503-544, were hauled to the Secure Landfill Cell No. 2 per Tech Spec 02210, 3.04. Load tickets are on file with MKE QC. The waste will be checked for bearing strength once placed and compacted in a complete lift at the Secure Landfill.

Work Item #7 - Solidification

- The onsite NYSDEC representative (Mike Cox) and Tom Lightfoot Alcoa informed the CQAI that small dosages (1-5%) of cement may be added to the stockpiled waste at the WLOL for constructibility purposes (e.i. to improve handling for transport and placement in the SLF). This material may be subject to pocket penetrometer testing at the WLOL at the CQAI's discretion. A minimum bearing strength of 16 psi is desirable prior to the material leaving the site. If the nature of the material changes and actual solidification is required to excavate the material at the WLOL or cement dosages reach 20% by weight, then the material will be subject to the requirements of the solidification specification 13740.

Work Item #10-SOL Sump Installation/ Maintenance

- MKE continued dewatering the sludge using a solids pump. The water was pumped

ALCOA REMEDIATION PROJECTS ORGANIZATION
WASTE LUBRICATING OIL LAGOON

INSPECTOR'S DAILY QUALITY ASSURANCE SUMMARY REPORT

PAGE: 1 of 3 WEATHER:clear, 75°F-92°F
DATE: July 17, 1997 REPORT:WLOL-21

from sludge displacement activities in east end of the east cell to the west end of the cell.

Work Item # 13 -Dewatering/Drainage

- MKE continued pumping SOL water via the PPA gravity line to the 500 k modutanks.

- MKE pumped contaminated stormwater run-off to the 140,000 tank as needed.

- MKE placed a pump in the southeast and southwest corner of the SOL to pump water produced from sludge displacement activities. The water was pumped to the west side of the east cell and subsequently to the east SOL cell.

B. Corresponding Data Sheets/Drawings:
Labor and Equipment Summary

C. Contractor's Equipment: none

D. Contractors Crew: See attached sheet

E. Subcontractor's Name and Crew:
None

II. Materials:
Materials Received: None

III. Visitors:
Alcoa-Tom Lightfoot
NYSDEC- Mike Cox
Darell Sweredowski
Greg Townsend

IV. Comments:

BY: Paul A. Swan Date: 7/17/97
Quality Assurance Inspector

Approved By: Wayne T. Tunstall Date: 23 July 1997
Quality Assurance Officer

ALCOA REMEDIATION PROJECTS ORGANIZATION

WASTE LUBRICATION OIL LAGOON

MKE LABOR AND EQUIPMENT SUMMARY

LABOR				
DESCRIPTION	QUANTITY	HOURS	TOTAL	
GENERAL FOREMAN	1	10	10	
SITE FOREMAN	1	10	10	
LABORERS	4	10	40	
OPERATORS	3	10	30	
TEAMSTERS	4	10	40	
I.H.	1	10	10	
EQUIPMENT				
400LC BACKHOE	1	10	10	
350 Cat Backhoe	1	10	10	
D-6 Dozer	1	10	10	
Hotsie	1	10	10	
Moxy	5	10	50	

ALCOA REMEDIATION PROJECTS ORGANIZATION
WASTE LUBRICATING OIL LAGOON

INSPECTOR'S DAILY QUALITY ASSURANCE SUMMARY REPORT

PAGE: 1 of 11
DATE: August 12, 1997

WEATHER:pc-rain, 65°F-75°F
REPORT:WLOL-40

I. Construction Work Performed

A. Work Item and Description:

Item #4 - Health and Safety

- MKE IH upgraded waste excavation activities to level C

Work Item #6 - Waste Excavation

- MKE continued waste excavation activities. A mixture of peat, clay and debris with some sand was excavated. The waste was moist; no free water was observed. MKE hauled 15 loads (150 cy) to the SLF, Cell No. 2.

- MKE dug test pits at the controlled excavation locations B-094 and B-452 as shown on design drawing B-137711-JM. The pits were dug to the planned elevations of 211.6 and 214.3, respectively. The test pit logs are attached for reference.

  Based on the observations seen in B-094 the CQAI called Field Engineering (Mike Bowen) for direction. On Alcoa's (Tom Lightfoot) directive a sample was collected from the pit and sent to the Alcoa Lab for PCB analysis. Clean-up verification testing was stopped at Alcoa's request. During the weekly progress meeting directly following the incident a decision was made among Alcoa, MKE and CDM that four additional test pits will be dug, one each in the s/e, s/w, n/e and center of the excavation surface to determine the extent of contamination throughout the sand lens. During the meeting the test pits were dug in the presence of the on-site NYSDEC representative. The CQAI was not present at the time the test pits were dug. Equipment was not deconned between the excavation of each test pit. Following the meeting, Mike Cox informed the CQAI that the NYSDEC was requesting that samples be collected from each test pit at the sand interface, Alcoa (Tom Lightfoot) concurred. MKE dewatered the test pit holes and the CQAI and Field Engineering(C. Osvodik) sampled the sand lens. Observations and sketches are attached to this report.

- Tom Lightfoot informed the CQAI that the sample collected from B-094 contained 58,000 ppm PCB's. MKE began excavating a 40-foot by 40-foot grid in the vicinity

of B-94. The waste material was stockpiled on the north slope. A collection swale was cut at the toe of the stockpile. None of the material was hauled to the Secure Landfill. wme

Work Item #10-SOL Sump Installation/ Maintenance

- MKE continued to pump the SOL sump to the west end of the East cell as needed.

Work Item # 13 -Dewatering/Drainage

- MKE continued pumping SOL water via the PPA gravity line to the 500 k modutanks.

- MKE created a sump in the northeast and center of the WLOL. MKE continued to pump these sumps to the 140,000 gallon tank.

- MKE pumped the test pit water to the 140,000k tank prior to sampling.

- MKE installed a silt curtain in the southwest corner of the west SOL cell.

B. Corresponding Data Sheets/Drawings:
Labor and Equipment Summary
Site Sketch
Test pit logs

C. Contractor's Equipment: See attached sheet

D. Contractors Crew: See attached sheet

E. Subcontractor's Name and Crew:
None

II. Materials:
Materials Received: None

III. Visitors:
NYSDEC-Mike Cox
Alcoa-Tom Lightfoot
CDM-Walt Chaffee, Wayne Kimball

ALCOA REMEDIATION PROJECTS ORGANIZATION
WASTE LUBRICATING OIL LAGOON

INSPECTOR'S DAILY QUALITY ASSURANCE SUMMARY REPORT

PAGE: 3 of 11 WEATHER:pc-rain, 65°F-75°F
DATE: August 12, 1997 REPORT:WLOL-40

IV. Comments:

1. Weekly progress meeting No. 7--see meeting minutes for details,

2. MKE held a weekly health and safety meeting.

3. Wayne Kimball, Lisa Swan and Pete Skiades had a conference call with Mike Schultz concerning the following:

   - Mike Schultz expressed concern over the slope stability during deep excavations (down to elevation 211) in the vicinity of B-094. Mike informed Pete Skiadas that inclinometer readings should be taken 7 days a week during this excavation activity.

   - Lisa Swan relayed field observations of the B-094 to Mike Schultz as discussed above in Item #6.

4. Wayne Kimball issued a DCF requesting guidance means and methods for removing the sand lense below elevation 214 and additional sampling protocols required for cleanup verification once the sand lense has been removed.

BY: Lisa A. Swan Date: 8/12/97
Quality Assurance Inspector

Approved By: Wayne T. Kimball Date: 08/20/97
Quality Assurance Officer

TEST PIT FIELD LOG

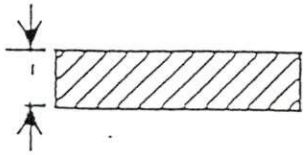
CDM Camp Dresser & Mckee	PROJECT: Alcoa - Massena Operations LOCATION: WLOL	TEST PIT NO.: B-094 DATE: 8-12-97
~PROX. DEPTH TO GROUNDWATER: 2.3' LOG PREPARED BY: LISA Swan	CONTRACTOR: MKE EQUIPMENT: ____	LOCATION: B-094

DEPTH	SOIL DESCRIPTION	EXCAV. EFFORT	LEL (%)	OVM (ppm)
0	↕.5' Stiff grey clay			
1	PEAT			
1.75'	WET TO Soft grey and Brown Clay, SOMESILT, TRACE SAND			
2	Brown SAND with oily looking sheen and a			
2.33	Clear viscous liquid seeping from all faces - GW INFILTRATION			
3	↓ WET grey clay to BOTTOM OF PIT			
4				
5				
6				
7				
8				
9				
10				

REMARKS:

A Sample was collected @ the SAND/ CLAY INTERFACE at 2.3' BGS, from the NORTH SIDE per TIM Lightfoot's request.

TEST PIT PLAN



Ground Surface Elevation: 216

LEGEND:

PROPORTIONS USED

TRACE	0 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

GROUNDWATER

▼ Observed Water Table

EXCAVATION EFFORT

E ---------- EASY
M ---------- MODERATE
D ---------- DIFFICULT

WLOL-10R-40
SHT. 4 OF 11

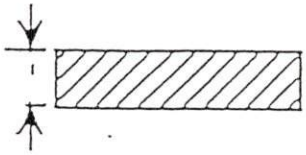
TEST PIT FIELD LOG

CDM Camp Dresser & McKee	PROJECT: Alcoa - Massena Operations LOCATION: WLOL	TEST PIT NO.: B-452 DATE: 8-12-97
APPROX. DEPTH TO GROUNDWATER:	CONTRACTOR: MK EQUIPMENT:	LOCATION: B-452
LOG PREPARED BY: L. Swol		

DEPTH	SOIL DESCRIPTION	EXCAV. EFFORT	LEL (%)	OVM (ppm)
0				
0.9	Stiff grey clay			
1	PEAT			
1.4	grey AND brown clay with trace of sand			
2	Brown sand with oily looking sheen			
2.5				
3	MOIST STIFF CLAY grey			
4	BOTTOM of Excavation			
5				
6				
7				
8				
9				
10				

REMARKS: A sample was collected at the sand/clay INTERFACE.

TEST PIT PLAN



Ground Surface Elevation: 216

LEGEND:

PROPORTIONS USED

TRACE	0 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

GROUNDWATER

▼ Observed Water Table

EXCAVATION EFFORT

E ---------- EASY
M ---------- MODERATE
D ---------- DIFFICULT

BR-WLOL-110
SHT. 50 of 11

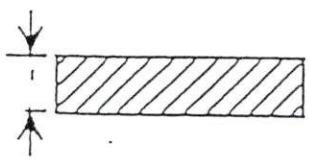
TEST PIT FIELD LOG

CDM Camp Dresser & McKee	PROJECT: Alcoa - Massena Operations LOCATION: WLC L	TEST PIT NO.: TP- S/W DATE: 8-12-97
APPROX. DEPTH TO GROUNDWATER: 3.5' LOG PREPARED BY: L. Swan	CONTRACTOR: MK EQUIPMENT:	LOCATION: S/W corner

DEPTH	SOIL DESCRIPTION	EXCAV. EFFORT	LEL (%)	OVM (ppm)
0				
0.5	Grey stiff clay			
1	Peat			
1.2	Brown and Gray clay, some sand, trace of silt. No visible sheen			
2				
3				
3.5'	↓ Moist, wet Grey Clay			
4				
5				
6				
7				
8				
9				
10				

REMARKS: A sample (TP- S/W) was collected at the sand/clay interface,

TEST PIT PLAN



Ground Surface Elevation: 215-216

LEGEND:

PROPORTIONS USED

TRACE	0 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

GROUNDWATER

▼ Observed Water Table

EXCAVATION EFFORT

E ---------- EASY
M ---------- MODERATE
D ---------- DIFFICULT

10R-WWL-40

SHT. 6 of 11

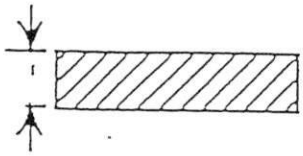
TEST PIT FIELD LOG

CDM Camp Dresser & McKee	PROJECT: Alcoa - Massena Operations LOCATION: WLOL.	TEST PIT NO.: S/E CORNER DATE: 8-12-97
APPROX. DEPTH TO GROUNDWATER:	CONTRACTOR: MK EQUIPMENT:	LOCATION: S/E CORNER
LOG PREPARED BY: L. Swift		

DEPTH	SOIL DESCRIPTION	EXCAV. EFFORT	LEL (%)	OVM (ppm)
0				
0.5'	Stiff grey clay			
1	PEAT			
1.8	Bluish grey clay with little silt, trace of gravel			
2	Black and Brown Sand, some silt			
3				
	Moist, wet grey clay			
4				
5				
6				
7				
8				
9				
10				

REMARKS: A sample was collected (TP S/E) from the sand/clay interface

TEST PIT PLAN



Ground Surface Elevation: 216

LEGEND:

PROPORTIONS USED

TRACE	0 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

GROUNDWATER

▼ Observed Water Table

EXCAVATION EFFORT

E ---------- EASY
M ---------- MODERATE
D ---------- DIFFICULT

IDR.WLOL-4D
SHT. 7 OF 11

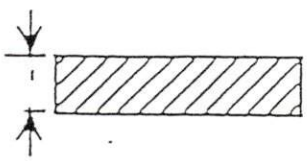
TEST PIT FIELD LOG

CDM Camp Dresser & McKee	PROJECT: Alcoa - Massena Operations	TEST PIT NO.: TP-C
	LOCATION: WLOL	DATE: 8-12-97
~PROX. DEPTH TO GROUNDWATER: 2.7'	CONTRACTOR: NK	LOCATION: TP-C
LOG PREPARED BY: Lisa Saxon	EQUIPMENT: ____	

DEPTH	SOIL DESCRIPTION	EXCAV. EFFORT	LEL (%)	OVM (ppm)
0				
0.4	Stiff grey clay			
1	1.1' PEAT			
	Brown sand, some silt and trace of clay			
2	2.1			
3	2.7 Brown Sand, some oily sheen			
	Moist, WET grey clay			
4				
5				
6				
7				
8				
9				
10				

REMARKS: A sample was collected at the sand/clay interface (TP-C).

TEST PIT PLAN



Ground Surface Elevation: ~215

LEGEND:

PROPORTIONS USED

TRACE	0 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

GROUNDWATER

▼ Observed Water Table

EXCAVATION EFFORT

E ---------- EASY
M ---------- MODERATE
D ---------- DIFFICULT

10e-WLOL-4D
SHT. 8 of 11

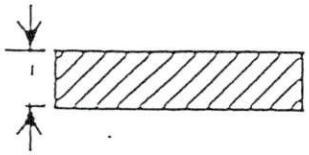
TEST PIT FIELD LOG

CDM Camp Dresser & McKee	PROJECT: Alcoa - Massena Operations	TEST PIT NO.: TP N/E
	LOCATION: WLOL	DATE: 8-12-97
APPROX. DEPTH TO GROUNDWATER:	CONTRACTOR:	LOCATION:
LOG PREPARED BY: L. Swan	EQUIPMENT:	TP N/E

DEPTH	SOIL DESCRIPTION	EXCAV. EFFORT	LEL (%)	OVM (ppm)
0				
0.5	stiff grey clay			
1	PEAT			
	Brown and grey clay, some silt, trace of sand and			
1.6	gravel			
2				
	↓ remaining hole caved in			
3				
4				
5				
6				
7				
8				
9				
10				

REMARKS: A sample was collected at 1.6' BGS (TP N/E) due to cave in, a sample could not be collected at the sand/clay interface

TEST PIT PLAN



Ground Surface Elevation: 215

LEGEND:

PROPORTIONS USED

TRACE	0 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

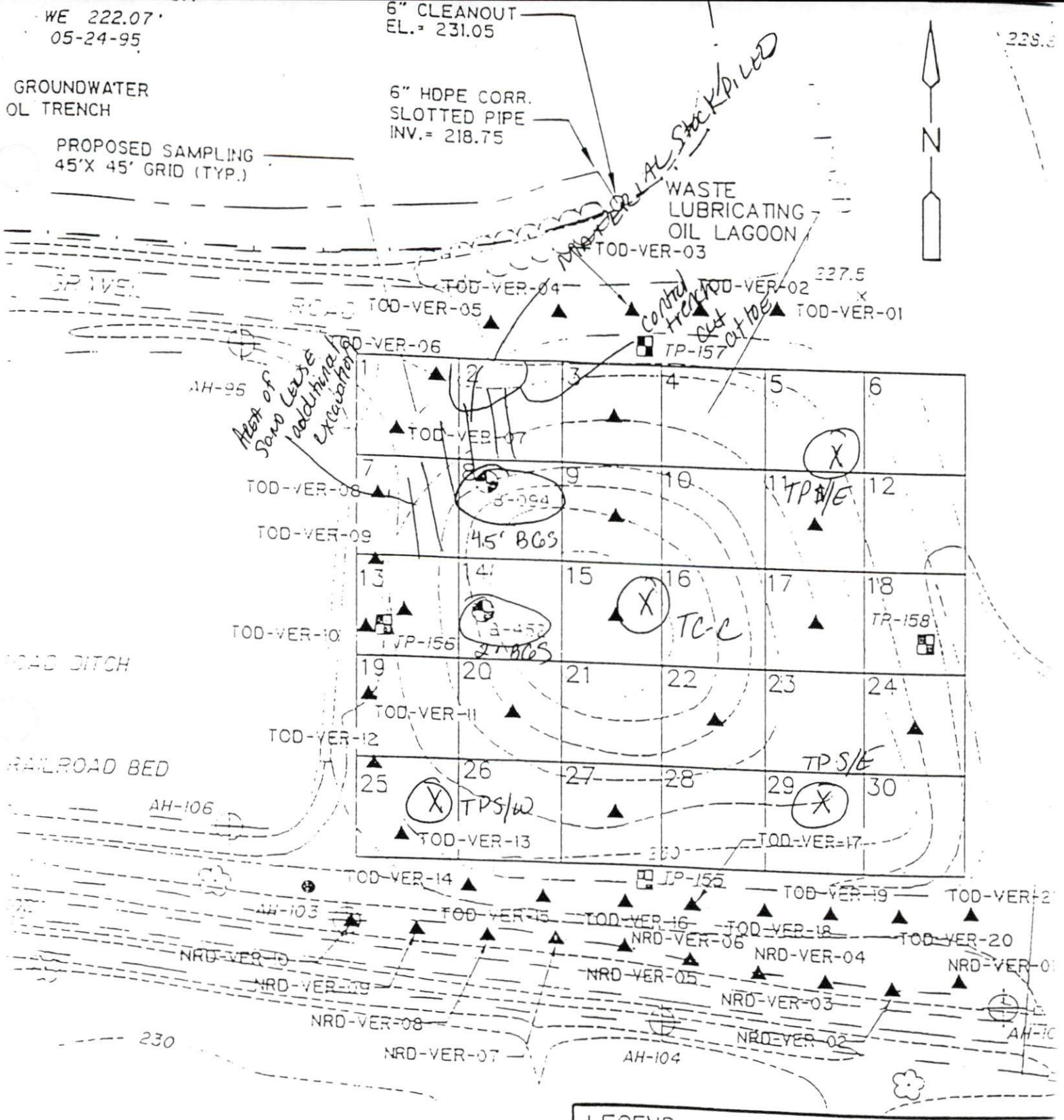
GROUNDWATER

▼ Observed Water Table

EXCAVATION EFFORT

E ---------- EASY
M ---------- MODERATE
D ---------- DIFFICULT

ID EWLOL-40
SHT. 9 of 11



IDR-WLO-40
SHT. 5 of 10 of 11

ALCOA REMEDIATION PROJECTS ORGANIZATION

WASTE LUBRICATION OIL LAGOON

MKE LABOR AND EQUIPMENT SUMMARY

DESCRIPTION	**QUANTITY**	**HOURS**	**TOTAL**	
GENERAL FOREMAN	1	10	10	
SITE FOREMAN	1	10	10	
LABORERS	5	10	50	
OPERATORS	3	10	30	
TEAMSTERS	3	10	30	
I.H.	1	10	10	
EQUIPMENT				
400LC BACKHOE	1	2	2	
330L Cat Backhoe	1	10	10	
Hotsie	1	10	10	
Moxy	3	10	30	

Appendix F

Miscellaneous Correspondence

Aluminum Company of America
Massena Operations

ALCOA

August 15, 1997

Mr. Gregg A. Townsend, P.E.
NYSDEC
Region 6 Headquarters
317 Washington Street
Watertown, New York 13601

Subject: Alcoa Remediation Projects Organization
Waste Lubricating Oil Lagoon
Proposed Sampling Plan for Stratum IIA-S Sand Lens

Dear Mr. Townsend:

Alcoa proposes the following sampling plan to delineate suspected contamination in a sand lens (Stratum IIA-S) overlying Stratum IIA-M (clay) material in the WLOL.

Field observations and analytical testing by the Alcoa Laboratory have indicated contamination of the sand lens in the northwest corner of the WLOL. Additional sampling and immunoassay field screening for PCBs is proposed to further delineate the contaminated area. The proposed samples will be spaced in an approximate 30-foot grid pattern, with actual location determined by Field Engineering. The total number of samples will be based upon field screening results. The attached sketch gives the tentative sampling locations. Additional locations may be added or positions modified in order to more accurately determine the extent of contamination based on field conditions.

Each sample location will be excavated to a depth of approximately 6-to 12-inches above the suspected sand lens. A hand auger would then be advanced into the sand lens.

Samples will either be sent to the Alcoa Laboratory for analysis or be field screened using immunoassay technique. Samples that are immunoassay field screened for PCBs will be at the 10 ppm level. Samples that are nondetect at the 10 ppm level would subsequently be tested at the 1 ppm level at the Alcoa Laboratory.

Please advise if this proposed sampling plan is acceptable to the Department.

Sincerely,

Thomas C. Lightfoot

Thomas C. Lightfoot
Project Manager

Park Avenue East P.O. Box 150 Massena, New York 13662-0150 USA

MB:alb

Attachments

cc w/out attachments: James Harrington, NYSDEC
John Sheehan, NYSDOH
James Luz, NYSDEC
Ann Rice, NYSDEC
Kevin Farrar, NYSDEC
Frank Bifera, NYSDEC
Christine McGrath, NYSDEC
Darrell Sweredoski, NYSDEC

cc w/attachments: Michael Cox, NYSDEC
James Shaw, Alcoa
Darrel Avery, MKE
Joseph Mihm, CDM
Michael Schultz, CDM
Wayne Kimball, CDM
Mike Bowen, CDM
Library, Archive, File/Alcoa

CDM Camp Dresser & McKee

consulting
engineering
construction
operations

P.O. Box 150, Park Avenue East
Massena, New York 13662
Tel: 315 764-4189 Fax: 315 764-4444

Memorandum

To: *Mike Bowen*

From: *Pete Skiadas* P.S.

Date: *July 31, 1997*

Subject: *Alcoa Remediation Projects Organization*
Waste Lubricating Oil Lagoon
Solidified Material Strength Testing

Introduction

A laboratory solidification test was conducted by CDM to qualitatively estimate the short and long-term bearing strength of Waste Lubricating Oil Lagoon (WLOL) material mixed with solidifying reagents (cement and lime). The results of these tests provide information to determine if the addition of cement/lime additives are effective in achieving the short and long-term requirements for disposal of WLOL materials in the Secure Landfill (SLF).

Test Methodology

The testing methodology followed the guidelines of the *Construction Quality Assurance Plan for the Waste Lubricating Oil Lagoon* (CQAP) (CDM, May 1997) which is a variation of the standard Proctor method modified to simulate SLF field conditions. Six-inch cement test cylinders were used instead of the 4-inch Proctor mold and the number of blows were increased from 25 to 56 to account for the increased surface area in order to apply similar compactive effort with the CQAP test.

Addition of Cement

The addition of cement was done on July 21, 1997. Soil material was collected randomly from the WLOL in two, 5-gallon buckets and taken to the Soils Lab for mixing. The WLOL material was grey-black, mostly sand with some clay and little coarse gravel, with a very strong hydrocarbon odor. Its moisture content was 16.5 percent. The test cylinders were prepared with additive concentrations of 2.5 percent, 6.5 percent and 13 percent cement by weight. A test cylinder without cement was also prepared in order to measure the inherent strength of the material.

Addition of Lime

The addition of lime was done on July 24, 1997. Soil material was collected randomly from the WLOL in one, 5-gallon bucket and taken to the Soils Lab for mixing. The WLOL material was grey, mostly fine clay and sand, some coarse gravel and some pockets of previously solidified material, with a light hydrocarbon odor. Its moisture content was 16.6 percent. The test cylinders were prepared at additive concentrations of 2.5 percent, 6.5 percent and 13 percent lime by weight. A test cylinder without lime was also prepared in order to measure the inherent strength of the material.

The lime in the cylinders reacted exothermically with the moisture in the soil material resulting in a meltdown of the plastic cylinder with the 13 percent lime content within 10 minutes of mixing. The 2.5 percent and 6.5 percent lime content test cylinders exhibited similar tendencies but to a lesser degree.

Results

Compressive strength readings were done using the pocket penetrometer. Figures 1 and 2 show the increase in compressive strength with time. Comparisons between the two additives cannot be done because two different types of soil were used. This is evident by the difference in the inherent strength of the soils (0 psi for the soil used for the cement test, and 6 psi for the soil used for the lime test) as tested immediately after compaction.

Both additives exhibited a significant increase in compressive strength with time. Solidification using both additives demonstrated that both the short and long-term compressive strength SLF requirements can be achieved immediately after mixing or within one day even for concentrations of 2.5 percent reagent (the lowest concentration tested).

Note the test sample with 0 percent cement also showed some strength increase with time. The increase in the strength of the materials without solidification additives is attributed to the decrease in the moisture content. This, however, does not imply that unsolidified material would meet long-term SLF strength requirements because it is unknown whether moisture content would decrease at the SLF.

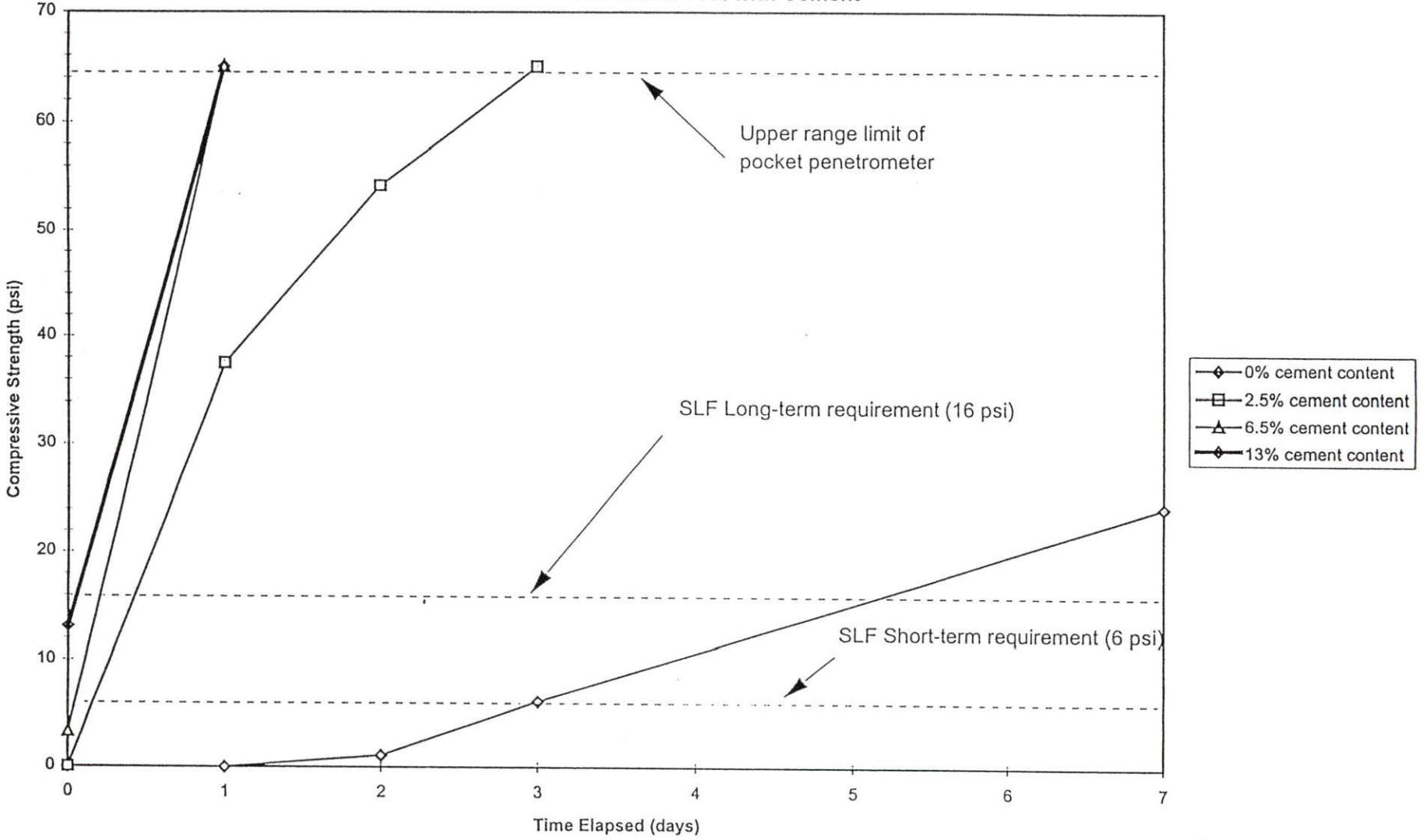
PS:alb

Attachments

cc: Joe Mihm
Mike Schultz
Wayne Kimball

Alcoa Remediation Pr[illegible]s Organization
Waste Lubrication Oil Lagoon

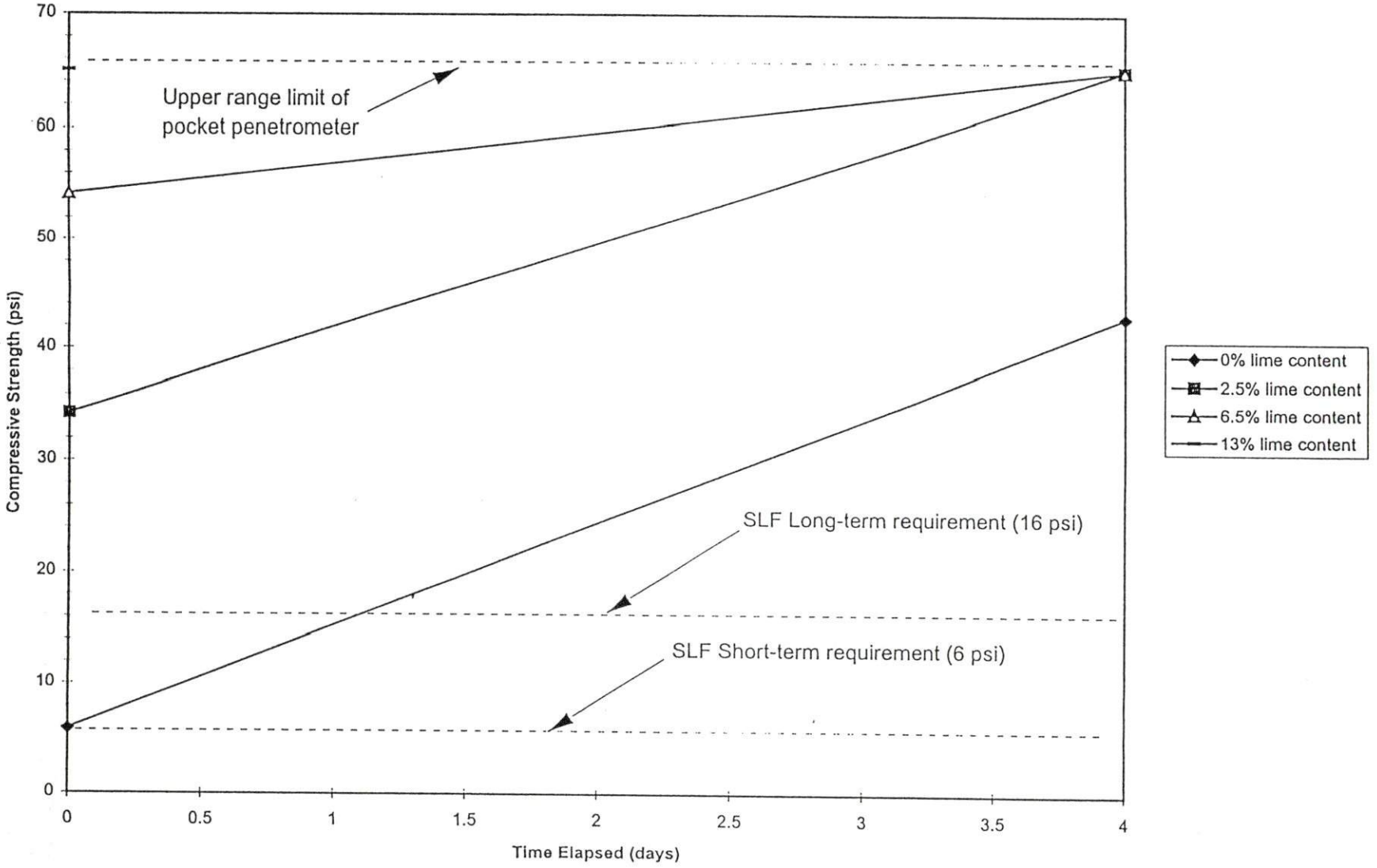
Figure 1
Solidification Test with Cement



7/31/97
c:\ann\soltest.xls

Alcoa Remediation Projects Organization
Waste Lubricating Oil Lagoon

Figure 2
Solidification Test with Lime



7/31/97
c:\ann\soltest.xls

Aluminum Company of America
Massena Operations

ALCOA

May 28, 1997

Mr. Gregg A. Townsend, P.E.
NYSDEC
Region 6 Headquarters
317 Washington Street
Watertown, New York 13601

Subject: Alcoa Remediation Projects Organization
Waste Lubricating Oil Lagoon
Final Design - Response to Comments

Dear Mr. Townsend:

Please find enclosed Alcoa's responses to the recent Department comments to the above referenced document. I have tried to make reasonable approaches to all the Department specified concerns in order to move the project forward from the design review and into the construction phase. I hope and anticipate the NYSDEC will find these attached responses to be acceptable toward the goal of properly remediating the WLOL.

Briefly, I wanted to add a few notes around other project considerations. We are requesting the approval to install two, 500,000 gallon modu-tanks north of PPA, to temporarily store (mainly) eastern cell SOL waters. The temporary tanks would be installed in the existing secondary containment footprint used on the PPA project. A narrative is attached that basically describes the pumping and storage sequencing. Your assistance in presenting this for approval to Ms. Ann Rice and the NYSDEC Department of Water is appreciated.

We would also request approval to install a shallow sump in the former trench immediately east of the Central Impoundment. As this conveyance does at times collect stormwater flowing southward, we wish to take the precaution to prevent this water from entering the WLOL work zone. Any stormwater collected would periodically be pumped over to the north side of the 60 Acre Lagoon. We do not visualize this to be a significant amount but as stated, a wise precaution for the site work.

The last item which I wish to briefly address is schedule. Currently, we are scheduled to start up the project during the first week of July, a month later than originally planned. I had hoped through meetings with the NYSDEC over the past six months, to alleviate all design questions so as we could proceed with this project during a normal construction season. The schedule is now becoming an issue as the revised completion date is moving toward November. I am hopeful the Department will look favorably on these design revisions so we can move onto a successful remediation (responses follow).

If you have any questions please contact me.

Sincerely,

Thomas C. Lightfoot
Project Manager

TCL:alb

Attachment

cc w/out attachment: James Harrington, NYSDEC
John Sheehan, NYSDOH
James Luz, NYSDEC
Ann Rice, NYSDEC
Kevin Farrar, NYSDEC
Frank Bifera, NYSDEC
Christine McGrath, NYSDEC
Darrell Sweredoski, NYSDEC

cc w/attachment: Michael Cox, NYSDEC
James Shaw, Alcoa
Darrel Avery, MKE
Joseph Mihm, CDM
Michael Schultz, CDM
Wayne Kimball, CDM
Library, Archive, File/Alcoa

MORRISON KNUDSEN CORPORATION

INTER-OFFICE CORRESPONDENCE

DATE: May 28, 1997

TO: TOM LIGHTFOOT

FROM: DARREL AVERY

LOCATION: RPO-MASSENA

LOCATION: RPO-MASSENA

SUBJECT: OPERATION OF 500K MODU-TANKS FOR THE SOL WATER

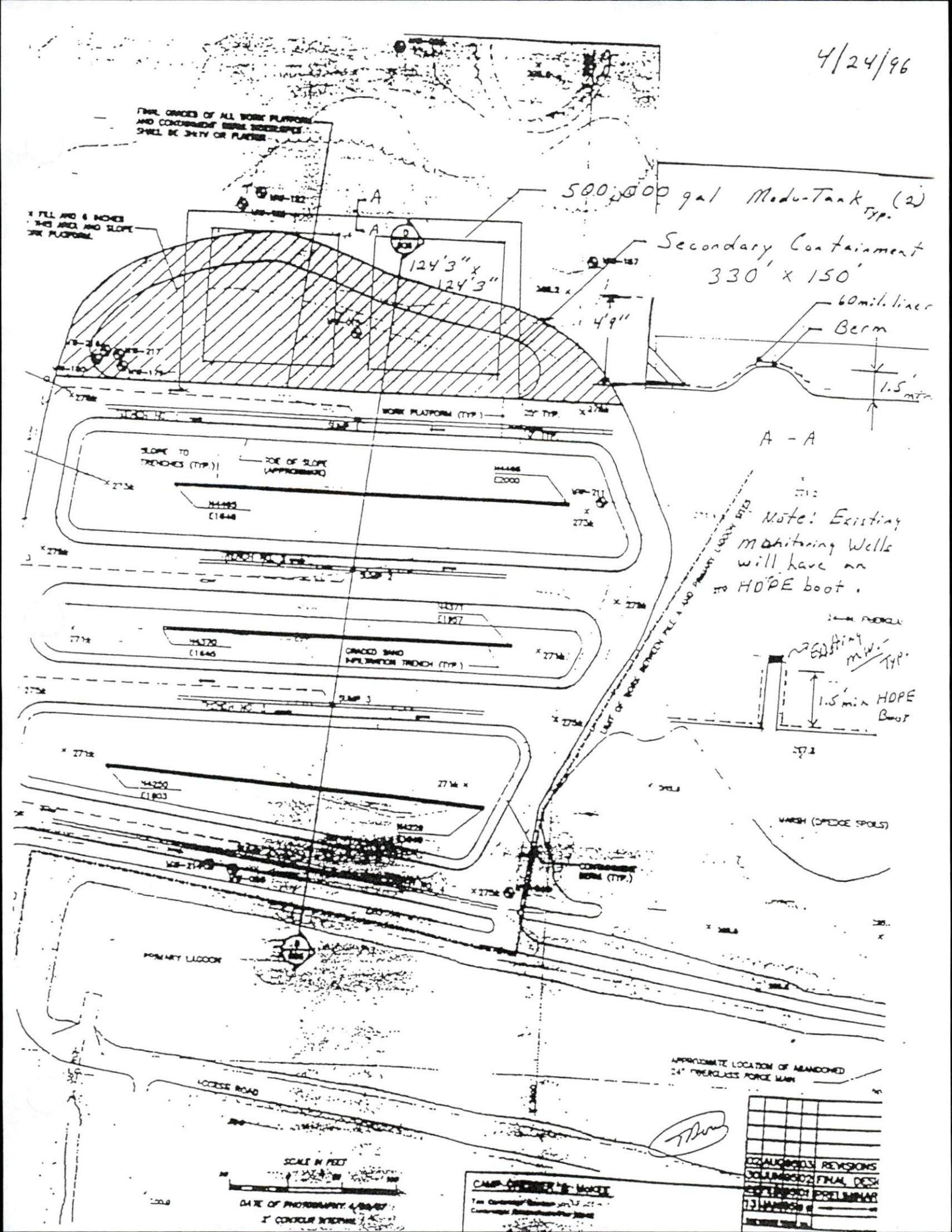
In an effort to avoid further impacts on the WLOL remediation associated with the SOL system treatment rates, Alcoa is proposing the use of two 500,000 gallon modu-tanks which will serve as equalization for the treatment process in Building 79C. These modu-tanks will be filled using the existing 3" pipe line which was constructed as part of the Potlining Pile A remediation project. This 3" pipe line will also be used to convey the waters from the tanks to Building 79C for treatment. The PPA system will continue to operate by hauling the water with the 10,000 gallon tanker. The attached plan is intended to provide additional detail on the operations of the 500,000 gallon modu-tanks.

DA/kan/I-3886
File: 11-3

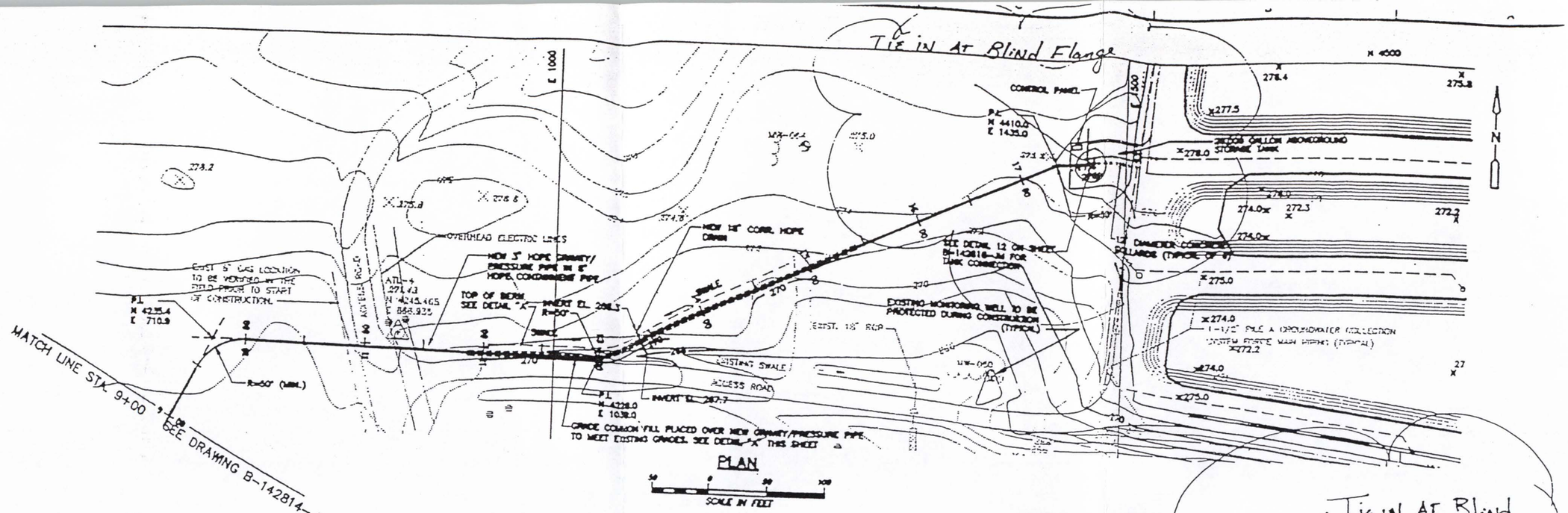
500k Modu-tanks Sequence of Operation

- Install two 500k gallon modu-tanks with 20 mil reinforced liner on the existing containment pad located north of the Pile A Infiltration Galleries.
- Install 3" HDPE hard line from the blind flange located south of the 20k tank to a discharge point located within the 500k tanks.
- Install a 3" valve in the existing line at the SOL such that the flow may be diverted to the 500k gallon modu-tanks.
- Install a pump and floating suction within the west SOL cell.
- Start up the pump and monitor the line to ensure there is no leakage.
- The filling operation will include dedicated personnel who will be responsible for monitoring the pipe line and the tank levels.
- 6 inches of freeboard will be maintained at all times.
- The area around the tank will be a controlled exclusion zone and the proper PPE will be worn when entering the zone. The tank will be treated as a confined space.
- After Alcoa has completed the treatment of the waters stored in these tanks they will be cleaned and disassembled.

4/24/96

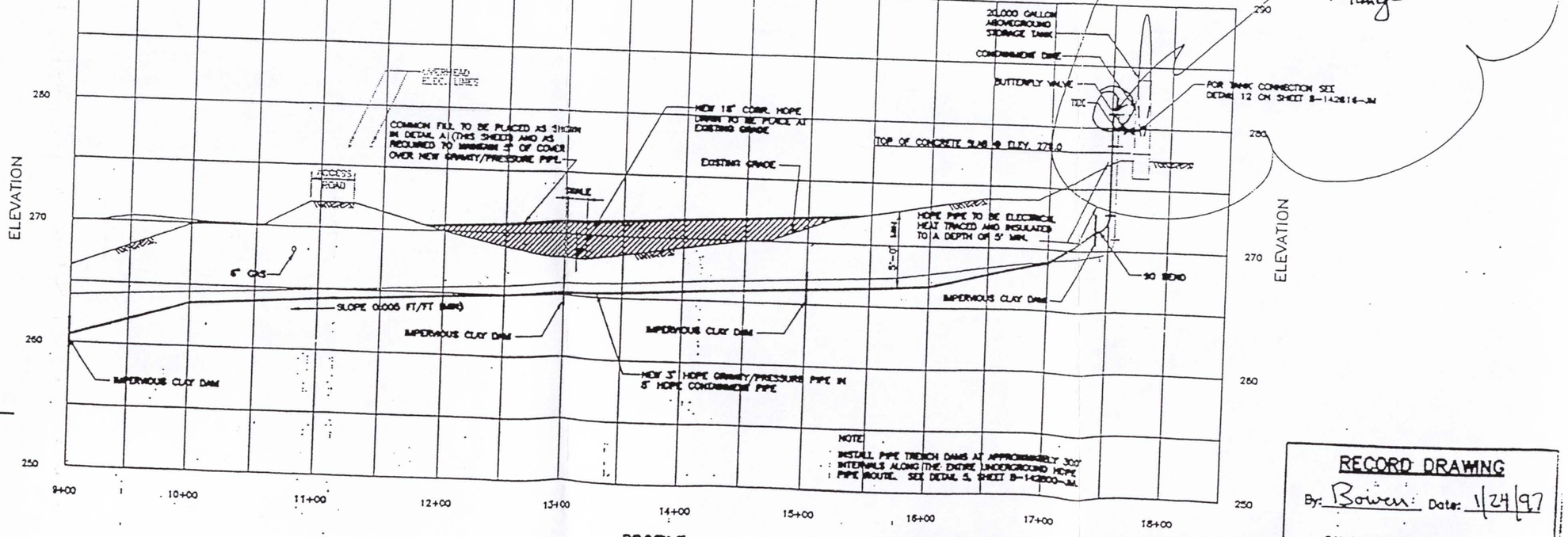

500,000 gal Modu-Tank typ. (2)
Secondary Containment
330' x 150'
60mil. liner
Berm
1.5' min
4'9"
124'3" x 124'3"
A - A
Note: Existing monitoring Wells will have an HDPE boot.
Existing MW's typ.
1.5' min HDPE Boot
WORK PLATFORM (TYP.)
SLOPE TO TRENCHES (TYP.)
TOE OF SLOPE (APPROXIMATE)
GRADED SAND INFILTRATION TRENCH (TYP.)
SUMP 3
MARSH (DREDGE SPOILS)
POND MAY LAGOON
LOOSE ROAD
APPROXIMATE LOCATION OF ABANDONED 24" FIBERGLASS FORCE MAIN
SCALE IN FEET
REVISIONS
FINAL DESI
PRELIMINAR

Tie in at Blind Flange



PLAN

SCALE IN FEET



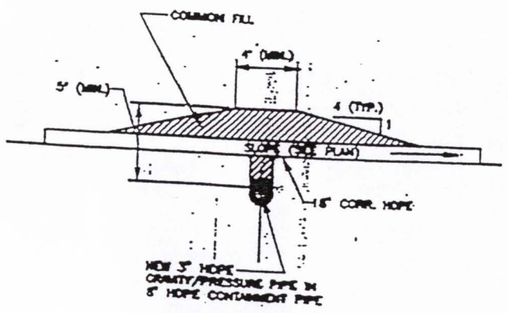
PROFILE

VERTICAL 5 0 5 10

HORIZONTAL 50 0 50 100

SCALE IN FEET

Tie in at Blind Flange



DETAIL "A"

N.T.S.

RECORD DRAWING

By: Bowen Date: 1/24/97

CAMP DRESSER & McKEE

CAMP DRESSER & McKEE

Ten Cambridge Center

Cambridge, Massachusetts 02142

CDM

24JAN97	02	REVISED FOR THE RECORD	MZ/ME
01 DEC95	01	DESIGN CHANGE ORDER NO. 1	
10 OCT95	0		

ALUMINUM COMPANY OF AMERICA

MASSENA OPERATIONS

YARD

ENVIR

SPENT POTLINING PILE A: PHASE II (BELOW GROUND)

GRAVITY/PRESSURE LINE: PLAN/PROFILE SHT. 2 OF 2

MICHAEL S. SCHULTZ, P.E.		J.J.D., G.J.T.
AS SHOWN		J.J.D., G.J.T.
		M.P.G.

B-142815-JM

B-142811-JM

TIE IN POINT FOR 3" HDPE

CROSS OVER EXISTING PIPE AS REQUIRED TO CONNECT NEW 3" STL GRAVITY/PRESSURE PIPE TO EXISTING 3" STL SOLUBLE OIL LAGOON PIPE. SEE SECTION A THIS SHEET FOR PLUG VALVE LOCATIONS

NEW 3" STL GRAVITY/PRESSURE PIPE TO BE ELECTRICAL HEAT TRACED AND INSULATED

EXISTING 3" STL SOLUBLE OIL PIPE TO BE ELECTRICAL HEAT TRACED AND INSULATED

EXIST. MONITORING WELL MW-46

EXISTING PIPE BRIDGE

EXISTING 6" STL (P)

EXISTING 3" STL SOLUBLE OIL LAGOON PIPING TO REMAIN, HEAT TRACING AND INSULATION NOT REQUIRED.

SOLUBLE OIL LAGOON

EXIST. SOLUBLE OIL PUMP STATION

CROSS OVER EXISTING PIPE AS REQUIRED TO INSTALL NEW 3" STL GRAVITY/PRESSURE PIPE ON EXIST. PIPE SUPPORTS. FIELD ADJUST PIPE ELEVATIONS AND SUPPORTS.

EXIST. 1-1/2" STL STEAM

EXIST. 2-1/2" STL (S)

EXIST. 6" STL (P)

MATCH LINE STA. 18+00 SEE DRAWING B-142810-JM

MATCH LINE STA. 3+50 SEE DRAWING B-142812-JM

EXISTING LIFT STATION

EXISTING 6" STL PIPE

EXISTING 3" STL PIPE

EXIST. AIR RELEASE

EXIST. 3" SOLUBLE OIL PIPING TO REMAIN

EXIST. 3" SOLUBLE OIL PIPE

EXIST. DRAIN

EXIST. GROUND

INSTALL A T and a VALVE

INSTALL 3" HDPE ON Same CROSSING

PLAN

SCALE IN FEET

DETAIL

NTS

SECTION

ELEVATION

PROFILE

SCALE IN FEET

NOTES:

1. EXISTING PIPE SUPPORTS AND TYPE ARE NOT SHOWN. FOR EXISTING PILE AND PIPE SUPPORTS, QUANTITIES AND LOCATIONS SEE REFERENCE DRAWINGS A-135782-JM, A-135783-JM, A-141353-JM, A-141354-JM, A-141355-JM, A-141356-JM, A-141360-JM, A-141361-JM, A-135779-JM, A-135780-JM, AND A-135785-JM BY CHESTER ENVIRONMENTAL.
2. BASELINE PIPE STATIONING IN PLAN AND PROFILE DOES NOT RUN ALONG EXPANSION LOOPS. LINEAR TAKE-OFF QUANTITIES FOR PIPE, HEAT TRACING, AND INSULATION SHOULD BE TAKEN FROM PLAN.
3. NEW 3" GRAVITY/PRESSURE LINE TO BE ANCHORED AT SIMILAR LOCATIONS AS EXISTING PIPES AT STATIONS INDICATED ON PLAN.
4. STATIONING SHOWN ON PLANS DOES NOT CORRESPOND TO STATIONING SHOWN ON CHESTER REFERENCE DRAWINGS.
5. TYPE OF PIPE SUPPORT ATTACHMENT FOR NEW 3" STEEL PIPE TO MATCH ADJACENT PIPING AT EACH EXISTING SUPPORT.
6. ELECTRIC HEAT TRACE AND INSULATION OF EXISTING 3-INCH STL SOLUBLE OIL PIPE SHALL INCLUDE ALL VALVES AND APPURTENANCES (I.E., AIR RELEASE VALVES AND DRAINS).

RECORD DRAWING
By: BCM/JCM Date: 1/24/97
CAMP DRESSER & McKEE

CAMP DRESSER & McKEE
Ten Cambridge Center
Cambridge, Massachusetts 02142

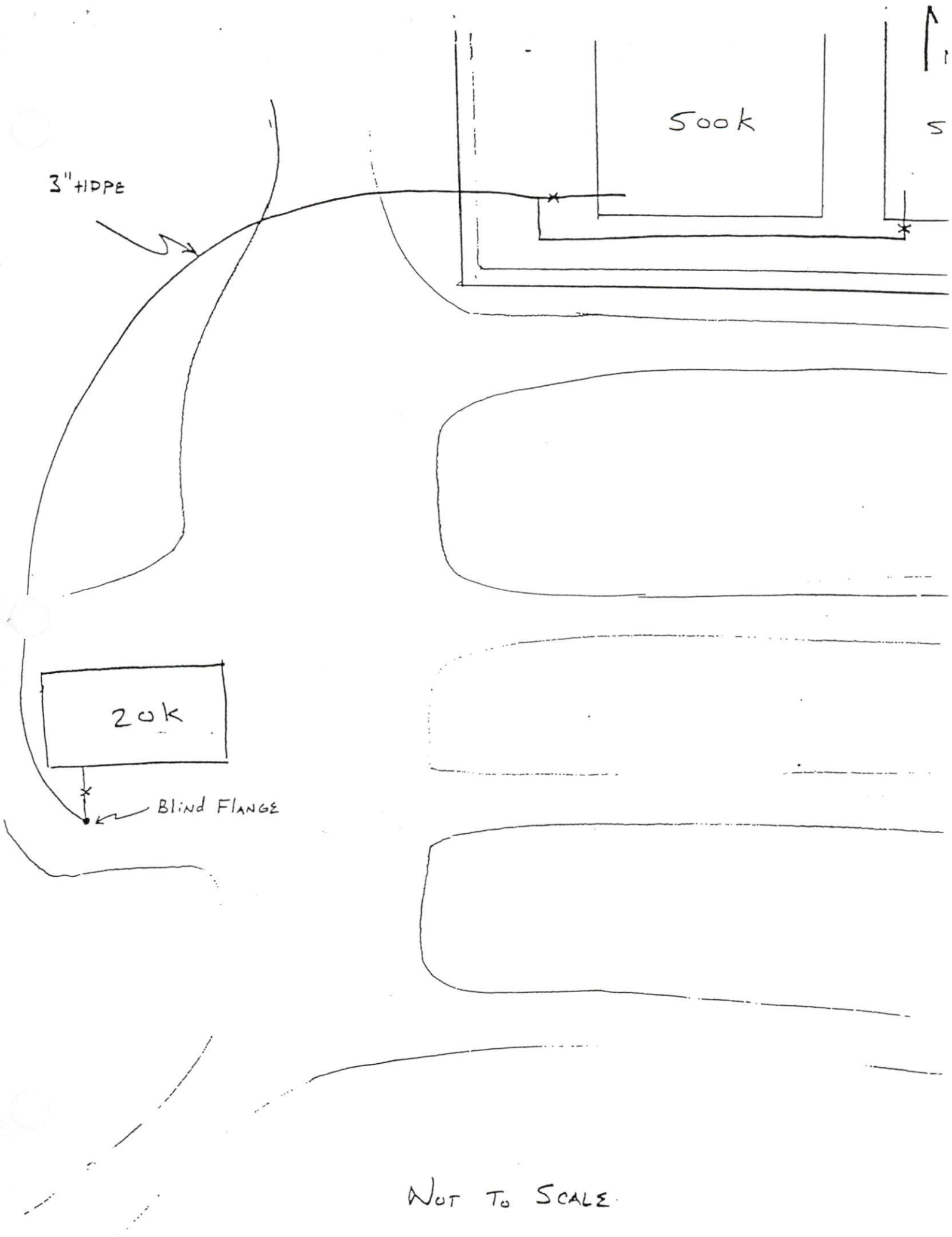
24	JAN97	03	REVISED FOR RECORD
15	DEC95	02	DETAIL ADDED
01	DEC95	01	DESIGN CHANGE ORDER NO. 1
10	OCT95	00	

ALUMINUM COMPANY OF AMERICA
MASSENA OPERATIONS

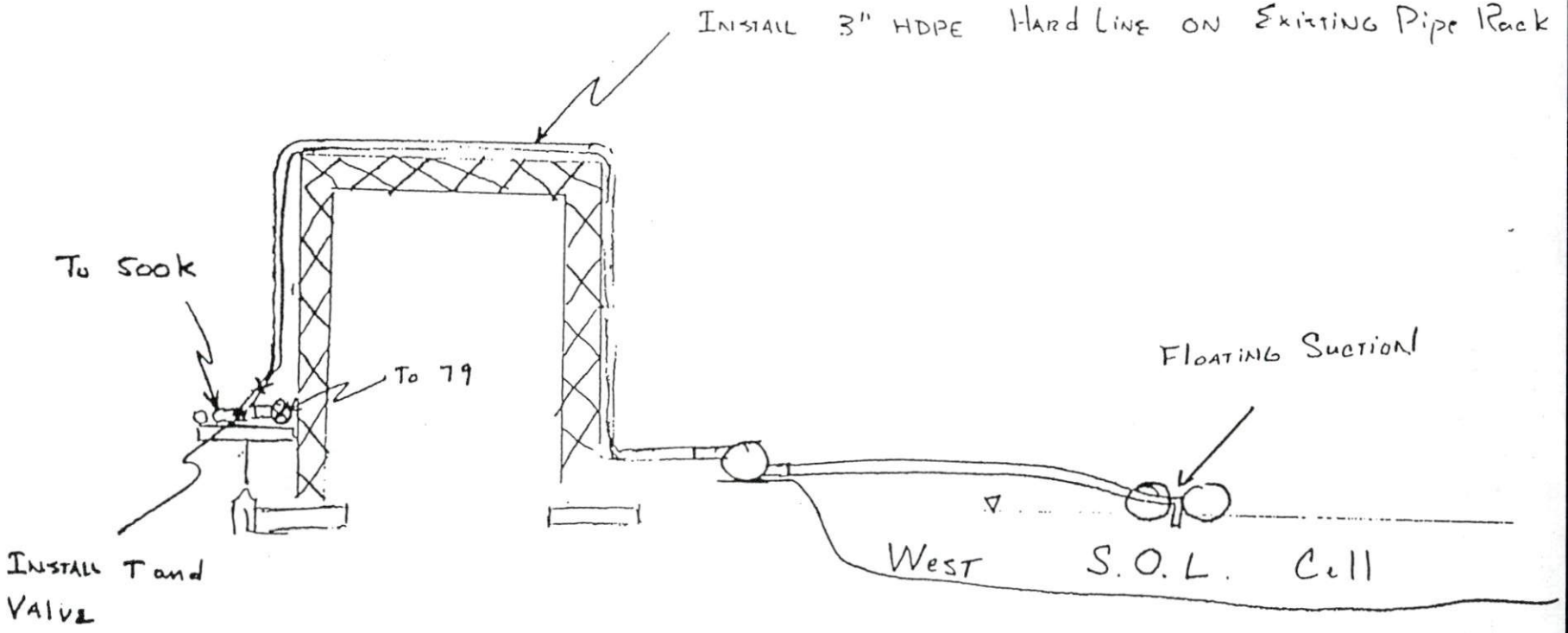
YARD
ENVR
SPENT POTLINING PILE A: PHASE II (ABOVEGROUND)
GRAVITY/PRESSURE LINE PLAN/PROFILE SHT. 4 OF 6

MICHAEL S. SCHULTZ, P.E.
AS SHOWN
HAG. JJD
GJT, JJD
DPK

B-142811-JM



NOT TO SCALE



Not to Scale

Looking North

ALUMINUM COMPANY OF AMERICA
WASTE LUBRICATING OIL LAGOON
REMEDIATION PLANS
RECORD DRAWINGS

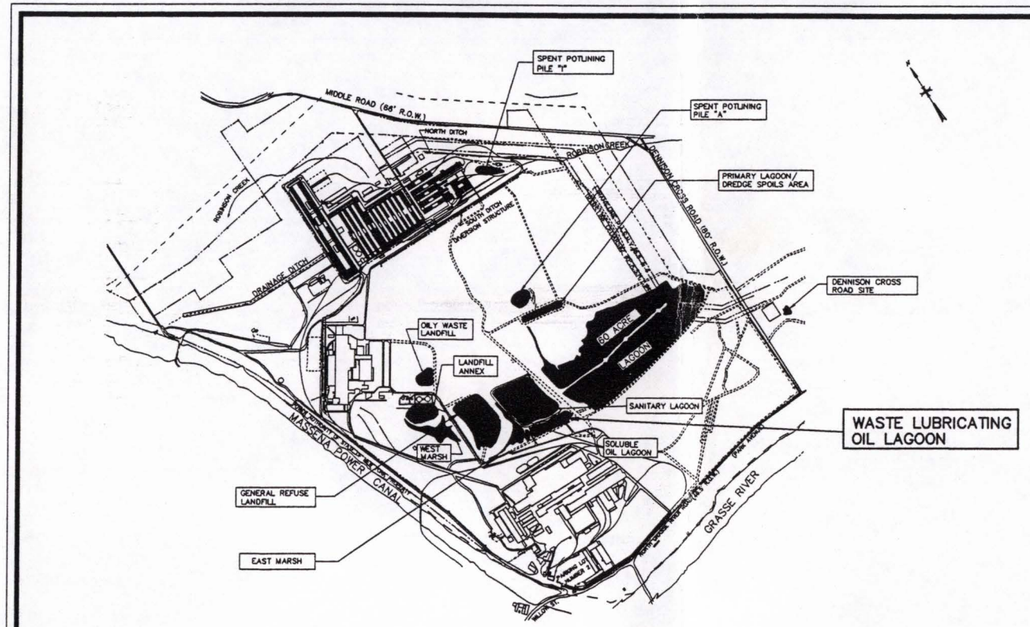
I HEREBY CERTIFY THAT THE REMEDIAL PROGRAM, AS ILLUSTRATED HERE ON THE RECORD DRAWINGS WAS COMPLETED IN ACCORDANCE WITH THE APPROVED REMEDIAL DESIGN. THIS CERTIFICATION IS BASED UPON THE ENGINEER OF RECORD'S PROFESSIONAL OPINION.

SIGNATURE: Joseph E. Mihm

JOSEPH E. MIHM, P.E.
ENGINEER OF RECORD
CAMP DRESSER & MCKEE

DATE: 1/30/98

STATE OF NEW YORK · JOSEPH E. MIHM · 061854-1 · LICENSED PROFESSIONAL ENGINEER



LOCATION PLAN

1500 0 1500 3000
SCALE IN FEET

DRAWING INDEX

DRAWING NO.	DRAWING TITLE
B-137707-JM	GENERAL NOTES AND LEGEND
B-137708-JM	EXISTING CONDITIONS PLAN
B-137709-JM	EXISTING CONDITIONS CROSS-SECTIONS A-A, B-B
B-137710-JM	SHALLOW GROUNDWATER CONTOUR PLAN
B-137711-JM	EXCAVATION AND INSTRUMENTATION PLAN
B-137712-JM	INTERIM GRADING PLAN
B-137713-JM	CROSS SECTION A-A
B-137714-JM	MISCELLANEOUS DETAILS

CAMP DRESSER & McKEE

DECEMBER 12, 1997

(REVISED JANUARY 30, 1998)

MASSENA, NEW YORK

environmental engineers, scientists, planners, & management consultants

CDM

DRAWING: WLOILCVSH

B-137707-JM

GENERAL NOTES

1.0 EXISTING CONDITIONS PLAN

1.1 ELEVATIONS SHOWN ARE BASED ON UNITED STATES LAKE SURVEY (USLS) DATUM.

1.2 HORIZONTAL COORDINATES ARE BASED ON ALCOA MASSENA OPERATIONS PLANT DATUM. NORTH ARROW INDICATES PLANT NORTH.

1.3 TOPOGRAPHY OF THE AREA SHOWN ON EXISTING CONDITIONS PLAN (DRAWING NO. B-137708-JM) IS BASED ON A 1987 AERIAL SURVEY (4/20/87), AERIAL SURVEY SHEET NO. 9. EAST MARSH GRADES BASED ON MORRISON KNUDSEN SURVEYING DATA OCTOBER 1994.

1.4 UTILITY LOCATIONS ARE APPROXIMATE AND WERE COMPILED BASED ON BEST AVAILABLE INFORMATION.

1.5 EXISTING CONDITIONS AND UTILITIES ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE THE START OF CONSTRUCTION. THE CONTRACTOR SHALL INFORM THE ENGINEER BEFORE CONSTRUCTION BEGINS OF ANY DIFFERING SITE CONDITIONS TO THOSE SHOWN ON THE DRAWINGS.

2.0 SUBSURFACE DATA

2.1 LOGS OF ALL AVAILABLE SUBSURFACE DATA FOR ALL SOIL BORINGS AND MONITORING WELLS (INCLUDING WELL SCHEMATICS) WERE COMPILED FOR THE WASTE LUBRICATING OIL LAGOON SITE, AND ARE PRESENTED IN THE APPENDICES OF THE FINAL DESIGN SUBMITTAL.

2.2 GROUNDWATER ELEVATIONS SHOWN ON DRAWING B-137710-JM, WERE MEASURED BETWEEN 11/28/95 AND 11/30/95, EXCEPT WHERE NOTED. THESE ELEVATIONS MAY NOT BE REPRESENTATIVE OF LONG TERM GROUNDWATER ELEVATIONS OR GROUNDWATER LEVELS AT THE TIME OF CONSTRUCTION.

3.0 GENERAL CONSTRUCTION SEQUENCING

3.1 EXCAVATION SHALL BE SEQUENCED TO PREVENT WASTE MATERIAL AND CONTAMINATED SOIL FROM EXPOSURE TO THE ENVIRONMENT AND TO MINIMIZE EMISSION OF DUST, DISTURBANCE OF THE EXISTING TOPSOIL OUTSIDE PROPOSED WORK AREAS, AND CONTACT OF EXPOSED WASTE MATERIAL OR CONTAMINATED SOIL WITH PRECIPITATION AND RUNOFF.

3.2 THE ENGINEER HAS BASED THE REMEDIAL DESIGN OF THE WASTE LUBRICATING OIL LAGOON ON THE FOLLOWING GENERAL CONSTRUCTION SEQUENCING. THIS SEQUENCE IS PROVIDED FOR THE CONTRACTOR'S INFORMATION AND DOES NOT PRECLUDE THE CONTRACTOR FROM MODIFYING THE CONSTRUCTION SEQUENCE TO COMPLETE THE WORK BASED ON THE CONTRACTOR'S MEANS AND METHODS.

3.3 ABANDONED UTILITIES SHALL BE REMOVED SO AS NOT TO IMPEDE EXCAVATION ACTIVITIES.

3.4 8-INCH GAS LINE RELOCATION WILL BE PERFORMED BY OTHERS AT ALCOA'S DIRECTION.

3.5 ESTABLISH ENVIRONMENTAL CONTROLS IN THE FIELD BASED ON THE CONTRACTOR'S NYSDEC APPROVED CONSTRUCTION WORK PLAN.

3.6 ESTABLISH EXCLUSION ZONES AS PER THE CONTRACTOR'S CONSTRUCTION HEALTH AND SAFETY PLAN PRIOR TO THE START OF THE CONSTRUCTION ACTIVITIES.

3.7 CLEARLY MARK ALL EXISTING MONITORING WELLS IN THE AREA OF THE WASTE LUBRICATING OIL LAGOON AND PROTECT THEM FROM DAMAGE DURING CONSTRUCTION.

3.8 REMOVE MONITORING WELLS DESIGNATED TO BE ABANDONED AS DEPICTED ON SHEET B-137708-JM IN ACCORDANCE WITH THE SITEWIDE QAPP PROCEDURES (REMOVAL WILL BE PERFORMED BY ATL).

3.9 DRAIN THE EAST AND WEST CELLS OF THE SOLUBLE OIL LAGOON TO THE TOP OF SLUDGE. WATER TO BE TREATED IN BUILDING 79 BY THE OWNER.

3.10 INSTALL INCLINOMETERS AND CHECK PLATES IN LOCATIONS SHOWN ON DRAWING B-137711-JM.

3.11 SURVEY CHECK PLATES AS SHOWN ON DRAWING B-137711-JM A MINIMUM OF TWICE A WEEK.

3.12 STOCKPILED CAP MATERIAL (TOPSOIL AND CLAY) WAS DISPOSED OF IN CELL 2 OF THE SECURE LANDFILL. CAP SAND WAS USED AS A BULKING AGENT AT WASTE LUBRICATING OIL LAGOON.

3.13 EXCAVATE SOLIDIFIED WASTE AND TRANSPORT TO CELL 2 OF THE SECURE LANDFILL. MATERIALS NOT MEETING SECURE LANDFILL STRENGTH REQUIREMENTS WILL BE BULKED WITH COARSER MATERIALS WITHIN THE WASTE LUBRICATING OIL LAGOON OR SOLIDIFIED WITH CEMENT AS NECESSARY.

3.14 IF FIELD CONDITIONS WARRANT, EXCAVATE ADDITIONAL SOILS IN THE VICINITY OF BORINGS B-094 AND B-452 AS NOTED ON DRAWING B-137711-JM.

3.15 EXCAVATE A MINIMUM OF 9" OF MATERIAL FROM THE ORIGINAL SURFACE OF THE TOP OF THE NORTH AND SOUTH DIKES AND A PORTION OF THE WEST DIKES. DISPOSE OF IN CELL 2 OF THE SECURE LANDFILL.

3.16 EXCAVATE A MINIMUM OF 2' OF MATERIAL FROM THE NORTH RAILROAD DITCH. DISPOSE OF IN CELL 2 OF THE SECURE LANDFILL.

3.17 RELOCATE A PORTION OF THE SLUDGE IN THE EAST CELL OF THE SOLUBLE OIL LAGOON. THE CONTRACTOR WILL INSTALL A SUMP IN THE EAST CELL AND MAINTAIN THE EAST CELL IN A DEWATERED CONDITION. AFTER CONSOLIDATING THE SLUDGE MATERIAL WITHIN THE SOIL PLACE A HDPE COVER OVER THE SOIL SLUDGE TO SEGREGATE CLEAN STORMWATER FROM THE EAST CELL SUMP.

3.18 MAINTAIN ACCESS TO THE BOTTOM OF THE EXCAVATION AND ASSIST ENGINEERING IN PERFORMING POST-EXCAVATION CLEANUP VERIFICATION SAMPLING. EXCAVATE ADDITIONAL CONTAMINATED SOILS AS REQUIRED BY TESTING RESULTS AND AS DIRECTED BY THE ENGINEER. PLACE EXCAVATED MATERIAL IN CELL 2 OF THE SECURE LANDFILL.

3.19 CONSTRUCT A SEEPAGE BARRIER ON THE WEST, NORTH, AND EAST SLOPES. CONSISTING OF GCL AND SELECT FILL MATERIAL AS DETAILED ON DRAWING B-137714-JM.

3.20 INSTALL UNDERDRAIN PIPING SYSTEM AND UNDERDRAIN SUMP AS DETAILED ON DRAWING B-137714-JM.

3.21 INSTALL AN INTERIM COVER OVER THE EXCAVATED AREA AS SHOWN ON DRAWING B-137712-JM AND DETAILED ON DRAWING B-137714-JM.

3.22 COMPLETE FINISH SITE WORK, INCLUDING EXCESS MATERIAL DISPOSAL, GRADING, PLACEMENT OF TEMPORARY PLASTIC SHEETING.

3.23 MAINTAIN ENVIRONMENTAL CONTROLS IN ACCORDANCE WITH THE APPROVED CONSTRUCTION WORK PLAN.

4.0 INTERIM COVER CONSTRUCTION

4.1 THE INTERIM COVER COMPONENTS FOR THE WASTE LUBRICATING OIL LAGOON SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS AND IN CONFORMANCE WITH THE TECHNICAL SPECIFICATIONS AND THE MANUFACTURER'S RECOMMENDATION.

4.2 THE INTERIM COVER SHALL BE PLACED TO THE LIMITS SHOWN ON THE DRAWINGS.

4.3 THE INTERIM COVER SHALL BE USED AS A TEMPORARY COVER. FINAL GRADING/CAPPING WILL BE PERFORMED DURING THE REMEDIATION OF THE SOLUBLE OIL LAGOON.

5.0 ENVIRONMENTAL CONTROLS

5.1 THE CONTRACTOR SHALL SUBMIT AN ENVIRONMENTAL CONTROL PLAN WHICH SHALL ADDRESS EROSION AND SEDIMENTATION CONTROL, POTENTIAL SPILL CONTROL, CONTROL OF CONTAMINATED STORMWATER, CONTROL OF ODORS DURING CONSTRUCTION AND CONTROL OF POTENTIALLY CONTAMINATED GROUNDWATER DURING CONSTRUCTION.

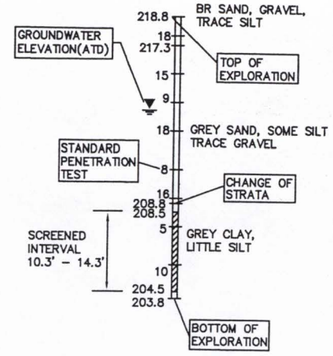
5.2 THE CONTRACTOR SHALL MAINTAIN ENVIRONMENTAL CONTROLS IN ACCORDANCE WITH THE APPROVED CONSTRUCTION WORK PLAN.

6.0 RECORD DRAWINGS

6.1 RECORD DRAWING INFORMATION BASED ON SURVEY DATA PROVIDED BY MORRISON KNUDSEN.

LEGEND

- B-321 — EXISTING SOIL BORING LOCATION
- MW-015 — EXISTING MONITORING WELL
- AH-092 — EXISTING HAND AUGER EXPLORATION LOCATION
- TP-155 — EXISTING TEST PIT LOCATION
- SOL-FLD-01 — EXISTING FIELD SAMPLE
- SG-003 — STAFF GAUGE
- MW-015 — MONITORING WELL TO BE ABANDONED
- PR-108 — ROAD SAMPLE (PLANT ROAD SAMPLING PROGRAM)
- PRS-023 — DITCH SAMPLE (PLANT ROAD SAMPLING PROGRAM)
- —228— — APPROXIMATE EXCAVATION CONTOUR
- 232 — EXISTING CONTOUR
- 270 — PROPOSED CONTOUR
- EDGE OF LAGOON WATER
- SPOT ELEVATION
- BENCH MARK
- SWAMP
- 3 — REVISION CLOUD
- G — GAS LINE
- S — SANITARY SEWER LINE
- P — PROCESS LINE
- OVERHEAD PIPE RACK
- 6" HDPE PERFORATED UNDERDRAIN
- PLANT ROADWAY
- 480V OR 115KV ELECTRICAL POLES
- 218 — GROUNDWATER CONTOUR
- ESTIMATED GROUNDWATER CONTOUR



RECORD DRAWING
By: Bowtm Date: 12/12/97
CAMP DRESSER & McKEE

CAMP DRESSER & McKEE
Ten Cambridge Center
Cambridge, Massachusetts 02142
environmental engineers, scientists, planners, & management consultants
CDM

12	DEC	97	06	REVISED FOR RECORD		DB	LS	
10	JUN	97	05	6/3/97 DEC COMMENTS		DB	JS	
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21	MAR	97	03	RESPONSE TO DEC COMM.		MZ	JS	
09	AUG	96	02	FINAL DESIGN SUBMITTAL		MZ	SA	
28	JUN	96	01	PRELIMINARY DESIGN SUBMITTAL		MZ	SA	
	APR	96	00	ORIGINAL DRAWING DATE		MZ	SA	
DAY	MONTH	YEAR	NO.	REVISION RECORD		DR.	CK.	ZONE

ALUMINUM COMPANY OF AMERICA
MASSENA OPERATIONS

BLDG. NO. YARD
ENVIR
WASTE LUBRICATING OIL LAGOON
GENERAL NOTES AND LEGEND

ENGINEER: JOSEPH E. MIHM P.E.
SCALE | ORIGIN | PLANT CODE | DWG. CLASS
DESIGNED BY: J. A. S.
DRAWN BY: M. M. Z.
CHECKED BY: J. A. S.
APPROVED BY: J. E. M.
DRAWING NUMBER: B-137707-JM

B-137708-JM

GENERAL REFUSE LANDFILL

E 500

E 1000

E 1500

N 2500

N 2000

GRAVEL ACCESS ROAD

OVERHEAD TRANSFER FORCEMAIN

LIMIT OF GCL SEEPAGE BARRIER ANCHOR TRENCH

CENTRAL IMPOUNDMENT (UNDER CONSTRUCTION)

MW-025

6" CLEANOUT EL.= 230.05

6" HDPE CORR. SLOTTED PIPE INV.= 218.17

SG-009

SOUTH GROUNDWATER CONTROL TRENCH

48" CORRUGATED HDPE DISCHARGE SUMP W/SUBMERSIBLE PUMP

MW-204/ B-434

EAST MARSH

24" DISCHARGE PIPE

SG-003

B-435

MW-104

B-436

AH-107

SOLUBLE OIL LAGOON

WE 229.13 04-26-95

B-437

B-438

AH-97

AH-98

AH-99

MW-202/ B-432

MW-201/B-431

B-439

B-444

MW-200/ B-430

AH-101

AH-100

ABANDONED RAILROAD BED

24" FLARED END INLET

PIPE BRIDGE OVER ACCESS ROAD

5' DIAM. PRECAST CONC. MANHOLE W/CAST IRON FRAME AND COVER

MW-203/ B-433

ATL-12
N 1929.860
E 204.150

HEADWALL INV. 216.76

MW-046D

MW-018
MW-060

CONCRETE PAD

MW-198/ B-428

GRAVEL ACCESS ROAD

6" CLEANOUT EL.= 231.05

6" HDPE CORR. SLOTTED PIPE INV.= 218.75

B 709

MW-199/ B-429

B-533

MW-205/ B-445

REMOVED 12" CMP

TP-157

MW-106

B-450

B-451

B-441

AH-96

SOLUBLE OIL LAGOON

B-094

OW

B-091

PIPE BOLLARDS (TYP.)

A 709

B-442

WASTE LUBRICATING OIL LAGOON

B-096

B-1

B-452

B-8

B-449

B-446

TP-156

TP-158

B-095

B-090

B-453

B-448

B-447

CONCRETE RETAINING WALL

GRAVEL ACCESS ROAD

B-443

AH-106

B-534

TP-155

T4

ROAD

AH-103

NORTH RAILROAD DITCH

SOUTH RAILROAD DITCH

24" CMP

AH-102

SOL-FLD-01

SOL-FLD-02

MW-007A
MW-007
MW-102
MW-103

AH-104

REMOVED 12" CMP

MW-031

AH-105

MW-12
B-21

PLUGGED 12" SANITARY PROCESS LINE

OVERHEAD TRANSFER FORCEMAIN

AREA I INFLUENT

OIL BOOM

GRAVEL ACCESS ROAD

ATL-2
N 2334.063
E 1391.549

60 ACRE LAGOON

EXISTING 18" DIA. PROCESS FORCEMAIN

EXISTING 12" DIA. SANITARY FORCEMAIN

MW-006A

SCALE IN FEET

50 0 50 100

DATE OF PHOTOGRAPHY 4/20/87

2' CONTOUR INTERVAL

RECORD DRAWING

By: Bowen Date: 12/12/97

CAMP DRESSER & McKEE

DAY	MONTH	YEAR	NO.	REVISION RECORD	DR.	CK.	ZONE
12	DEC	97	05	REVISED FOR RECORD	DB	LS	
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28	JUN	96	01	PRELIMINARY DESIGN SUBMITTAL	MZ	SA	
	APR	96	00	ORIGINAL DRAWING DATE	MZ	SA	

CAMP DRESSER & McKEE
Ten Cambridge Center
Cambridge, Massachusetts 02142

environmental engineers, scientists, planners, & management consultants

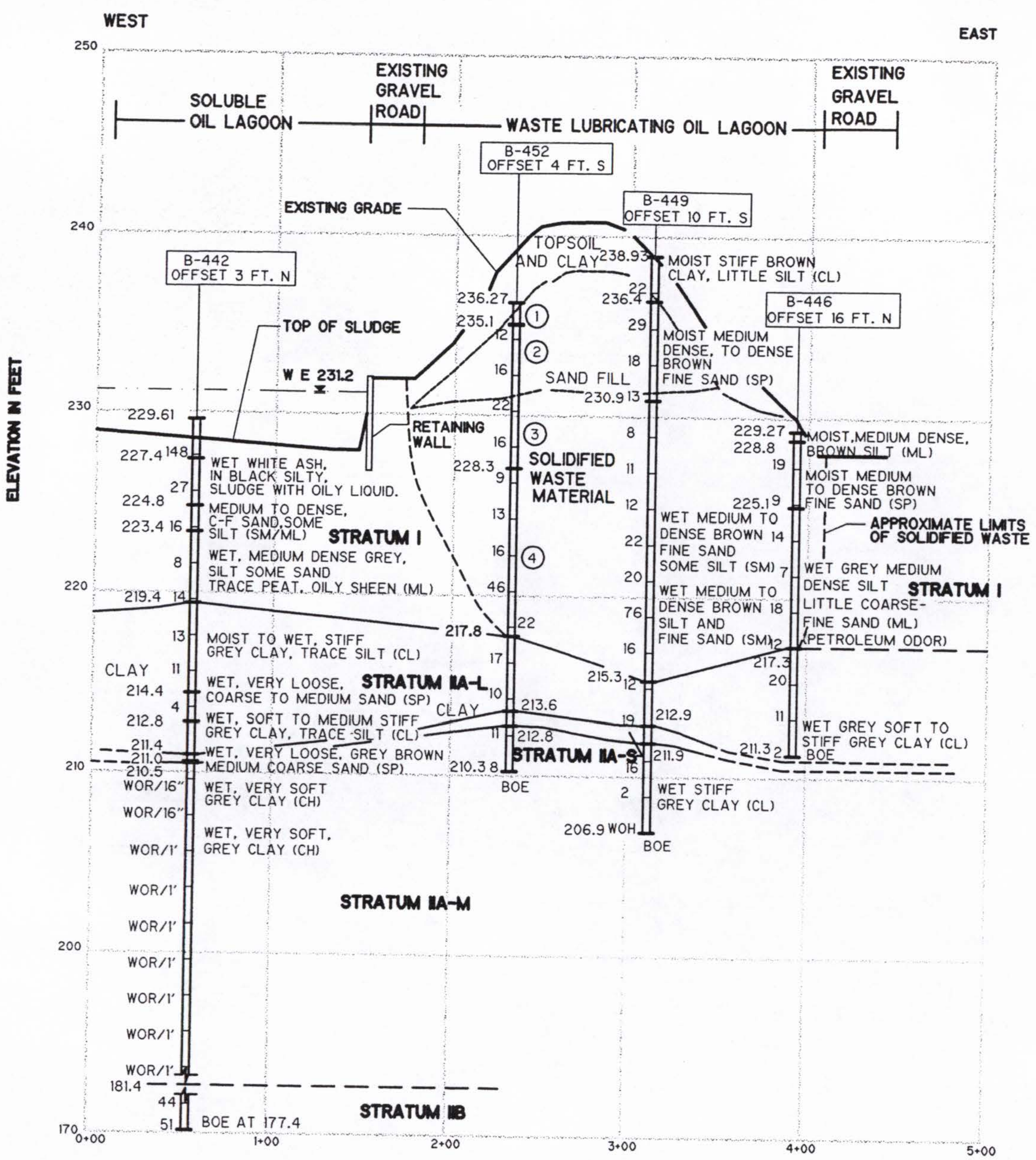
CDM

ALUMINUM COMPANY OF AMERICA
MASSENA OPERATIONS

BLDG. NO. YARD
ENVIR
WASTE LUBRICATING OIL LAGOON
EXISTING CONDITIONS PLAN

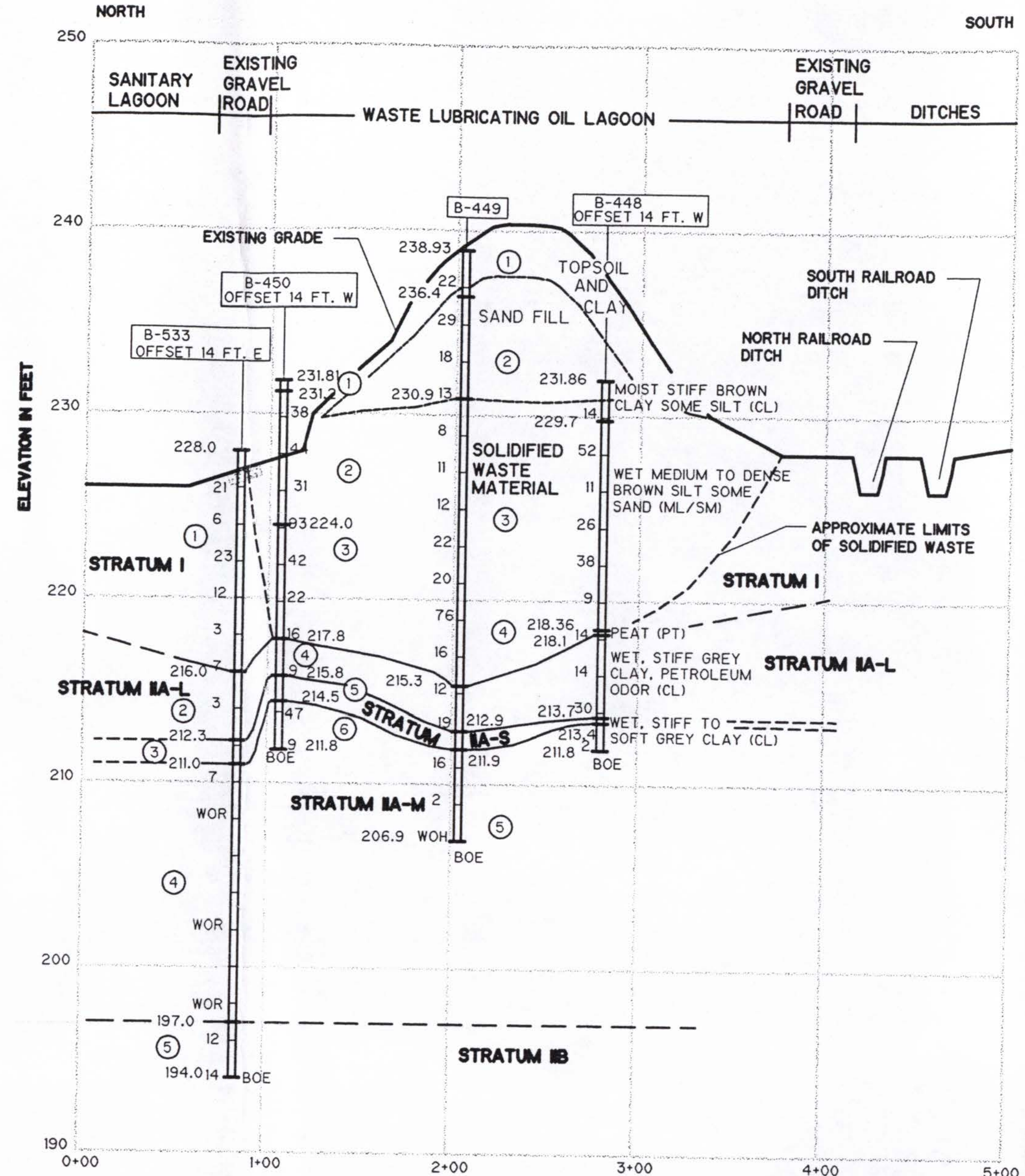
ENGINEER: JOSEPH E. MIHM, P.E.
PLANT CODE:
DESIGNED BY: J. A. S.
SCALE: AS SHOWN
ORIGIN:
DWG. CLASS:
DRAWN BY: M. M. Z.
DRAWING NUMBER: B-137708-JM
CHECKED BY: J. A. S.
APPROVED BY: J. E. M.

B-137709-JM



SECTION AA (708)

1" = 50' HOR.
1" = 5' VER.



SECTION BB (708)

H: 1" = 50'
V: 1" = 5'

B-450

1	MOIST, STIFF BROWN CLAY
2	MOIST DENSE FINE SAND (SP)
3	WET, MEDIUM DENSE SILT SOME SAND (ML) PETROLEUM, STAINING
4	WET PEAT AND STIFF GRAY CLAY (CL)
5	WET, DENSE FINE SAND (SP)
6	WET, MEDIUM STIFF GREY CLAY (CL)

B-533

1	WET MEDIUM DENSE BROWN SAND, SOME GRAVEL, AND SILT (SM)
2	WET, GREY AND BROWN CLAY, SOME SILT, LITTLE ORGANICS (OL)
3	WET, GREY CMF SAND TRACE SILT, (SW)
4	WET, VERY SOFT, GREY CLAY AND SILT (CL)
5	WET, MEDIUM DENSE, GREY FINE SAND, SOME SILT,LITTLE GRAVEL (SM)

B-452

1	MOIST, STIFF BROWN CLAY (CL)
2	MOIST MEDIUM DENSE BROWN SAND SOME SILT (SM) PETROLEUM STAINED
3	WET GREY SILT, SOME GREY SILT, COARSE FINE SAND (ML), PETROLEUM STAINED
4	WET PEAT AND STIFF GREY CLAY (CL)

B-449

1	MOIST STIFF BROWN CLAY LITTLE SILT (CL)
2	MOIST MEDIUM DENSE TO DENSE BROWN FINE SAND (SP)
3	WET MEDIUM TO DENSE BROWN FINE SAND, SOME SILT, (SM)
4	WET MEDIUM TO DENSE SILT AND FINE SAND, (SM)
5	WET STIFF GREY CLAY (CL)

50 0 50 100 HORIZ.
5 0 5 10 VERT.

RECORD DRAWING
By: Bowen Date: 12/12/97
CAMP DRESSER & McKEE

CAMP DRESSER & McKEE
Ten Cambridge Center
Cambridge, Massachusetts 02142
environmental engineers, scientists, planners, & management consultants
CDM

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28	JUN	96	01	PRELIMINARY DESIGN SUBMITTAL	MZ	SA	
	APR	96	00	ORIGINAL DRAWING DATE	MZ	SA	

ALUMINUM COMPANY OF AMERICA
MASSENA OPERATIONS

BLDG. NO. YARD
ENVIR
WASTE LUBRICATING OIL LAGOON
EXISTING CONDITIONS CROSS-SECTIONS A-A, B-B
ENGINEER JOSEPH E. MIHM, P.E.
SCALE AS SHOWN
DESIGNED BY J. A. S.
DRAWN BY M. M. Z.
CHECKED BY K. P. M.
APPROVED BY J. E. M.
DRAWING NUMBER B-137709-JM

B-137710-JM

LEACHATE COLLECTION SUMP P-105

GENERAL REFUSE LANDFILL

GROUNDWATER CONTROL TRENCH TOP OF TRENCH EL. 222.00' BOTTOM OF TRENCH EL. 216.84'

OVERHEAD TRANSFER FORCEMAIN

MW-025 (214.9)

6" HDPE PERF. UNDERDRAIN NORTH INV. EL. 213.37 SOUTH INV. EL. 215.18

6" CLEANOUT EL.= 230.05

6" HDPE CORR. SLOTTED PIPE INV.= 218.17

OUTFALL 006

SG-009

48" CORRUGATED HDPE DISCHARGE SUMP W/SUBMERSIBLE PUMP

EAST MARSH

LIMIT OF 6" PERF. UNDERDRAIN INV. EL. 217.72

SEEPAGE BARRIER TOP OF GCL EL. 226.1

24" FLARED END INLET

PIPE BRIDGE OVER ACCESS ROAD

24" DISCHARGE PIPE

PRE-CAST CONC. MANHOLE W/CAST IRON FRAME AND COVER

MW-203

ATL-12 N 1929.862 E 204.150

HEADWALL INV. 216.76

MW-046D

SANITARY LAGOON

WE 222.24 11-30-95

SOUTH GROUNDWATER CONTROL TRENCH

MW-204

MW-104 (222.2)

SG-003

SOLUBLE OIL LAGOON

WE 229.52 11-28-95

SOLUBLE OIL LAGOON

MW-202 MW-201 (225.0)

ABANDONED RAILROAD BED

MW-018 MW-060 228.0

LIMIT OF GCL SEEPAGE BARRIER ANCHOR TRENCH

6" CLEANOUT EL.= 231.05

6" HDPE CORR. SLOTTED PIPE INV.= 218.75

MW-198

MW-199

MW-205 (225.0)

MW-106 (228.1)

WASTE LUBRICATING OIL LAGOON

MW-200

NORTH RAILROAD DITCH

SOUTH RAILROAD DITCH

MW-007A (225.6)

MW-007

MW-102

MW-103

MW-031 (225.6)

MW-006A (226.2)

MW-12

OVERHEAD TRANSFER FORCEMAIN

GRAVEL ACCESS ROAD

AREA I INFLUENT

OIL BOOM

ATL-2 N 2234.563 E 139.549

60 ACRE LAGOON

WE 225.59 11-28-95

E 500 E 1000 E 1500

N 2500 N 2000

SCALE IN FEET

50 0 50 100

DATE OF PHOTOGRAPHY 4/20/87

2' CONTOUR INTERVAL

RECORD DRAWING

By: Bowen Date: 12/12/97

CAMP DRESSER & McKEE

CAMP DRESSER & McKEE

Ten Cambridge Center

Cambridge, Massachusetts 02142

environmental engineers, scientists, planners, & management consultants

CDM

NOTES:

1. GROUNDWATER LEVELS WERE MEASURED IN WELLS BETWEEN NOVEMBER 28 AND NOVEMBER 30 OF 1995.
2. ONLY WELLS SCREENED IN THE SHALLOW UNCONFINED GROUNDWATER SYSTEM ARE SHOWN.

DAY	MONTH	YEAR	NO.	REVISION RECORD	DR.	CK.	ZONE
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	APR	96	00	ORIGINAL DRAWING DATE	MZ	SA	

ALUMINUM COMPANY OF AMERICA

MASSENA OPERATIONS

BLDG. NO. YARD

ENVIR

WASTE LUBRICATING OIL LAGOON

SHALLOW GROUNDWATER CONTOUR PLAN

ENGINEER JOSEPH E. MIHM, P.E.

PLANT CODE

DESIGNED BY J. E. R.

SCALE AS SHOWN

ORIGIN

DWG. CLASS

DRAWN BY M. M. Z.

DRAWING NUMBER B-137710-JM

CHECKED BY K. K. M.

APPROVED BY J. E. M.

B-137711-JM

LIMIT OF GCL SEEPAGE BARRIER ANCHOR TRENCH

CENTRAL IMPOUNDMENT (UNDER CONSTRUCTION)

N 2174
E 1190

MATCHLINE A

MW-139/B-429

GRAVEL ACCESS ROAD

SEE NOTE 7

B-553

CP-01

IN-593/B-593

CP-08

8" GAS LINE

E 1500

INSTALL A SUMP AND MAINTAIN IN A DEWATERED CONDITION. (LOCATION TO BE DETERMINED BY CONTRACTOR)

B-441

CP-07

LIMIT OF WORK BETWEEN WLOL AND SOL SITES

SOLUBLE OIL LAGOON

SUMP DETAIL 5/714

EXTEND LIMIT OF GCL 5 FT. MIN. PAST EXCAVATION LIMIT

B-094 (211.6)

B-452

CONCRETE RETAINING WALL

C/713

B-442

RELOCATE SLUDGE TO SOIL INTERFACE. CONSOLIDATE SLUDGES WITHIN THE CONFINES OF THE SOL.

IN-596/B-596

30' MIN.

N 2000

UNDERDRAIN 6/714

INV. = 209.27

INV. = 209.66

REMOVE & DISPOSE OF PIPE BOLLARDS IN CELL 2 OF THE SLF

SUMP

B-443

CP-06

B-534

NORTH RAILROAD DITCH

ABANDONED RAILROAD BED

SOUTH RAILROAD DITCH

CLAY EARTHERN BERM

5'

N 1873
E 1176

APPROXIMATE HORIZONTAL LIMIT OF CONTAMINATION

LIMIT OF EXCAVATION

CP-05

IN-595/B-595

CP-04

GRAVEL ACCESS ROAD

SEE NOTE 7

MW-031

MW-007A
MW-007
MW-102
MW-103

SCALE IN FEET
20 0 20 40

DATE OF PHOTOGRAPHY 4/20/87
2' CONTOUR INTERVAL

LIMIT OF GCL SEEPAGE BARRIER

CP-03

CHECK PLATE 1/714

INCLINOMETER 2/714

IN-594/B-594

EXISTING 12" DIA. SANITARY FORCE MAIN

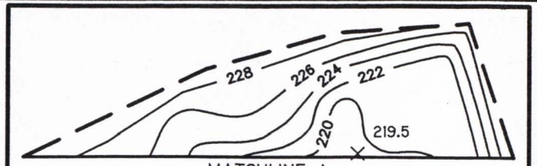
ANCHOR TRENCH NOT REQUIRED FOR EAST BERM

CP-02

EXISTING 18" DIA. PROCESS FORCE MAIN

PLUGGED 12" SANITARY PROCESS LINE

60 ACRE LAGOON



MATCHLINE A

NORTHERN TOP OF DIKE EXCAVATION EXTENTION

PROPOSED ADDITIONAL EXCAVATION LOCATIONS

BORING	COORDINATE NORTHING (ft.)	COORDINATE EASTING (ft.)	SAMPLE NUMBER	SAMPLE ELEVATIONS (ft.)
B-094	2085.0	1230.0	S-13	213.6 – 211.6
B-452	2027.9	1228.4	S-11	216.3 – 214.3

NOTES:

1. UNDERGROUND UTILITIES WILL BE FIELD VERIFIED PRIOR TO CONSTRUCTION ACTIVITIES. REMOVAL AND RELOCATION OF UNDERGROUND UTILITIES MAY BE NECESSARY TO PROCEED WITH CONSTRUCTION WORK.
2. CLEAN CAP MATERIAL WILL BE SEGREGATED FROM THE SOLIDIFIED WASTE AS DIRECTED BY THE ENGINEER. CAP MATERIAL WILL BE STOCKPILED FOR CONFIRMATORY TESTING.
3. HORIZONTAL LIMITS OF CONTAMINATION HAVE BEEN PROVIDED ON THIS PLAN BASED ON TEST PIT OBSERVANCES OF THE WASTE/SOIL INTERFACE. ACTUAL HORIZONTAL LIMITS WILL BE DETERMINED IN THE FIELD BASED ON THE TERMINATION POINT OF THE WASTE ZONE AS OBSERVED.
4. THE EXCAVATION SIDESLOPES DEPICTED ARE ESTIMATED BASED ON THE HORIZONTAL LIMITS OF THE CONTAMINATION. SAFE SLOPES AND EXCAVATION MEANS AND METHODS WILL BE PROVIDED IN THE CONTRACTOR'S WORK PLAN.
5. VERTICAL LIMITS OF EXCAVATION SHALL PROCEED TO THE WASTE/SOIL INTERFACE AS OBSERVED IN THE FIELD. THE CONTRACTOR SHALL REMOVE THE SOLIDIFIED WASTE AND UP TO 1 FOOT OF VISIBLY CONTAMINATED SOIL. CLEANUP VERIFICATION WILL THEN BE PERFORMED. THIS DRAWING DEPICTS THE WASTE/SOIL INTERFACE AS OBSERVED IN THE SOIL BORINGS.
6. SPOT ELEVATIONS SHOWN IN PARENTHESES INDICATE THE DEPTHS OF THE ADDITIONAL CONTROLLED EXCAVATIONS THAT WOULD BE PERFORMED IF FIELD CONDITIONS WARRANT. LATERAL LIMITS OF EXCAVATION TO BE DETERMINED BASED ON ADDITIONAL HAND AUGER BORING RESULTS.
7. REMOVE A MINIMUM OF 9" OF SOIL FROM THE ORIGINAL TOP OF DIKE SURFACE AND 2' OF SOIL FROM THE NORTH RAILROAD DITCH AND PERFORM CLEANUP VERIFICATION TESTING.

LEGEND:

217.4	ELEVATIONS DENOTE THE OBSERVED WASTE/SOIL INTERFACE.
(217.4)	ELEVATION DENOTES THE POSSIBLE LIMIT OF ADDITIONAL EXCAVATION
⊕	INCLINOMETER LOCATION
◉	CHECK PLATE
⊗	UTILITY POLE

RECORD DRAWING
By: Bowman Date: 12/12/97
CAMP DRESSER & McKEE

CAMP DRESSER & McKEE
Ten Cambridge Center
Cambridge, Massachusetts 02142
environmental engineers, scientists, planners, & management consultants
CDM

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	APR	96	ø ø	ORIGINAL DRAWING DATE	MZ	SA	

ALUMINUM COMPANY OF AMERICA
MASSENA OPERATIONS

BLDG. NO. YARD
ENVIR
WASTE LUBRICATING OIL LAGOON
EXCAVATION AND INSTRUMENTATION PLAN

ENGINEER: JOSEPH E. MIHM, P.E.	PLANT CODE		DESIGNED BY: J. A. S.
SCALE: AS SHOWN	ORIGIN	DWG. CLASS	DRAWN BY: M. M. Z.
DRAWING NUMBER: B-137711-JM			CHECKED BY: J. A. S.
			APPROVED BY: J. E. M.

B-137712-JM

CENTRAL IMPOUNDMENT (UNDER CONSTRUCTION)

SOUTH GROUNDWATER CONTROL TRENCH

LIMIT OF GCL SEEPAGE BARRIER ANCHOR TRENCH

N 2174
E 1190

E 1000

E 1500

MW-198/ B-428

MW-199/ B-429

GRAVEL ACCESS ROAD

IN-593/B-593

8" GAS LINE

60 ACRE LAGOON

EXISTING 12" DIA. SANITARY FORCEMAIN

EXISTING 18" DIA. PROCESS FORCEMAIN

SOLUBLE OIL LAGOON

WE 229.13
04-26-95

UNDERDRAIN SUMP

LIMIT OF WORK SITE

C 713

CONCRETE RETAINING WALL

IN-596/B-596

IN-594/B-594

MW-008A

N 2000

UNDERDRAIN

EARTHERN BERM (6" MIN. HEIGHT)

LIMIT OF TEMPORARY PLASTIC COVER

PLUGGED 12" SANITARY PROCESS LINE

NORTH RAILROAD DITCH

ABANDONED RAILROAD BED

SOUTH RAILROAD DITCH

IN-595/B-595

MW-031

MW-007A
MW-007
MW-102
MW-103

SCALE IN FEET
20 0 20 40

DATE OF PHOTOGRAPHY 4/20/87
2' CONTOUR INTERVAL

CAMP DRESSER & McKEE
Ten Cambridge Center
Cambridge, Massachusetts 02142

environmental engineers, scientists, planners, & management consultants

CDM

RECORD DRAWING
By: Bowen Date: 12/12/97
CAMP DRESSER & McKEE

NOTES:

1. THE INTERIM COVER SHALL BE USED AS A TEMPORARY COVER. FINAL GRADING/CAPPING WILL BE PERFORMED DURING THE REMEDIATION OF THE SOLUBLE OIL LAGOON.

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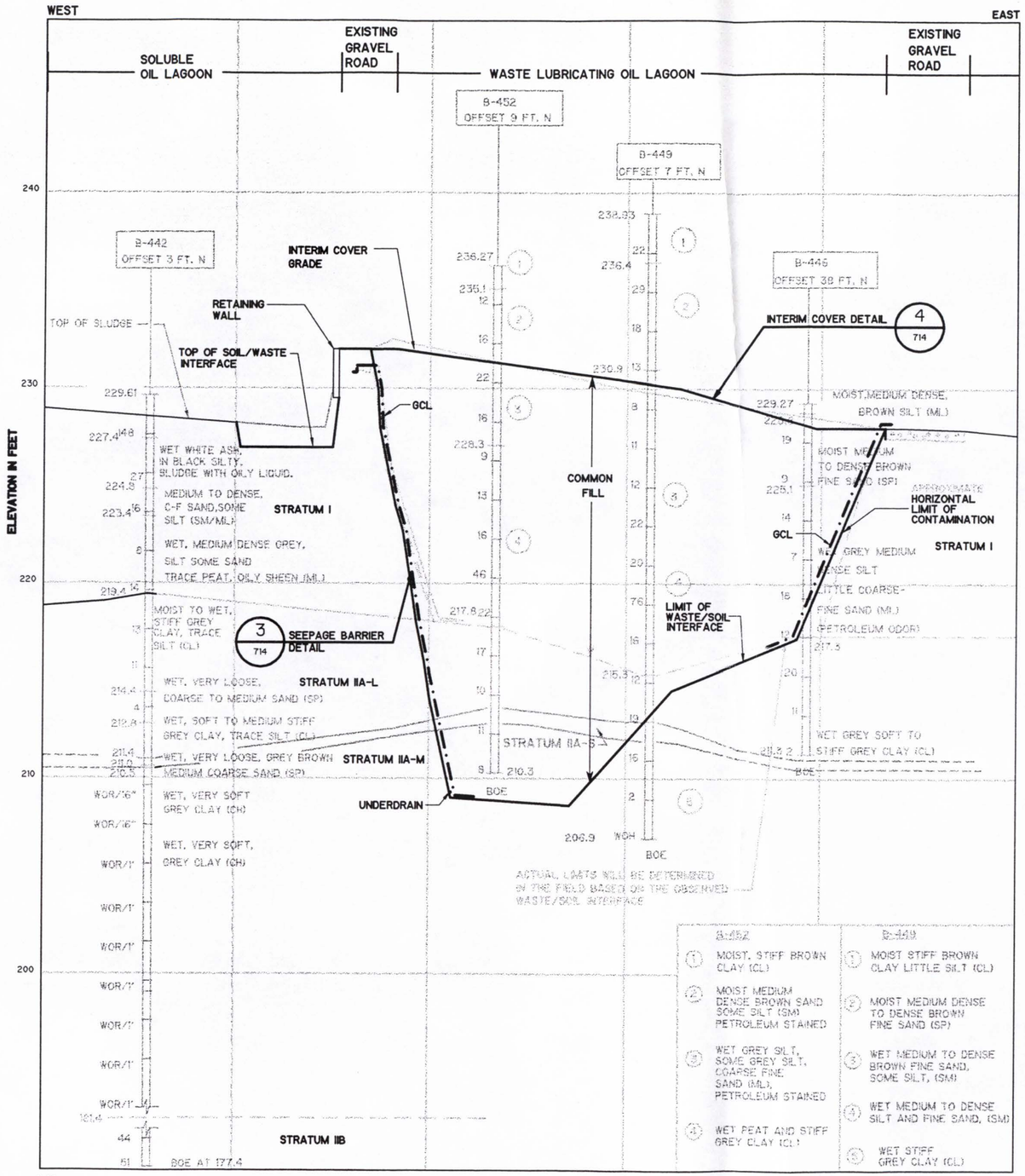
	APR	96	00	ORIGINAL DRAWING DATE	MZ	SA	

ALUMINUM COMPANY OF AMERICA
MASSENA OPERATIONS

BLDG. NO. YARD
ENVIR
WASTE LUBRICATING LAGOON
INTERIM GRADING PLAN

ENGINEER JOSEPH E. MIHM, P.E.
PLANT CODE
DESIGNED BY J. A. S.
SCALE AS SHOWN
ORIGIN
DWG. CLASS
DRAWN BY M. M. Z.
DRAWING NUMBER B-137712-JM
CHECKED BY J. A. S.
APPROVED BY J. E. M.

B-137713-JM



B-452Z	B-449
① MOIST, STIFF BROWN CLAY (CL)	① MOIST STIFF BROWN CLAY LITTLE SILT (CL)
② MOIST MEDIUM DENSE BROWN SAND SOME SILT (SM) PETROLEUM STAINED	② MOIST MEDIUM DENSE TO DENSE BROWN FINE SAND (SP)
③ WET GREY SILT, SOME GREY SILT, COARSE FINE SAND (ML), PETROLEUM STAINED	③ WET MEDIUM TO DENSE BROWN FINE SAND, SOME SILT, (SM)
④ WET PEAT AND STIFF GREY CLAY (CL)	④ WET MEDIUM TO DENSE SILT AND FINE SAND, (SM)
	⑤ WET STIFF GREY CLAY (CL)

SECTION
1" = 50' HOR.
1" = 5' VER.

CC 711/712

100 0 100 200 HORIZ.
10 0 10 20 VERT.

RECORD DRAWING
By: Bowen Date: 12/12/97
CAMP DRESSER & McKEE

CAMP DRESSER & McKEE
Ten Cambridge Center
Cambridge, Massachusetts 02142
environmental engineers, scientists, planners, & management consultants
CDM

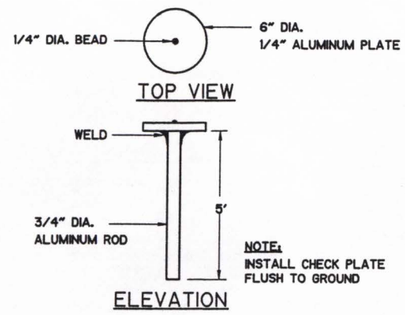
DAY	MONTH	YEAR	NO.	REVISION RECORD	DR.	CK.	ZONE
12	DEC	97	05	REVISED FOR RECORD	DB	LS	
28	MAY	97	04	5/9/97 DEC COMMENTS	DB	JS	
21	MAR	97	03	RESPONSE TO DEC COMM.	MZ	JS	
27	AUG	96	02	FINAL DESIGN SUBMITTAL	MZ	SA	
28	JUN	96	01	PRELIMINARY DESIGN SUBMITTAL	MZ	SA	
	APR	96	ØØ	ORIGINAL DRAWING DATE	MZ	SA	

ALUMINUM COMPANY OF AMERICA
MASSENA OPERATIONS

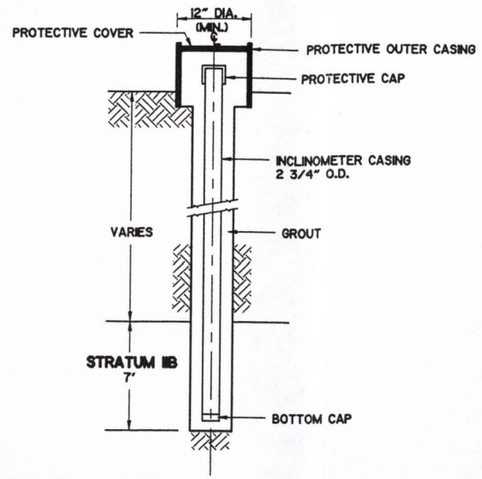
BLDG. NO. YARD
ENVIR
WASTE LUBRICATING OIL LAGOON
CROSS SECTION A-A

ENGINEER: JOSEPH E. MIHM, P. E.	PLANT CODE	DESIGNED BY: J. A. S.	
SCALE: AS SHOWN	ORIGIN	DWG. CLASS	DRAWN BY: M. M. Z.
DRAWING NUMBER: B-137713-JM			CHECKED BY: J. A. S.
			APPROVED BY: J. E. M.

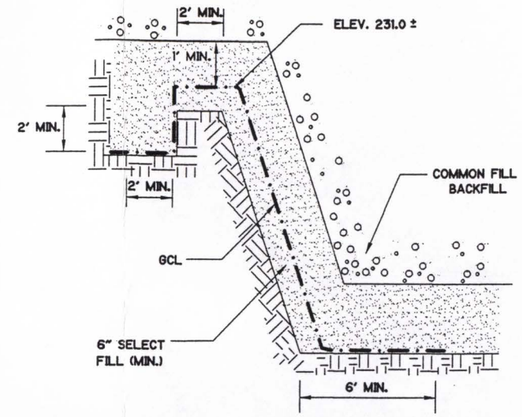
B-137714-JM



CHECK PLATE DETAIL — 1 / 711
N. T. S.



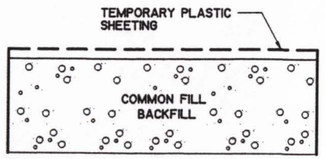
INCLINOMETER INSTALLATION DETAIL (TYP.) — 2 / 711
N. T. S.



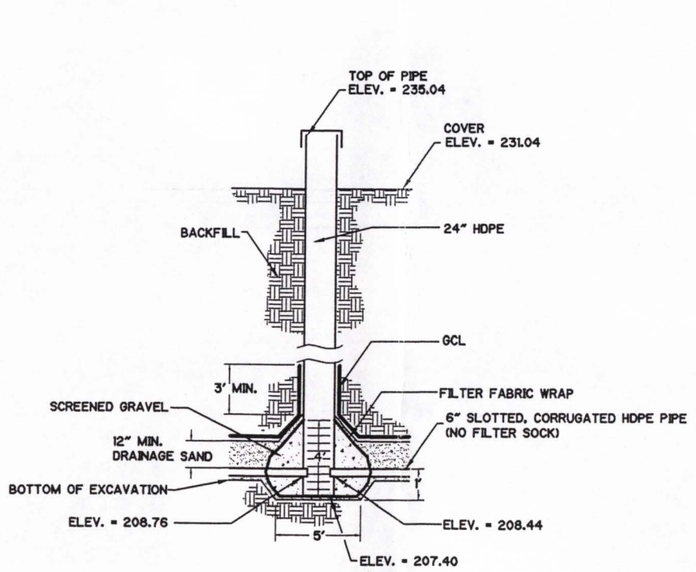
SEEPAGE BARRIER DETAIL — 3 / 713
N. T. S.

NOTE:

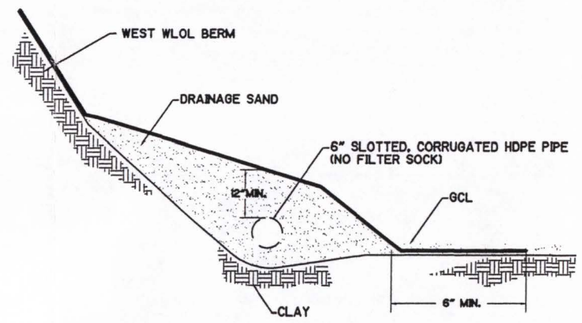
1. ANCHOR TRENCH WAS NOT REQUIRED FOR THE NORTHEAST AND EAST BERMS AS SHOWN IN PLAN VIEW ON DRAWING B-137711-JM.



INTERIM COVER — 4 / 713
N. T. S.



UNDERDRAIN SUMP DETAIL — 5 / 711
N. T. S.



UNDERDRAIN DETAIL (TYP.) — 6 / 711
N. T. S.

RECORD DRAWING
By Bowen Date: 1/30/98
CAMP DRESSER & McKEE

CAMP DRESSER & McKEE
Ten Cambridge Center
Cambridge, Massachusetts 02142
environmental engineers, scientists, planners, & management consultants
CDM

DAY	MONTH	YEAR	NO.	REVISION RECORD	DR.	CK.	ZONE
30	JAN	98	02	REVISED PER DEC COMMENTS	DB	LS	
12	DEC	97	01	REVISED FOR RECORD	DB	LS	
07	OCT	97	00	ORIGINAL DRAWING DATE	DB	LS	

ALUMINUM COMPANY OF AMERICA
MASSENA OPERATIONS

BLDG. NO. YARD
ENVIR
WASTE LUBRICATING OIL LAGOON
MISCELLANEOUS DETAILS

ENGINEER: JOSEPH E. MIHM, P. E. — PLANT CODE — DESIGNED BY: J. A. S.
SCALE: AS SHOWN — ORIGIN — DWG. CLASS — DRAWN BY: D.R.B.
DRAWING NUMBER: B-137714-JM — CHECKED BY: L.A.S.
APPROVED BY: J. E. M.